



**DIE ALTERNATIVE**  
The alternative  
L'alternative  
L'alternativa

# RatioLine®

 **Ihr Vorteil:**  
**RatioLine®**

Mit der neuen Marketingstrategie **RatioLine®** konnten wir bei WEXO® die drei wichtigsten Forderungen unserer Kunden in idealer Weise vereinen.

**Preis:**

Die Fertigung ausgewählter und bewährter Werkzeuge in großen Stückzahlen, auf hochmodernen Präzisions-Schleifmaschinen, führt zu einer deutlichen Steigerung der Produktivität. Der mit der Produktivitätssteigerung verbundene Preisvorteil wird in vollem Umfang an die Kunden der neuen **RatioLine®** weitergegeben.

**Qualität:**

Durch den Einsatz ausgewählter Schneidstoffe mit auf die Anwendung hin optimierter Oberflächenveredelungen, die Fertigung auf hochmodernen Präzisions-Schleifmaschinen und durchgängigen Kontrollmechanismen ist die neue **RatioLine®** ein Beweis für gelebte Qualität **Made by WEXO®**.

**Verfügbarkeit:**

Ein Höchstmaß an Verfügbarkeit wird durch die Fertigung großer Lose unserer **RatioLine®**-Werkzeuge erreicht. Prüfen Sie uns! Bestellen Sie noch heute per Telefon, Fax oder E-Mail und Sie können schon morgen mit den Werkzeugen der **RatioLine®** Ihre Fertigung rationalisieren.

 **Your benefit:**  
**RatioLine®**

Our new marketing strategy **RatioLine®** has enabled us to unify our customers' three key purchasing criteria.

**Price:**

The production of tools in large quantities using state-of-the-art precision grinding


machines has greatly increased our productivity, a benefit we are passing on to our customers' manufacturing processes in the form of competitive pricing.

**Quality:**

The use of selected cutting material with an application-specific surface finish, the production using state-of-the-art grinding machines, and end-to-end total quality control, demonstrate that **RatioLine®** is quality **Made by WEXO®**.

**Availability:**

Availability is guaranteed by manufacturing in large batches, thereby maximising flexibility for our customers. Try WEXO® today and order by telephone, fax or email and tomorrow you will be in a position to rationalise your manufacturing processes using **RatioLine®** tools.

 **Vos avantages:**  
**RatioLine®**

Avec la nouvelle stratégie de marketing, WEXO® a pu unir 3 exigences de notre clientèle.

**Prix:**

La production de masse sur des machines ultramodernes et précises permet une nette amélioration de la productivité. Vous profitez complètement de cet avantage de prix obtenu grâce à ces critères.


**Qualité:**

En utilisant des matières premières spécifiques et des revêtements optimisés, des machines ultramodernes et des mécanismes de contrôle permanents, la nouvelle **RatioLine®** prouve la qualité connue **Made by WEXO®**.

**Disponibilité:**

Nous vous garantissons un maximum de disponibilité grâce à nos lots de production

importants de notre gamme **RatioLine®**. Passez encore aujourd'hui votre commande soit par téléphone, fax ou courrier électronique et dès demain vous rationalisez votre production avec nos outils de la **RatioLine®**.

 **Il Vostro Vantaggio:**  
**RatioLine®**

La nostra nuova strategia di marketing **RatioLine®** consente ai ns. clienti di unificare tre criteri di acquisto.

**Prezzo:**

la produzione di utensili in grandi quantità, utilizzando rettifiche moderne, ha notevolmente incrementato la produttività e questo vantaggio noi lo passiamo ai nostri clienti sotto forma di prezzo competitivo.

**Qualità:**





















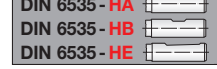







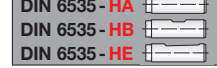







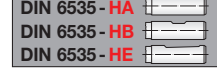







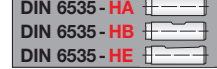







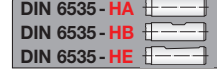


L'uso di materiali da taglio selezionati con finiture superficiali specifiche, macchine moderne e un controllo minuzioso, ci fanno affermare che la **RatioLine®** e' qualità **MADE by WEXO®**.

**Diponibilita':**

La disponibilita' e' garantita dal fatto che gli utensili vengono prodotti in grandi lotti e consentono ai nostri clienti la massima flessibilita'. Prova WEXO® oggi, ordina al telefono, via fax o via e-mail ai nostri rivenditori e domani ti renderai conto di come potrai razionalizzare i tuoi processi produttivi utilizzando gli utensili **RatioLine®**.

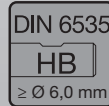
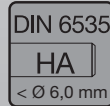
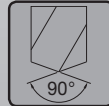
**Allgemeine Geschäftsbedingungen**  
**General sales conditions**  
**Conditions générales de vente**  
**Condizioni generali di vendita:**  
<http://www.wexo.com>



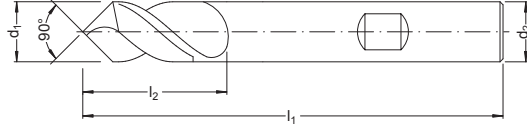
|  |  |
|--|--|
| <b>NCA90-HM / 15 / NCA90TA-HM / 15</b>   | 4  |
| NC-Anbohrer<br>NC-Foret à pointer<br>NC-Spotting drill<br>NC-Punte da centro   |  |
|         |   |
| <b>NCA142-HM / 15 / NCA142TA-HM / 15</b>   | 6  |
| NC-Anbohrer<br>NC-Foret à pointer<br>NC-Spotting drill<br>NC-Punte da centro   |  |
|         |   |
| <b>S3DTA-HM</b>  | 8  |
| VHM Hochleistungsbohrer<br>Foret en carbure monobloc à haute performance<br>Solid Carbide High Performance Twist Drill<br>Punte ad alta prestazione in MDI   |  |
|                      |    |
| <b>S3DIKTA-HM</b>  | 10   |
| VHM Hochleistungsbohrer<br>Foret en carbure monobloc à haute performance<br>Solid Carbide High Performance Twist Drill<br>Punte ad alta prestazione in MDI   |  |
|                      |    |
| <b>S5DIKTA-HM</b>  | 12   |
| VHM Hochleistungsbohrer<br>Foret en carbure monobloc à haute performance<br>Solid Carbide High Performance Twist Drill<br>Punte ad alta prestazione in MDI   |  |
|        |  |
| <b>S8DIKTA-HM</b>  | 14   |
| VHM Hochleistungsbohrer<br>Foret en carbure monobloc à haute performance<br>Solid Carbide High Performance Twist Drill<br>Punte ad alta prestazione in MDI   |  |
|        |  |
| <b>S12DIKTA-HM</b>   | 16   |
| VHM Hochleistungsbohrer<br>Foret en carbure monobloc à haute performance<br>Solid Carbide High Performance Twist Drill<br>Punte ad alta prestazione in MDI   |  |
|        |  |
|  Werkstoffgruppe<br>Classification of work materials<br>Groupe de matières<br>Gruppo materiali   | 18   |
| Kurzzeichenerklärung<br>Explanation of symbols<br>Explication des symboles<br>Spiegazione dei simboli  | 26   |

**NC-Anbohrer**  
**NC-Foret à pointer**

**NC-Spotting drill**  
**NC-Punte da centro**



$d_1 = h6$   
 $d_2 = h6$



**VHM**

| Katalog-Nr. / Rabattgruppe<br>No. of catalogue / Discount group<br>No. de catalogue / Groupe de remise<br>Nr. di catalogo / Gruppo sconto |               |               |               | <b>NCA90-HM / 15</b> |        | Katalog-Nr. / Rabattgruppe<br>No. of catalogue / Discount group<br>No. de catalogue / Groupe de remise<br>Nr. di catalogo / Gruppo sconto |               |               |               | <b>NCA90TA-HM / 15</b> |        |
|---|---------------|---------------|---------------|----------------------|--------|---|---------------|---------------|---------------|------------------------|--------|
|   |               |               |               |                      |        |   |               |               |               | <b>TiAlN</b>           |        |
| $d_1$<br>[mm]   | $l_2$<br>[mm] | $l_1$<br>[mm] | $d_2$<br>[mm] | Code<br>             | €      | $d_1$<br>[mm]   | $l_2$<br>[mm] | $l_1$<br>[mm] | $d_2$<br>[mm] | Code<br>               | €      |
| 3,0   | 8             | 35            | 3,0           | 680 001              | 6,60   | 3,0   | 8             | 35            | 3,0           | 685 001                | 10,50  |
| 4,0   | 10            | 40            | 4,0           | 680 002              | 8,00   | 4,0   | 10            | 40            | 4,0           | 685 002                | 12,00  |
| 6,0   | 16            | 50            | 6,0           | 680 004              | 18,75  | 6,0   | 16            | 50            | 6,0           | 685 004                | 22,75  |
| 8,0   | 23            | 60            | 8,0           | 680 005              | 24,50  | 8,0   | 23            | 60            | 8,0           | 685 005                | 29,50  |
| 10,0  | 24            | 70            | 10,0          | 680 006              | 36,00  | 10,0  | 24            | 70            | 10,0          | 685 006                | 42,00  |
| 12,0  | 25            | 70            | 12,0          | 680 007              | 48,50  | 12,0  | 25            | 70            | 12,0          | 685 007                | 56,00  |
| 16,0  | 30            | 80            | 16,0          | 680 008              | 88,00  | 16,0  | 30            | 80            | 16,0          | 685 008                | 99,00  |
| 20,0  | 35            | 100           | 20,0          | 680 009              | 152,00 | 20,0  | 35            | 100           | 20,0          | 685 009                | 170,00 |

**Schnittdatenempfehlung**  
**Paramètres de coupe**
**Recommended cutting data**  
**Parametri di taglio**

## NCA90-HM

**Typ UNI**


| MAT               | 1.1                  |         | 1.2.3                |         | 1.2.2 + 1.2.4        |         | 1.2.1 + 1.3          |         | 1.4                  |         |                      |         |
|-------------------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|
|                   | 40 ~ 50 m/min        |         | 40 ~ 60 m/min        |         | 30 ~ 40 m/min        |         | 35 ~ 45 m/min        |         | <1000 N/mm²          |         | (1000~1200 N/mm²)    |         |
| $v_c$             |                      |         |                      |         |                      |         |                      |         | 30 ~ 40 m/min        |         | 20 ~ 30 m/min        |         |
| $\varnothing d_1$ | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       |
|                   | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] |
| 3                 | 4.770                | 0,12    | 5.310                | 0,12    | 3.710                | 0,12    | 4.240                | 0,09    | 3.710                | 0,09    | 2.650                | 0,09    |
| 4                 | 3.580                | 0,16    | 3.980                | 0,16    | 2.790                | 0,16    | 3.180                | 0,12    | 2.790                | 0,12    | 1.990                | 0,12    |
| 6                 | 2.390                | 0,18    | 2.650                | 0,18    | 1.860                | 0,18    | 2.120                | 0,15    | 1.860                | 0,15    | 1.330                | 0,15    |
| 8                 | 1.790                | 0,24    | 1.990                | 0,24    | 1.390                | 0,24    | 1.590                | 0,20    | 1.390                | 0,20    | 990                  | 0,20    |
| 10                | 1.430                | 0,30    | 1.590                | 0,30    | 1.110                | 0,30    | 1.270                | 0,20    | 1.110                | 0,20    | 800                  | 0,20    |
| 12                | 1.190                | 0,35    | 1.330                | 0,35    | 930                  | 0,35    | 1.060                | 0,24    | 930                  | 0,24    | 660                  | 0,24    |
| 16                | 900                  | 0,40    | 990                  | 0,40    | 700                  | 0,40    | 800                  | 0,30    | 700                  | 0,30    | 500                  | 0,30    |
| 20                | 720                  | 0,45    | 800                  | 0,45    | 560                  | 0,45    | 640                  | 0,35    | 560                  | 0,35    | 400                  | 0,35    |

**VHM**

| MAT               | 1.5                  |         |                      |         |                      |         | 1.6                  |         | 2                    |         | 3                    |         | 4                    |         |
|-------------------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|
|                   | <1000 N/mm²          |         | (1000~1200 N/mm²)    |         | (1200~1500 N/mm²)    |         | 10 ~ 20 m/min        |         | 40 ~ 50 m/min        |         | 40 ~ 60 m/min        |         | 80 ~ 100 m/min       |         |
| $v_c$             | 25 ~ 35 m/min        |         | 20 ~ 30 m/min        |         | 15 ~ 25 m/min        |         |                      |         |                      |         |                      |         |                      |         |
| $\varnothing d_1$ | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       |
|                   | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] |
| 3                 | 3.180                | 0,09    | 2.650                | 0,09    | 2.120                | 0,09    | 1.590                | 0,09    | 4.770                | 0,12    | 5.310                | 0,12    | 9.550                | 0,18    |
| 4                 | 2.390                | 0,12    | 1.990                | 0,12    | 1.590                | 0,12    | 1.190                | 0,12    | 3.580                | 0,16    | 3.980                | 0,16    | 7.160                | 0,24    |
| 6                 | 1.590                | 0,15    | 1.330                | 0,15    | 1.060                | 0,15    | 800                  | 0,15    | 2.390                | 0,18    | 2.650                | 0,18    | 4.770                | 0,30    |
| 8                 | 1.190                | 0,20    | 990                  | 0,20    | 800                  | 0,20    | 600                  | 0,20    | 1.790                | 0,24    | 1.990                | 0,24    | 3.580                | 0,32    |
| 10                | 950                  | 0,20    | 800                  | 0,20    | 640                  | 0,20    | 480                  | 0,20    | 1.430                | 0,30    | 1.590                | 0,30    | 2.860                | 0,36    |
| 12                | 800                  | 0,24    | 660                  | 0,24    | 530                  | 0,24    | 400                  | 0,24    | 1.190                | 0,35    | 1.330                | 0,35    | 2.390                | 0,40    |
| 16                | 600                  | 0,30    | 500                  | 0,30    | 400                  | 0,30    | 300                  | 0,30    | 900                  | 0,40    | 990                  | 0,40    | 1.790                | 0,48    |
| 20                | 480                  | 0,35    | 400                  | 0,35    | 320                  | 0,35    | 240                  | 0,35    | 720                  | 0,45    | 800                  | 0,45    | 1.430                | 0,60    |

## NCA90TA-HM

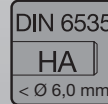
**Typ UNI**


| MAT               | 1.1                  |         | 1.2.3                |         | 1.2.2 + 1.2.4        |         | 1.2.1 + 1.3          |         | 1.4                  |         |                      |         |
|-------------------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|
|                   | 70 ~ 80 m/min        |         | 70 ~ 90 m/min        |         | 60 ~ 70 m/min        |         | 65 ~ 75 m/min        |         | <1000 N/mm²          |         | (1000~1200 N/mm²)    |         |
| $v_c$             |                      |         |                      |         |                      |         |                      |         | 60 ~ 70 m/min        |         | 50 ~ 60 m/min        |         |
| $\varnothing d_1$ | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       |
|                   | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] |
| 3                 | 7.960                | 0,12    | 8.490                | 0,12    | 6.900                | 0,12    | 7.430                | 0,09    | 6.900                | 0,09    | 5.840                | 0,09    |
| 4                 | 5.970                | 0,16    | 6.370                | 0,16    | 5.170                | 0,16    | 5.570                | 0,12    | 5.170                | 0,12    | 4.380                | 0,12    |
| 6                 | 3.980                | 0,18    | 4.240                | 0,18    | 3.450                | 0,18    | 3.710                | 0,15    | 3.450                | 0,15    | 2.920                | 0,15    |
| 8                 | 2.980                | 0,24    | 3.180                | 0,24    | 2.590                | 0,24    | 2.790                | 0,20    | 2.590                | 0,20    | 2.190                | 0,20    |
| 10                | 2.390                | 0,30    | 2.550                | 0,30    | 2.070                | 0,30    | 2.230                | 0,20    | 2.070                | 0,20    | 1.750                | 0,20    |
| 12                | 1.990                | 0,35    | 2.120                | 0,35    | 1.720                | 0,35    | 1.860                | 0,24    | 1.720                | 0,24    | 1.460                | 0,24    |
| 16                | 1.490                | 0,40    | 1.590                | 0,40    | 1.290                | 0,40    | 1.390                | 0,30    | 1.290                | 0,30    | 1.090                | 0,30    |
| 20                | 1.190                | 0,45    | 1.270                | 0,45    | 1.030                | 0,45    | 1.110                | 0,35    | 1.030                | 0,35    | 880                  | 0,35    |

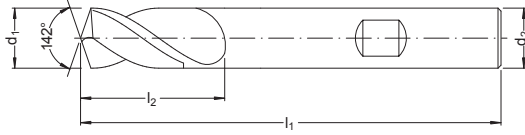
| MAT               | 1.5                  |         |                      |         |                      |         | 1.6                  |         | 2                    |         | 3                    |         | 4                    |         |
|-------------------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|
|                   | <1000 N/mm²          |         | (1000~1200 N/mm²)    |         | (1200~1500 N/mm²)    |         | 20 ~ 25 m/min        |         | 70 ~ 90 m/min        |         | 80 ~ 100 m/min       |         | 130 ~ 160 m/min      |         |
| $v_c$             | 60 ~ 70 m/min        |         | 45 ~ 55 m/min        |         | 30 ~ 40 m/min        |         |                      |         |                      |         |                      |         |                      |         |
| $\varnothing d_1$ | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       | n                    | f       |
|                   | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] | [min <sup>-1</sup> ] | [min/U] |
| 3                 | 6.900                | 0,09    | 5.310                | 0,09    | 3.710                | 0,09    | 2.390                | 0,09    | 8.490                | 0,12    | 9.550                | 0,12    | 15.380               | 0,18    |
| 4                 | 5.170                | 0,12    | 3.980                | 0,12    | 2.790                | 0,12    | 1.790                | 0,12    | 6.370                | 0,16    | 7.160                | 0,16    | 11.540               | 0,24    |
| 6                 | 3.450                | 0,15    | 2.650                | 0,15    | 1.860                | 0,15    | 1.190                | 0,15    | 4.240                | 0,18    | 4.770                | 0,18    | 7.690                | 0,30    |
| 8                 | 2.590                | 0,20    | 1.990                | 0,20    | 1.390                | 0,20    | 900                  | 0,20    | 3.180                | 0,24    | 3.580                | 0,24    | 5.770                | 0,32    |
| 10                | 2.070                | 0,20    | 1.590                | 0,20    | 1.110                | 0,20    | 720                  | 0,20    | 2.550                | 0,30    | 2.860                | 0,30    | 4.620                | 0,36    |
| 12                | 1.720                | 0,24    | 1.330                | 0,24    | 930                  | 0,24    | 600                  | 0,24    | 2.120                | 0,35    | 2.390                | 0,35    | 3.850                | 0,40    |
| 16                | 1.290                | 0,30    | 990                  | 0,30    | 700                  | 0,30    | 450                  | 0,30    | 1.590                | 0,40    | 1.790                | 0,40    | 2.880                | 0,48    |
| 20                | 1.030                | 0,35    | 800                  | 0,35    | 560                  | 0,35    | 360                  | 0,35    | 1.270                | 0,45    | 1.430                | 0,45    | 2.310                | 0,60    |

NC-Anbohrer  
 NC-Foret à pointer

NC-Spotting drill  
 NC-Punte da centro



$d_1 = h6$   
 $d_2 = h6$



**VHM**

| Katalog-Nr. / Rabattgruppe<br>No. of catalogue / Discount group<br>No. de catalogue / Groupe de remise<br>Nr. di catalogo / Gruppo sconto |               |               |               | <b>NCA142-HM / 15</b> |        | Katalog-Nr. / Rabattgruppe<br>No. of catalogue / Discount group<br>No. de catalogue / Groupe de remise<br>Nr. di catalogo / Gruppo sconto |               |               |               | <b>NCA142TA-HM / 15</b> |        |
|---|---------------|---------------|---------------|-----------------------|--------|---|---------------|---------------|---------------|-------------------------|--------|
|   |               |               |               |                       |        |   |               |               |               | <b>TiAIN</b>            |        |
| $d_1$<br>[mm]   | $l_2$<br>[mm] | $l_1$<br>[mm] | $d_2$<br>[mm] | Code<br>              | €      | $d_1$<br>[mm]   | $l_2$<br>[mm] | $l_1$<br>[mm] | $d_2$<br>[mm] | Code<br>                | €      |
| 3,0   | 8             | 35            | 3,0           | 680 011               | 6,60   | 3,0   | 8             | 35            | 3,0           | 685 011                 | 10,50  |
| 4,0   | 10            | 40            | 4,0           | 680 012               | 8,00   | 4,0   | 10            | 40            | 4,0           | 685 012                 | 12,00  |
| 6,0   | 16            | 50            | 6,0           | 680 014               | 18,75  | 6,0   | 16            | 50            | 6,0           | 685 014                 | 22,75  |
| 8,0   | 23            | 60            | 8,0           | 680 015               | 24,50  | 8,0   | 23            | 60            | 8,0           | 685 015                 | 29,50  |
| 10,0  | 24            | 70            | 10,0          | 680 016               | 36,00  | 10,0  | 24            | 70            | 10,0          | 685 016                 | 42,00  |
| 12,0  | 25            | 70            | 12,0          | 680 017               | 48,50  | 12,0  | 25            | 70            | 12,0          | 685 017                 | 56,00  |
| 16,0  | 30            | 80            | 16,0          | 680 018               | 88,00  | 16,0  | 30            | 80            | 16,0          | 685 018                 | 99,00  |
| 20,0  | 35            | 100           | 20,0          | 680 019               | 152,00 | 20,0  | 35            | 100           | 20,0          | 685 019                 | 170,00 |

**Schnittdatenempfehlung**  
**Paramètres de coupe**
**Recommended cutting data**  
**Parametri di taglio**

## NCA142-HM

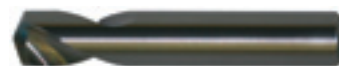
**Typ UNI**


| MAT               | 1.1                    |           | 1.2.3                  |           | 1.2.2 + 1.2.4          |           | 1.2.1 + 1.3            |           | 1.4                    |           |                        |           |
|-------------------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|
|                   | 40 ~ 50 m/min          |           | 40 ~ 60 m/min          |           | 30 ~ 40 m/min          |           | 35 ~ 45 m/min          |           | (<1000 N/mm²)          |           | (1000~1200 N/mm²)      |           |
| $v_c$             |                        |           |                        |           |                        |           |                        |           | 30 ~ 40 m/min          |           | 20 ~ 30 m/min          |           |
| $\varnothing d_1$ | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] |
| 3                 | 4.770                  | 0,12      | 5.310                  | 0,12      | 3.710                  | 0,12      | 4.240                  | 0,09      | 3.710                  | 0,09      | 2.650                  | 0,09      |
| 4                 | 3.580                  | 0,16      | 3.980                  | 0,16      | 2.790                  | 0,16      | 3.180                  | 0,12      | 2.790                  | 0,12      | 1.990                  | 0,12      |
| 6                 | 2.390                  | 0,18      | 2.650                  | 0,18      | 1.860                  | 0,18      | 2.120                  | 0,15      | 1.860                  | 0,15      | 1.330                  | 0,15      |
| 8                 | 1.790                  | 0,24      | 1.990                  | 0,24      | 1.390                  | 0,24      | 1.590                  | 0,20      | 1.390                  | 0,20      | 990                    | 0,20      |
| 10                | 1.430                  | 0,30      | 1.590                  | 0,30      | 1.110                  | 0,30      | 1.270                  | 0,20      | 1.110                  | 0,20      | 800                    | 0,20      |
| 12                | 1.190                  | 0,35      | 1.330                  | 0,35      | 930                    | 0,35      | 1.060                  | 0,24      | 930                    | 0,24      | 660                    | 0,24      |
| 16                | 900                    | 0,40      | 990                    | 0,40      | 700                    | 0,40      | 800                    | 0,30      | 700                    | 0,30      | 500                    | 0,30      |
| 20                | 720                    | 0,45      | 800                    | 0,45      | 560                    | 0,45      | 640                    | 0,35      | 560                    | 0,35      | 400                    | 0,35      |

**VHM**

| MAT               | 1.5                    |           |                        |           |                        |           | 1.6                    |           | 2                      |           | 3                      |           | 4                      |           |
|-------------------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|
|                   | (<1000 N/mm²)          |           | (1000~1200 N/mm²)      |           | (1200~1500 N/mm²)      |           | 10 ~ 20 m/min          |           | 40 ~ 50 m/min          |           | 40 ~ 60 m/min          |           | 80 ~ 100 m/min         |           |
| $v_c$             | 25 ~ 35 m/min          |           | 20 ~ 30 m/min          |           | 15 ~ 25 m/min          |           |                        |           |                        |           |                        |           |                        |           |
| $\varnothing d_1$ | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] |
| 3                 | 3.180                  | 0,09      | 2.650                  | 0,09      | 2.120                  | 0,09      | 1.590                  | 0,09      | 4.770                  | 0,12      | 5.310                  | 0,12      | 9.550                  | 0,18      |
| 4                 | 2.390                  | 0,12      | 1.990                  | 0,12      | 1.590                  | 0,12      | 1.190                  | 0,12      | 3.580                  | 0,16      | 3.980                  | 0,16      | 7.160                  | 0,24      |
| 6                 | 1.590                  | 0,15      | 1.330                  | 0,15      | 1.060                  | 0,15      | 800                    | 0,15      | 2.390                  | 0,18      | 2.650                  | 0,18      | 4.770                  | 0,30      |
| 8                 | 1.190                  | 0,20      | 990                    | 0,20      | 800                    | 0,20      | 600                    | 0,20      | 1.790                  | 0,24      | 1.990                  | 0,24      | 3.580                  | 0,32      |
| 10                | 950                    | 0,20      | 800                    | 0,20      | 640                    | 0,20      | 480                    | 0,20      | 1.430                  | 0,30      | 1.590                  | 0,30      | 2.860                  | 0,36      |
| 12                | 800                    | 0,24      | 660                    | 0,24      | 530                    | 0,24      | 400                    | 0,24      | 1.190                  | 0,35      | 1.330                  | 0,35      | 2.390                  | 0,40      |
| 16                | 600                    | 0,30      | 500                    | 0,30      | 400                    | 0,30      | 300                    | 0,30      | 900                    | 0,40      | 990                    | 0,40      | 1.790                  | 0,48      |
| 20                | 480                    | 0,35      | 400                    | 0,35      | 320                    | 0,35      | 240                    | 0,35      | 720                    | 0,45      | 800                    | 0,45      | 1.430                  | 0,60      |

## NCA142TA-HM

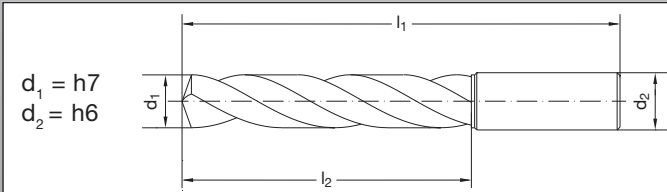
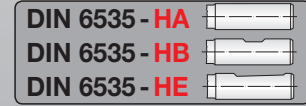
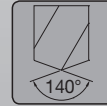
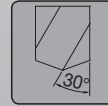
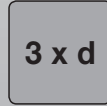
**Typ UNI**


| MAT               | 1.1                    |           | 1.2.3                  |           | 1.2.2 + 1.2.4          |           | 1.2.1 + 1.3            |           | 1.4                    |           |                        |           |
|-------------------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|
|                   | 70 ~ 80 m/min          |           | 70 ~ 90 m/min          |           | 60 ~ 70 m/min          |           | 65 ~ 75 m/min          |           | (<1000 N/mm²)          |           | (1000~1200 N/mm²)      |           |
| $v_c$             |                        |           |                        |           |                        |           |                        |           | 60 ~ 70 m/min          |           | 50 ~ 60 m/min          |           |
| $\varnothing d_1$ | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] |
| 3                 | 7.960                  | 0,12      | 8.490                  | 0,12      | 6.900                  | 0,12      | 7.430                  | 0,09      | 6.900                  | 0,09      | 5.840                  | 0,09      |
| 4                 | 5.970                  | 0,16      | 6.370                  | 0,16      | 5.170                  | 0,16      | 5.570                  | 0,12      | 5.170                  | 0,12      | 4.380                  | 0,12      |
| 6                 | 3.980                  | 0,18      | 4.240                  | 0,18      | 3.450                  | 0,18      | 3.710                  | 0,15      | 3.450                  | 0,15      | 2.920                  | 0,15      |
| 8                 | 2.980                  | 0,24      | 3.180                  | 0,24      | 2.590                  | 0,24      | 2.790                  | 0,20      | 2.590                  | 0,20      | 2.190                  | 0,20      |
| 10                | 2.390                  | 0,30      | 2.550                  | 0,30      | 2.070                  | 0,30      | 2.230                  | 0,20      | 2.070                  | 0,20      | 1.750                  | 0,20      |
| 12                | 1.990                  | 0,35      | 2.120                  | 0,35      | 1.720                  | 0,35      | 1.860                  | 0,24      | 1.720                  | 0,24      | 1.460                  | 0,24      |
| 16                | 1.490                  | 0,40      | 1.590                  | 0,40      | 1.290                  | 0,40      | 1.390                  | 0,30      | 1.290                  | 0,30      | 1.090                  | 0,30      |
| 20                | 1.190                  | 0,45      | 1.270                  | 0,45      | 1.030                  | 0,45      | 1.110                  | 0,35      | 1.030                  | 0,35      | 880                    | 0,35      |

| MAT               | 1.5                    |           |                        |           |                        |           | 1.6                    |           | 2                      |           | 3                      |           | 4                      |           |
|-------------------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|
|                   | (<1000 N/mm²)          |           | (1000~1200 N/mm²)      |           | (1200~1500 N/mm²)      |           | 20 ~ 25 m/min          |           | 70 ~ 90 m/min          |           | 80 ~ 100 m/min         |           | 130 ~ 160 m/min        |           |
| $v_c$             | 60 ~ 70 m/min          |           | 45 ~ 55 m/min          |           | 30 ~ 40 m/min          |           |                        |           |                        |           |                        |           |                        |           |
| $\varnothing d_1$ | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] | n [min <sup>-1</sup> ] | f [min/U] |
| 3                 | 6.900                  | 0,09      | 5.310                  | 0,09      | 3.710                  | 0,09      | 2.390                  | 0,09      | 8.490                  | 0,12      | 9.550                  | 0,12      | 15.380                 | 0,18      |
| 4                 | 5.170                  | 0,12      | 3.980                  | 0,12      | 2.790                  | 0,12      | 1.790                  | 0,12      | 6.370                  | 0,16      | 7.160                  | 0,16      | 11.540                 | 0,24      |
| 6                 | 3.450                  | 0,15      | 2.650                  | 0,15      | 1.860                  | 0,15      | 1.190                  | 0,15      | 4.240                  | 0,18      | 4.770                  | 0,18      | 7.690                  | 0,30      |
| 8                 | 2.590                  | 0,20      | 1.990                  | 0,20      | 1.390                  | 0,20      | 900                    | 0,20      | 3.180                  | 0,24      | 3.580                  | 0,24      | 5.770                  | 0,32      |
| 10                | 2.070                  | 0,20      | 1.590                  | 0,20      | 1.110                  | 0,20      | 720                    | 0,20      | 2.550                  | 0,30      | 2.860                  | 0,30      | 4.620                  | 0,36      |
| 12                | 1.720                  | 0,24      | 1.330                  | 0,24      | 930                    | 0,24      | 600                    | 0,24      | 2.120                  | 0,35      | 2.390                  | 0,35      | 3.850                  | 0,40      |
| 16                | 1.290                  | 0,30      | 990                    | 0,30      | 700                    | 0,30      | 450                    | 0,30      | 1.590                  | 0,40      | 1.790                  | 0,40      | 2.880                  | 0,48      |
| 20                | 1.030                  | 0,35      | 800                    | 0,35      | 560                    | 0,35      | 360                    | 0,35      | 1.270                  | 0,45      | 1.430                  | 0,45      | 2.310                  | 0,60      |

**VHM Hochleistungsbohrer**  
Foret en carbure monobloc à haute performance

**Solid Carbide High Performance Twist Drill**  
Punte ad alta prestazione in MDI



**VHM**

| Katalog-Nr./Rabattgruppe<br>No. of catalogue / Discount group<br>No. de catalogue / Groupe de remise<br>Nr. di catalogo / Gruppo sconto |                |                |                | <b>S3DTA-HM / 15</b> |       |                |                | Katalog-Nr./Rabattgruppe<br>No. of catalogue / Discount group<br>No. de catalogue / Groupe de remise<br>Nr. di catalogo / Gruppo sconto |                |            |        | <b>S3DTA-HM / 15</b> |                |                |                |            |        |
|---|----------------|----------------|----------------|----------------------|-------|----------------|----------------|---|----------------|------------|--------|----------------------|----------------|----------------|----------------|------------|--------|
|   |                |                |                | TiAIN                |       |                |                |   |                |            |        | TiAIN                |                |                |                |            |        |
| d <sub>1</sub>  | l <sub>2</sub> | l <sub>1</sub> | d <sub>2</sub> | Code                 | €     | d <sub>1</sub> | l <sub>2</sub> | l <sub>1</sub>  | d <sub>2</sub> | Code       | €      | d <sub>1</sub>       | l <sub>2</sub> | l <sub>1</sub> | d <sub>2</sub> | Code       | €      |
| [mm]  | [mm]           | [mm]           | [mm]           |                      |       | [mm]           | [mm]           | [mm]  | [mm]           |            |        | [mm]                 | [mm]           | [mm]           | [mm]           |            |        |
| 2,0   | 20             | 55             | 4,0            | 685 020 HA           | 26,00 | 7,7            | 41             | 79  | 8,0            | 685 077 H? | 27,00  | 7,7                  | 41             | 79             | 8,0            | 685 078 H? | 27,00  |
| 2,1   | 20             | 55             | 4,0            | 685 021 HA           | 26,00 | 7,8            | 41             | 79  | 8,0            | 685 079 H? | 27,00  | 7,8                  | 41             | 79             | 8,0            | 685 080 H? | 27,00  |
| 2,2   | 20             | 55             | 4,0            | 685 022 HA           | 26,00 | 7,9            | 41             | 79  | 8,0            | 685 081 H? | 31,00  | 7,9                  | 41             | 79             | 8,0            | 685 082 H? | 31,00  |
| 2,3   | 20             | 55             | 4,0            | 685 023 HA           | 26,00 | 8,0            | 41             | 79  | 8,0            | 685 083 H? | 31,00  | 8,0                  | 41             | 79             | 8,0            | 685 084 H? | 31,00  |
| 2,4   | 20             | 55             | 4,0            | 685 024 HA           | 26,00 | 8,1            | 47             | 89  | 10,0           | 685 085 H? | 31,00  | 8,1                  | 47             | 89             | 10,0           | 685 086 H? | 31,00  |
| 2,5   | 20             | 55             | 4,0            | 685 025 HA           | 26,00 | 8,2            | 47             | 89  | 10,0           | 685 087 H? | 31,00  | 8,2                  | 47             | 89             | 10,0           | 685 088 H? | 31,00  |
| 2,6   | 20             | 55             | 4,0            | 685 026 HA           | 26,00 | 8,3            | 47             | 89  | 10,0           | 685 089 H? | 31,00  | 8,3                  | 47             | 89             | 10,0           | 685 090 H? | 31,00  |
| 2,7   | 20             | 55             | 4,0            | 685 027 HA           | 26,00 | 8,4            | 47             | 89  | 10,0           | 685 091 H? | 31,00  | 8,4                  | 47             | 89             | 10,0           | 685 092 H? | 31,00  |
| 2,8   | 20             | 55             | 4,0            | 685 028 HA           | 26,00 | 8,5            | 47             | 89  | 10,0           | 685 093 H? | 31,00  | 8,5                  | 47             | 89             | 10,0           | 685 094 H? | 31,00  |
| 2,9   | 20             | 55             | 4,0            | 685 029 HA           | 26,00 | 8,6            | 47             | 89  | 10,0           | 685 095 H? | 31,00  | 8,6                  | 47             | 89             | 10,0           | 685 096 H? | 31,00  |
| 3,0   | 20             | 62             | 6,0            | 685 030 H?           | 26,00 | 8,7            | 47             | 89  | 10,0           | 685 097 H? | 31,00  | 8,7                  | 47             | 89             | 10,0           | 685 098 H? | 31,00  |
| 3,1   | 20             | 62             | 6,0            | 685 031 H?           | 26,00 | 8,8            | 47             | 89  | 10,0           | 685 099 H? | 31,00  | 8,8                  | 47             | 89             | 10,0           | 685 100 H? | 31,00  |
| 3,2   | 20             | 62             | 6,0            | 685 032 H?           | 26,00 | 8,9            | 47             | 89  | 10,0           | 685 101 H? | 44,00  | 8,9                  | 47             | 89             | 10,0           | 685 102 H? | 44,00  |
| 3,3   | 20             | 62             | 6,0            | 685 033 H?           | 26,00 | 9,0            | 47             | 89  | 10,0           | 685 103 H? | 44,00  | 9,0                  | 47             | 89             | 10,0           | 685 104 H? | 44,00  |
| 3,4   | 20             | 62             | 6,0            | 685 034 H?           | 26,00 | 9,1            | 47             | 89  | 10,0           | 685 105 H? | 44,00  | 9,1                  | 47             | 89             | 10,0           | 685 106 H? | 44,00  |
| 3,5   | 20             | 62             | 6,0            | 685 035 H?           | 26,00 | 9,2            | 47             | 89  | 10,0           | 685 107 H? | 44,00  | 9,2                  | 47             | 89             | 10,0           | 685 108 H? | 44,00  |
| 3,6   | 20             | 62             | 6,0            | 685 036 H?           | 26,00 | 9,3            | 47             | 89  | 10,0           | 685 109 H? | 44,00  | 9,3                  | 47             | 89             | 10,0           | 685 110 H? | 44,00  |
| 3,7   | 20             | 62             | 6,0            | 685 037 H?           | 26,00 | 9,4            | 47             | 89  | 10,0           | 685 111 H? | 44,00  | 9,4                  | 47             | 89             | 10,0           | 685 112 H? | 44,00  |
| 3,8   | 24             | 66             | 6,0            | 685 038 H?           | 26,00 | 9,5            | 47             | 89  | 10,0           | 685 113 H? | 44,00  | 9,5                  | 47             | 89             | 10,0           | 685 114 H? | 44,00  |
| 3,9   | 24             | 66             | 6,0            | 685 039 H?           | 26,00 | 9,6            | 47             | 89  | 10,0           | 685 115 H? | 44,00  | 9,6                  | 47             | 89             | 10,0           | 685 116 H? | 44,00  |
| 4,0   | 24             | 66             | 6,0            | 685 040 H?           | 26,00 | 9,7            | 47             | 89  | 10,0           | 685 117 H? | 44,00  | 9,7                  | 47             | 89             | 10,0           | 685 118 H? | 44,00  |
| 4,1   | 24             | 66             | 6,0            | 685 041 H?           | 26,00 | 9,8            | 47             | 89  | 10,0           | 685 119 H? | 44,00  | 9,8                  | 47             | 89             | 10,0           | 685 120 H? | 44,00  |
| 4,2   | 24             | 66             | 6,0            | 685 042 H?           | 26,00 | 9,9            | 47             | 89  | 10,0           | 685 121 H? | 60,00  | 9,9                  | 47             | 89             | 10,0           | 685 122 H? | 60,00  |
| 4,3   | 24             | 66             | 6,0            | 685 043 H?           | 26,00 | 10,0           | 47             | 89  | 10,0           | 685 123 H? | 60,00  | 10,0                 | 47             | 89             | 10,0           | 685 124 H? | 60,00  |
| 4,4   | 24             | 66             | 6,0            | 685 044 H?           | 26,00 | 10,1           | 55             | 102   | 12,0           | 685 125 H? | 60,00  | 10,1                 | 55             | 102            | 12,0           | 685 126 H? | 60,00  |
| 4,5   | 24             | 66             | 6,0            | 685 045 H?           | 26,00 | 10,2           | 55             | 102   | 12,0           | 685 127 H? | 60,00  | 10,2                 | 55             | 102            | 12,0           | 685 128 H? | 60,00  |
| 4,6   | 24             | 66             | 6,0            | 685 046 H?           | 26,00 | 10,3           | 55             | 102   | 12,0           | 685 129 H? | 60,00  | 10,3                 | 55             | 102            | 12,0           | 685 130 H? | 60,00  |
| 4,7   | 24             | 66             | 6,0            | 685 047 H?           | 26,00 | 10,4           | 55             | 102   | 12,0           | 685 131 H? | 60,00  | 10,4                 | 55             | 102            | 12,0           | 685 132 H? | 60,00  |
| 4,8   | 28             | 66             | 6,0            | 685 048 H?           | 26,00 | 10,5           | 55             | 102   | 12,0           | 685 133 H? | 60,00  | 10,5                 | 55             | 102            | 12,0           | 685 134 H? | 60,00  |
| 4,9   | 28             | 66             | 6,0            | 685 049 H?           | 26,00 | 10,6           | 55             | 102   | 12,0           | 685 135 H? | 60,00  | 10,6                 | 55             | 102            | 12,0           | 685 136 H? | 60,00  |
| 5,0   | 28             | 66             | 6,0            | 685 050 H?           | 26,00 | 10,7           | 55             | 102   | 12,0           | 685 137 H? | 60,00  | 10,7                 | 55             | 102            | 12,0           | 685 138 H? | 60,00  |
| 5,1   | 28             | 66             | 6,0            | 685 051 H?           | 26,00 | 10,8           | 55             | 102   | 12,0           | 685 139 H? | 60,00  | 10,8                 | 55             | 102            | 12,0           | 685 140 H? | 60,00  |
| 5,2   | 28             | 66             | 6,0            | 685 052 H?           | 26,00 | 10,9           | 55             | 102   | 12,0           | 685 141 H? | 60,00  | 10,9                 | 55             | 102            | 12,0           | 685 142 H? | 60,00  |
| 5,3   | 28             | 66             | 6,0            | 685 053 H?           | 26,00 | 11,0           | 55             | 102   | 12,0           | 685 143 H? | 60,00  | 11,0                 | 55             | 102            | 12,0           | 685 144 H? | 60,00  |
| 5,4   | 28             | 66             | 6,0            | 685 054 H?           | 26,00 | 11,2           | 55             | 102   | 12,0           | 685 145 H? | 77,00  | 11,2                 | 55             | 102            | 12,0           | 685 146 H? | 77,00  |
| 5,5   | 28             | 66             | 6,0            | 685 055 H?           | 26,00 | 11,5           | 55             | 102   | 12,0           | 685 147 H? | 77,00  | 11,5                 | 55             | 102            | 12,0           | 685 148 H? | 77,00  |
| 5,6   | 28             | 66             | 6,0            | 685 056 H?           | 26,00 | 11,8           | 55             | 102   | 12,0           | 685 149 H? | 77,00  | 11,8                 | 55             | 102            | 12,0           | 685 150 H? | 77,00  |
| 5,7   | 28             | 66             | 6,0            | 685 057 H?           | 26,00 | 12,0           | 55             | 102   | 12,0           | 685 151 H? | 77,00  | 12,0                 | 55             | 102            | 12,0           | 685 152 H? | 77,00  |
| 5,8   | 28             | 66             | 6,0            | 685 058 H?           | 26,00 | 12,2           | 60             | 107   | 14,0           | 685 153 H? | 122,00 | 12,2                 | 60             | 107            | 14,0           | 685 154 H? | 122,00 |
| 5,9   | 28             | 66             | 6,0            | 685 059 H?           | 26,00 | 12,5           | 60             | 107   | 14,0           | 685 155 H? | 122,00 | 12,5                 | 60             | 107            | 14,0           | 685 156 H? | 122,00 |
| 6,0   | 28             | 66             | 6,0            | 685 060 H?           | 26,00 | 12,8           | 60             | 107   | 14,0           | 685 157 H? | 122,00 | 12,8                 | 60             | 107            | 14,0           | 685 158 H? | 122,00 |
| 6,1   | 34             | 79             | 8,0            | 685 061 H?           | 27,00 | 13,0           | 60             | 107   | 14,0           | 685 159 H? | 122,00 | 13,0                 | 60             | 107            | 14,0           | 685 160 H? | 122,00 |
| 6,2   | 34             | 79             | 8,0            | 685 062 H?           | 27,00 | 13,5           | 60             | 107   | 14,0           | 685 161 H? | 122,00 | 13,5                 | 60             | 107            | 14,0           | 685 162 H? | 122,00 |
| 6,3   | 34             | 79             | 8,0            | 685 063 H?           | 27,00 | 13,8           | 60             | 107   | 14,0           | 685 163 H? | 122,00 | 13,8                 | 60             | 107            | 14,0           | 685 164 H? | 122,00 |
| 6,4   | 34             | 79             | 8,0            | 685 064 H?           | 27,00 | 14,0           | 60             | 107   | 14,0           | 685 165 H? | 122,00 | 14,0                 | 60             | 107            | 14,0           | 685 166 H? | 122,00 |
| 6,5   | 34             | 79             | 8,0            | 685 065 H?           | 27,00 | 14,5           | 65             | 115   | 16,0           | 685 167 H? | 142,00 | 14,5                 | 65             | 115            | 16,0           | 685 168 H? | 142,00 |
| 6,6   | 34             | 79             | 8,0            | 685 066 H?           | 27,00 | 15,0           | 65             | 115   | 16,0           | 685 169 H? | 142,00 | 15,0                 | 65             | 115            | 16,0           | 685 170 H? | 142,00 |
| 6,7   | 34             | 79             | 8,0            | 685 067 H?           | 27,00 | 15,5           | 65             | 115   | 16,0           | 685 171 H? | 142,00 | 15,5                 | 65             | 115            | 16,0           | 685 172 H? | 142,00 |
| 6,8   | 34             | 79             | 8,0            | 685 068 H?           | 27,00 | 16,0           | 65             | 115   | 16,0           | 685 173 H? | 142,00 | 16,0                 | 65             | 115            | 16,0           | 685 174 H? | 142,00 |
| 6,9   | 34             | 79             | 8,0            | 685 069 H?           | 27,00 | 16,5           | 73             | 123   | 18,0           | 685 175 H? | 142,00 | 16,5                 | 73             | 123            | 18,0           | 685 176 H? | 142,00 |
| 7,0   | 34             | 79             | 8,0            | 685 070 H?           | 27,00 | 17,0           | 73             | 123   | 18,0           | 685 177 H? | 142,00 | 17,0                 | 73             | 123            | 18,0           | 685 178 H? | 142,00 |
| 7,1   | 41             | 79             | 8,0            | 685 071 H?           | 27,00 | 17,5           | 73             | 123   | 18,0           | 685 179 H? | 142,00 | 17,5                 | 73             | 123            | 18,0           | 685 180 H? | 142,00 |
| 7,2   | 41             | 79             | 8,0            | 685 072 H?           | 27,00 | 18,0           | 73             | 123   | 18,0           | 685 181 H? | 142,00 | 18,0                 | 73             | 123            | 18,0           | 685 182 H? | 142,00 |
| 7,3   | 41             | 79             | 8,0            | 685 073 H?           | 27,00 | 18,5           | 79             | 131   | 20,0           | 685 183 H? | 142,00 | 18,5                 | 79             | 131            | 20,0           | 685 184 H? | 142,00 |
| 7,4   | 41             | 79             | 8,0            | 685 074 H?           | 27,00 | 19,0           | 79             | 131   | 20,0           | 685 185 H? | 142,00 | 19,0                 | 79             | 131            | 20,0           | 685 186 H? | 142,00 |
| 7,5   | 41             | 79             | 8,0            | 685 075 H?           | 27,00 | 19,5           | 79             | 131   | 20,0           | 685 187 H? | 142,00 | 19,5                 | 79             | 131            | 20,0           | 685 188 H? | 142,00 |
| 7,6   | 41             | 79             | 8,0            | 685 076 H?           | 27,00 | 20,0           | 79             | 131   | 20,0           | 685 189 H? | 142,00 | 20,0                 | 79             | 131            | 20,0           | 685 190 H? | 142,00 |



**Schnittdatenempfehlung**  
**Paramètres de coupe**
**Recommended cutting data**  
**Parametri di taglio**
**S3DTA-HM**
**Typ UNI, 3 x d, VHM-TiAlN**


| MAT              | 1.1                       |               | 1.2.3                     |               | 1.2.2 + 1.2.4             |               | 1.2.1 + 1.3<br>(<1000 N/mm <sup>2</sup> ) |               | 1.4<br>(1000~<br>1200 N/mm <sup>2</sup> ) |               | 1.5                        |               |                                    |               |                                    |               |
|------------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---|---------------|---|---------------|----------------------------|---------------|------------------------------------|---------------|------------------------------------|---------------|
|                  | 70 ~ 85<br>m/min          |               | 70 ~ 90<br>m/min          |               | 70 ~ 85<br>m/min          |               | 60 ~ 70<br>m/min                          |               | 45 ~ 55<br>m/min                          |               | (<1000 N/mm <sup>2</sup> ) |               | (1000~<br>1200 N/mm <sup>2</sup> ) |               | (1200~<br>1500 N/mm <sup>2</sup> ) |               |
| V <sub>c</sub>   |                           |               |                           |               |                           |               |   |               |   |               |                            |               |                                    |               |                                    |               |
| Ø d <sub>1</sub> | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]                 | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]                 | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]  | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]          | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]          | f<br>[min/U]  |
| 2                | 11.550                    | 0,07~<br>0,09 | 12.750                    | 0,07~<br>0,09 | 11.150                    | 0,07~<br>0,09 | 9.550                                     | 0,04~<br>0,05 | 7.150                                     | 0,04~<br>0,05 | 9.550                      | 0,04~<br>0,05 | 7.150                              | 0,04~<br>0,05 | 4.400                              | 0,04~<br>0,05 |
| 3                | 7.700                     | 0,13~<br>0,16 | 8.500                     | 0,13~<br>0,16 | 7.450                     | 0,13~<br>0,16 | 6.350                                     | 0,06~<br>0,08 | 4.750                                     | 0,06~<br>0,08 | 6.350                      | 0,06~<br>0,08 | 4.750                              | 0,06~<br>0,08 | 2.900                              | 0,06~<br>0,08 |
| 4                | 5.750                     | 0,13~<br>0,16 | 6.350                     | 0,13~<br>0,16 | 5.550                     | 0,13~<br>0,16 | 4.750                                     | 0,06~<br>0,08 | 3.600                                     | 0,06~<br>0,08 | 4.750                      | 0,06~<br>0,08 | 3.600                              | 0,06~<br>0,08 | 2.200                              | 0,06~<br>0,08 |
| 5                | 4.600                     | 0,13~<br>0,16 | 5.100                     | 0,13~<br>0,16 | 4.450                     | 0,13~<br>0,16 | 3.800                                     | 0,06~<br>0,08 | 2.850                                     | 0,06~<br>0,08 | 3.800                      | 0,06~<br>0,08 | 2.850                              | 0,06~<br>0,08 | 1.750                              | 0,06~<br>0,08 |
| 6                | 3.850                     | 0,18~<br>0,22 | 4.250                     | 0,18~<br>0,22 | 3.700                     | 0,18~<br>0,22 | 3.200                                     | 0,10~<br>0,12 | 2.400                                     | 0,10~<br>0,12 | 3.200                      | 0,10~<br>0,12 | 2.400                              | 0,10~<br>0,12 | 1.450                              | 0,10~<br>0,12 |
| 8                | 2.900                     | 0,18~<br>0,22 | 3.200                     | 0,18~<br>0,22 | 2.800                     | 0,18~<br>0,22 | 2.400                                     | 0,10~<br>0,12 | 1.800                                     | 0,10~<br>0,12 | 2.400                      | 0,10~<br>0,12 | 1.800                              | 0,10~<br>0,12 | 1.100                              | 0,10~<br>0,12 |
| 10               | 2.300                     | 0,22~<br>0,28 | 2.550                     | 0,22~<br>0,28 | 2.250                     | 0,22~<br>0,28 | 1.900                                     | 0,12~<br>0,15 | 1.450                                     | 0,12~<br>0,15 | 1.900                      | 0,12~<br>0,15 | 1.450                              | 0,12~<br>0,15 | 900                                | 0,12~<br>0,15 |
| 12               | 1.900                     | 0,22~<br>0,28 | 2.100                     | 0,22~<br>0,28 | 1.850                     | 0,22~<br>0,28 | 1.600                                     | 0,12~<br>0,15 | 1.200                                     | 0,12~<br>0,15 | 1.600                      | 0,12~<br>0,15 | 1.200                              | 0,12~<br>0,15 | 750                                | 0,12~<br>0,15 |
| 14               | 1.650                     | 0,27~<br>0,34 | 1.800                     | 0,27~<br>0,34 | 1.600                     | 0,27~<br>0,34 | 1.350                                     | 0,16~<br>0,20 | 1.000                                     | 0,16~<br>0,20 | 1.350                      | 0,16~<br>0,20 | 1.000                              | 0,16~<br>0,20 | 650                                | 0,16~<br>0,20 |
| 16               | 1.450                     | 0,27~<br>0,34 | 1.600                     | 0,27~<br>0,34 | 1.400                     | 0,27~<br>0,34 | 1.200                                     | 0,16~<br>0,20 | 900                                       | 0,16~<br>0,20 | 1.200                      | 0,16~<br>0,20 | 900                                | 0,16~<br>0,20 | 550                                | 0,16~<br>0,20 |
| 18               | 1.300                     | 0,30~<br>0,38 | 1.400                     | 0,30~<br>0,38 | 1.250                     | 0,30~<br>0,38 | 1.050                                     | 0,20~<br>0,25 | 800                                       | 0,20~<br>0,25 | 1.050                      | 0,20~<br>0,25 | 800                                | 0,20~<br>0,25 | 500                                | 0,20~<br>0,25 |
| 20               | 1.150                     | 0,30~<br>0,38 | 1.250                     | 0,30~<br>0,38 | 1.100                     | 0,30~<br>0,38 | 950                                       | 0,20~<br>0,25 | 700                                       | 0,20~<br>0,25 | 950                        | 0,20~<br>0,25 | 700                                | 0,20~<br>0,25 | 450                                | 0,20~<br>0,25 |

**VHM**

| MAT              | 2.1 + 2.2                 |               | 2.3 + 2.4                 |               |
|------------------|---------------------------|---------------|---------------------------|---------------|
|                  | 65 ~ 90<br>m/min          |               | 60 ~ 75<br>m/min          |               |
| V <sub>c</sub>   |                           |               |                           |               |
| Ø d <sub>1</sub> | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  |
| 2                | 12.750                    | 0,10~<br>0,12 | 11.150                    | 0,06~<br>0,07 |
| 3                | 8.500                     | 0,16~<br>0,20 | 7.450                     | 0,10~<br>0,12 |
| 4                | 6.350                     | 0,16~<br>0,20 | 5.550                     | 0,10~<br>0,12 |
| 5                | 5.100                     | 0,16~<br>0,20 | 4.450                     | 0,10~<br>0,12 |
| 6                | 4.250                     | 0,20~<br>0,25 | 3.700                     | 0,14~<br>0,17 |
| 8                | 3.200                     | 0,20~<br>0,25 | 2.800                     | 0,14~<br>0,17 |
| 10               | 2.550                     | 0,28~<br>0,35 | 2.250                     | 0,18~<br>0,22 |
| 12               | 2.100                     | 0,28~<br>0,35 | 1.850                     | 0,18~<br>0,22 |
| 14               | 1.800                     | 0,32~<br>0,40 | 1.600                     | 0,24~<br>0,30 |
| 16               | 1.600                     | 0,32~<br>0,40 | 1.400                     | 0,24~<br>0,30 |
| 18               | 1.400                     | 0,37~<br>0,46 | 1.250                     | 0,30~<br>0,37 |
| 20               | 1.250                     | 0,37~<br>0,46 | 1.100                     | 0,30~<br>0,37 |

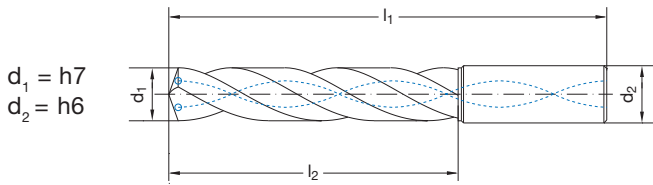
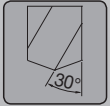
■ Kühlmittel, Coolant, Lubrification, Lubrificante: Emulsion, Emulsion, Emulsion, Emulsion

VHM Hochleistungsbohrer

Foret en carbure monobloc à haute performance

Solid Carbide High Performance Twist Drill

Punte ad alta prestazione in MDI



VHM

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**S3DIKTA-HM / 15**

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No. de catalogue / Groupe de remise  
Nr. di catalogo / Gruppo sconto

**S3DIKTA-HM / 15**

TiAIN

| d <sub>1</sub><br>[mm] | l <sub>2</sub><br>[mm] | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | S3DIKTA-HM / 15 |       | S3DIKTA-HM / 15 |    | S3DIKTA-HM / 15 |      |            |        |
|------------------------|------------------------|------------------------|------------------------|-----------------|-------|-----------------|----|-----------------|------|------------|--------|
|                        |                        |                        |                        | Code            | €     | Code            | €  | Code            | €    |            |        |
| 3,0                    | 20                     | 62                     | 6,0                    | 685 230 H?      | 36,00 | 8,2             | 47 | 89              | 10,0 | 685 282 H? | 60,00  |
| 3,1                    | 20                     | 62                     | 6,0                    | 685 231 H?      | 36,00 | 8,3             | 47 | 89              | 10,0 | 685 283 H? | 60,00  |
| 3,2                    | 20                     | 62                     | 6,0                    | 685 232 H?      | 36,00 | 8,4             | 47 | 89              | 10,0 | 685 284 H? | 60,00  |
| 3,3                    | 20                     | 62                     | 6,0                    | 685 233 H?      | 36,00 | 8,5             | 47 | 89              | 10,0 | 685 285 H? | 60,00  |
| 3,4                    | 20                     | 62                     | 6,0                    | 685 234 H?      | 36,00 | 8,6             | 47 | 89              | 10,0 | 685 286 H? | 60,00  |
| 3,5                    | 20                     | 62                     | 6,0                    | 685 235 H?      | 36,00 | 8,7             | 47 | 89              | 10,0 | 685 287 H? | 60,00  |
| 3,6                    | 20                     | 62                     | 6,0                    | 685 236 H?      | 36,00 | 8,8             | 47 | 89              | 10,0 | 685 288 H? | 60,00  |
| 3,7                    | 20                     | 62                     | 6,0                    | 685 237 H?      | 36,00 | 8,9             | 47 | 89              | 10,0 | 685 289 H? | 60,00  |
| 3,8                    | 24                     | 66                     | 6,0                    | 685 238 H?      | 36,00 | 9,0             | 47 | 89              | 10,0 | 685 290 H? | 60,00  |
| 3,9                    | 24                     | 66                     | 6,0                    | 685 239 H?      | 36,00 | 9,1             | 47 | 89              | 10,0 | 685 291 H? | 60,00  |
| 4,0                    | 24                     | 66                     | 6,0                    | 685 240 H?      | 36,00 | 9,2             | 47 | 89              | 10,0 | 685 292 H? | 60,00  |
| 4,1                    | 24                     | 66                     | 6,0                    | 685 241 H?      | 36,00 | 9,3             | 47 | 89              | 10,0 | 685 293 H? | 60,00  |
| 4,2                    | 24                     | 66                     | 6,0                    | 685 242 H?      | 36,00 | 9,4             | 47 | 89              | 10,0 | 685 294 H? | 60,00  |
| 4,3                    | 24                     | 66                     | 6,0                    | 685 243 H?      | 36,00 | 9,5             | 47 | 89              | 10,0 | 685 295 H? | 60,00  |
| 4,4                    | 24                     | 66                     | 6,0                    | 685 244 H?      | 36,00 | 9,6             | 47 | 89              | 10,0 | 685 296 H? | 60,00  |
| 4,5                    | 24                     | 66                     | 6,0                    | 685 245 H?      | 36,00 | 9,7             | 47 | 89              | 10,0 | 685 297 H? | 60,00  |
| 4,6                    | 24                     | 66                     | 6,0                    | 685 246 H?      | 36,00 | 9,8             | 47 | 89              | 10,0 | 685 298 H? | 60,00  |
| 4,7                    | 24                     | 66                     | 6,0                    | 685 247 H?      | 36,00 | 9,9             | 47 | 89              | 10,0 | 685 299 H? | 60,00  |
| 4,8                    | 28                     | 66                     | 6,0                    | 685 248 H?      | 36,00 | 10,0            | 47 | 89              | 10,0 | 685 300 H? | 60,00  |
| 4,9                    | 28                     | 66                     | 6,0                    | 685 249 H?      | 36,00 | 10,1            | 55 | 102             | 12,0 | 685 301 H? | 83,00  |
| 5,0                    | 28                     | 66                     | 6,0                    | 685 250 H?      | 36,00 | 10,2            | 55 | 102             | 12,0 | 685 302 H? | 83,00  |
| 5,1                    | 28                     | 66                     | 6,0                    | 685 251 H?      | 36,00 | 10,3            | 55 | 102             | 12,0 | 685 303 H? | 83,00  |
| 5,2                    | 28                     | 66                     | 6,0                    | 685 252 H?      | 36,00 | 10,4            | 55 | 102             | 12,0 | 685 304 H? | 83,00  |
| 5,3                    | 28                     | 66                     | 6,0                    | 685 253 H?      | 36,00 | 10,5            | 55 | 102             | 12,0 | 685 305 H? | 83,00  |
| 5,4                    | 28                     | 66                     | 6,0                    | 685 254 H?      | 36,00 | 10,6            | 55 | 102             | 12,0 | 685 306 H? | 83,00  |
| 5,5                    | 28                     | 66                     | 6,0                    | 685 255 H?      | 36,00 | 10,7            | 55 | 102             | 12,0 | 685 307 H? | 83,00  |
| 5,6                    | 28                     | 66                     | 6,0                    | 685 256 H?      | 36,00 | 10,8            | 55 | 102             | 12,0 | 685 308 H? | 83,00  |
| 5,7                    | 28                     | 66                     | 6,0                    | 685 257 H?      | 36,00 | 10,9            | 55 | 102             | 12,0 | 685 309 H? | 83,00  |
| 5,8                    | 28                     | 66                     | 6,0                    | 685 258 H?      | 36,00 | 11,0            | 55 | 102             | 12,0 | 685 310 H? | 83,00  |
| 5,9                    | 28                     | 66                     | 6,0                    | 685 259 H?      | 36,00 | 11,2            | 55 | 102             | 12,0 | 685 312 H? | 83,00  |
| 6,0                    | 28                     | 66                     | 6,0                    | 685 260 H?      | 36,00 | 11,5            | 55 | 102             | 12,0 | 685 315 H? | 83,00  |
| 6,1                    | 34                     | 79                     | 8,0                    | 685 261 H?      | 48,50 | 11,8            | 55 | 102             | 12,0 | 685 318 H? | 83,00  |
| 6,2                    | 34                     | 79                     | 8,0                    | 685 262 H?      | 48,50 | 12,0            | 55 | 102             | 12,0 | 685 320 H? | 83,00  |
| 6,3                    | 34                     | 79                     | 8,0                    | 685 263 H?      | 48,50 | 12,2            | 60 | 107             | 14,0 | 685 322 H? | 110,00 |
| 6,4                    | 34                     | 79                     | 8,0                    | 685 264 H?      | 48,50 | 12,5            | 60 | 107             | 14,0 | 685 325 H? | 110,00 |
| 6,5                    | 34                     | 79                     | 8,0                    | 685 265 H?      | 48,50 | 12,8            | 60 | 107             | 14,0 | 685 328 H? | 110,00 |
| 6,6                    | 34                     | 79                     | 8,0                    | 685 266 H?      | 48,50 | 13,0            | 60 | 107             | 14,0 | 685 330 H? | 110,00 |
| 6,7                    | 34                     | 79                     | 8,0                    | 685 267 H?      | 48,50 | 13,5            | 60 | 107             | 14,0 | 685 335 H? | 110,00 |
| 6,8                    | 34                     | 79                     | 8,0                    | 685 268 H?      | 48,50 | 13,8            | 60 | 107             | 14,0 | 685 338 H? | 110,00 |
| 6,9                    | 34                     | 79                     | 8,0                    | 685 269 H?      | 48,50 | 14,0            | 60 | 107             | 14,0 | 685 340 H? | 110,00 |
| 7,0                    | 34                     | 79                     | 8,0                    | 685 270 H?      | 48,50 | 14,5            | 65 | 115             | 16,0 | 685 345 H? | 132,00 |
| 7,1                    | 41                     | 79                     | 8,0                    | 685 271 H?      | 48,50 | 15,0            | 65 | 115             | 16,0 | 685 350 H? | 132,00 |
| 7,2                    | 41                     | 79                     | 8,0                    | 685 272 H?      | 48,50 | 15,5            | 65 | 115             | 16,0 | 685 355 H? | 132,00 |
| 7,3                    | 41                     | 79                     | 8,0                    | 685 273 H?      | 48,50 | 16,0            | 65 | 115             | 16,0 | 685 360 H? | 132,00 |
| 7,4                    | 41                     | 79                     | 8,0                    | 685 274 H?      | 48,50 | 16,5            | 73 | 123             | 18,0 | 685 365 H? | 200,00 |
| 7,5                    | 41                     | 79                     | 8,0                    | 685 275 H?      | 48,50 | 17,0            | 73 | 123             | 18,0 | 685 370 H? | 200,00 |
| 7,6                    | 41                     | 79                     | 8,0                    | 685 276 H?      | 48,50 | 17,5            | 73 | 123             | 18,0 | 685 375 H? | 200,00 |
| 7,7                    | 41                     | 79                     | 8,0                    | 685 277 H?      | 48,50 | 18,0            | 73 | 123             | 18,0 | 685 380 H? | 200,00 |
| 7,8                    | 41                     | 79                     | 8,0                    | 685 278 H?      | 48,50 | 18,5            | 79 | 131             | 20,0 | 685 385 H? | 230,00 |
| 7,9                    | 41                     | 79                     | 8,0                    | 685 279 H?      | 48,50 | 19,0            | 79 | 131             | 20,0 | 685 390 H? | 230,00 |
| 8,0                    | 41                     | 79                     | 8,0                    | 685 280 H?      | 48,50 | 19,5            | 79 | 131             | 20,0 | 685 395 H? | 230,00 |
| 8,1                    | 47                     | 89                     | 10,0                   | 685 281 H?      | 60,00 | 20,0            | 79 | 131             | 20,0 | 685 400 H? | 230,00 |

**Schnittdatenempfehlung**  
**Paramètres de coupe**
**Recommended cutting data**  
**Parametri di taglio**
**S3DIKTA-HM**
**Typ UNI, 3 x d, VHM-TiAlN-IKZ**


| MAT               | 1.1                       |              | 1.2.3                     |              | 1.2.2 + 1.2.4             |              | 1.2.1 + 1.3<br>(<1000 N/mm <sup>2</sup> ) |              | 1.4<br>(1000~1200 N/mm <sup>2</sup> ) |              | 1.5                        |              |                                |              |                                |              |
|-------------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---|--------------|---------------------------------------|--------------|----------------------------|--------------|--------------------------------|--------------|--------------------------------|--------------|
|                   | 75 ~ 100<br>m/min         |              | 90 ~ 100<br>m/min         |              | 75 ~ 100<br>m/min         |              | 75 ~ 85<br>m/min                          |              | 50 ~ 60<br>m/min                      |              | (<1000 N/mm <sup>2</sup> ) |              | (1000~1200 N/mm <sup>2</sup> ) |              | (1200~1500 N/mm <sup>2</sup> ) |              |
| $v_c$             |                           |              |                           |              |                           |              |   |              |                                       |              |                            |              |                                |              |                                |              |
| $\varnothing d_1$ | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ]                 | f<br>[min/U] | n<br>[min <sup>-1</sup> ]             | f<br>[min/U] | n<br>[min <sup>-1</sup> ]  | f<br>[min/U] | n<br>[min <sup>-1</sup> ]      | f<br>[min/U] | n<br>[min <sup>-1</sup> ]      | f<br>[min/U] |
| 3                 | 9.300                     | 0,13~0,16    | 10.100                    | 0,13~0,16    | 9.000                     | 0,13~0,16    | 7.150                                     | 0,06~0,08    | 5.300                                 | 0,06~0,08    | 6.900                      | 0,06~0,08    | 5.300                          | 0,06~0,08    | 3.450                          | 0,06~0,08    |
| 4                 | 6.950                     | 0,13~0,16    | 7.550                     | 0,13~0,16    | 6.750                     | 0,13~0,16    | 5.350                                     | 0,06~0,08    | 4.000                                 | 0,06~0,08    | 5.150                      | 0,06~0,08    | 4.000                          | 0,06~0,08    | 2.600                          | 0,06~0,08    |
| 5                 | 5.550                     | 0,13~0,16    | 6.050                     | 0,13~0,16    | 5.400                     | 0,13~0,16    | 4.300                                     | 0,06~0,08    | 3.200                                 | 0,06~0,08    | 4.150                      | 0,06~0,08    | 3.200                          | 0,06~0,08    | 2.050                          | 0,06~0,08    |
| 6                 | 4.650                     | 0,18~0,22    | 5.050                     | 0,18~0,22    | 4.500                     | 0,18~0,22    | 3.600                                     | 0,10~0,12    | 2.650                                 | 0,10~0,12    | 3.450                      | 0,10~0,12    | 2.650                          | 0,10~0,12    | 1.700                          | 0,10~0,12    |
| 8                 | 3.500                     | 0,18~0,22    | 3.800                     | 0,18~0,22    | 3.400                     | 0,18~0,22    | 2.700                                     | 0,10~0,12    | 2.000                                 | 0,10~0,12    | 2.600                      | 0,10~0,12    | 2.000                          | 0,10~0,12    | 1.300                          | 0,10~0,12    |
| 10                | 2.800                     | 0,22~0,28    | 3.000                     | 0,22~0,28    | 2.700                     | 0,22~0,28    | 2.150                                     | 0,12~0,15    | 1.600                                 | 0,12~0,15    | 2.050                      | 0,12~0,15    | 1.600                          | 0,12~0,15    | 1.050                          | 0,12~0,15    |
| 12                | 2.300                     | 0,22~0,28    | 2.500                     | 0,22~0,28    | 2.250                     | 0,22~0,28    | 1.800                                     | 0,12~0,15    | 1.350                                 | 0,12~0,15    | 1.700                      | 0,12~0,15    | 1.350                          | 0,12~0,15    | 850                            | 0,12~0,15    |
| 14                | 2.000                     | 0,27~0,34    | 2.150                     | 0,27~0,34    | 1.950                     | 0,27~0,34    | 1.550                                     | 0,16~0,20    | 1.150                                 | 0,16~0,20    | 1.500                      | 0,16~0,20    | 1.150                          | 0,16~0,20    | 750                            | 0,16~0,20    |
| 16                | 1.750                     | 0,27~0,34    | 1.900                     | 0,27~0,34    | 1.700                     | 0,27~0,34    | 1.350                                     | 0,16~0,20    | 1.000                                 | 0,16~0,20    | 1.300                      | 0,16~0,20    | 1.000                          | 0,16~0,20    | 650                            | 0,16~0,20    |
| 18                | 1.550                     | 0,30~0,38    | 1.700                     | 0,30~0,38    | 1.500                     | 0,30~0,38    | 1.200                                     | 0,20~0,25    | 900                                   | 0,20~0,25    | 1.150                      | 0,20~0,25    | 900                            | 0,20~0,25    | 550                            | 0,20~0,25    |
| 20                | 1.400                     | 0,30~0,38    | 1.500                     | 0,30~0,38    | 1.350                     | 0,30~0,38    | 1.050                                     | 0,20~0,25    | 800                                   | 0,20~0,25    | 1.050                      | 0,20~0,25    | 800                            | 0,20~0,25    | 500                            | 0,20~0,25    |

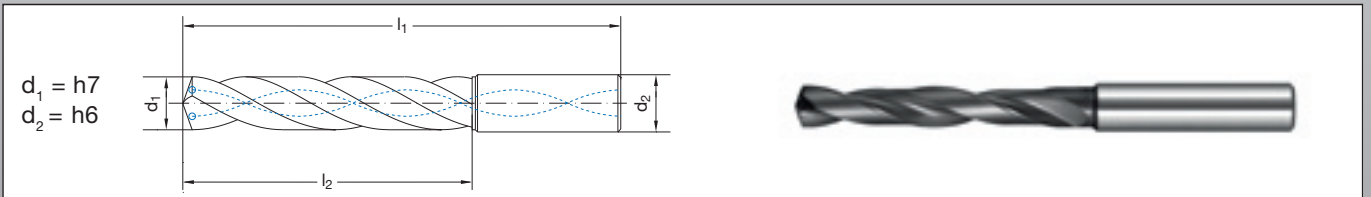
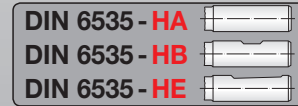
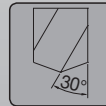
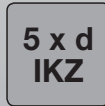
| MAT               | 1.6.1                     |              | 1.6.2                     |              | 1.6.3                     |              | 1.6.4                     |              | 1.6.5                     |              | 2.1 + 2.2                 |              | 2.3 + 2.4                 |              | 5                         |              |
|-------------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|
| $v_c$             | 50 ~ 60<br>m/min          |              | 35 ~ 50<br>m/min          |              | 30 ~ 45<br>m/min          |              | 45 ~ 55<br>m/min          |              | 25 ~ 30<br>m/min          |              | 80 ~ 110<br>m/min         |              | 70 ~ 100<br>m/min         |              | 25 ~ 30<br>m/min          |              |
| $\varnothing d_1$ | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] |
| 3                 | 5.300                     | 0,06~0,08    | 4.500                     | 0,06~0,08    | 4.000                     | 0,06~0,08    | 5.300                     | 0,06~0,08    | 2.900                     | 0,06~0,08    | 10.100                    | 0,16~0,20    | 9.000                     | 0,10~0,12    | 2.920                     | 0,03~0,04    |
| 4                 | 4.000                     | 0,06~0,08    | 3.400                     | 0,06~0,08    | 3.000                     | 0,06~0,08    | 4.000                     | 0,06~0,08    | 2.200                     | 0,06~0,08    | 7.550                     | 0,16~0,20    | 6.750                     | 0,10~0,12    | 2.190                     | 0,03~0,04    |
| 5                 | 3.200                     | 0,06~0,08    | 2.700                     | 0,06~0,08    | 2.400                     | 0,06~0,08    | 3.200                     | 0,06~0,08    | 1.750                     | 0,06~0,08    | 6.050                     | 0,16~0,20    | 5.400                     | 0,10~0,12    | 1.750                     | 0,03~0,04    |
| 6                 | 2.650                     | 0,10~0,12    | 2.250                     | 0,10~0,12    | 2.000                     | 0,10~0,12    | 2.650                     | 0,10~0,12    | 1.450                     | 0,10~0,12    | 5.050                     | 0,20~0,25    | 4.500                     | 0,14~0,17    | 1.460                     | 0,05~0,08    |
| 8                 | 2.000                     | 0,10~0,12    | 1.700                     | 0,10~0,12    | 1.500                     | 0,10~0,12    | 2.000                     | 0,10~0,12    | 1.100                     | 0,10~0,12    | 3.800                     | 0,20~0,25    | 3.400                     | 0,14~0,17    | 1.100                     | 0,05~0,08    |
| 10                | 1.600                     | 0,12~0,15    | 1.350                     | 0,12~0,15    | 1.200                     | 0,12~0,15    | 1.600                     | 0,12~0,15    | 900                       | 0,12~0,15    | 3.000                     | 0,28~0,35    | 2.700                     | 0,18~0,22    | 875                       | 0,09~0,12    |
| 12                | 1.350                     | 0,12~0,15    | 1.150                     | 0,12~0,15    | 1.000                     | 0,12~0,15    | 1.350                     | 0,12~0,15    | 750                       | 0,12~0,15    | 2.500                     | 0,28~0,35    | 2.250                     | 0,18~0,22    | 730                       | 0,09~0,12    |
| 14                | 1.150                     | 0,16~0,20    | 950                       | 0,16~0,20    | 850                       | 0,16~0,20    | 1.150                     | 0,16~0,20    | 650                       | 0,16~0,20    | 2.150                     | 0,32~0,40    | 1.950                     | 0,24~0,30    | 625                       | 0,13~0,16    |
| 16                | 1.000                     | 0,16~0,20    | 850                       | 0,16~0,20    | 750                       | 0,16~0,20    | 1.000                     | 0,16~0,20    | 550                       | 0,16~0,20    | 1.900                     | 0,32~0,40    | 1.700                     | 0,24~0,30    | 550                       | 0,13~0,16    |
| 18                | 900                       | 0,20~0,25    | 750                       | 0,20~0,25    | 650                       | 0,20~0,25    | 900                       | 0,20~0,25    | 500                       | 0,20~0,25    | 1.700                     | 0,37~0,46    | 1.500                     | 0,30~0,37    | 490                       | 0,17~0,20    |
| 20                | 800                       | 0,20~0,25    | 700                       | 0,20~0,25    | 600                       | 0,20~0,25    | 800                       | 0,20~0,25    | 450                       | 0,20~0,25    | 1.500                     | 0,37~0,46    | 1.350                     | 0,30~0,37    | 400                       | 0,17~0,20    |

**VHM**

■ Kühlmittel, Coolant, Lubrification, Lubrificante: Emulsion, Emulsion, Emulsion, Emulsion

VHM Hochleistungsbohrer  
Foret en carbure monobloc à haute performance

Solid Carbide High Performance Twist Drill  
Punte ad alta prestazione in MDI



VHM

| Katalog-Nr./Rabattgruppe<br>No. of catalogue / Discount group<br>No. de catalogue / Groupe de remise<br>Nr. di catalogo / Gruppo sconto |                        |                        |                        | S5DIKTA-HM / 15 |       |                        | Katalog-Nr./Rabattgruppe<br>No. of catalogue / Discount group<br>No. de catalogue / Groupe de remise<br>Nr. di catalogo / Gruppo sconto |                        |                        |            | S5DIKTA-HM / 15 |  |  |
|---|------------------------|------------------------|------------------------|-----------------|-------|------------------------|---|------------------------|------------------------|------------|-----------------|--|--|
|   |                        |                        |                        | TiAIN           |       |                        |   |                        |                        |            | TiAIN           |  |  |
| d <sub>1</sub><br>[mm]  | l <sub>2</sub><br>[mm] | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | Code            | €     | d <sub>1</sub><br>[mm] | l <sub>2</sub><br>[mm]  | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | Code       | €               |  |  |
| 2,8   | 21                     | 57                     | 4,0                    | 685 428 HA      | 45,00 | 8,1                    | 61  | 103                    | 10,0                   | 685 481 H? | 61,00           |  |  |
| 2,85  | 21                     | 57                     | 4,0                    | 685 603 HA      | 45,00 | 8,2                    | 61  | 103                    | 10,0                   | 685 482 H? | 61,00           |  |  |
| 3,0   | 28                     | 66                     | 6,0                    | 685 430 H?      | 45,00 | 8,3                    | 61  | 103                    | 10,0                   | 685 483 H? | 61,00           |  |  |
| 3,1   | 28                     | 66                     | 6,0                    | 685 431 H?      | 45,00 | 8,4                    | 61  | 103                    | 10,0                   | 685 484 H? | 61,00           |  |  |
| 3,2   | 28                     | 66                     | 6,0                    | 685 432 H?      | 45,00 | 8,5                    | 61  | 103                    | 10,0                   | 685 485 H? | 61,00           |  |  |
| 3,3   | 28                     | 66                     | 6,0                    | 685 433 H?      | 45,00 | 8,6                    | 61  | 103                    | 10,0                   | 685 486 H? | 61,00           |  |  |
| 3,4   | 28                     | 66                     | 6,0                    | 685 434 H?      | 45,00 | 8,7                    | 61  | 103                    | 10,0                   | 685 487 H? | 61,00           |  |  |
| 3,5   | 28                     | 66                     | 6,0                    | 685 435 H?      | 45,00 | 8,8                    | 61  | 103                    | 10,0                   | 685 488 H? | 61,00           |  |  |
| 3,6   | 28                     | 66                     | 6,0                    | 685 436 H?      | 45,00 | 8,9                    | 61  | 103                    | 10,0                   | 685 489 H? | 61,00           |  |  |
| 3,7   | 28                     | 66                     | 6,0                    | 685 437 H?      | 45,00 | 9,0                    | 61  | 103                    | 10,0                   | 685 490 H? | 61,00           |  |  |
| 3,8   | 36                     | 74                     | 6,0                    | 685 438 H?      | 45,00 | 9,1                    | 61  | 103                    | 10,0                   | 685 491 H? | 61,00           |  |  |
| 3,9   | 36                     | 74                     | 6,0                    | 685 439 H?      | 45,00 | 9,2                    | 61  | 103                    | 10,0                   | 685 492 H? | 61,00           |  |  |
| 4,0   | 36                     | 74                     | 6,0                    | 685 440 H?      | 45,00 | 9,3                    | 61  | 103                    | 10,0                   | 685 493 H? | 61,00           |  |  |
| 4,1   | 36                     | 74                     | 6,0                    | 685 441 H?      | 45,00 | 9,4                    | 61  | 103                    | 10,0                   | 685 494 H? | 61,00           |  |  |
| 4,2   | 36                     | 74                     | 6,0                    | 685 442 H?      | 45,00 | 9,5                    | 61  | 103                    | 10,0                   | 685 495 H? | 61,00           |  |  |
| 4,3   | 36                     | 74                     | 6,0                    | 685 443 H?      | 45,00 | 9,55                   | 61  | 103                    | 10,0                   | 685 608 H? | 61,00           |  |  |
| 4,4   | 36                     | 74                     | 6,0                    | 685 444 H?      | 45,00 | 9,6                    | 61  | 103                    | 10,0                   | 685 496 H? | 61,00           |  |  |
| 4,5   | 36                     | 74                     | 6,0                    | 685 445 H?      | 45,00 | 9,7                    | 61  | 103                    | 10,0                   | 685 497 H? | 61,00           |  |  |
| 4,6   | 36                     | 74                     | 6,0                    | 685 446 H?      | 45,00 | 9,8                    | 61  | 103                    | 10,0                   | 685 498 H? | 61,00           |  |  |
| 4,65  | 36                     | 74                     | 6,0                    | 685 604 H?      | 45,00 | 9,9                    | 61  | 103                    | 10,0                   | 685 499 H? | 61,00           |  |  |
| 4,7   | 36                     | 74                     | 6,0                    | 685 447 H?      | 45,00 | 10,0                   | 61  | 103                    | 10,0                   | 685 500 H? | 61,00           |  |  |
| 4,8   | 44                     | 82                     | 6,0                    | 685 448 H?      | 45,00 | 10,1                   | 71  | 118                    | 12,0                   | 685 501 H? | 85,00           |  |  |
| 4,9   | 44                     | 82                     | 6,0                    | 685 449 H?      | 45,00 | 10,2                   | 71  | 118                    | 12,0                   | 685 502 H? | 85,00           |  |  |
| 5,0   | 44                     | 82                     | 6,0                    | 685 450 H?      | 45,00 | 10,3                   | 71  | 118                    | 12,0                   | 685 503 H? | 85,00           |  |  |
| 5,1   | 44                     | 82                     | 6,0                    | 685 451 H?      | 45,00 | 10,4                   | 71  | 118                    | 12,0                   | 685 504 H? | 85,00           |  |  |
| 5,2   | 44                     | 82                     | 6,0                    | 685 452 H?      | 45,00 | 10,5                   | 71  | 118                    | 12,0                   | 685 505 H? | 85,00           |  |  |
| 5,3   | 44                     | 82                     | 6,0                    | 685 453 H?      | 45,00 | 10,6                   | 71  | 118                    | 12,0                   | 685 506 H? | 85,00           |  |  |
| 5,4   | 44                     | 82                     | 6,0                    | 685 454 H?      | 45,00 | 10,7                   | 71  | 118                    | 12,0                   | 685 507 H? | 85,00           |  |  |
| 5,5   | 44                     | 82                     | 6,0                    | 685 455 H?      | 45,00 | 10,8                   | 71  | 118                    | 12,0                   | 685 508 H? | 85,00           |  |  |
| 5,55  | 44                     | 82                     | 6,0                    | 685 605 H?      | 45,00 | 10,9                   | 71  | 118                    | 12,0                   | 685 509 H? | 85,00           |  |  |
| 5,6   | 44                     | 82                     | 6,0                    | 685 456 H?      | 45,00 | 11,0                   | 71  | 118                    | 12,0                   | 685 510 H? | 85,00           |  |  |
| 5,65  | 44                     | 82                     | 6,0                    | 685 606 H?      | 45,00 | 11,2                   | 71  | 118                    | 12,0                   | 685 512 H? | 85,00           |  |  |
| 5,7   | 44                     | 82                     | 6,0                    | 685 457 H?      | 45,00 | 11,3                   | 71  | 118                    | 12,0                   | 685 513 H? | 85,00           |  |  |
| 5,8   | 44                     | 82                     | 6,0                    | 685 458 H?      | 45,00 | 11,5                   | 71  | 118                    | 12,0                   | 685 515 H? | 85,00           |  |  |
| 5,9   | 44                     | 82                     | 6,0                    | 685 459 H?      | 45,00 | 11,8                   | 71  | 118                    | 12,0                   | 685 518 H? | 85,00           |  |  |
| 6,0   | 44                     | 82                     | 6,0                    | 685 460 H?      | 45,00 | 12,0                   | 71  | 118                    | 12,0                   | 685 520 H? | 85,00           |  |  |
| 6,1   | 53                     | 91                     | 8,0                    | 685 461 H?      | 52,00 | 12,2                   | 77  | 124                    | 14,0                   | 685 522 H? | 112,00          |  |  |
| 6,2   | 53                     | 91                     | 8,0                    | 685 462 H?      | 52,00 | 12,5                   | 77  | 124                    | 14,0                   | 685 525 H? | 112,00          |  |  |
| 6,3   | 53                     | 91                     | 8,0                    | 685 463 H?      | 52,00 | 12,8                   | 77  | 124                    | 14,0                   | 685 528 H? | 112,00          |  |  |
| 6,4   | 53                     | 91                     | 8,0                    | 685 464 H?      | 52,00 | 13,0                   | 77  | 124                    | 14,0                   | 685 530 H? | 112,00          |  |  |
| 6,5   | 53                     | 91                     | 8,0                    | 685 465 H?      | 52,00 | 13,3                   | 77  | 124                    | 14,0                   | 685 533 H? | 112,00          |  |  |
| 6,6   | 53                     | 91                     | 8,0                    | 685 466 H?      | 52,00 | 13,5                   | 77  | 124                    | 14,0                   | 685 535 H? | 112,00          |  |  |
| 6,7   | 53                     | 91                     | 8,0                    | 685 467 H?      | 52,00 | 13,8                   | 77  | 124                    | 14,0                   | 685 538 H? | 112,00          |  |  |
| 6,8   | 53                     | 91                     | 8,0                    | 685 468 H?      | 52,00 | 14,0                   | 77  | 124                    | 14,0                   | 685 540 H? | 112,00          |  |  |
| 6,9   | 53                     | 91                     | 8,0                    | 685 469 H?      | 52,00 | 14,5                   | 83  | 133                    | 16,0                   | 685 545 H? | 136,00          |  |  |
| 7,0   | 53                     | 91                     | 8,0                    | 685 470 H?      | 52,00 | 15,0                   | 83  | 133                    | 16,0                   | 685 550 H? | 136,00          |  |  |
| 7,1   | 53                     | 91                     | 8,0                    | 685 471 H?      | 52,00 | 15,3                   | 83  | 133                    | 16,0                   | 685 553 H? | 136,00          |  |  |
| 7,2   | 53                     | 91                     | 8,0                    | 685 472 H?      | 52,00 | 15,5                   | 83  | 133                    | 16,0                   | 685 555 H? | 136,00          |  |  |
| 7,3   | 53                     | 91                     | 8,0                    | 685 473 H?      | 52,00 | 16,0                   | 83  | 133                    | 16,0                   | 685 560 H? | 136,00          |  |  |
| 7,4   | 53                     | 91                     | 8,0                    | 685 474 H?      | 52,00 | 16,5                   | 93  | 143                    | 18,0                   | 685 565 H? | 218,00          |  |  |
| 7,5   | 53                     | 91                     | 8,0                    | 685 475 H?      | 52,00 | 17,0                   | 93  | 143                    | 18,0                   | 685 570 H? | 218,00          |  |  |
| 7,55  | 53                     | 91                     | 8,0                    | 685 607 H?      | 52,00 | 17,5                   | 93  | 143                    | 18,0                   | 685 575 H? | 218,00          |  |  |
| 7,6   | 53                     | 91                     | 8,0                    | 685 476 H?      | 52,00 | 18,0                   | 93  | 143                    | 18,0                   | 685 580 H? | 218,00          |  |  |
| 7,7   | 53                     | 91                     | 8,0                    | 685 477 H?      | 52,00 | 18,5                   | 101   | 153                    | 20,0                   | 685 585 H? | 232,00          |  |  |
| 7,8   | 53                     | 91                     | 8,0                    | 685 478 H?      | 52,00 | 19,0                   | 101   | 153                    | 20,0                   | 685 590 H? | 232,00          |  |  |
| 7,9   | 53                     | 91                     | 8,0                    | 685 479 H?      | 52,00 | 19,5                   | 101   | 153                    | 20,0                   | 685 595 H? | 232,00          |  |  |
| 8,0   | 53                     | 91                     | 8,0                    | 685 480 H?      | 52,00 | 20,0                   | 101   | 153                    | 20,0                   | 685 600 H? | 232,00          |  |  |

**Schnittdatenempfehlung**  
**Paramètres de coupe**
**Recommended cutting data**  
**Parametri di taglio**
**S5DIKTA-HM**
**Typ UNI, 5 x d, VHM-TiAlN-IKZ**


| MAT              | 1.1                       |               | 1.2.3                     |               | 1.2.2 + 1.2.4             |               | 1.2.1 + 1.3<br>(<1000 N/mm <sup>2</sup> ) |               | 1.4<br>(1000~<br>1200 N/mm <sup>2</sup> ) |               | 1.5                        |               |                                    |               |                                    |               |
|------------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---|---------------|---|---------------|----------------------------|---------------|------------------------------------|---------------|------------------------------------|---------------|
|                  | 75 ~ 100<br>m/min         |               | 90 ~ 100<br>m/min         |               | 75 ~ 95<br>m/min          |               | 70 ~ 80<br>m/min                          |               | 45 ~ 55<br>m/min                          |               | (<1000 N/mm <sup>2</sup> ) |               | (1000~<br>1200 N/mm <sup>2</sup> ) |               | (1200~<br>1500 N/mm <sup>2</sup> ) |               |
| V <sub>c</sub>   |                           |               |                           |               |                           |               |   |               |   |               |                            |               |                                    |               |                                    |               |
| Ø d <sub>1</sub> | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]                 | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]                 | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]  | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]          | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]          | f<br>[min/U]  |
| 3                | 9.300                     | 0,13~<br>0,16 | 10.100                    | 0,13~<br>0,16 | 9.000                     | 0,13~<br>0,16 | 7.150                                     | 0,06~<br>0,08 | 5.300                                     | 0,06~<br>0,08 | 6.900                      | 0,06~<br>0,08 | 5.300                              | 0,06~<br>0,08 | 3.450                              | 0,06~<br>0,08 |
| 4                | 6.950                     | 0,13~<br>0,16 | 7.550                     | 0,13~<br>0,16 | 6.750                     | 0,13~<br>0,16 | 5.350                                     | 0,06~<br>0,08 | 4.000                                     | 0,06~<br>0,08 | 5.150                      | 0,06~<br>0,08 | 4.000                              | 0,06~<br>0,08 | 2.600                              | 0,06~<br>0,08 |
| 5                | 5.550                     | 0,13~<br>0,16 | 6.050                     | 0,13~<br>0,16 | 5.400                     | 0,13~<br>0,16 | 4.300                                     | 0,06~<br>0,08 | 3.200                                     | 0,06~<br>0,08 | 4.150                      | 0,06~<br>0,08 | 3.200                              | 0,06~<br>0,08 | 2.050                              | 0,06~<br>0,08 |
| 6                | 4.650                     | 0,18~<br>0,22 | 5.050                     | 0,18~<br>0,22 | 4.500                     | 0,18~<br>0,22 | 3.600                                     | 0,10~<br>0,12 | 2.650                                     | 0,10~<br>0,12 | 3.450                      | 0,10~<br>0,12 | 2.650                              | 0,10~<br>0,12 | 1.700                              | 0,10~<br>0,12 |
| 8                | 3.500                     | 0,18~<br>0,22 | 3.800                     | 0,18~<br>0,22 | 3.400                     | 0,18~<br>0,22 | 2.700                                     | 0,10~<br>0,12 | 2.000                                     | 0,10~<br>0,12 | 2.600                      | 0,10~<br>0,12 | 2.000                              | 0,10~<br>0,12 | 1.300                              | 0,10~<br>0,12 |
| 10               | 2.800                     | 0,22~<br>0,28 | 3.000                     | 0,22~<br>0,28 | 2.700                     | 0,22~<br>0,28 | 2.150                                     | 0,12~<br>0,15 | 1.600                                     | 0,12~<br>0,15 | 2.050                      | 0,12~<br>0,15 | 1.600                              | 0,12~<br>0,15 | 1.050                              | 0,12~<br>0,15 |
| 12               | 2.300                     | 0,22~<br>0,28 | 2.500                     | 0,22~<br>0,28 | 2.250                     | 0,22~<br>0,28 | 1.800                                     | 0,12~<br>0,15 | 1.350                                     | 0,12~<br>0,15 | 1.700                      | 0,12~<br>0,15 | 1.350                              | 0,12~<br>0,15 | 850                                | 0,12~<br>0,15 |
| 14               | 2.000                     | 0,27~<br>0,34 | 2.150                     | 0,27~<br>0,34 | 1.950                     | 0,27~<br>0,34 | 1.550                                     | 0,16~<br>0,20 | 1.150                                     | 0,16~<br>0,20 | 1.500                      | 0,16~<br>0,20 | 1.150                              | 0,16~<br>0,20 | 750                                | 0,16~<br>0,20 |
| 16               | 1.750                     | 0,27~<br>0,34 | 1.900                     | 0,27~<br>0,34 | 1.700                     | 0,27~<br>0,34 | 1.350                                     | 0,16~<br>0,20 | 1.000                                     | 0,16~<br>0,20 | 1.300                      | 0,16~<br>0,20 | 1.000                              | 0,16~<br>0,20 | 650                                | 0,16~<br>0,20 |
| 18               | 1.550                     | 0,30~<br>0,38 | 1.700                     | 0,30~<br>0,38 | 1.500                     | 0,30~<br>0,38 | 1.200                                     | 0,20~<br>0,25 | 900                                       | 0,20~<br>0,25 | 1.150                      | 0,20~<br>0,25 | 900                                | 0,20~<br>0,25 | 550                                | 0,20~<br>0,25 |
| 20               | 1.400                     | 0,30~<br>0,38 | 1.500                     | 0,30~<br>0,38 | 1.350                     | 0,30~<br>0,38 | 1.050                                     | 0,20~<br>0,25 | 800                                       | 0,20~<br>0,25 | 1.050                      | 0,20~<br>0,25 | 800                                | 0,20~<br>0,25 | 500                                | 0,20~<br>0,25 |

| MAT              | 1.6.1                     |               | 1.6.2                     |               | 1.6.3                     |               | 1.6.4                     |               | 1.6.5                     |               | 2.1 + 2.2                 |               | 2.3 + 2.4                 |               | 5                         |               |
|------------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|
|                  | 50 ~ 60<br>m/min          |               | 35 ~ 50<br>m/min          |               | 30 ~ 45<br>m/min          |               | 45 ~ 55<br>m/min          |               | 25 ~ 30<br>m/min          |               | 80 ~ 110<br>m/min         |               | 70 ~ 100<br>m/min         |               | 25 ~ 30<br>m/min          |               |
| V <sub>c</sub>   |                           |               |                           |               |                           |               |                           |               |                           |               |                           |               |                           |               |                           |               |
| Ø d <sub>1</sub> | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  |
| 3                | 5.300                     | 0,06~<br>0,08 | 4.500                     | 0,06~<br>0,08 | 4.000                     | 0,06~<br>0,08 | 5.300                     | 0,06~<br>0,08 | 2.900                     | 0,06~<br>0,08 | 10.100                    | 0,16~<br>0,20 | 9.000                     | 0,10~<br>0,12 | 2.920                     | 0,03~<br>0,04 |
| 4                | 4.000                     | 0,06~<br>0,08 | 3.400                     | 0,06~<br>0,08 | 3.000                     | 0,06~<br>0,08 | 4.000                     | 0,06~<br>0,08 | 2.200                     | 0,06~<br>0,08 | 7.550                     | 0,16~<br>0,20 | 6.750                     | 0,10~<br>0,12 | 2.190                     | 0,03~<br>0,04 |
| 5                | 3.200                     | 0,06~<br>0,08 | 2.700                     | 0,06~<br>0,08 | 2.400                     | 0,06~<br>0,08 | 3.200                     | 0,06~<br>0,08 | 1.750                     | 0,06~<br>0,08 | 6.050                     | 0,16~<br>0,20 | 5.400                     | 0,10~<br>0,12 | 1.750                     | 0,03~<br>0,04 |
| 6                | 2.650                     | 0,10~<br>0,12 | 2.250                     | 0,10~<br>0,12 | 2.000                     | 0,10~<br>0,12 | 2.650                     | 0,10~<br>0,12 | 1.450                     | 0,10~<br>0,12 | 5.050                     | 0,20~<br>0,25 | 4.500                     | 0,14~<br>0,17 | 1.460                     | 0,05~<br>0,08 |
| 8                | 2.000                     | 0,10~<br>0,12 | 1.700                     | 0,10~<br>0,12 | 1.500                     | 0,10~<br>0,12 | 2.000                     | 0,10~<br>0,12 | 1.100                     | 0,10~<br>0,12 | 3.800                     | 0,20~<br>0,25 | 3.400                     | 0,14~<br>0,17 | 1.100                     | 0,05~<br>0,08 |
| 10               | 1.600                     | 0,12~<br>0,15 | 1.350                     | 0,12~<br>0,15 | 1.200                     | 0,12~<br>0,15 | 1.600                     | 0,12~<br>0,15 | 900                       | 0,12~<br>0,15 | 3.000                     | 0,28~<br>0,35 | 2.700                     | 0,18~<br>0,22 | 875                       | 0,09~<br>0,12 |
| 12               | 1.350                     | 0,12~<br>0,15 | 1.150                     | 0,12~<br>0,15 | 1.000                     | 0,12~<br>0,15 | 1.350                     | 0,12~<br>0,15 | 750                       | 0,12~<br>0,15 | 2.500                     | 0,28~<br>0,35 | 2.250                     | 0,18~<br>0,22 | 730                       | 0,09~<br>0,12 |
| 14               | 1.150                     | 0,16~<br>0,20 | 950                       | 0,16~<br>0,20 | 850                       | 0,16~<br>0,20 | 1.150                     | 0,16~<br>0,20 | 650                       | 0,16~<br>0,20 | 2.150                     | 0,32~<br>0,40 | 1.950                     | 0,24~<br>0,30 | 625                       | 0,13~<br>0,16 |
| 16               | 1.000                     | 0,16~<br>0,20 | 850                       | 0,16~<br>0,20 | 750                       | 0,16~<br>0,20 | 1.000                     | 0,16~<br>0,20 | 550                       | 0,16~<br>0,20 | 1.900                     | 0,32~<br>0,40 | 1.700                     | 0,24~<br>0,30 | 550                       | 0,13~<br>0,16 |
| 18               | 900                       | 0,20~<br>0,25 | 750                       | 0,20~<br>0,25 | 650                       | 0,20~<br>0,25 | 900                       | 0,20~<br>0,25 | 500                       | 0,20~<br>0,25 | 1.700                     | 0,37~<br>0,46 | 1.500                     | 0,30~<br>0,37 | 490                       | 0,17~<br>0,20 |
| 20               | 800                       | 0,20~<br>0,25 | 700                       | 0,20~<br>0,25 | 600                       | 0,20~<br>0,25 | 800                       | 0,20~<br>0,25 | 450                       | 0,20~<br>0,25 | 1.500                     | 0,37~<br>0,46 | 1.350                     | 0,30~<br>0,37 | 400                       | 0,17~<br>0,20 |

**VHM**

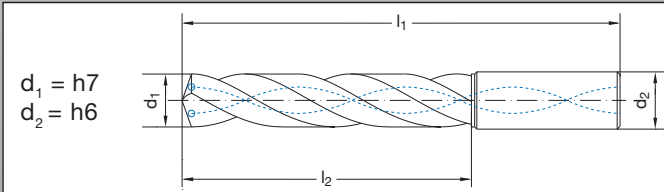
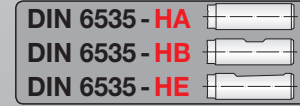
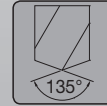
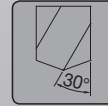
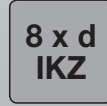
■ Kühlmittel, Coolant, Lubrification, Lubrificante: Emulsion, Emulsion, Emulsion, Emulsion

VHM Hochleistungsbohrer

Foret en carbure monobloc à haute performance

Solid Carbide High Performance Twist Drill

Punte ad alta prestazione in MDI



VHM

Katalog-Nr. / Rabattgruppe  
No. of catalogue / Discount group  
No. de catalogue / Groupe de remise  
Nr. di catalogo / Gruppo sconto

**S8DIKTA-HM / 15**

TiAIN

Katalog-Nr. / Rabattgruppe  
No. of catalogue / Discount group  
No. de catalogue / Groupe de remise  
Nr. di catalogo / Gruppo sconto

**S8DIKTA-HM / 15**

TiAIN

| d <sub>1</sub><br>[mm] | l <sub>2</sub><br>[mm] | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | Code       | €      |
|------------------------|------------------------|------------------------|------------------------|------------|--------|
| 3,0                    | 34                     | 72                     | 6,0                    | 685 620 H? | 102,00 |
| 3,3                    | 34                     | 72                     | 6,0                    | 685 623 H? | 102,00 |
| 3,5                    | 34                     | 72                     | 6,0                    | 685 625 H? | 102,00 |
| 4,0                    | 43                     | 81                     | 6,0                    | 685 630 H? | 102,00 |
| 4,2                    | 43                     | 81                     | 6,0                    | 685 632 H? | 102,00 |
| 4,5                    | 43                     | 81                     | 6,0                    | 685 635 H? | 102,00 |
| 5,0                    | 57                     | 95                     | 6,0                    | 685 640 H? | 102,00 |
| 5,5                    | 57                     | 95                     | 6,0                    | 685 645 H? | 102,00 |
| 6,0                    | 57                     | 95                     | 6,0                    | 685 650 H? | 102,00 |
| 6,5                    | 76                     | 114                    | 8,0                    | 685 655 H? | 126,00 |
| 6,8                    | 76                     | 114                    | 8,0                    | 685 658 H? | 126,00 |
| 7,0                    | 76                     | 114                    | 8,0                    | 685 660 H? | 126,00 |
| 7,5                    | 76                     | 114                    | 8,0                    | 685 665 H? | 126,00 |
| 7,8                    | 76                     | 114                    | 8,0                    | 685 668 H? | 126,00 |
| 8,0                    | 76                     | 114                    | 8,0                    | 685 670 H? | 126,00 |
| 8,5                    | 95                     | 142                    | 10,0                   | 685 675 H? | 160,00 |
| 9,0                    | 95                     | 142                    | 10,0                   | 685 680 H? | 160,00 |
| 9,5                    | 95                     | 142                    | 10,0                   | 685 685 H? | 160,00 |
| 10,0                   | 95                     | 142                    | 10,0                   | 685 690 H? | 160,00 |
| 10,2                   | 114                    | 162                    | 12,0                   | 685 692 H? | 214,00 |
| 10,5                   | 114                    | 162                    | 12,0                   | 685 695 H? | 214,00 |
| 11,0                   | 114                    | 162                    | 12,0                   | 685 700 H? | 214,00 |
| 11,5                   | 114                    | 162                    | 12,0                   | 685 705 H? | 214,00 |
| 12,0                   | 114                    | 162                    | 12,0                   | 685 710 H? | 214,00 |

| d <sub>1</sub><br>[mm] | l <sub>2</sub><br>[mm] | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | Code       | €      |
|------------------------|------------------------|------------------------|------------------------|------------|--------|
| 12,5                   | 133                    | 178                    | 14,0                   | 685 715 H? | 280,00 |
| 12,7                   | 133                    | 178                    | 14,0                   | 685 717 H? | 280,00 |
| 13,0                   | 133                    | 178                    | 14,0                   | 685 720 H? | 280,00 |
| 13,5                   | 133                    | 178                    | 14,0                   | 685 725 H? | 280,00 |
| 14,0                   | 133                    | 178                    | 14,0                   | 685 730 H? | 280,00 |
| 14,5                   | 152                    | 203                    | 16,0                   | 685 735 H? | 380,00 |
| 15,0                   | 152                    | 203                    | 16,0                   | 685 740 H? | 380,00 |
| 15,5                   | 152                    | 203                    | 16,0                   | 685 745 H? | 380,00 |
| 16,0                   | 152                    | 203                    | 16,0                   | 685 750 H? | 380,00 |
| 16,5                   | 171                    | 222                    | 18,0                   | 685 755 H? | 460,00 |
| 17,0                   | 171                    | 222                    | 18,0                   | 685 760 H? | 460,00 |
| 17,5                   | 171                    | 222                    | 18,0                   | 685 765 H? | 460,00 |
| 18,0                   | 171                    | 222                    | 18,0                   | 685 770 H? | 460,00 |
| 18,5                   | 190                    | 243                    | 20,0                   | 685 775 H? | 550,00 |
| 19,0                   | 190                    | 243                    | 20,0                   | 685 780 H? | 550,00 |
| 19,5                   | 190                    | 243                    | 20,0                   | 685 785 H? | 550,00 |
| 20,0                   | 190                    | 243                    | 20,0                   | 685 790 H? | 550,00 |

**Schnittdatenempfehlung**  
**Paramètres de coupe**
**Recommended cutting data**  
**Parametri di taglio**
**S8DIKTA-HM**
**Typ UNI, 8 x d, VHM-TiAlN-IKZ**


| MAT              | 1.1                       |              | 1.2.3                     |              | 1.2.2 + 1.2.4             |              | 1.2.1 + 1.3<br>(<1000 N/mm <sup>2</sup> ) |              | 1.4<br>(1000~1200 N/mm <sup>2</sup> ) |              | 1.5                        |              |                                |              |                                |              |
|------------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---|--------------|---------------------------------------|--------------|----------------------------|--------------|--------------------------------|--------------|--------------------------------|--------------|
|                  | 70 ~ 85<br>m/min          |              | 75 ~ 85<br>m/min          |              | 70 ~ 85<br>m/min          |              | 65 ~ 75<br>m/min                          |              | 45 ~ 55<br>m/min                      |              | (<1000 N/mm <sup>2</sup> ) |              | (1000~1200 N/mm <sup>2</sup> ) |              | (1200~1500 N/mm <sup>2</sup> ) |              |
| V <sub>c</sub>   |                           |              |                           |              |                           |              |   |              |                                       |              |                            |              |                                |              |                                |              |
| Ø d <sub>1</sub> | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ]                 | f<br>[min/U] | n<br>[min <sup>-1</sup> ]             | f<br>[min/U] | n<br>[min <sup>-1</sup> ]  | f<br>[min/U] | n<br>[min <sup>-1</sup> ]      | f<br>[min/U] | n<br>[min <sup>-1</sup> ]      | f<br>[min/U] |
| 3                | 8.200                     | 0,13~0,16    | 8.500                     | 0,13~0,16    | 7.950                     | 0,13~0,16    | 6.900                                     | 0,06~0,08    | 5.300                                 | 0,06~0,08    | 6.900                      | 0,06~0,08    | 5.300                          | 0,06~0,08    | 3.450                          | 0,06~0,08    |
| 4                | 6.150                     | 0,13~0,16    | 6.350                     | 0,13~0,16    | 5.950                     | 0,13~0,16    | 5.150                                     | 0,06~0,08    | 4.000                                 | 0,06~0,08    | 5.150                      | 0,06~0,08    | 4.000                          | 0,06~0,08    | 2.600                          | 0,06~0,08    |
| 5                | 4.950                     | 0,13~0,16    | 5.100                     | 0,13~0,16    | 4.750                     | 0,13~0,16    | 4.150                                     | 0,06~0,08    | 3.200                                 | 0,06~0,08    | 4.150                      | 0,06~0,08    | 3.200                          | 0,06~0,08    | 2.050                          | 0,06~0,08    |
| 6                | 4.100                     | 0,18~0,22    | 4.250                     | 0,18~0,22    | 4.000                     | 0,18~0,22    | 3.450                                     | 0,10~0,12    | 2.650                                 | 0,10~0,12    | 3.450                      | 0,10~0,12    | 2.650                          | 0,10~0,12    | 1.700                          | 0,10~0,12    |
| 8                | 3.100                     | 0,18~0,22    | 3.200                     | 0,18~0,22    | 3.000                     | 0,18~0,22    | 2.600                                     | 0,10~0,12    | 2.000                                 | 0,10~0,12    | 2.600                      | 0,10~0,12    | 2.000                          | 0,10~0,12    | 1.300                          | 0,10~0,12    |
| 10               | 2.450                     | 0,22~0,28    | 2.550                     | 0,22~0,28    | 2.400                     | 0,22~0,28    | 2.050                                     | 0,12~0,15    | 1.600                                 | 0,12~0,15    | 2.050                      | 0,12~0,15    | 1.600                          | 0,12~0,15    | 1.050                          | 0,12~0,15    |
| 12               | 2.050                     | 0,22~0,28    | 2.100                     | 0,22~0,28    | 2.000                     | 0,22~0,28    | 1.700                                     | 0,12~0,15    | 1.350                                 | 0,12~0,15    | 1.700                      | 0,12~0,15    | 1.350                          | 0,12~0,15    | 850                            | 0,12~0,15    |
| 14               | 1.750                     | 0,27~0,34    | 1.800                     | 0,27~0,34    | 1.700                     | 0,27~0,34    | 1.500                                     | 0,16~0,20    | 1.150                                 | 0,16~0,20    | 1.500                      | 0,16~0,20    | 1.150                          | 0,16~0,20    | 750                            | 0,16~0,20    |
| 16               | 1.550                     | 0,27~0,34    | 1.600                     | 0,27~0,34    | 1.500                     | 0,27~0,34    | 1.300                                     | 0,16~0,20    | 1.000                                 | 0,16~0,20    | 1.300                      | 0,16~0,20    | 1.000                          | 0,16~0,20    | 650                            | 0,16~0,20    |
| 18               | 1.350                     | 0,30~0,38    | 1.400                     | 0,30~0,38    | 1.350                     | 0,30~0,38    | 1.150                                     | 0,20~0,25    | 900                                   | 0,20~0,25    | 1.150                      | 0,20~0,25    | 900                            | 0,20~0,25    | 550                            | 0,20~0,25    |
| 20               | 1.250                     | 0,30~0,38    | 1.250                     | 0,30~0,38    | 1.200                     | 0,30~0,38    | 1.050                                     | 0,20~0,25    | 800                                   | 0,20~0,25    | 1.050                      | 0,20~0,25    | 800                            | 0,20~0,25    | 500                            | 0,20~0,25    |

| MAT              | 1.6.1                     |              | 1.6.2                     |              | 1.6.3                     |              | 1.6.4                     |              | 1.6.5                     |              | 2.1 + 2.2                 |              | 2.3 + 2.4                 |              | 5                         |              |
|------------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|
|                  | 55 ~ 75<br>m/min          |              | 50 ~ 70<br>m/min          |              | 45 ~ 65<br>m/min          |              | 55 ~ 75<br>m/min          |              | 30 ~ 45<br>m/min          |              | 70 ~ 95<br>m/min          |              | 65 ~ 85<br>m/min          |              | 25 ~ 30<br>m/min          |              |
| V <sub>c</sub>   |                           |              |                           |              |                           |              |                           |              |                           |              |                           |              |                           |              |                           |              |
| Ø d <sub>1</sub> | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] | n<br>[min <sup>-1</sup> ] | f<br>[min/U] |
| 3                | 6.900                     | 0,06~0,08    | 6.350                     | 0,06~0,08    | 5.850                     | 0,06~0,08    | 6.900                     | 0,06~0,08    | 4.000                     | 0,06~0,08    | 7.950                     | 0,16~0,20    | 7.150                     | 0,10~0,12    | 2.920                     | 0,03~0,04    |
| 4                | 5.150                     | 0,06~0,08    | 4.750                     | 0,06~0,08    | 4.400                     | 0,06~0,08    | 5.150                     | 0,06~0,08    | 3.000                     | 0,06~0,08    | 5.950                     | 0,16~0,20    | 5.350                     | 0,10~0,12    | 2.190                     | 0,03~0,04    |
| 5                | 4.150                     | 0,06~0,08    | 3.800                     | 0,06~0,08    | 3.500                     | 0,06~0,08    | 4.150                     | 0,06~0,08    | 2.400                     | 0,06~0,08    | 4.750                     | 0,16~0,20    | 4.300                     | 0,10~0,12    | 1.750                     | 0,03~0,04    |
| 6                | 3.450                     | 0,10~0,12    | 3.200                     | 0,10~0,12    | 2.900                     | 0,10~0,12    | 3.450                     | 0,10~0,12    | 2.000                     | 0,10~0,12    | 4.000                     | 0,20~0,25    | 3.600                     | 0,14~0,17    | 1.460                     | 0,05~0,08    |
| 8                | 2.600                     | 0,10~0,12    | 2.400                     | 0,10~0,12    | 2.200                     | 0,10~0,12    | 2.600                     | 0,10~0,12    | 1.500                     | 0,10~0,12    | 3.000                     | 0,20~0,25    | 2.700                     | 0,14~0,17    | 1.100                     | 0,05~0,08    |
| 10               | 2.050                     | 0,12~0,15    | 1.900                     | 0,12~0,15    | 1.750                     | 0,12~0,15    | 2.050                     | 0,12~0,15    | 1.200                     | 0,12~0,15    | 2.400                     | 0,28~0,35    | 2.150                     | 0,18~0,22    | 875                       | 0,09~0,12    |
| 12               | 1.700                     | 0,12~0,15    | 1.600                     | 0,12~0,15    | 1.450                     | 0,12~0,15    | 1.700                     | 0,12~0,15    | 1.000                     | 0,12~0,15    | 2.000                     | 0,28~0,35    | 1.800                     | 0,18~0,22    | 730                       | 0,09~0,12    |
| 14               | 1.500                     | 0,16~0,20    | 1.350                     | 0,16~0,20    | 1.250                     | 0,16~0,20    | 1.500                     | 0,16~0,20    | 850                       | 0,16~0,20    | 1.700                     | 0,32~0,40    | 1.550                     | 0,24~0,30    | 625                       | 0,13~0,16    |
| 16               | 1.300                     | 0,16~0,20    | 1.200                     | 0,16~0,20    | 1.100                     | 0,16~0,20    | 1.300                     | 0,16~0,20    | 750                       | 0,16~0,20    | 1.500                     | 0,32~0,40    | 1.350                     | 0,24~0,30    | 550                       | 0,13~0,16    |
| 18               | 1.150                     | 0,20~0,25    | 1.050                     | 0,20~0,25    | 950                       | 0,20~0,25    | 1.150                     | 0,20~0,25    | 650                       | 0,20~0,25    | 1.350                     | 0,37~0,46    | 1.200                     | 0,30~0,37    | 490                       | 0,17~0,20    |
| 20               | 1.050                     | 0,20~0,25    | 950                       | 0,20~0,25    | 900                       | 0,20~0,25    | 1.050                     | 0,20~0,25    | 600                       | 0,20~0,25    | 1.200                     | 0,37~0,46    | 1.050                     | 0,30~0,37    | 400                       | 0,17~0,20    |

**VHM**

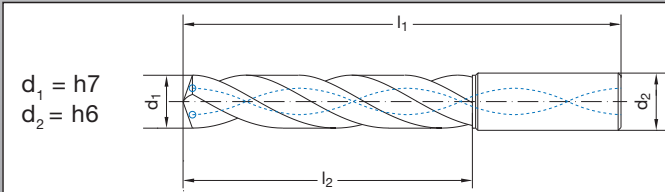
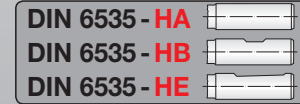
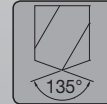
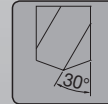
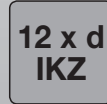
■ Kühlmittel, Coolant, Lubrification, Lubrificante: Emulsion, Emulsion, Emulsion, Emulsion

VHM Hochleistungsbohrer

Foret en carbure monobloc à haute performance

Solid Carbide High Performance Twist Drill

Punte ad alta prestazione in MDI



VHM

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No. de catalogue / Groupe de remise  
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**S12DIKTA-HM / 15**

TiAIN

Katalog-Nr./Rabattgruppe  
No. of catalogue / Discount group  
No. de catalogue / Groupe de remise  
Nr. di catalogo / Gruppo sconto

**S12DIKTA-HM / 15**

TiAIN

| d <sub>1</sub><br>[mm] | l <sub>2</sub><br>[mm] | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | Code       | €      |
|------------------------|------------------------|------------------------|------------------------|------------|--------|
| 3,0                    | 54                     | 92                     | 6,0                    | 685 800 H? | 126,00 |
| 3,3                    | 54                     | 92                     | 6,0                    | 685 803 H? | 126,00 |
| 3,5                    | 54                     | 92                     | 6,0                    | 685 805 H? | 126,00 |
| 4,0                    | 64                     | 102                    | 6,0                    | 685 810 H? | 126,00 |
| 4,2                    | 64                     | 102                    | 6,0                    | 685 812 H? | 126,00 |
| 4,5                    | 64                     | 102                    | 6,0                    | 685 815 H? | 126,00 |
| 5,0                    | 78                     | 116                    | 6,0                    | 685 820 H? | 126,00 |
| 5,5                    | 78                     | 116                    | 6,0                    | 685 825 H? | 126,00 |
| 6,0                    | 78                     | 116                    | 6,0                    | 685 830 H? | 126,00 |
| 6,5                    | 108                    | 146                    | 8,0                    | 685 835 H? | 156,00 |
| 6,8                    | 108                    | 146                    | 8,0                    | 685 838 H? | 156,00 |
| 7,0                    | 108                    | 146                    | 8,0                    | 685 840 H? | 156,00 |
| 7,5                    | 108                    | 146                    | 8,0                    | 685 845 H? | 156,00 |
| 7,8                    | 108                    | 146                    | 8,0                    | 685 848 H? | 156,00 |
| 8,0                    | 108                    | 146                    | 8,0                    | 685 850 H? | 156,00 |
| 8,5                    | 120                    | 162                    | 10,0                   | 685 855 H? | 206,00 |
| 9,0                    | 120                    | 162                    | 10,0                   | 685 860 H? | 206,00 |
| 9,5                    | 120                    | 162                    | 10,0                   | 685 865 H? | 206,00 |
| 10,0                   | 120                    | 162                    | 10,0                   | 685 870 H? | 206,00 |
| 10,2                   | 156                    | 204                    | 12,0                   | 685 872 H? | 290,00 |
| 11,0                   | 156                    | 204                    | 12,0                   | 685 880 H? | 290,00 |
| 11,5                   | 156                    | 204                    | 12,0                   | 685 885 H? | 290,00 |
| 12,0                   | 156                    | 204                    | 12,0                   | 685 890 H? | 290,00 |

| d <sub>1</sub><br>[mm] | l <sub>2</sub><br>[mm] | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | Code       | €      |
|------------------------|------------------------|------------------------|------------------------|------------|--------|
| 12,5                   | 182                    | 230                    | 14,0                   | 685 895 H? | 370,00 |
| 12,7                   | 182                    | 230                    | 14,0                   | 685 897 H? | 370,00 |
| 13,0                   | 182                    | 230                    | 14,0                   | 685 900 H? | 370,00 |
| 13,5                   | 182                    | 230                    | 14,0                   | 685 905 H? | 370,00 |
| 14,0                   | 182                    | 230                    | 14,0                   | 685 910 H? | 370,00 |
| 14,5                   | 208                    | 260                    | 16,0                   | 685 915 H? | 480,00 |
| 15,0                   | 208                    | 260                    | 16,0                   | 685 920 H? | 480,00 |
| 15,5                   | 208                    | 260                    | 16,0                   | 685 925 H? | 480,00 |
| 16,0                   | 208                    | 260                    | 16,0                   | 685 930 H? | 480,00 |
| 16,5                   | 234                    | 285                    | 18,0                   | 685 935 H? | 530,00 |
| 17,0                   | 234                    | 285                    | 18,0                   | 685 940 H? | 530,00 |
| 17,5                   | 234                    | 285                    | 18,0                   | 685 945 H? | 530,00 |
| 18,0                   | 234                    | 285                    | 18,0                   | 685 950 H? | 530,00 |
| 18,5                   | 258                    | 310                    | 20,0                   | 685 955 H? | 650,00 |
| 19,0                   | 258                    | 310                    | 20,0                   | 685 960 H? | 650,00 |
| 19,5                   | 258                    | 310                    | 20,0                   | 685 965 H? | 650,00 |
| 20,0                   | 258                    | 310                    | 20,0                   | 685 970 H? | 650,00 |

| d <sub>1</sub><br>[mm] | l <sub>2</sub><br>[mm] | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | Code       | €      |
|------------------------|------------------------|------------------------|------------------------|------------|--------|
| 12,5                   | 182                    | 230                    | 14,0                   | 685 895 H? | 370,00 |
| 12,7                   | 182                    | 230                    | 14,0                   | 685 897 H? | 370,00 |
| 13,0                   | 182                    | 230                    | 14,0                   | 685 900 H? | 370,00 |
| 13,5                   | 182                    | 230                    | 14,0                   | 685 905 H? | 370,00 |
| 14,0                   | 182                    | 230                    | 14,0                   | 685 910 H? | 370,00 |
| 14,5                   | 208                    | 260                    | 16,0                   | 685 915 H? | 480,00 |
| 15,0                   | 208                    | 260                    | 16,0                   | 685 920 H? | 480,00 |
| 15,5                   | 208                    | 260                    | 16,0                   | 685 925 H? | 480,00 |
| 16,0                   | 208                    | 260                    | 16,0                   | 685 930 H? | 480,00 |
| 16,5                   | 234                    | 285                    | 18,0                   | 685 935 H? | 530,00 |
| 17,0                   | 234                    | 285                    | 18,0                   | 685 940 H? | 530,00 |
| 17,5                   | 234                    | 285                    | 18,0                   | 685 945 H? | 530,00 |
| 18,0                   | 234                    | 285                    | 18,0                   | 685 950 H? | 530,00 |
| 18,5                   | 258                    | 310                    | 20,0                   | 685 955 H? | 650,00 |
| 19,0                   | 258                    | 310                    | 20,0                   | 685 960 H? | 650,00 |
| 19,5                   | 258                    | 310                    | 20,0                   | 685 965 H? | 650,00 |
| 20,0                   | 258                    | 310                    | 20,0                   | 685 970 H? | 650,00 |

| d <sub>1</sub><br>[mm] | l <sub>2</sub><br>[mm] | l <sub>1</sub><br>[mm] | d <sub>2</sub><br>[mm] | Code       | €      |
|------------------------|------------------------|------------------------|------------------------|------------|--------|
| 12,5                   | 182                    | 230                    | 14,0                   | 685 895 H? | 370,00 |
| 12,7                   | 182                    | 230                    | 14,0                   | 685 897 H? | 370,00 |
| 13,0                   | 182                    | 230                    | 14,0                   | 685 900 H? | 370,00 |
| 13,5                   | 182                    | 230                    | 14,0                   | 685 905 H? | 370,00 |
| 14,0                   | 182                    | 230                    | 14,0                   | 685 910 H? | 370,00 |
| 14,5                   | 208                    | 260                    | 16,0                   | 685 915 H? | 480,00 |
| 15,0                   | 208                    | 260                    | 16,0                   | 685 920 H? | 480,00 |
| 15,5                   | 208                    | 260                    | 16,0                   | 685 925 H? | 480,00 |
| 16,0                   | 208                    | 260                    | 16,0                   | 685 930 H? | 480,00 |
| 16,5                   | 234                    | 285                    | 18,0                   | 685 935 H? | 530,00 |
| 17,0                   | 234                    | 285                    | 18,0                   | 685 940 H? | 530,00 |
| 17,5                   | 234                    | 285                    | 18,0                   | 685 945 H? | 530,00 |
| 18,0                   | 234                    | 285                    | 18,0                   | 685 950 H? | 530,00 |
| 18,5                   | 258                    | 310                    | 20,0                   | 685 955 H? | 650,00 |
| 19,0                   | 258                    | 310                    | 20,0                   | 685 960 H? | 650,00 |
| 19,5                   | 258                    | 310                    | 20,0                   | 685 965 H? | 650,00 |
| 20,0                   | 258                    | 310                    | 20,0                   | 685 970 H? | 650,00 |



**Schnittdatenempfehlung**  
**Paramètres de coupe**
**Recommended cutting data**  
**Parametri di taglio**
**S12DIKTA-HM**
**Typ UNI, 12 x d, VHM-TiAlN-IKZ**


| MAT               | 1.1                       |               | 1.2.3                     |               | 1.2.2 + 1.2.4             |               | 1.2.1 + 1.3<br>(<1000 N/mm <sup>2</sup> ) |               | 1.4<br>(1000~1200 N/mm <sup>2</sup> ) |               | 1.5                        |               |                                |               |                                |               |
|-------------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---|---------------|---------------------------------------|---------------|----------------------------|---------------|--------------------------------|---------------|--------------------------------|---------------|
|                   | 65 ~ 80<br>m/min          |               | 70 ~ 80<br>m/min          |               | 65 ~ 75<br>m/min          |               | 55 ~ 65<br>m/min                          |               | 40 ~ 50<br>m/min                      |               | (<1000 N/mm <sup>2</sup> ) |               | (1000~1200 N/mm <sup>2</sup> ) |               | (1200~1500 N/mm <sup>2</sup> ) |               |
| $v_c$             |                           |               |                           |               |                           |               |   |               |                                       |               |                            |               |                                |               |                                |               |
| $\varnothing d_1$ | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]                 | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]             | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]  | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]      | f<br>[min/U]  | n<br>[min <sup>-1</sup> ]      | f<br>[min/U]  |
| 3                 | 7.700                     | 0,13~<br>0,16 | 7.950                     | 0,13~<br>0,16 | 7.450                     | 0,13~<br>0,16 | 6.350                                     | 0,06~<br>0,08 | 5.300                                 | 0,06~<br>0,08 | 6.350                      | 0,06~<br>0,08 | 5.300                          | 0,06~<br>0,08 | 3.100                          | 0,06~<br>0,08 |
| 4                 | 5.750                     | 0,13~<br>0,16 | 5.950                     | 0,13~<br>0,16 | 5.550                     | 0,13~<br>0,16 | 4.750                                     | 0,06~<br>0,08 | 4.000                                 | 0,06~<br>0,08 | 4.750                      | 0,06~<br>0,08 | 4.000                          | 0,06~<br>0,08 | 2.300                          | 0,06~<br>0,08 |
| 5                 | 4.600                     | 0,13~<br>0,16 | 4.750                     | 0,13~<br>0,16 | 4.450                     | 0,13~<br>0,16 | 3.800                                     | 0,06~<br>0,08 | 3.200                                 | 0,06~<br>0,08 | 3.800                      | 0,06~<br>0,08 | 3.200                          | 0,06~<br>0,08 | 1.850                          | 0,06~<br>0,08 |
| 6                 | 3.850                     | 0,18~<br>0,22 | 4.000                     | 0,18~<br>0,22 | 3.700                     | 0,18~<br>0,22 | 3.200                                     | 0,10~<br>0,12 | 2.650                                 | 0,10~<br>0,12 | 3.200                      | 0,10~<br>0,12 | 2.650                          | 0,10~<br>0,12 | 1.550                          | 0,10~<br>0,12 |
| 8                 | 2.900                     | 0,18~<br>0,22 | 3.000                     | 0,18~<br>0,22 | 2.800                     | 0,18~<br>0,22 | 2.400                                     | 0,10~<br>0,12 | 2.000                                 | 0,10~<br>0,12 | 2.400                      | 0,10~<br>0,12 | 2.000                          | 0,10~<br>0,12 | 1.150                          | 0,10~<br>0,12 |
| 10                | 2.300                     | 0,22~<br>0,28 | 2.400                     | 0,22~<br>0,28 | 2.250                     | 0,22~<br>0,28 | 1.900                                     | 0,12~<br>0,15 | 1.600                                 | 0,12~<br>0,15 | 1.900                      | 0,12~<br>0,15 | 1.600                          | 0,12~<br>0,15 | 900                            | 0,12~<br>0,15 |
| 12                | 1.900                     | 0,22~<br>0,28 | 2.000                     | 0,22~<br>0,28 | 1.850                     | 0,22~<br>0,28 | 1.600                                     | 0,12~<br>0,15 | 1.350                                 | 0,12~<br>0,15 | 1.600                      | 0,12~<br>0,15 | 1.350                          | 0,12~<br>0,15 | 750                            | 0,12~<br>0,15 |
| 14                | 1.650                     | 0,27~<br>0,34 | 1.700                     | 0,27~<br>0,34 | 1.600                     | 0,27~<br>0,34 | 1.350                                     | 0,16~<br>0,20 | 1.150                                 | 0,16~<br>0,20 | 1.350                      | 0,16~<br>0,20 | 1.150                          | 0,16~<br>0,20 | 650                            | 0,16~<br>0,20 |
| 16                | 1.450                     | 0,27~<br>0,34 | 1.500                     | 0,27~<br>0,34 | 1.400                     | 0,27~<br>0,34 | 1.200                                     | 0,16~<br>0,20 | 1.000                                 | 0,16~<br>0,20 | 1.200                      | 0,16~<br>0,20 | 1.000                          | 0,16~<br>0,20 | 600                            | 0,16~<br>0,20 |
| 18                | 1.300                     | 0,30~<br>0,38 | 1.350                     | 0,30~<br>0,38 | 1.250                     | 0,30~<br>0,38 | 1.050                                     | 0,20~<br>0,25 | 900                                   | 0,20~<br>0,25 | 1.050                      | 0,20~<br>0,25 | 900                            | 0,20~<br>0,25 | 500                            | 0,20~<br>0,25 |
| 20                | 1.150                     | 0,30~<br>0,38 | 1.200                     | 0,30~<br>0,38 | 1.100                     | 0,30~<br>0,38 | 950                                       | 0,20~<br>0,25 | 800                                   | 0,20~<br>0,25 | 950                        | 0,20~<br>0,25 | 800                            | 0,20~<br>0,25 | 450                            | 0,20~<br>0,25 |

| MAT               | 1.6.1                     |               | 1.6.2                     |               | 1.6.3                     |               | 1.6.4                     |               | 1.6.5                     |               | 2.1 + 2.2                 |               | 2.3 + 2.4                 |               | 5                         |               |
|-------------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|---------------------------|---------------|
|                   | 50 ~ 70<br>m/min          |               | 45 ~ 65<br>m/min          |               | 40 ~ 60<br>m/min          |               | 50 ~ 70<br>m/min          |               | 25 ~ 40<br>m/min          |               | 65 ~ 80<br>m/min          |               | 60 ~ 75<br>m/min          |               | 25 ~ 30<br>m/min          |               |
| $v_c$             |                           |               |                           |               |                           |               |                           |               |                           |               |                           |               |                           |               |                           |               |
| $\varnothing d_1$ | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  | n<br>[min <sup>-1</sup> ] | f<br>[min/U]  |
| 3                 | 6.350                     | 0,06~<br>0,08 | 5.850                     | 0,06~<br>0,08 | 5.300                     | 0,06~<br>0,08 | 6.350                     | 0,06~<br>0,08 | 3.450                     | 0,06~<br>0,08 | 7.450                     | 0,16~<br>0,20 | 6.650                     | 0,10~<br>0,12 | 2.920                     | 0,03~<br>0,04 |
| 4                 | 4.750                     | 0,06~<br>0,08 | 4.400                     | 0,06~<br>0,08 | 4.000                     | 0,06~<br>0,08 | 4.750                     | 0,06~<br>0,08 | 2.600                     | 0,06~<br>0,08 | 5.550                     | 0,16~<br>0,20 | 4.950                     | 0,10~<br>0,12 | 2.190                     | 0,03~<br>0,04 |
| 5                 | 3.800                     | 0,06~<br>0,08 | 3.500                     | 0,06~<br>0,08 | 3.200                     | 0,06~<br>0,08 | 3.800                     | 0,06~<br>0,08 | 2.050                     | 0,06~<br>0,08 | 4.450                     | 0,16~<br>0,20 | 4.000                     | 0,10~<br>0,12 | 1.750                     | 0,03~<br>0,04 |
| 6                 | 3.200                     | 0,10~<br>0,12 | 2.900                     | 0,10~<br>0,12 | 2.650                     | 0,10~<br>0,12 | 3.200                     | 0,10~<br>0,12 | 1.700                     | 0,10~<br>0,12 | 3.700                     | 0,20~<br>0,25 | 3.300                     | 0,14~<br>0,17 | 1.460                     | 0,05~<br>0,08 |
| 8                 | 2.400                     | 0,10~<br>0,12 | 2.200                     | 0,10~<br>0,12 | 2.000                     | 0,10~<br>0,12 | 2.400                     | 0,10~<br>0,12 | 1.300                     | 0,10~<br>0,12 | 2.800                     | 0,20~<br>0,25 | 2.500                     | 0,14~<br>0,17 | 1.100                     | 0,05~<br>0,08 |
| 10                | 1.900                     | 0,12~<br>0,15 | 1.750                     | 0,12~<br>0,15 | 1.600                     | 0,12~<br>0,15 | 1.900                     | 0,12~<br>0,15 | 1.050                     | 0,12~<br>0,15 | 2.250                     | 0,28~<br>0,35 | 2.000                     | 0,18~<br>0,22 | 875                       | 0,09~<br>0,12 |
| 12                | 1.600                     | 0,12~<br>0,15 | 1.450                     | 0,12~<br>0,15 | 1.350                     | 0,12~<br>0,15 | 1.600                     | 0,12~<br>0,15 | 850                       | 0,12~<br>0,15 | 1.850                     | 0,28~<br>0,35 | 1.650                     | 0,18~<br>0,22 | 730                       | 0,09~<br>0,12 |
| 14                | 1.350                     | 0,16~<br>0,20 | 1.250                     | 0,16~<br>0,20 | 1.150                     | 0,16~<br>0,20 | 1.350                     | 0,16~<br>0,20 | 750                       | 0,16~<br>0,20 | 1.600                     | 0,32~<br>0,40 | 1.400                     | 0,24~<br>0,30 | 625                       | 0,13~<br>0,16 |
| 16                | 1.200                     | 0,16~<br>0,20 | 1.100                     | 0,16~<br>0,20 | 1.000                     | 0,16~<br>0,20 | 1.200                     | 0,16~<br>0,20 | 650                       | 0,16~<br>0,20 | 1.400                     | 0,32~<br>0,40 | 1.250                     | 0,24~<br>0,30 | 550                       | 0,13~<br>0,16 |
| 18                | 1.050                     | 0,20~<br>0,25 | 950                       | 0,20~<br>0,25 | 900                       | 0,20~<br>0,25 | 1.050                     | 0,20~<br>0,25 | 550                       | 0,20~<br>0,25 | 1.250                     | 0,37~<br>0,46 | 1.100                     | 0,30~<br>0,37 | 490                       | 0,17~<br>0,20 |
| 20                | 950                       | 0,20~<br>0,25 | 900                       | 0,20~<br>0,25 | 800                       | 0,20~<br>0,25 | 950                       | 0,20~<br>0,25 | 500                       | 0,20~<br>0,25 | 1.100                     | 0,37~<br>0,46 | 1.000                     | 0,30~<br>0,37 | 400                       | 0,17~<br>0,20 |

**VHM**

■ Kühlmittel, Coolant, Lubrification, Lubrificante: Emulsion, Emulsion, Emulsion, Emulsion

**Werkstoffübersicht nach Werkstoffnummer (W.-Nr.)**  
**Index-Groupe de matières selon numéro (W.-Nr.)**
**Work material overview according material-no. (W.-Nr.)**  
**Materiali da lavorare secondo nr. materiale (W.-Nr.)**

| W.-Nr. | DIN (DE)                 | Werkstoffgruppen<br>Classification of<br>work materials<br>Groupes de matières<br>Gruppo materiali |
|--------|--------------------------|--|
| -      | AFK Aramidfaserverstärkt | 7.3  |
| -      | Albanit                  | 7.2  |
| -      | AMPCO 8                  | 3.4  |
| -      | AMPCO 12                 | 3.4  |
| -      | AMPCO 15                 | 3.4  |
| -      | AMPCO 16                 | 3.4  |
| -      | AMPCO 18                 | 3.5  |
| -      | AMPCO 20                 | 3.5  |
| -      | AMPCO 21                 | 3.6  |
| -      | AMPCO 22                 | 3.6  |
| -      | AMPCO 25                 | 3.6  |
| -      | AMPCO 26                 | 3.6  |
| -      | ASP 23                   | 1.5.3/8.2  |
| -      | ASP 30                   | 1.5.3/8.2  |
| -      | ASP 60                   | 1.5.3/8.2  |
| -      | Bakelit                  | 7.2  |
| -      | CFK Kohlefaserverstärkt  | 7.3  |
| -      | CPM 10 V                 | 1.5.2/8.2  |
| -      | CPM REX M4               | 1.5.3/8.2  |
| -      | Degolan                  | 7.1  |
| -      | Ferrotic                 | 8.1  |
| -      | Ferrotitanit             | 8.1  |
| -      | Ferrozell                | 7.2  |
| -      | G-AlSi 17 Cu 4           | 4.5  |
| -      | G-AlSi 21 CuNiMg         | 4.5  |
| -      | G-AlSi 25 CuNiMg         | 4.5  |
| -      | GFK Glasfaserverstärkt   | 7.3  |
| -      | GGV-30                   | 2.4  |
| -      | GGV-40                   | 2.4  |
| -      | HARDOX 400               | 1.4.4  |
| -      | HARDOX 500               | 8.2.1  |
| -      | Hostaform                | 7.1  |
| -      | Hostalen                 | 7.1  |
| -      | Makralon                 | 7.1  |
| -      | Pertinax                 | 7.2  |
| -      | Polystyrol               | 7.1  |
| -      | Resopal                  | 7.2  |
| -      | TOOLOX 33                | 1.5.2/8.2  |
| -      | TOOLOX 44                | 8.2.1  |
| -      | Ultramit                 | 7.1  |
| -      | VANADIS 4                | 1.5.2/8.2  |
| -      | VANADIS 10               | 1.5.2/8.2  |
| 0.6010 | GG-10                    | 2.1  |
| 0.6015 | GG-15                    | 2.1  |
| 0.6020 | GG-20                    | 2.1  |
| 0.6025 | GG-25                    | 2.1  |
| 0.6030 | GG-30                    | 2.2  |
| 0.6035 | GG-35                    | 2.2  |
| 0.6040 | GG-40                    | 2.2  |
| 0.7033 | GGG-35.3                 | 2.3  |
| 0.7040 | GGG-40                   | 2.3  |
| 0.7043 | GGG-40.3                 | 2.3  |
| 0.7050 | GGG-50                   | 2.3  |
| 0.7060 | GGG-60                   | 2.3  |
| 0.8035 | GTW-35-04                | 2.3  |
| 0.8040 | GTW-40-05                | 2.3  |
| 0.8045 | GTW-45-07                | 2.3  |
| 0.8055 | GTW-55                   | 2.3  |
| 0.8065 | GTW-65                   | 2.3  |
| 0.8135 | GTS-35-10                | 2.3  |
| 0.8145 | GTS-45-06                | 2.3  |
| 0.8155 | GTS-55-04                | 2.3  |
| 0.8165 | GTS-65-02                | 2.3  |
| 1.0035 | St 33                    | 1.1.1  |
| 1.0037 | St 37-2                  | 1.1.1  |
| 1.0044 | St 44-2                  | 1.1.1  |
| 1.0050 | St 50-2                  | 1.1.1  |
| 1.0060 | St 60-2                  | 1.1.1  |
| 1.0070 | St 70-2                  | 1.1.1  |
| 1.0116 | St 37-3                  | 1.1.1  |
| 1.0120 | St 37                    | 1.1.1  |
| 1.0140 | St 42                    | 1.1.1  |
| 1.0144 | St 44-3                  | 1.1.1  |
| 1.0181 | St 42-2                  | 1.1.1  |
| 1.0301 | C 10                     | 1.2.1  |
| 1.0345 | H I                      | 1.1.2  |
| 1.0401 | C 15                     | 1.2.1  |
| 1.0402 | C 22                     | 1.2.2  |
| 1.0420 | GS-38                    | 1.1.3  |
| 1.0425 | H II                     | 1.1.2  |
| 1.0435 | H III                    | 1.1.2  |
| 1.0443 | GS-45                    | 1.1.3  |
| 1.0445 | H IV                     | 1.1.2  |
| 1.0461 | StE 255                  | 1.1.4  |
| 1.0482 | 19 Mn 5                  | 1.3.2  |
| 1.0501 | C 35                     | 1.2.2  |
| 1.0503 | C 45                     | 1.2.2  |
| 1.0528 | C 30                     | 1.2.2  |
| 1.0531 | St 50                    | 1.1.1  |

| W.-Nr. | DIN (DE)           | Werkstoffgruppen<br>Classification of<br>work materials<br>Groupes de matières<br>Gruppo materiali |
|--------|--------------------|--|
| 1.0552 | GS-52              | 1.1.3  |
| 1.0558 | GS-60              | 1.1.3  |
| 1.0570 | St 52-3            | 1.1.1  |
| 1.0582 | StE 355            | 1.1.4  |
| 1.0710 | 15 S 10            | 1.2.3  |
| 1.0715 | 9 SMn 28           | 1.2.3  |
| 1.0718 | 9 SMnPb 28         | 1.2.3  |
| 1.0721 | 10 S 20            | 1.2.3  |
| 1.0722 | 10 SPb 20          | 1.2.3  |
| 1.0723 | 15 S 20            | 1.2.3  |
| 1.0726 | 35 S 20            | 1.2.3  |
| 1.0727 | 45 S 20            | 1.2.3  |
| 1.0736 | 9 SMn 36           | 1.2.3  |
| 1.0737 | 9 SMnPb 36         | 1.2.3  |
| 1.1121 | Ck 10              | 1.2.1  |
| 1.1132 | Cq 15              | 1.2.4  |
| 1.1133 | 20 Mn 5            | 1.3.4/1.4.1  |
| 1.1140 | Cm 15 (C 15 R)     | 1.2.1  |
| 1.1141 | Ck 15              | 1.2.1  |
| 1.1151 | Ck 22              | 1.2.2  |
| 1.1152 | Cq 22              | 1.2.4  |
| 1.1157 | 40 Mn 4            | 1.3.4  |
| 1.1157 | 40 Mn 4 V          | 1.4.1  |
| 1.1169 | 20 Mn 6            | 1.3.1  |
| 1.1170 | 28 Mn 6            | 1.3.4  |
| 1.1170 | 28 Mn 6 V          | 1.4.1  |
| 1.1172 | Cq 35              | 1.2.4  |
| 1.1178 | Ck 30              | 1.2.2  |
| 1.1180 | Cm 35              | 1.2.2  |
| 1.1181 | Ck 35              | 1.2.2  |
| 1.1191 | Ck 45              | 1.2.2  |
| 1.1192 | Cq 45              | 1.2.4  |
| 1.1520 | C 70 W1            | 1.5.1/8.2  |
| 1.1525 | C 80 W1            | 1.5.1/8.2  |
| 1.1545 | C 105 W1           | 1.5.1/8.2  |
| 1.1554 | C 110 W            | 1.5.1/8.2  |
| 1.1730 | C 45 W             | 1.5.1/8.2  |
| 1.1740 | C 60 W             | 1.5.1/8.2  |
| 1.1744 | C 67 W             | 1.5.1/8.2  |
| 1.1820 | C 55 W             | 1.5.1/8.2  |
| 1.2080 | X 210 Cr 12        | 1.5.2/8.2  |
| 1.2083 | X 42Cr 13          | 1.5.4/8.2  |
| 1.2127 | 105 MnCr 4         | 1.5.2/8.2  |
| 1.2201 | X 165 CrV 12       | 1.5.2/8.2  |
| 1.2303 | 100 CrMo 5         | 1.5.2/8.2  |
| 1.2309 | 65 MnCrMo 4        | 1.5.5/8.2  |
| 1.2311 | 40 CrMnMo 7        | 1.5.5/8.2  |
| 1.2312 | 40 CrMnMoS 8 6     | 1.5.4/8.2  |
| 1.2316 | X 36CrMo 17        | 1.5.4/8.2  |
| 1.2343 | X 38CrMoV 5 1      | 1.5.5/8.2  |
| 1.2344 | X 40 CrMoV 5 1     | 1.5.5/8.2  |
| 1.2363 | X 100 CrMoV 5 1    | 1.5.2/8.2  |
| 1.2367 | X 38 CrMoV 5 3     | 1.5.5/8.2  |
| 1.2379 | X155 CrMoV 12 1    | 1.5.2/8.2  |
| 1.2436 | X 210 CrW 12       | 1.5.2/8.2  |
| 1.2601 | X 165 CrMoV 12     | 1.5.2/8.2  |
| 1.2622 | X 60 WCrMoV 9 4    | 1.5.5/8.2  |
| 1.2678 | X 45 CrCoWV 5 5 5  | 1.5.5/8.2  |
| 1.2731 | X 50 NiCrWV 13 13  | 1.5.5/8.2  |
| 1.2767 | X 45 NiCrMo 4      | 1.5.5/8.2  |
| 1.2842 | 90 MnCrV 8         | 1.5.2/8.2  |
| 1.2880 | X 165 CrCoMo 12    | 1.5.2/8.2  |
| 1.2884 | X 210 CrCoW 12     | 1.5.2/8.2  |
| 1.2889 | X 45 CoCrMoV 5 5 3 | 1.5.5/8.2  |
| 1.2889 | X 45 CoCrMoV 5 5 3 | 1.5.5/8.2  |
| 1.3243 | S 6-5-2-5          | 1.5.3/8.2  |
| 1.3343 | S 6-5-2            | 1.5.3/8.2  |
| 1.3344 | S 6-5-3            | 1.5.3/8.2  |
| 1.3346 | S 2-9-1            | 1.5.3/8.2  |
| 1.3348 | S 2-9-2            | 1.5.3/8.2  |
| 1.3401 | X 120 Mn 12        | 1.4.4  |
| 1.3501 | 100 Cr 2 (W1)      | 1.4.2  |
| 1.3503 | 105 Cr 4 (W2)      | 1.4.2  |
| 1.3505 | 100 Cr 6 (W3)      | 1.4.2  |
| 1.3520 | 100 CrMn 6 (W4)    | 1.4.2  |
| 1.3543 | X 102 CrMo 17      | 1.4.2  |
| 1.3956 | X 8 CrNi 18 12     | 1.6.2  |
| 1.4000 | X 6 Cr 13          | 1.6.3  |
| 1.4002 | X 6 CrAl 13        | 1.6.3  |
| 1.4005 | X 12 CrS 13        | 1.6.5/8.2  |
| 1.4006 | X 10 Cr 13         | 1.6.5/8.2  |
| 1.4008 | G-X 8 CrNi 13      | 1.6.3  |
| 1.4016 | X 6 Cr 17          | 1.6.3  |
| 1.4021 | X 20 Cr 13         | 1.6.5/8.2  |
| 1.4024 | X 15 Cr 13         | 1.6.5/8.2  |
| 1.4027 | G-X 20 Cr 14       | 1.6.3  |
| 1.4028 | X 30 Cr 13         | 1.6.5/8.2  |
| 1.4034 | X 46 Cr 13         | 1.6.5/8.2  |
| 1.4057 | X 20 CrNi 17 2     | 1.6.5/8.2  |

**Werkstoffübersicht nach Werkstoffnummer (W.-Nr.)**  
**Index-Groupe de matières selon numéro (W.-Nr.)**

| W.-Nr. | DIN (DE)              | Werkstoffgruppen<br>Classification of<br>work materials<br>Groupes de matières<br>Gruppo materiali |
|--------|-----------------------|--|
| 1.4059 | G-X 22 CrNi 17        | 1.6.3  |
| 1.4104 | X 12 CrMoS 17         | 1.6.1  |
| 1.4105 | X 4 CrMoS 18          | 1.6.1  |
| 1.4106 | X 10 CrMo 13          | 1.6.5/8.2  |
| 1.4112 | X 90 CrMoV 18         | 1.6.5/8.2  |
| 1.4113 | X 6 CrMo 17           | 1.6.3  |
| 1.4116 | X 45 CrMoV 15         | 1.6.5/8.2  |
| 1.4138 | G-X 120 CrMo 29 2     | 1.6.5/8.2  |
| 1.4300 | X 12 CrNi 18 8        | 1.6.2  |
| 1.4301 | X 5 CrNi 18 10        | 1.6.2  |
| 1.4305 | X 10 CrNiS 18 9       | 1.6.1  |
| 1.4305 | X 10 CrNiS 18 9       | 1.6.1  |
| 1.4308 | X 6 CrNi 18 9         | 1.6.2  |
| 1.4311 | X 2 CrNiN 18 10       | 1.3.1  |
| 1.4312 | G-X 10 CrNi 18 8      | 1.6.2  |
| 1.4406 | X 2 CrNiMoN 17 12 2   | 1.3.1/1.6.2  |
| 1.4408 | X 6 CrNiMo 18 10      | 1.6.2  |
| 1.4410 | X 3 CrNiMoN 25 7 4    | 1.6.2  |
| 1.4433 | X 2 CrNiMo 18 15      | 1.6.2  |
| 1.4435 | X 2 CrNiMo 18 14 3    | 1.6.2  |
| 1.4460 | X 8 CrNiMo 27 5       | 1.6.4  |
| 1.4510 | X 6 CrTi 17           | 1.6.3  |
| 1.4511 | X 6 CrNb 17           | 1.6.3  |
| 1.4512 | X 5 CrTi 12           | 1.6.3  |
| 1.4528 | X 105 CrCoMo 18 2     | 1.6.3  |
| 1.4536 | G-X 2 NiCrMoCuN 25 20 | 1.6.2  |
| 1.4541 | X 6 CrNiTi 18 10      | 1.6.2  |
| 1.4550 | G-X 6 CrNiNb 18 10    | 1.6.2  |
| 1.4571 | X 6 CrNiMoTi 17 12 2  | 1.6.2  |
| 1.4573 | X 10 CrNiMoTi 18 12   | 1.6.2  |
| 1.4581 | G-X 5 CrNiMoNb 18 10  | 1.6.2  |
| 1.4582 | X 4 CrNiMoNb 25 7     | 1.6.4  |
| 1.4710 | G-X 30 CrSi 6         | 1.6.6/8.2  |
| 1.4712 | X 10 CrSi 6           | 1.6.3  |
| 1.4718 | X 45 CrSi 9 3         | 1.6.6/8.2  |
| 1.4722 | X 10 CrSi 13          | 1.6.3  |
| 1.4729 | G-X 40 CrSi 13        | 1.6.6/8.2  |
| 1.4747 | X 80 CrNiSi 20        | 1.6.6/8.2  |
| 1.4762 | X 10 CrAl 24          | 1.6.3  |
| 1.4821 | X 20 CrNiSi 25 4      | 1.6.4  |
| 1.4825 | G-X 25 CrNiSi 18 9    | 1.6.6/8.2  |
| 1.4848 | G-X 40 CrNiSi 25 20   | 1.6.6/8.2  |
| 1.4922 | X 20 CrMoV 12 1       | 1.3.2  |
| 1.5022 | 38 Si 6               | 1.4.3  |
| 1.5024 | 46 Si 7               | 1.4.3  |
| 1.5025 | 51 Si 7               | 1.4.3  |
| 1.5142 | 60 SiMn 5             | 1.4.3  |
| 1.5404 | 21 MoV 53             | 1.3.2  |
| 1.5406 | 17 MoV 84             | 1.3.2  |
| 1.5622 | 14 Ni 6               | 1.3.1  |
| 1.5633 | 24 Ni 8               | 1.3.1  |
| 1.5919 | GS-15 CrNi 6          | 1.3.5  |
| 1.5919 | 15 CrNi 6             | 1.4.6  |
| 1.7012 | 13 Cr 2 (EC30)        | 1.2.1  |
| 1.7015 | 15 Cr 3 (EC60)        | 1.2.1  |
| 1.7103 | 67 SiCr 5             | 1.4.3  |
| 1.7131 | 16 MnCr 5 (EC 80)     | 1.2.1/1.4.6  |
| 1.7147 | 20 MnCr 5             | 1.4.6  |
| 1.7218 | GS-25 CrMo 4          | 1.3.5  |
| 1.7218 | 25 CrMo 4             | 1.4.1  |
| 1.7219 | 26 CrMo 4             | 1.3.1  |
| 1.7220 | GS-34 CrMo 4          | 1.3.5  |
| 1.7220 | 34 CrMo 4             | 1.3.4/1.4.5  |
| 1.7225 | 42 CrMo 4             | 1.3.4/1.4.5  |
| 1.7228 | 50 CrMo 4             | 1.3.4/1.4.5  |
| 1.7321 | 20 MoCr 4             | 1.4.6  |
| 1.7325 | 25 MoCr 4             | 1.4.6  |
| 1.7337 | 16 CrMo 4 4           | 1.3.2  |
| 1.7379 | GS-18 CrMo 9 10       | 1.3.5  |
| 1.7701 | 51 CrMoV 4            | 1.4.3  |
| 1.8070 | 21 CrMoV 5 11         | 1.3.2  |
| 1.8504 | 34 CrAl 6             | 1.3.3/1.4.7  |
| 1.8506 | 34 CrAlS 5            | 1.3.3  |
| 1.8507 | 34 CrAlMo 5           | 1.4.7  |
| 1.8509 | 41 CrAlMo 7           | 1.4.7  |
| 1.8515 | 31 CrMo 12            | 1.3.3/1.4.7  |
| 1.8519 | 31 CrMoV 9            | 1.3.3  |
| 1.8550 | 34 CrAlNi 7           | 1.3.3/1.4.7  |
| 1.8905 | StE 460               | 1.1.4  |
| 1.8907 | StE 500               | 1.1.4  |
| 1.8931 | StE 690 V             | 1.4.8  |
| 1.8941 | StE 960 V             | 1.4.8  |
| 2.0060 | E-Cu 57               | 3.1  |
| 2.0070 | SE-Cu                 | 3.1  |
| 2.0090 | SF-Cu                 | 3.1  |
| 2.0250 | CuZn 20 (Ms80)        | 3.3  |
| 2.0265 | CuZn 30 (Ms70)        | 3.3  |
| 2.0321 | CuZn 37               | 3.3  |
| 2.0335 | CuZn 36 (Ms63)        | 3.3  |

**Work material overview according material-no. (W.-Nr.)**  
**Materiali da lavorare secondo nr. materiale (W.-Nr.)**

| W.-Nr.      | DIN (DE)                | Werkstoffgruppen<br>Classification of<br>work materials<br>Groupes de matières<br>Gruppo materiali |
|-------------|-------------------------|--|
| 2.0360      | CuZn 40 (Ms60)          | 3.2  |
| 2.0380      | CuZn 39 Pb 2 (Ms58)     | 3.2  |
| 2.0410      | CuZn 44 Pb 2 (Ms 56)    | 3.2  |
| 2.0561      | CuZn 40 Al 1            | 3.2  |
| 2.0580      | CuZn 40 Mn 1 Pb         | 3.2  |
| 2.0771      | CuNi 7 Zn 39 Mn 5 Pb 3  | 3.2  |
| 2.0916      | CuAl 5 (AlBz 5)         | 3.4  |
| 2.0932      | CuAl 8 Fe 3 (AlBz 8 Fe) | 3.4  |
| 2.0966      | CuAl 10 Ni 5 Fe 4       | 3.4  |
| 2.0978      | CuAl 11 Ni 6 Fe 5       | 3.5  |
| 2.1020      | CuSn 6                  | 3.3  |
| 2.1030      | CuSn 8                  | 3.3  |
| 2.1050      | G-CuSn 10 Zn (Rg 10)    | 3.2  |
| 2.1080      | CuSn 6 Zn 6             | 3.3  |
| 2.1086      | G-CuSn 10               | 3.2  |
| 2.1093      | G-CuSn 6 ZnNi           | 3.2  |
| 2.1096      | G-CuSn 5 ZnPb (Rg 5)    | 3.2  |
| 2.1245      | CuBe 1,7 F110           | 3.3/3.5/3.6  |
| 2.1247      | CuBe 2                  | 3.3/3.4/3.6  |
| 2.1293      | CuCrZr                  | 3.3  |
| 2.1356      | CuMn 3                  | 3.1  |
| 2.1504 LN   | NiAlBz                  | 6.1  |
| 2.1522      | CuSi 2 Mn               | 3.1  |
| 2.1525      | CuSi 3 Mn               | 3.3  |
| 2.4042      | Ni 99 CSi               | 6.1  |
| 2.4060      | Ni 99,6                 | 6.1  |
| 2.4062      | Ni 99,4 Fe              | 6.1  |
| 2.4360      | NiCu 30 Fe              | 6.2  |
| 2.4374 LN   | -                       | 6.2  |
| 2.4617      | NiMo 28                 | 6.2  |
| 2.4631      | NiCr 20 TiAl            | 6.3  |
| 2.4632      | NiCr 20 Co 18 Ti        | 6.3  |
| 2.4634      | NiCo 20 Cr 15 MoAlTi    | 6.3  |
| 2.4662      | -                       | 6.3  |
| 2.4665      | NiCr 22 Fe 18 Mo        | 6.2  |
| 2.4668      | NiCr 19 FeNbMo          | 6.3  |
| 2.4670 LN   | G - NiCr 13 Al 6 MoNb   | 6.3  |
| 2.4674 LN   | NiCo 15 Cr 10 MoAlTi    | 6.3  |
| 2.4812      | -                       | 6.2  |
| 2.4816      | NiCr 15 Fe              | 6.2  |
| 2.4856      | NiCr 22 Mo 9 Nb         | 6.3  |
| 2.4876      | -                       | 6.2  |
| 2.4983      | NiCr 18 Co 18 MoTi      | 6.2  |
| 2.6554      | -                       | 6.3  |
| 3.0250      | Al 99,5 H               | 4.1  |
| 3.0256      | E-Al H                  | 4.1  |
| 3.0280      | Al 99,8 H               | 4.1  |
| 3.0515      | G-Al 99,5               | 4.2  |
| 3.0516      | S-AlMn                  | 4.2  |
| 3.0525      | AlMn 1 Mg 0,5           | 4.2  |
| 3.0615      | AlMgSiPb                | 4.2  |
| 3.1325      | AlCuMg 1                | 4.2  |
| 3.1355      | AlCuMg 2                | 4.2  |
| 3.1841      | G-AlCu 4 Ti             | 4.2  |
| 3.2134      | GD-AlSi 5 Cu 1 Mg       | 4.3  |
| 3.2152      | GD-AlSi 6 Cu 4          | 4.3  |
| 3.2162      | GD-AlSi 8 Cu 3          | 4.3  |
| 3.2373      | G-AlSi 9 Mg             | 4.3  |
| 3.2381      | G-AlSi 10 Mg            | 4.4  |
| 3.2383      | G-AlSi 10 Mg (Cu)       | 4.4  |
| 3.2581      | G-AlSi 12               | 4.4  |
| 3.2583      | G-AlSi 12 (Cu)          | 4.4  |
| 3.2982      | GD-AlSi 12 (Cu)         | 4.4  |
| 3.3241      | G-AlMg 3 Si             | 4.2  |
| 3.3292      | GD-AlMg 9               | 4.2  |
| 3.3308      | Al 99,9 Mg 0,5          | 4.1  |
| 3.3315      | AlMg 1                  | 4.2  |
| 3.3535      | AlMg 3                  | 4.2  |
| 3.4365      | AlZnMgCu 1,5            | 4.2  |
| 3.5106      | G-MgAg 3 SE 2 Zr 1      | 4.4  |
| 3.5562      | G-MgAl 6                | 4.4  |
| 3.5812      | GD-MgAl 8 Zn 1          | 4.4  |
| 3.5912      | GD-MgAl 9 Zn 1          | 4.4  |
| 3.7024.1 LN | Ti 99,5                 | 5.1  |
| 3.7034.1 LN | Ti 99,7                 | 5.1  |
| 3.7055      | Ti 99,4                 | 5.1  |
| 3.7064.1 LN | Ti 99,2                 | 5.1  |
| 3.7114 LN   | TiAl 5 Sn 2             | 5.2  |
| 3.7124 LN   | TiCu 2                  | 5.2/5.3  |
| 3.7144 LN   | TiAl 6 Sn 2 Zr 4 Mo 2   | 5.3  |
| 3.7154 LN   | TiAl 6 Zr 5             | 5.3  |
| 3.7163 LN   | TiAl 6 V 4              | 5.2  |
| 3.7164 LN   | TiAl 5 V 4              | 5.3  |
| 3.7164 LN   | TiAl 6 V 4              | 5.3  |
| 3.7174 LN   | TiAl 6 V 6 Sn 2         | 5.2/5.3  |
| 3.7184 LN   | TiAl 4 Mo 4 Sn 2        | 5.3  |

**Werkstoffgruppen  
Groupes de matières**

**Classification of work materials  
Gruppi materiali**

| W-Nr.  | DIN (DE)            | EN (EU)                          | NF A (FR)                       | BS (GB)                    | UNI (IT)              | SS (SE)    | UNE (ES)               | SAE/ASTM (US)         | JIS (JP)                  |
|--|---------------------|----------------------------------|---------------------------------|----------------------------|-----------------------|------------|------------------------|-----------------------|---------------------------|
| <b>1 Stähle – Steels – Aciers – Acciai</b>   |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| <b>1.1 Baustähle (Rm &lt; 800 N/mm²) – Structural steels (tensile strength &lt; 800 N/mm²) – Aciers de construction (résistance &lt; 800 N/mm²) – Acciai da costruzione (resistenza &lt; 800 N/mm²)</b>  |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| <b>1.1.1 Allgemeine Baustähle – General structural steels – Aciers mi-dur – Acciai per applicazioni generali</b>   |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.0035   | St 33               | -                                | A 33                            | -                          | Fe 320                | -          | AE 235-B               | -                     | -                         |
| 1.0037   | St 37-2             | S 235 JRG 2                      | E 24-2NE                        | 4360-40 C                  | Fe 360 B              | 1312       | -                      | A 570 Grade 36        | STKM 12 C                 |
| 1.0044   | St 44-2             | S 275 JR                         | E 28-2                          | 4360-43 B                  | Fe 430 BFN            | 1412       | AE 275-B               | A 570 Grade 40        | -                         |
| 1.0050   | St 50-2             | E 295                            | A 50-2                          | 4360-50 B                  | Fe 490                | 2172       | -                      | A 570 Grade 50        | SS 50                     |
| 1.0060   | St 60-2             | -                                | A 60-2                          | 4360-55 E                  | Fe 590                | -          | -                      | -                     | SM 58                     |
| 1.0070   | St 70-2             | -                                | A 70-2                          | -                          | Fe 70-2               | -          | A 690-2                | -                     | -                         |
| 1.0116   | St 37-3             | Fe 360 D1(2);<br>S 235 J2G3(4)   | Fe 360 D1(2); E 24-4            | Fe 360 D1(2);<br>4360-40 D | Fe 360 D 1(2); Fe37-3 | 1313       | Fe 360 D 1(2); A 360 C | A 573-81 65; Grade 58 | -                         |
| 1.0120   | St 37               | -                                | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.0140   | St 42               | -                                | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.0144   | St 44-3             | Fe 430 D1(2);<br>S 275 J2 G3 (4) | Fe 430 D1(2); E 28-4            | Fe 430 D1(2);<br>4360 43 D | Fe 430 D1(2)          | 1414       | Fe 430 D 1(2)          | A 573-81; Grade 70    | SM 41 C                   |
| 1.0181   | St 42-2             | -                                | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.0531   | St 50               | -                                | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.0570   | St 52-3             | Fe 510 D1;<br>S 355 J 2 G 3      | Fe 510 D1; E 36-4               | Fe 510 D1;<br>4360-50 D    | Fe 510 D1             | 2134-01    | Fe 510 D 1             | Grade 50              | SM 520 C                  |
| <b>1.1.2 Kesselbleche – Boiler plate – Tôles – Piastre per boiler</b>  |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.0345   | H I                 | P 235 GH                         | A 37 CP; CC 12                  | 1501 161                   | -                     | 1330       | F.1110; A 37 RC 1      | A 515 65              | SGV 410, 450,<br>480, 490 |
| 1.0425   | H II                | P 265 GH                         | A 42 CP; XC 25                  | 161-400                    | Fe 410 1 KW           | 1432       | A 42 RC 1              | -                     | SGV 410, 450,<br>480      |
| 1.0435   | H III               | P 285 NH                         | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.0445   | H IV                | P 295 NH                         | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| <b>1.1.3 Stahlguss – Cast steel – Fonte d'acier - Acciai fusi</b>  |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.0420   | GS-38               | GE 200                           | E 24-2 Ne                       | -                          | -                     | 1306       | -                      | -                     | -                         |
| 1.0443   | GS-45               | -                                | 230-400 M                       | A 1                        | -                     | 1305       | F.221                  | A 27 65-35            | -                         |
| 1.0552   | GS-52               | GE 260                           | AF 55 C 35                      | A 2                        | -                     | 1505       | -                      | A 27 70-36            | -                         |
| 1.0558   | GS-60               | GE 360; S 355J 0                 | AF 65 C 45; E 36-3              | A 3; En 50 C               | Fe 510                | 1606       | -                      | A 148 80-40           | -                         |
| <b>1.1.4 Feinkornbaustähle – Fine-grain structural steel – Aciers frittés – Acciai a grana fina</b>  |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.0461   | StE 255             | S 255 N                          | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.0582   | StE 355             | P 355 N                          | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.8905   | StE 460             | P 460 N                          | E 460 RIFP; S 460 N             | -                          | -                     | -          | AE 460 KG              | A 633 Grade E         | -                         |
| 1.8907   | StE 500             | S 500 N                          | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| <b>1.2 Unlegierte und niedriglegierte Stähle (Rm &lt; 800 N/mm²) – Unalloyed and low-alloy steel (tensile strength &lt; 800 N/mm²) – Aciers non alliés et faiblement alliés (résistance &lt; 800 N/mm²) – Acciai non e debolmente legati (resistenza &lt; 800 N/mm²)</b> |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| <b>1.2.1 Einsatzstähle – Cementation steels – Aciers de cémentation – Acciai da cementazione</b>   |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.0301   | C 10                | -                                | AF 34 C 10; XC 10               | 045 M 10                   | C 10                  | -          | -                      | 1010                  | S 10 C                    |
| 1.0401   | C 15                | -                                | AF 37 C 12; XC 12               | 080 M 15                   | C 15; C 16            | 1350       | F.111                  | 1015                  | S 15 C                    |
| 1.1121   | Ck 10               | 2 C 10                           | C 10 E; XC 10                   | 045 M 10                   | C 10                  | 1265       | F.1510 – C 10 k        | 1010                  | S 10 C                    |
| 1.1140   | Cm 15 (C 15 R)      | C 15 R                           | C 15 R                          | C 15 R                     | C 15 R                | C 15 R     | -                      | -                     | -                         |
| 1.1141   | Ck 15               | 2 C 15                           | C 15 E; XC 12                   | 080 M 15                   | C 16                  | 1370       | F.1511 – C 16 k        | 1015                  | S 15 C                    |
| 1.7012   | 13 Cr 2 (EC30)      | -                                | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.7015   | 15 Cr 3 (EC60)      | -                                | 12 C 3                          | 523 M 15                   | -                     | -          | -                      | 5015                  | Scr 415 (H)               |
| 1.7131   | 16 MnCr 5 (EC 80)   | 16 MnCr 5                        | 16 MC 5; 15 D 3                 | 527 M 17                   | 16 MnCr 5             | 2511       | F.1515 – 16 MnCr 5     | 5115                  | Scr 415                   |
| <b>1.2.2 Vergütungsstähle – Heat-treatable steels – Aciers d'amélioration – Acciai da bonifica</b>   |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.0402   | C 22                | 1 C 22                           | AF 42 C 20; XC 25               | 050 A 20                   | C 20; C 21            | 1450       | F.112                  | 1020                  | S 22 C                    |
| 1.0501   | C 35                | 1 C 35                           | AF 55 C 35; XC 38               | 060 A 35                   | C 35                  | 1550       | F.113                  | 1035                  | S 35 C                    |
| 1.0503   | C 45                | 1 C 45                           | AF 65 C 45; CC 45               | 080 M 46                   | C 45                  | 1650       | F.114; F.5110          | 1043; 1045            | S 45 C                    |
| 1.0528   | C 30                | 1 C 30                           | AF 50 C 30; CC 32               | 080 M 30                   | C 30                  | -          | -                      | 1030                  | S 30 C                    |
| 1.1151   | Ck 22               | 2 C 22                           | C 22 E; XC 25                   | 050 A 20; 070 M 20         | C 20                  | -          | F.1120 – C 25 k        | 1023; 1020            | S 22 C                    |
| 1.1178   | Ck 30               | 2 C 30                           | C 30 E; XC 32                   | 080 M 30                   | C 30                  | -          | -                      | 1030                  | S 30 C                    |
| 1.1180   | Cm 35               | 3 C 35                           | C 35 R; XC 32                   | 080 M 36                   | -                     | 1572-03/04 | F.1135 – C 35 K – 1    | -                     | -                         |
| 1.1181   | Ck 35               | 2 C 35                           | C 35 E; XC 38 H 1;<br>320-560 M | 080 A 32; 080 M 36         | C 35                  | 1572       | F.1135 – C 35 k        | 1035                  | S 35 C                    |
| 1.1191   | Ck 45               | 2 C 45                           | C 45 E; XC 42 H 1; XC 45        | 080 M 46                   | C 45                  | 1672       | F.1140 – C 45 k        | 1042; 1045            | S 45 C                    |
| <b>1.2.3 Automatenstähle – Free cutting steels – Aciers de décolletage – Acciai automatici</b>   |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.0710   | 15 S 10             | -                                | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.0715   | 9 SMn 28            | 11 SMn 28                        | S 250                           | 230 M 07                   | CF 9 SMn 28           | 1912       | F.2111 – 11 SMn 28     | 1213                  | SUM 22                    |
| 1.0718   | 9 SMnPb 28          | 11 SMnPb 28                      | S 250 Pb; 35 MF 4               | -                          | CF 9 SMnPb 28         | 1914       | F.2112 – 11 SMnPb 28   | 12 L13                | SUM 22 L                  |
| 1.0721   | 10 S 20             | 10 S 20                          | 10 F 1                          | 210 M 15                   | CF 10 S 20            | -          | F.2121 – 10 S 20       | 1108                  | -                         |
| 1.0722   | 10 SPb 20           | 10 SPb 20                        | 10 Pb F 2                       | -                          | CF 10 SPb 20          | -          | F.2122 – 10 SPb 20     | 11 L 08               | -                         |
| 1.0723   | 15 S 20             | -                                | S 300                           | 210 A 15                   | -                     | 1922       | F.210.F                | -                     | SUM 32                    |
| 1.0726   | 35 S 20             | 35 S 20                          | 35 MF 4                         | 212 M 36                   | -                     | 1957       | F.210 G                | 1140                  | -                         |
| 1.0727   | 45 S 20             | 45 S 20                          | 45 MF 4                         | 212 M 44                   | -                     | 1973       | -                      | 1146                  | -                         |
| 1.0736   | 9 SMn 36            | -                                | S 300                           | 240 M 07                   | CF 9 SMn 36           | -          | F.2113 – 12 SMn 35     | 1215                  | -                         |
| 1.0737   | 9 SMnPb 36          | -                                | S 300 Pb                        | -                          | CF 9 SMnPb 36         | 1926       | F.2114 – 12 SMnPb 35   | 12 L14                | -                         |
| <b>1.2.4 Kaltfließpressstähle – Cold flow press steels – Aciers pour extrusion à froid – Acciai estrusi a freddo</b>   |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.1132   | Cq 15               | C 15 KD                          | C 15 C                          | C15E2C                     | C15E2C                | C15E2C     | -                      | -                     | SWRCH15K                  |
| 1.1152   | Cq 22               | C 21 KD                          | C 22 C                          | C20E2C                     | C20E2C                | C20E2C     | -                      | -                     | SWRCH20K                  |
| 1.1172   | Cq 35               | C 35 KD                          | C 35 C                          | -                          | -                     | -          | -                      | -                     | -                         |
| 1.1192   | Cq 45               | C 45 KD                          | C 45 C                          | C45EC                      | C45EC                 | C45EC      | -                      | -                     | SWRCH45K                  |
| <b>1.3 Legierte Stähle (Rm &lt; 800 N/mm²) – Alloyed steel (tensile strength &lt; 800 N/mm²) – Aciers alliés (résistance &lt; 800 N/mm²) – Acciai legati (resistenza &lt; 800 N/mm²)</b>   |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| <b>1.3.1 Kaltzähe Baustähle – Cold-tough structural steels – Aciers alliés pour l'usage à froid – Acciai per l'uso a freddo</b>  |                     |                                  |                                 |                            |                       |            |                        |                       |                           |
| 1.1169   | 20 Mn 6             | -                                | -                               | -                          | -                     | -          | -                      | -                     | -                         |
| 1.4311   | X 2 CrNiN 18 10     | X 2 CrNiN 18 10                  | Z 2 CN 18-10 AZ                 | 304 S 62                   | X 2 CrNiN 18 11       | 2371       | F.3541                 | 304 LN                | SUS 304 LN                |
| 1.4406   | X 2 CrNiMoN 17 12 2 | X 3 CrNiMoN 17 12 2              | Z 3 CN 17-12 AZ                 | 316 S 61                   | X 2 CrNiMoN 17 12     | 2375       | F.3543                 | 316 LN                | SUS 316 LN                |
| 1.5622   | 14 Ni 6             | -                                | 16 N 6                          | -                          | 14 Ni 6               | -          | F.2641 – 15 Ni 6       | A 350 – LF 5          | -                         |
| 1.5633   | 24 Ni 8             | -                                | 22 N 8                          | -                          | -                     | -          | -                      | -                     | -                         |
| 1.7219   | 26 CrMo 4           | -                                | 25 CD 4 S                       | -                          | -                     | -          | -                      | -                     | -                         |

**Werkstoffgruppen**  
**Groupes de matières**
**Classification of work materials**  
**Gruppi materiali**

| W-Nr.   | DIN (DE)          | EN (EU)     | NF A (FR)             | BS (GB)           | UNI (IT)             | SS (SE) | UNE (ES)                 | SAE/ASTM (US) | JIS (JP)            |
|---|-------------------|-------------|-----------------------|-------------------|----------------------|---------|--------------------------|---------------|---------------------|
| <b>1.3.2 Warmfeste Baustähle – Heat resistant structural steels – Aciers réfractaires – Acciai resistenti al calore</b>   |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.0482  | 19 Mn 5           | P 335 GH    | A 52 CP; AP; FP       | 224-460           | -                    | 2101    | A 47 RB II               | A 537         | -                   |
| 1.4922  | X 20 CrMoV 12 1   | -           | X 20 CrMoV 11 1       | 762               | X 20 CrMoNi 12 01 KG | 2317    | -                        | -             | -                   |
| 1.5404  | 21 MoV 53         | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.5406  | 17 MoV 84         | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.7337  | 16 CrMo 4.4       | -           | 15 CD 4.5             | 1501 620 Gr. 27   | 14 CrMo 4 5          | 2216    | -                        | A 387 12 Cl.2 | -                   |
| 1.8070  | 21 CrMoV 5 11     | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| <b>1.3.3 Nitrierstähle – Nitriding alloy steels – Aciers de nitruration – Acciai da nitrurazione</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.8504  | 34 CrAl 6         | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.8506  | 34 CrAlS 5        | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.8515  | 31 CrMo 12        | 31 CrMo 12  | 30 CD 12              | 722 M 24          | 31 CrMo 12           | 2240    | F.1712 – 31 CrMo 12      | -             | -                   |
| 1.8519  | 31 CrMoV 9        | -           | 40 CAD 6.12           | -                 | -                    | -       | -                        | -             | -                   |
| 1.8550  | 34 CrAlNi 7       | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| <b>1.3.4 Vergütungsstähle – Heat-treatable steels – Aciers d'amélioration – Acciai da bonifica</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.1133  | 20 Mn 5           | -           | 20 M 5                | 120 M 19          | G 22 Mn 3            | 1410    | F-1515                   | 1022; 1518    | SMnC 420            |
| 1.1157  | 40 Mn 4           | -           | 35 M 5, 40 M 5        | 150 M 36          | -                    | -       | -                        | 1039          | -                   |
| 1.1170  | 28 Mn 6           | -           | 20 M 5                | 150 M 28          | C 28 Mn              | -       | -                        | 1330          | SCMn 1              |
| 1.7220  | 34 CrMo 4         | 34 CrMo 4   | 34 CD 4               | 708 A 37          | 35 CrMo 4            | 2234    | F.8231-AM – 34 CrMo 4    | 4137; 4135    | SCM 432;<br>SCM 435 |
| 1.7225  | 42 CrMo 4         | 42 CrMo 4   | 42 CD 4; 42 C 4 TS    | 708 M 40          | 42 CrMo 4            | 2244    | F.8232 – 42 CrMo 4       | 4140; 4142    | SCM 440             |
| 1.7228  | 50 CrMo 4         | 50 CrMo 4   | -                     | 708 A 47          | 50 CrMo 4            | -       | 50 CrMo 4                | 4150          | SCM 445 (H)         |
| <b>1.3.5 Stahlguss – Cast steel – Fonte d'acier – Acciaio fuso</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.5919  | GS-15 CrNi 6      | -           | 16 NC 6               | S 107             | 16 CrNi 4            | -       | -                        | -             | -                   |
| 1.7218  | GS-25 CrMo 4      | 25 CrMo 4   | 25 CD 4               | 708 A 25; CDS 110 | 25 CrMo 4            | 2225    | F.8330-AM – 25 CrMo 4    | 4130          | SCM 420;<br>SCM 430 |
| 1.7220  | GS-34 CrMo 4      | 34 CrMo 4   | 34 CD 4               | 708 A 37          | 35 CrMo 4            | 2234    | F.8231-AM – 34 CrMo 4    | 4137; 4135    | SCM 432;<br>SCM 435 |
| 1.7379  | GS-18 CrMo 9 10   | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| <b>1.4 Legierte, vergütete Stähle (Rm 800 – 1200 N/mm<sup>2</sup>) – Alloyed, Pre hardened steels (tensile strength 800 – 1200 N/mm<sup>2</sup>) – Aciers alliés, améliorés (résistance 800-1200 N/mm<sup>2</sup>) – Acciaio legato , pre trattato (resistenza 800 – 1200 N/mm<sup>2</sup>)</b> |                   |             |                       |                   |                      |         |                          |               |                     |
| <b>Legierte, vergütete Stähle (kurzspanend) – Alloyed, Pre hardened steels (short chipping) – Aciers alliés, dureté entre (laitons) – Acciaio legato , pre trattato a truciolo corto</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| <b>1.4.1 Vergütungsstähle – Heat-treatable steels – Aciers d'amélioration – Acciai da bonifica</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.1133  | 20 Mn 5           | -           | 20 M 5                | 120 M 19          | G 22 Mn 3            | 1410    | F-1515                   | 1022; 1518    | SMnC 420            |
| 1.1157  | 40 Mn 4 V         | -           | 35 M 5, 40 M 5        | 150 M 36          | -                    | -       | -                        | 1039          | -                   |
| 1.1170  | 28 Mn 6 V         | -           | 35 M 5, 20 M 5        | 150 M 28          | C 28 Mn              | -       | -                        | 1330          | SMn 433             |
| 1.7218  | 25 CrMo 4         | 25 CrMo 4   | 25 CD 4               | 708 A 25          | 25 CrMo 4            | 2225    | F.8330-AM – 25 CrMo 4    | 4130          | SCM 420;<br>SCM 430 |
| <b>1.4.2 Wälzlagerstähle – Roller and ball bearing steels – Aciers laminés – Acciai per cuscinetti</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.3501  | 100 Cr 2 (W1)     | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.3503  | 105 Cr 4 (W2)     | -           | -                     | -                 | -                    | -       | -                        | E 51100       | -                   |
| 1.3505  | 100 Cr 6 (W3)     | 100 Cr 6    | 100 C 6; 20 NCD 2     | 534 A 99          | 100 Cr 6             | 2258    | F.1310 – 100 Cr 6        | 52100         | SUJ 2, SUJ 4        |
| 1.3520  | 100 CrMn 6 (W4)   | 100 CrMn 6  | 100 CM 6              | -                 | -                    | -       | 100 CrMn 6               | A 485/2       | SUJ 3               |
| 1.3543  | X 102 CrMo 17     | -           | -                     | -                 | X 105 CrMo 17        | -       | X 100 CrMo 17            | -             | -                   |
| <b>1.4.3 Federstähle – Spring steels – Aciers à ressort – Acciai per molle</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.5022  | 38 Si 6           | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.5024  | 46 Si 7           | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.5025  | 51 Si 7           | -           | -                     | -                 | 51 Si 7              | -       | -                        | -             | -                   |
| 1.5142  | 60 SiMn 5         | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.7103  | 67 SiCr 5         | -           | 60 CS 7               | -                 | 67 SiCr 5            | -       | -                        | -             | -                   |
| 1.7701  | 51 CrMoV 4        | -           | 51 CDV 4              | -                 | 51 CrMoV 4           | -       | -                        | -             | -                   |
| <b>1.4.4 Verschleißfeste Stähle – Wear resisting steels – Aciers résistant à l'usure – Acciai resistenti all'usura</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.3401  | X 120 Mn 12       | -           | Z 120 M 12            | BW 10             | X G 120 Mn 12        | 2183    | F.82551-AM – X 120 Mn 12 | A 128 75      | SCMnH 1             |
| -   | HARDOX 400        | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| <b>Legierte, vergütete Stähle (langspanend) – Alloyed, Pre hardened steels (long chipping) – Aciers alliés, dureté entre (à copeaux longs) – Acciaio legato , pre trattato a truciolo lungo</b>   |                   |             |                       |                   |                      |         |                          |               |                     |
| <b>1.4.5 Vergütungsstähle – Heat-treatable steels – Aciers d'amélioration – Acciai da bonifica</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.7220  | 34 CrMo 4         | 34 CrMo 4   | 34 CD 4               | 708 A 37          | 35 CrMo 4            | 2234    | F.8231-AM – 34 CrMo 4    | 4137; 4135    | SCM 432;<br>SCM 435 |
| 1.7225  | 42 CrMo 4         | 42 CrMo 4   | 42 CD 4; 42 C 4 TS    | 708 M 40          | 42 CrMo 4            | 2244    | F.8232 – 42 CrMo 4       | 4140; 4142    | SCM 440             |
| 1.7228  | 50 CrMo 4         | 50 CrMo 4   | -                     | 708 A 47          | 50 CrMo 4            | -       | 50 CrMo 4                | 4150          | SCM 445 (H)         |
| <b>1.4.6 Einsatzstähle – Cementation steels – Aciers de cémentation – Acciai da cementazione</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.7131  | 16 MnCr 5 (EC 80) | 16 MnCr 5   | 16 MC 5; 15 D 3       | 527 M 17          | 16 MnCr 5            | 2511    | F.1515 – 16 MnCr 5       | 5115          | SCr 415             |
| 1.7147  | 20 MnCr 5         | -           | 20 MC 5               | -                 | 20 MnCr 5            | 2523    | F.150.D                  | 5120          | SMnC 420 (H)        |
| 1.7321  | 20 MoCr 4         | 20 MoCr 4   | -                     | -                 | 16 NiCrMo 2          | 2506    | -                        | 8620          | SNMC 220            |
| 1.7325  | 25 MoCr 4         | -           | -                     | -                 | 20 NiCrMo 2          | -       | -                        | 8625          | -                   |
| 1.5919  | 15 CrNi 6         | -           | 16 NC 6               | S 107             | 16 CrNi 4            | -       | -                        | -             | -                   |
| <b>1.4.7 Nitrierstähle – Nitriding alloy steels – Aciers de nitruration – Acciai da nitrurazione</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.8504  | 34 CrAl 6         | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.8507  | 34 CrAlMo 5       | 34 CrAlMo 5 | 30 CAD 6.12           | 905 M 31          | 34 CrAlMo 7          | -       | F.1741 – 34 CrAlMo 5     | A 355 Cl. D   | -                   |
| 1.8509  | 41 CrAlMo 7       | 41 CrAlMo 7 | 40 CAD 6.12; Z 8 C 13 | 905 M 39          | 41 CrAlMo 7          | 2940    | F.1740 – 41 CrAlMo 7     | A 355 Cl. A   | SACM 645            |
| 1.8515  | 31 CrMo 12        | 31 CrMo 12  | 30 CD 12              | 722 M 24          | 31 CrMo12            | 2240    | F.1712 – 31 CrMo 12      | -             | -                   |
| 1.8550  | 34 CrAlNi 7       | 34 CrAlNi 7 | -                     | -                 | -                    | -       | -                        | A 355 Cl. C   | -                   |
| <b>1.4.8 Feinkornbaustähle – Fine-grain structural steels – Aciers frittés – Acciai a grana fina</b>  |                   |             |                       |                   |                      |         |                          |               |                     |
| 1.8931  | StE 690 V         | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |
| 1.8941  | StE 960 V         | -           | -                     | -                 | -                    | -       | -                        | -             | -                   |

**Werkstoffgruppen  
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**Classification of work materials  
Gruppi materiali**

| W-Nr.   | DIN (DE)              | EN (EU)              | NF A (FR)               | BS (GB)            | UNI (IT)            | SS (SE) | UNE (ES)                     | SAE/ASTM (US) | JIS (JP)           |
|---|-----------------------|----------------------|-------------------------|--------------------|---------------------|---------|------------------------------|---------------|--------------------|
| <b>1.5 Werkzeugstähle (Rm &lt; 1300 N/mm²) – Tool steels (tensile strength &lt; 1300 N/mm²) – Aciers à outils (résistance &lt; 1300 N/mm²) – Acciai per utensili (resistenza &lt; 1300 N/mm²)</b>                         |                       |                      |                         |                    |                     |         |                              |               |                    |
| <b>Werkzeugstähle (kurzspanend) – Tool steels (short shipping) – Aciers à outils (laitons) – Acciai per utensili a truciolo corto</b>   |                       |                      |                         |                    |                     |         |                              |               |                    |
| <b>1.5.1 Unlegierte Werkzeugstähle – Unalloyed tool steels – Aciers à outils non alliés – Acciai per utensili , non legati</b>  |                       |                      |                         |                    |                     |         |                              |               |                    |
| 1.1520  | C 70 W1               | C 70 U               | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.1525  | C 80 W1               | C 80 U               | Y190; Y180              | –                  | C 80 KU             | –       | –                            | W108          | –                  |
| 1.1545  | C 105 W1              | C 105 U              | Y 105                   | B W 1 A            | C 100 KU            | 1880    | F.5118                       | W 110         | –                  |
| 1.1554  | C 110 W               | C 110 U              | –                       | 1407               | –                   | –       | –                            | –             | –                  |
| 1.1730  | C 45 W                | C 45 U               | Y 3 42                  | En 43 B            | –                   | 1672    | F.114                        | 1045          | –                  |
| 1.1740  | C 60 W                | C 60 U               | Y 3 55                  | –                  | –                   | –       | –                            | –             | SK 7               |
| 1.1744  | C 67 W                | –                    | Y 1 70                  | –                  | –                   | –       | F.512                        | –             | –                  |
| 1.1820  | C 55 W                | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| <b>1.5.2 Werkzeugstähle für Kaltarbeit – Tool steels for cold work – Aciers pour travail à froid – Acciai per lavorazioni a freddo</b>  |                       |                      |                         |                    |                     |         |                              |               |                    |
| 1.2080  | X 210 Cr 12           | X 210 Cr 12          | Z 200 C 12              | BD 3               | X 210 Cr 13 KU      | 2710    | F.5212 – X 210 Cr 12         | D 3           | SKD 1              |
| 1.2127  | 105 MnCr 4            | –                    | –                       | –                  | 100 CrMn 4 KU       | –       | –                            | –             | SUJ 3              |
| 1.2201  | X 165 CrV 12          | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2303  | 100 CrMo 5            | –                    | –                       | –                  | –                   | –       | –                            | L 7           | –                  |
| 1.2363  | X 100 CrMoV 5 1       | –                    | Z 100 CDV 5             | BA 2               | X 100 CrMoV 5 1 KU  | 2260    | F.5227 – X 100 CrMoV 5       | A 2           | SKD 12             |
| 1.2379  | X155 CrMoV 12 1       | –                    | Z 160 CDV 12            | BD2                | X 155 CrMoV 12 1 KU | 2310    | F.5211 – X 155 CrMoV 12-1    | D 2           | –                  |
| 1.2436  | X 210 CrW 12          | X 210 CrW 12         | Z 200 CD 12             | BD 6               | X 215 CrW 12 1 KU   | 2312    | F.5213 – X 210 CrW 12        | D 4 (D 6)     | SKD 2              |
| 1.2601  | X 165 CrMoV 12        | X 165 CrMoV 12       | –                       | –                  | X 165 CrMoW 12 KU   | 2310    | F.5211 – X 160 CrMoV 12      | –             | –                  |
| 1.2842  | 90 MnCrV 8            | –                    | 90 MV 8                 | BO 2               | 90 MnVCr 8 KU       | –       | –                            | O 2           | –                  |
| 1.2880  | X 165 CrCoMo 12       | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2884  | X 210 CrCoW 12        | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| –   | VANADIS 4             | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| –   | VANADIS 10            | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| –   | CPM 10 V              | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| –   | TOOLOX 33             | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| <b>1.5.3 Schnellarbeitsstähle – High speed steels – Aciers rapides – Acciai rapidi</b>  |                       |                      |                         |                    |                     |         |                              |               |                    |
| 1.3243  | S 6-5-2-5             | (HS 6-5-2-5)         | 785 WD; KCV 06-05-04-02 | –                  | HS 6-5-2-5          | 2723    | F.5613 6-5-2-5               | M 35          | SKH 55             |
| 1.3343  | S 6-5-2               | HS 6-5-2             | Z 85 WDCV 06-05-04-02   | BM 2               | HS 6-5-2            | 2722    | F.5603 6-5-2                 | M 2           | SKH 9; SKH 51      |
| 1.3344  | S 6-5-3               | HS 6-5-3             | Z 120 WDCV 06-05-04-03  | BM 4               | HS 6-5-3            | –       | F.5605 6-5-3                 | M 3 Cl.2      | SKH 52; SKH 53     |
| 1.3346  | S 2-9-1               | HS 1-8-1             | Z 85 DCWV 08-04-02-01   | BM 1               | HS 1-8-1            | –       | –                            | H 41; M 1     | –                  |
| 1.3348  | S 2-9-2               | HS 2-9-2             | Z 100 WCWV 09-04-02-02  | –                  | HS 2-9-2            | 2782    | F.5607 2-9-2                 | M 7           | –                  |
| –   | ASP 23                | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| –   | ASP 30                | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| –   | ASP 60                | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| –   | CPM REX M4            | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| <b>Werkzeugstähle (langspanend) – Tool steels (long shipping) – Aciers à outils (à copeaux longs) – Acciai per utensili a truciolo lungo</b>  |                       |                      |                         |                    |                     |         |                              |               |                    |
| <b>1.5.4 Werkzeugstähle für Kaltarbeit – Tool steels for cold work – Aciers pour travail à froid – Acciai per lavorazioni a freddo</b>  |                       |                      |                         |                    |                     |         |                              |               |                    |
| 1.2083  | X 42Cr 13             | X 42 Cr 13           | Z 40 C 14               | –                  | X 41 Cr 13 KU       | –       | –                            | –             | SUS 420 J 2        |
| 1.2312  | 40 CrMnMoS 8 6        | –                    | –                       | –                  | –                   | –       | X 210 CrW 12                 | P 20 + 1      | –                  |
| 1.2316  | X 36CrMo 17           | X 36 CrMo 17         | –                       | –                  | X 38 CrMo 16 1 KU   | –       | X 38 CrMo 16                 | –             | –                  |
| <b>1.5.5 Werkzeugstähle für Warmarbeit – Tool steels for hot work – Aciers pour travail à chaud – Acciai per lavorazioni a caldo</b>  |                       |                      |                         |                    |                     |         |                              |               |                    |
| 1.2309  | 65 MnCrMo 4           | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2311  | 40 CrMnMo 7           | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2343  | X 38CrMoV 5 1         | X 38 CrMoV 5 1       | Z 38 CDV 5              | BH 11              | X 37 CrMoV 5 1 KU   | –       | F.5317 – X 37 CrMoV 5        | H 11          | SKD 6              |
| 1.2344  | X 40 CrMoV 5 1        | –                    | Z 40 CDV 5              | BH 13              | X 40 CrMoV 5 1 KU   | 2242    | F.5318 – X 40 CrMoV 5        | H 13          | SKD 61             |
| 1.2367  | X 38 CrMoV 5 3        | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2622  | X 60 WCrMoV 9 4       | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2678  | X 45 CrCoVW 5 5 5     | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2731  | X 50 NiCrWV 13 13     | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2767  | X 45 NiCrMo 4         | –                    | –                       | –                  | 42 NiCrMo 15 7      | –       | –                            | –             | –                  |
| 1.2889  | X 45 CoCrMoV 5 5 3    | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.2889  | X 45 CoCrMoV 5 5 3    | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| <b>1.6 Rost-, säure- und hitzebeständige Stähle – Stainless, acid- and heatproof steels – Aciers inoxydables, résistants aux acides et aciers réfractaires – Acciai inossidabili – resistenti agli acidi e refrattari</b> |                       |                      |                         |                    |                     |         |                              |               |                    |
| <b>1.6.1 Rostfrei, geschwefelt – Stainless steels, sulfur – Inox, soufrés – Acciaio inox sulfureo</b>   |                       |                      |                         |                    |                     |         |                              |               |                    |
| 1.4104  | X 12 CrMoS 17         | X 14 CrMoS 17        | Z 10 CF 17; Z 6 CT 12   | 420 S 37; 441 S 29 | X 12 CrMoS 17       | 2383    | F.3117 – X 10 CrS 17         | 430 F         | SUS 430 F          |
| 1.4105  | X 4 CrMoS 18          | X 6 CrMoS 17         | Z 6 CDF 18-02           | X 6 CrMoS 17       | X 6 CrMoS 17        | –       | –                            | 430 FR        | –                  |
| 1.4305  | X 10 CrNiS 18 9       | X 10 CrNiS 18 9      | Z 10 CNF 18-09          | 303 S 31           | X 10 CrNiS 18 9     | 2346    | F.3508 – X 10 CrNiS 18-09    | 303           | SUS 303            |
| 1.4305  | X 10 CrNiS 18 9       | X 10 CrNiS 18 9      | Z 10 CNF 18-09          | 303 S 31           | X 10 CrNiS 18 9     | 2346    | F.3508 – X 10 CrNiS 18-09    | 303           | SUS 303            |
| <b>1.6.2 Rostfrei, austenitisch – Austenitic stainless steels – Acier inoxydable, austénitique – Acciaio inox austenitico</b>   |                       |                      |                         |                    |                     |         |                              |               |                    |
| 1.4300  | X 12 CrNi 18 8        | –                    | –                       | 302 S 25           | –                   | –       | –                            | –             | –                  |
| 1.4301  | X 5 CrNi 18 10        | X 5 CrNi 18 10       | Z 6 CN 18-09            | 304 S 15           | X 5 CrNi 18 10      | 2332    | F.3504 – X 5 CrNi 18-10      | 304; 304 H    | SUS 304            |
| 1.4308  | X 6 CrNi 18 9         | X 6 CrNi 18 9        | Z 6 CN 18-10 M          | 304 C 15           | GX 5 CrNi 19-10     | 2333    | –                            | 3042          | SCS 13             |
| 1.3956  | X 8 CrNi 18 12        | X 8 CrNi 18 12       | –                       | 305 S 19           | X 8CrNi 19 10       | –       | F.3503 – X 8 CrNi 19-10      | 305           | SUS 305            |
| 1.4312  | G-X 10 CrNi 18 8      | G-X 10 CrNi 18 8     | Z 10 CN 18-09 M         | 302 C 25           | –                   | –       | –                            | –             | SCS 12             |
| 1.4406  | X 2 CrNiMoN 17 12 2   | X 3 CrNiMoN 17 12 2  | Z 3 CND 17-12 AZ        | 316 S 61           | X 2 CrNiMoN 17 12   | 2375    | F.3543                       | 316 LN        | SUS 316 LN         |
| 1.4408  | X 6 CrNiMo 18 10      | X 6 CrNiMo 18 10     | GX 5 CrNiMo 19-11-2     | 316 C 16; 340 C 15 | GX 5 CrNiMo 19-11-2 | 2343    | F.8414-AM – X 7 CrNiMo 20-10 | CF-8 M        | SCS 14             |
| 1.4410  | X 3 CrNiMoN 25 7 4    | X 3 CrNiMoN 25 7 4   | Z 5 CND 20-10 M         | –                  | –                   | –       | –                            | S 32750       | –                  |
| 1.4433  | X 2 CrNiMo 18 15      | –                    | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.4435  | X 2 CrNiMo 18 14 3    | X 2 CrNiMo 18 16     | Z 3 CND 18-14-03        | 316 S 13           | X 2 CrNiMo 18 14 3  | 2353    | F.3533-Z – 2 CrNiMo 17-12-03 | 316 L         | SUS 316 L / SCS 16 |
| 1.4536  | G-X 2 NiCrMoCuN 25 20 | GX 2 NiCrMoCuN 25 20 | –                       | –                  | –                   | –       | –                            | –             | –                  |
| 1.4541  | X 6 CrNiTi 18 10      | X 6 CrNiTi 18 10     | Z 6 CNT 18-10           | 321 S 31           | X 6 CrNiTi 18 10    | 2337    | F.3523 – X 7 CrNiTi 18-11    | 321           | SUS 321            |
| 1.4550  | G-X 6 CrNiNb 18 10    | G-X 6 CrNiNb 18 10   | Z 6 CNNb 18-10          | 347 S 31           | Z 6 CrNiNb 18-10    | 2338    | F.3552 – X 7 CrNiNb 18-11    | 347           | –                  |
| 1.4571  | X 6 CrNiMoTi 17 12 2  | X 6 CrNiMoTi 17 12 2 | Z 6 CNDT 17-12-02       | 320 S 31           | X 6 CrNiMoTi 17 12  | 2350    | F.3535                       | 316 Ti        | SUS 316 Ti         |
| 1.4573  | X 10 CrNiMoTi 18 12   | –                    | –                       | 320 S 33           | X 6 CrNiMoTi 17 13  | –       | –                            | 316 Ti        | –                  |
| 1.4581  | G-X 5 CrNiMoNb 18 10  | –                    | Z 4 CNDNb 18-12 M       | 318 C 17           | GX 6 CrMoNb 20 11   | –       | –                            | –             | SCS 22             |

**Werkstoffgruppen**  
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| W-Nr.  | DIN (DE)               | EN (EU)             | NF A (FR)          | BS (GB)             | UNI (IT)         | SS (SE)           | UNE (ES)                   | SAE/ASTM (US)        | JIS (JP)       |
|--|------------------------|---------------------|--------------------|---------------------|------------------|-------------------|----------------------------|----------------------|----------------|
| <b>1.6.3 Rostfrei, ferritisch – Ferritic stainless steels – Acier inoxydable, ferritique – Acciaio inox ferritico</b>  |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 1.4000   | X 6 Cr 13              | X 6 Cr 13           | Z 6 C 13           | 403 S 17            | X 6 Cr 13        | 2301              | F.3110 – X 6 Cr 13         | 403                  | SUS 403        |
| 1.4002   | X 6 CrAl 13            | X 6 CrAl 13         | Z 6 CA 13          | 405 S 17            | X 6 CrAl 13      | 2302              | F.3111 – X 6 CrAl 13       | 405                  | SUS 405        |
| 1.4008   | G-X 8 CrNi 13          | (G-X 7 CrNiMo 12-1) | Z 12 CN 13 M       | 410 C 21            | GX 12 Cr 13      | -                 | -                          | -                    | SCS 1          |
| 1.4016   | X 6 Cr 17              | X 8 Cr 17           | Z 8 C 17           | 430 S 17            | X 8 Cr 17        | 2320              | F.3113 – X 8 Cr 17         | 430                  | SUS 430        |
| 1.4027   | G-X 20 Cr 14           | -                   | Z 20 C 13 M        | 420 C 29            | -                | -                 | -                          | -                    | SCS 2          |
| 1.4059   | G-X 22 CrNi 17         | -                   | Z 20 CN 17-02 M    | ANC 2               | -                | -                 | -                          | -                    | -              |
| 1.4113   | X 6 CrMo 17            | (X 8 CrMo 17)       | Z 8 CD 17-01       | 434 S 17            | X 8 CrMo 17      | 2325              | -                          | 434                  | SUS 434        |
| 1.4510   | X 6 CrTi 17            | -                   | -                  | -                   | X 6 CrTi 17      | -                 | F.3114 – X 8 CrTi 17       | 430 Ti               | SUS 430 LX     |
| 1.4511   | X 6 CrNb 17            | -                   | Z 4 CNb 17         | -                   | X 6 CrNb 17      | -                 | -                          | 430 Nb               | SUS 430 LX     |
| 1.4512   | X 5 CrTi 12            | -                   | Z 6 CT 12          | 409 S 19            | X 6 CrTi 12      | -                 | -                          | 409                  | SUH 409        |
| 1.4528   | X 105 CrCoMo 18 2      | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 1.4712   | X 10 CrSi 6            | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 1.4722   | X 10 CrSi 13           | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 1.4762   | X 10 CrAl 24           | -                   | Z 10 CAS 24        | -                   | X 16 Cr 26       | 2322              | F.3154 – X 10 CrAl 24      | 446                  | SUH 446        |
| <b>1.6.4 Rostfrei, ferritisch-austenitisch – Ferritic-austenitic stainless steels – Acier inoxydable, ferritique-austénitique – Acciaio inox ferritico-austenitico</b> |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 1.4460   | X 8 CrNiMo 27 5        | -                   | Z 5 CND 27-05 AZ   | -                   | -                | 2324              | F.3309 – X 8 CrNiMo 27-05  | 329                  | SUS 329 J 1    |
| 1.4582   | X 4 CrNiMoNb 25 7      | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 1.4821   | X 20 CrNiSi 25 4       | -                   | Z 20 CNS 25-04     | -                   | X 20 CrNiSi 25 4 | -                 | X 20 CrNiSi 25-04          | -                    | -              |
| <b>1.6.5 Rostfrei, martensitisch – Martensitic stainless steels – Aciers inoxydables martensitique – Acciaio inox martensitico</b>                                     |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 1.4005   | X 12 CrS 13            | X 12 CrS 13         | Z 12 CF 13         | 416 S 21            | X 12 CrS 13      | 2380              | F.3411 – X 12 CrS 13       | 416                  | SUS 416        |
| 1.4006   | X 10 Cr 13             | X 10 Cr 13          | Z 10 C 14          | 410 S 21            | X 12 Cr 13       | 2302              | F.3401 – X 12 Cr 13        | 410                  | SUS 410        |
| 1.4021   | X 20 Cr 13             | X 20 Cr 13          | Z 20 C 13          | 420 S 37            | X 20 Cr 13       | 2303              | F.3402 – X 20 Cr 13        | 420                  | SUS 420 J 1    |
| 1.4024   | X 15 Cr 13             | X 15 Cr 13          | -                  | 420 S 29            | X 15 Cr 13       | -                 | -                          | 410                  | SUS 410 J 1    |
| 1.4028   | X 30 Cr 13             | X 30 Cr 13          | Z 30 C 13          | 420 S 45            | X 30 Cr 13       | 2304              | F.3403 – X 30 Cr 13        | 420                  | SUS 420 J 2    |
| 1.4034   | X 46 Cr 13             | X 46 Cr 13          | Z 44 C 14          | (420 S45)           | X 40 Cr 14       | -                 | F.3405 – X 45 Cr 13        | -                    | -              |
| 1.4057   | X 20 CrNi 17 2         | X 19 CrNi 17 2      | Z 15 CN 16-02      | 431 S 29            | X 16 CrNi 16     | 2321              | F.3427 – X 15 CrNi 16      | 431                  | SUS 431        |
| 1.4106   | X 10 CrMo 13           | -                   | X 2 CrMoSiS 18-2-1 | -                   | -                | -                 | -                          | -                    | -              |
| 1.4112   | X 90 CrMoV 18          | -                   | X 89 CrMoV 18-1    | X 89 CrMoV 18       | X 89 CrMoV 18    | -                 | -                          | 440 B                | SUS 440 B      |
| 1.4116   | X 45 CrMoV 15          | -                   | Z 50 CD 15         | X 50 CrMoV 15       | X 50 CrMoV 16    | -                 | X 45 CrMoV 15              | -                    | -              |
| 1.4138   | G-X 120 CrMo 29 2      | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| <b>1.6.6 Hitzebeständige Stähle – Heat resistant steels – Aciers réfractaires – Acciai refrattari</b>  |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 1.4710   | G-X 30 CrSi 6          | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 1.4718   | X 45 CrSi 9 3          | X 45 CrSi 8         | Z 45 CS 9          | 401 S 45            | X 45 CrSi 8      | -                 | F.3220 – X 4 CrSi 09-03    | HNV 3; HW 3; S 65007 | SUH 1          |
| 1.4729   | G-X 40 CrSi 13         | -                   | -                  | -                   | G X 35 Cr 13     | -                 | -                          | -                    | SCH 1          |
| 1.4747   | X 80 CrNiSi 20         | -                   | Z 80 CSN 20-02     | 443 S 65            | X 80 CrNiSi 20   | -                 | F.3222 – X 80 CrSiNi 20-02 | HNV 6                | SUH 4          |
| 1.4825   | G-X 25 CrNiSi 18 9     | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 1.4848   | G-X 40 CrNiSi 25 20    | -                   | -                  | 310 C 40            | GX 40 CrNi 26 20 | -                 | F.8452 – AM                | 310 S                | SCH 21         |
| <b>2 Gusseisen – Cast iron – Fontes – Ghise</b>  |                        |                     |                    |                     |                  |                   |                            |                      |                |
| <b>2.1 Gusseisen mit Lamellengraphit (stark abrasiv) – Grey cast iron – Fonte grise – Ghisa grigia</b>   |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 0.6010   | GG-10                  | GJL-100             | Ft 10 B; FGL 100   | Grade 100           | G 10             | 0110-00           | FG 10                      | A 48-20 B            | FC 100         |
| 0.6015   | GG-15                  | GJL-150             | Ft 15 D; FGL 150   | Grade 150           | G 15; GS 370-17  | 0115-00           | FG 15                      | A 48-25 B            | FC 150         |
| 0.6020   | GG-20                  | GJL-200             | Ft 20 D; FGL 200   | Grade 200           | G 20             | 0120-00           | FG 20                      | A 48-30 B            | FC 200         |
| 0.6025   | GG-25                  | GJL-250             | Ft 25 D; FGL 250   | Grade 250; 260      | G 25             | 0125-00           | FG 25                      | A 48-40 B            | FC 250         |
| <b>2.2 Gusseisen mit Lamellengraphit – Grey cast iron – Fonte grise – Ghisa grigia</b>   |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 0.6030   | GG-30                  | GJL-300             | Ft 30 D; FGL 300   | Grade 300           | G 30; GS 700-2   | 0130-00           | FG 30                      | A 48-45 B            | FC 300         |
| 0.6035   | GG-35                  | GJL-350             | Ft 35 D; FGL 350   | Grade 350           | G 35             | 0135-00           | FG 35                      | A 48-50 B            | FC 350         |
| 0.6040   | GG-40                  | GJL-400             | Ft 40 D; FGL 400   | Grade 400           | G 40; GMN 70     | 0140-00           | FG 40                      | A 48-60 B            | FC 400         |
| <b>2.3 Kugelgraphitguss, Temperguss – Nodular cast iron, malleable cast iron – Fonte grise à graphite sphéroïdal – Ghisa sferoidale</b>                                |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 0.7033   | GGG-35.3               | GJS-350-22          | FGS 370-17         | 350/22 L 40         | GMN 45           | 0717-15           | -                          | -                    | -              |
| 0.7040   | GGG-40                 | GJS-400-15          | FGS 400-15         | SNG 420 / 12        | GS 400-12        | 0717-02           | FGE 38-17                  | 60-40-18             | FCD 400        |
| 0.7043   | GGG-40.3               | GJS-400-18          | FGS 370-17         | SNG 370 / 17        | GSO 42/17        | 0717-12           | -                          | -                    | FCD 370        |
| 0.7050   | GGG-50                 | GJS-500-7           | FGS 500-7          | SNG 500 / 7         | GS 500-7         | 0727-02           | FGE 50-7                   | 65-45-12             | FCD 500        |
| 0.7060   | GGG-60                 | GJS-600-3           | FGS 600-3          | SNG 600 / 3         | GS 600-3         | 0732-03           | FGE 60-2                   | 80-55-06             | FCD 600        |
| 0.8035   | GTW-35-04              | GJMW-350-4          | MB 35-7            | W 340 / 3; W 35-04  | W 35-04          | -                 | Type B                     | -                    | FCMW 330       |
| 0.8040   | GTW-40-05              | GJMW-400-5          | MB 40-10; MB 400-5 | W 410 / 4; W 40-05  | GMB 40 / W40-05  | -                 | Type A                     | -                    | FCMW 370       |
| 0.8045   | GTW-45-07              | GJMW-450-7          | MB 45-07           | W 45-07             | GMB 45 / W45-07  | -                 | -                          | -                    | FCMWP 440      |
| 0.8055   | GTW-55                 | -                   | -                  | -                   | GMB 55           | -                 | -                          | -                    | -              |
| 0.8065   | GTW-65                 | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 0.8135   | GTS-35-10              | GJMB-350-10         | MN 350-10          | B 340 / 12; B 35-12 | P 35-10          | 0815-00           | -                          | 32510                | FCMB 340       |
| 0.8145   | GTS-45-06              | GJMB-450-6          | MN 450-6           | P 440 / 7; P 45-06  | GMN 55 / P45-06  | 0852-00           | -                          | A220-40010           | FCMP 440 / 490 |
| 0.8155   | GTS-55-04              | GJMB-550-4          | MN 550-4 / MP 50-5 | P 510 / 4; P 55-04  | GMN 65 / P55-04  | 0854-00           | -                          | A220-50005           | FCMP 540       |
| 0.8165   | GTS-65-02              | GJMB-650-2          | MN 650-3           | P 570 / 3; P 65-02  | GMN 70 / P65-02  | 0856-00 / 0858-00 | -                          | A220-70003           | FCMP 590       |
| <b>2.4 Gußeisen mit Vermiculargraphit – Compacted graphite cast iron – Fonte vermiculaire – Ghisa vermicolare</b>  |                        |                     |                    |                     |                  |                   |                            |                      |                |
| -  | GGV-30                 | EN-GJV-300          | -                  | -                   | -                | -                 | -                          | -                    | -              |
| -  | GGV-40                 | EN-GJV-400          | -                  | -                   | -                | -                 | -                          | -                    | -              |
| <b>3 Kupfer / Kupferlegierungen – Copper / Copper alloys – Cuivre / Alliages de cuivre – Rame / leghe di Rame</b>  |                        |                     |                    |                     |                  |                   |                            |                      |                |
| <b>3.1 Kupfer (unlegiert, niedriglegiert) – Copper – Cuivre (non allié, faiblement allié) – Rame non e debolmente legato</b>   |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 2.0060   | E-Cu 57                | -                   | Cu-a 1; A 2        | Cu-ETP-2 C 101      | -                | -                 | -                          | C 11000              | -              |
| 2.0070   | SE-Cu                  | -                   | Cu-c1              | C 101               | -                | -                 | -                          | C 10300              | -              |
| 2.0090   | SF-Cu                  | -                   | Cu-b1              | Cu-DHP C 106        | -                | -                 | -                          | C 12200              | -              |
| 2.1356   | CuMn 3                 | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 2.1522   | CuSi 2 Mn              | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| <b>3.2 Kupfer-Legierungen (kurzspanend) – Copper alloys (short chipping) – Alliages de cuivre à copeaux courts (laitons) – Leghe di Rame a truciolo corto</b>          |                        |                     |                    |                     |                  |                   |                            |                      |                |
| 2.0360   | CuZn 40 (Ms60)         | -                   | CuZn 40 (Ms60)     | CZ 109              | OT 60            | -                 | -                          | C 28000              | -              |
| 2.0380   | CuZn 39 Pb 2 (Ms58)    | -                   | MS 58              | CZ 120              | OT 58            | -                 | -                          | C 10300              | -              |
| 2.0410   | CuZn 44 Pb 2 (Ms 56)   | -                   | CuZn 44 Pb 2       | CZ 130              | OT 56            | -                 | -                          | C 38500              | -              |
| 2.0561   | CuZn 40 Al 1           | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |
| 2.0580   | CuZn 40 Mn 1 Pb        | -                   | -                  | CZ 115              | -                | -                 | -                          | -                    | -              |
| 2.0771   | CuNi 7 Zn 39 Mn 5 Pb 3 | -                   | -                  | -                   | -                | -                 | -                          | -                    | -              |

**Werkstoffgruppen  
Groupes de matières**
**Classification of work materials  
Gruppi materiali**

| W-Nr.   | DIN (DE)                | EN (EU)          | NF A (FR)                     | BS (GB)            | UNI (IT) | SS (SE)  | UNE (ES) | SAE/ASTM (US) | JIS (JP) |
|---|-------------------------|------------------|-------------------------------|--------------------|----------|----------|----------|---------------|----------|
| 2.1050  | G-CuSn 10 Zn (Rg 10)    | -                | -                             | G 1                | -        | -        | -        | C 90500       | -        |
| 2.1086  | G-CuSn 10               | -                | -                             | CT 1               | -        | -        | -        | C 90250       | -        |
| 2.1093  | G-CuSn 6 ZnNi           | -                | -                             | LG 4               | -        | -        | -        | C 92410       | -        |
| 2.1096  | G-CuSn 5 ZnPb (Rg 5)    | -                | CuPb 5 Sn 5 Zn 5              | LG 2               | -        | -        | -        | C 83600       | -        |
| <b>3.3 Kupferlegierungen (langspannend) – Copper alloys (long chipping) – Alliages de cuivre (à copeaux longs) – Leghe di Rame a truciolo lungo</b>                   |                         |                  |                               |                    |          |          |          |               |          |
| 2.0250  | CuZn 20 (Ms80)          | -                | -                             | CZ 103             | OT 80    | -        | -        | C 24000       | -        |
| 2.0265  | CuZn 30 (Ms70)          | -                | CuZn 30                       | CZ 106             | OT 70    | -        | -        | C 26000       | -        |
| 2.0321  | CuZn 37                 | -                | CuZn 37                       | CZ 108             | C 2720   | -        | -        | C 27400       | -        |
| 2.0335  | CuZn 36 (Ms63)          | -                | CuZn 36                       | -                  | OT 63    | -        | -        | C 27000       | -        |
| 2.1020  | CuSn 6                  | -                | -                             | -                  | -        | -        | -        | -             | -        |
| 2.1030  | CuSn 8                  | -                | -                             | -                  | -        | -        | -        | -             | -        |
| 2.1080  | CuSn 6 Zn 6             | -                | -                             | -                  | -        | -        | -        | -             | -        |
| 2.1245  | CuBe 1,7                | -                | CuBe 1,7                      | CB 101             | -        | -        | -        | C 17000       | -        |
| 2.1247  | CuBe 2                  | -                | CuBe 1,9                      | -                  | -        | -        | -        | C 17200       | -        |
| 2.1293  | CuCrZr                  | -                | UC 1 Zr                       | CC 102             | -        | -        | -        | C 18100       | -        |
| 2.1525  | CuSi 3 Mn               | -                | -                             | -                  | -        | -        | -        | -             | -        |
| <b>3.4 Kupfer-Sonderlegierungen (&lt; 200 HB) – Copper alloys (&lt; 200 HB) – Alliages de cuivre (&lt; 200 HB) – Leghe di Rame speciali (&lt; 200 HB)</b>             |                         |                  |                               |                    |          |          |          |               |          |
| 2.0916  | CuAl 5 (AlBz 5)         | -                | -                             | -                  | -        | -        | -        | -             | -        |
| 2.0932  | CuAl 8 Fe 3 (AlBz 8 Fe) | -                | CuAl 7 Fe 2                   | CA 106             | -        | -        | -        | C 61400       | -        |
| 2.0966  | CuAl 10 Ni 5 Fe 4       | -                | CuAl 9 Ni 5 Fe 3 Mn; U-A 10 N | CA 104             | -        | -        | -        | C 63200       | -        |
| 2.1247  | CuBe 2 Fe 40            | -                | CuBe 1,9                      | -                  | -        | -        | -        | C 17200       | -        |
| -   | AMPCO 8                 | -                | -                             | -                  | -        | -        | -        | -             | -        |
| -   | AMPCO 12                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| -   | AMPCO 15                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| -   | AMPCO 16                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| <b>3.5 Kupfer-Sonderlegierungen (200 HB – 300 HB) – Copper alloys (200 HB – 300 HB) – Alliages de cuivre (200 – 300HB) – Leghe di Rame speciali (200 HB – 300 HB)</b> |                         |                  |                               |                    |          |          |          |               |          |
| 2.0978  | CuAl 11 Ni 6 Fe 5       | -                | CuAl 11 Ni 6 Fe 5             | -                  | -        | -        | -        | -             | -        |
| 2.1245  | CuBe 1,7 F55            | -                | CuBe 1,7                      | CB 101             | -        | -        | -        | C 17000       | -        |
| -   | AMPCO 18                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| -   | AMPCO 20                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| <b>3.6 Kupfer-Sonderlegierungen (&gt; 300 HB) – Copper alloys (&gt; 300 HB) – Alliages de cuivre (&gt; 300 HB) – Leghe di Rame speciali (&gt; 300 HB)</b>             |                         |                  |                               |                    |          |          |          |               |          |
| 2.1245  | CuBe 1,7 F110           | -                | CuBe 1,7                      | CB 101             | -        | -        | -        | C 17000       | -        |
| 2.1247  | CuBe 2 F125             | -                | CuBe 1,9                      | -                  | -        | -        | -        | C 17200       | -        |
| -   | AMPCO 21                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| -   | AMPCO 22                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| -   | AMPCO 25                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| -   | AMPCO 26                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| <b>4 Aluminium / Aluminiumlegierungen – Aluminium / Aluminium alloys – Aluminium / Alliages d' aluminium – Alluminio / Leghe di Alluminio</b>                         |                         |                  |                               |                    |          |          |          |               |          |
| <b>4.1 Aluminium (unlegiert, niedriglegiert) – Aluminium – Aluminium (non allie-faiblement allié) – Alluminio non e debolmente legato</b>                             |                         |                  |                               |                    |          |          |          |               |          |
| 3.0250  | Al 99,5 H               | -                | A 59050 C                     | 1 B; L31 / 34 / 36 | -        | 144007   | L-3051   | 1050 A        | -        |
| 3.0256  | E-Al H                  | -                | A 5 / L                       | 1 E                | -        | 144008   | L-3052   | 1350 A        | -        |
| 3.0280  | Al 99,8 H               | -                | A 8                           | 1 A                | -        | 144004   | L-3081   | 1080 A        | -        |
| 3.3308  | Al 99,9 Mg 0,5          | -                | A-9-G 0,5                     | -                  | -        | -        | -        | -             | -        |
| <b>4.2 Aluminium-Legierungen (&lt; 0,5% Si) – Aluminium alloys (&lt; 0,5% Si) – Alliages d'aluminium (&lt; 0,5% Si) – Leghe di Alluminio (&lt; 0,5% Si)</b>           |                         |                  |                               |                    |          |          |          |               |          |
| 3.0515  | G-Al 99,5               | -                | 3103                          | N 3                | 3568     | 144054   | L 3811   | 3103          | -        |
| 3.0516  | S-AlMn                  | -                | -                             | NG 3               | -        | 144055   | -        | -             | -        |
| 3.0525  | AlMn 1 Mg 0,5           | -                | A – M 1 G 0,5                 | -                  | -        | -        | -        | 3005          | A 3005   |
| 3.0615  | AlMgSiPb                | -                | 6262                          | -                  | -        | -        | L 3452   | 6012          | -        |
| 3.1325  | AlCuMg 1                | AW-2017 A        | A – U 4 G                     | H 14               | 3579     | -        | L-3120   | 2017 A        | A 2017   |
| 3.1355  | AlCuMg 2                | AW-2024          | A – U 4 G 1                   | 2 L 98             | 3583     | -        | L-3140   | 2024          | A 2024   |
| 3.1841  | G-AlCu 4 Ti             | -                | -                             | 2 L 91/92          | 3044     | -        | -        | -             | A C 1 A  |
| 3.3241  | G-AlMg 3 Si             | -                | A-G 3 T                       | -                  | -        | -        | L 2341   | 511           | -        |
| 3.3292  | GD-AlMg 9               | -                | -                             | -                  | -        | -        | -        | -             | -        |
| 3.3315  | AlMg 1                  | AW-6082          | A – G 0,6                     | N 41               | 5764     | 144106   | L-3350   | 5005 A        | A 5005   |
| 3.3535  | AlMg 3                  | -                | A – G 3 M                     | N 5                | 3575     | 144133   | L-3390   | 5754          | -        |
| 3.4365  | AlZnMgCu 1,5            | -                | A – Z 5 GU                    | 2 L 95             | 3735     | -        | L-3710   | 7075          | A 7075   |
| <b>4.3 Aluminium-Legierungen (0,5% – 10% Si) – Aluminium alloys (0,5% – 10% Si) – Alliages d'aluminium (0,5% – 10% Si) – Leghe di Alluminio (0,5% – 10% Si)</b>       |                         |                  |                               |                    |          |          |          |               |          |
| 3.2134  | GD-AISI 5 Cu 1 Mg       | -                | A – S 4 Gu                    | LM 16              | 3600     | -        | L-2571   | 355,1         | A C 4 D  |
| 3.2152  | GD-AISI 6 Cu 4          | -                | A – S 5 U                     | LM 4 – LM 22       | -        | 4230     | L-2660   | 319,2         | -        |
| 3.2162  | GD-AISI 8 Cu 3          | -                | A – S 9 U 3                   | LM 24              | -        | 4252     | L-2630   | 380,1         | -        |
| 3.2373  | G-AISI 9 Mg             | -                | A 7 – S 10 G                  | -                  | 3051     | 4235     | -        | -             | A C 4 A  |
| <b>4.4 Aluminium-Legierungen (10% – 15% Si) – Aluminium alloys (10% – 15% Si) – Alliages d'aluminium (10% – 15% Si) – Leghe di Alluminio (10% – 15% Si)</b>           |                         |                  |                               |                    |          |          |          |               |          |
| 3.2381  | G-AISI 10 Mg            | -                | A – S 10 G                    | LM 9               | -        | 4253     | L-2560   | A 360         | -        |
| 3.2383  | G-AISI 10 Mg (Cu)       | -                | A – S 10 UG                   | LM 9               | -        | 4253     | -        | A 360,2       | A D C 3  |
| 3.2581  | G-AISI 12               | -                | A – S 13                      | LM 6               | 4514     | 4261     | L-2520   | A 413,2       | A C 3 A  |
| 3.2583  | G-AISI 12 (Cu)          | -                | A – S 12 U                    | LM 20              | 3048     | 4260     | L-2530   | A 413,1       | A D C 1  |
| 3.2982  | GD-AISI 12 (Cu)         | -                | -                             | -                  | -        | -        | -        | -             | -        |
| 3.5106  | G-MgAg 3 SE 2 Zr 1      | MCMgRE 2 Ag 2 Zr | G-Ag 22,5                     | MAG 12             | -        | -        | -        | QE 22         | -        |
| 3.5562  | G-MgAl 6                | -                | -                             | -                  | -        | -        | -        | -             | -        |
| 3.5812  | GD-MgAl 8 Zn 1          | MCMgAl 8 Zn 1    | G-A 9                         | MAG 1              | AZ 81 hp | AZ 81 hp | AZ 81 hp | AZ 81         | AZ 81 hp |
| 3.5912  | GD-MgAl 9 Zn 1          | MCMgAl 9 Zn 1    | G-A 9 Z 1                     | MAG 7              | AZ 91 hp | -        | -        | AZ 91         | -        |
| <b>4.5 Aluminium-Legierungen (&gt; 15% Si) – Aluminium alloys (&gt; 15% Si) – Alliages d'aluminium (&gt; 15% Si) – Leghe di Alluminio (&gt; 15% Si)</b>               |                         |                  |                               |                    |          |          |          |               |          |
| -   | G-AISI 17 Cu 4          | -                | -                             | -                  | -        | -        | -        | 390           | -        |
| -   | G-AISI 21 CuNiMg        | -                | -                             | LM 28              | -        | -        | -        | -             | -        |
| -   | G-AISI 25 CuNiMg        | -                | -                             | LM 29              | -        | -        | -        | 393           | -        |







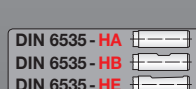





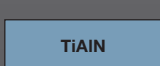


**Werkstoffgruppen**  
**Groupes de matières**
**Classification of work materials**  
**Gruppi materiali**

| W-Nr.  | DIN (DE)                 | EN (EU)       | NF A (FR)         | BS (GB)                    | UNI (IT) | SS (SE) | UNE (ES) | SAE/ASTM (US)      | JIS (JP) |
|--|--------------------------|---------------|-------------------|----------------------------|----------|---------|----------|--------------------|----------|
| <b>5 Titan / Titanlegierungen – Titanium / Titanium alloys – Titane / Alliages de titane – Titanio / Leghe di Titanio</b>  |                          |               |                   |                            |          |         |          |                    |          |
| <b>5.1 Reintitan – Pure titanium – Titane pur – Titanio puro</b>   |                          |               |                   |                            |          |         |          |                    |          |
| 3.7024.1 LN  | Ti 99,5                  | -             | T-60              | TA-6/7/8/9                 | -        | -       | Ti-PO4   | 4901/21            | -        |
| 3.7034.1 LN  | Ti 99,7                  | -             | T-40              | TA-2/3/4/5                 | -        | -       | Ti-PO2   | 4941/42/51/4902    | -        |
| 3.7055   | Ti 99,4                  | -             | T-50              | TA 3                       | -        | -       | -        | R 50550            | -        |
| 3.7064.1 LN  | Ti 99,2                  | -             | T-60              | 2 TA-6/7/8/9               | -        | -       | -        | -                  | -        |
| <b>5.2 Titanlegierungen (Rm &lt; 900 N/mm²) – Titanium alloys (tensile strength &lt; 900 N/mm²) – Alliages de titane (résistance &lt; 900 N/mm²) – Leghe di Titanio (resistenza &lt; 900 N/mm²)</b>  |                          |               |                   |                            |          |         |          |                    |          |
| 3.7114 LN  | TiAl 5 Sn 2              | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| 3.7124 LN  | TiCu 2                   | -             | T-U 2             | 2 TA.21-24;<br>TA.52-55/58 | -        | -       | Ti-P11   | -                  | -        |
| 3.7163 LN  | TiAl 6 V 4               | -             | T-A 6 V           | TA.10-13/28/56             | -        | -       | Ti-P63   | 491128/35/54/65/67 | -        |
| 3.7174 LN  | TiAl 6 V 6 Sn 2          | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| <b>5.3 Titanlegierungen (Rm 900 – 1500 N/mm²) – Titanium alloys (tensile strength 900 – 1500 N/mm²) – Alliages de titane (résistance 900 – 1500 N/mm²) – Leghe di Titanio (resistenza 900 – 1500 N/mm²)</b>  |                          |               |                   |                            |          |         |          |                    |          |
| 3.7124 LN  | TiCu 2                   | -             | T-U 2             | 2 TA.21-24;<br>TA.52-55/58 | -        | -       | Ti-P11   | -                  | -        |
| 3.7144 LN  | TiAl 6 Sn 2 Zr 4 Mo 2    | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| 3.7154 LN  | TiAl 6 Zr 5              | -             | T-A 6 ZD          | TA.43/44                   | -        | -       | Ti-P67   | -                  | -        |
| 3.7164 LN  | TiAl 5 V 4               | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| 3.7164 LN  | TiAl 6 V 4               | -             | T-A 6 V           | TA.10-13/28/56             | -        | -       | Ti-P63   | 491128/35/54/65/67 | -        |
| 3.7174 LN  | TiAl 6 V 6 Sn 2          | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| 3.7184 LN  | TiAl 4 Mo 4 Sn 2         | -             | T-A 4 DE          | TA.45-51/57                | -        | -       | Ti-P68   | -                  | -        |
| <b>6 Nickel / Nickellegierungen – Nickel / Nickel alloys – Nickel / Alliages de nickel – Nickel / Leghe di Nickel</b>  |                          |               |                   |                            |          |         |          |                    |          |
| <b>6.1 Reinnickel – Pure nickel – Nickel pur – Nickel puro</b>   |                          |               |                   |                            |          |         |          |                    |          |
| 2.1504 LN  | NiAlBz                   | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| 2.4042   | Ni 99 CSi                | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| 2.4060   | Ni 99,6                  | -             | -                 | NA 46                      | -        | -       | -        | -                  | -        |
| 2.4062   | Ni 99,4 Fe               | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| <b>6.2 Nickellegierungen (Rm &lt; 900 N/mm²) – Nickel alloys (tensile strength &lt; 900 N/mm²) – Alliages de Nickel (résistance &lt; 900 N/mm²) – Leghe di Nickel (resistenza &lt; 900 N/mm²)</b>  |                          |               |                   |                            |          |         |          |                    |          |
| 2.4360   | NiCu 30 Fe               | Monel 400     | NU 30             | NA 13                      | -        | -       | -        | N 04400            | -        |
| 2.4374 LN  | -                        | Monel 500     | -                 | -                          | -        | -       | -        | -                  | -        |
| 2.4617   | NiMo 28                  | Hastelloy B 2 | NiMo 28           | NA 14                      | -        | -       | -        | N 10665            | -        |
| 2.4665   | NiCr 22 Fe 18 Mo         | Hastelloy X   | NC 22 FeD         | HR 6/204                   | -        | -       | MH-03    | 5536E              | -        |
| 2.4812   | -                        | Hastelloy C   | -                 | -                          | -        | -       | -        | -                  | -        |
| 2.4816   | NiCr 15 Fe               | Inconel 600   | NC 15 Fe          | NA 14                      | -        | -       | -        | 5540               | NCF 600  |
| 2.4876   | -                        | Inconel 800   | -                 | -                          | -        | -       | -        | -                  | -        |
| 2.4983   | NiCr 18 Co 18 MoTi       | Inconel 500   | NCK 19 DAT        | -                          | -        | -       | -        | 684                | -        |
| <b>6.3 Nickellegierungen (Rm 900 – 1500 N/mm²) – Nickel alloys (tensile strength 900 – 1500 N/mm²) – Alliages de Nickel (résistance 900 – 1500 N/mm²) – Leghe di Nickel (resistenza 900 – 1500 N/mm²)</b>  |                          |               |                   |                            |          |         |          |                    |          |
| 2.4631   | NiCr 20 TiAl             | Nimonic 80A   | NC 20 TA          | HR 401                     | -        | -       | MH-07    | -                  | NCF 80 A |
| 2.4632   | NiCr 20 Co 18 Ti         | Nimonic 90    | -                 | BA 19                      | -        | -       | -        | -                  | -        |
| 2.4634   | NiCo 20 Cr 15 MoAlTi     | Nimonic 105   | NCKD 20 ATV       | HR 3/5007                  | -        | -       | MH-14    | -                  | -        |
| 2.4662   | -                        | Nimonic 901   | Z 8 NCDT 42       | MH 16                      | -        | -       | MH-16    | 5660 C             | -        |
| 2.4668   | NiCr 19 FeNbMo           | Inconel 718   | NC 19 Fe Nb       | HR 8                       | -        | -       | MH-06    | N 07718            | NCF 718  |
| 2.4670 LN  | G – NiCr 13 Al 6 MoNb    | Nimocast 713  | NC 13 AD          | HC 203                     | -        | -       | MH-31    | 5391 A             | -        |
| 2.4674 LN  | NiCo 15 Cr 10 MoAlTi     | Nimocast PK24 | NK 15 CAT         | HC 204                     | -        | -       | -        | 5397               | -        |
| 2.4856   | NiCr 22 Mo 9 Nb          | Inconel 625   | NC 22 FeDNB       | NA 21                      | -        | -       | -        | 5581 / N 06625     | NCF 625  |
| 2.6554   | -                        | Waspaloy      | -                 | -                          | -        | -       | -        | -                  | -        |
| <b>7 Kunststoffe – Plastics – Plastiques – Materie plastiche</b>   |                          |               |                   |                            |          |         |          |                    |          |
| <b>7.1 Thermoplaste – Thermoplastics – Thermoplastiques – Termoplastiche</b>   |                          |               |                   |                            |          |         |          |                    |          |
| -  | Ultramit                 | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | Makralon                 | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | Hostalen                 | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | Degolan                  | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | Polystyrol               | -             | Polystyrène       | Styrene                    | -        | -       | -        | -                  | -        |
| -  | Hostaform                | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| <b>7.2 Duroplaste und Pressstoffe – Thermosetting polymers and pressed materials – Duroplastiques – Polimeri termoindurenti e materiali pressati</b>   |                          |               |                   |                            |          |         |          |                    |          |
| -  | Bakelit                  | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | Pertinax                 | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | Ferrozell                | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | Resopal                  | -             | Résopal – Formica | Formica                    | -        | -       | -        | -                  | -        |
| -  | Albanit                  | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| <b>7.3 Faserverstärkte Kunststoffe – Reinforced plastics – Matières synthétiques, renforcées par des fibres de verre – Plastiche rinforzate</b>  |                          |               |                   |                            |          |         |          |                    |          |
| -  | CFK Kohlefaserverstärkt  | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | GFK Glasfaserverstärkt   | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | AFK Aramidfaserverstärkt | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| <b>8 Hartstoffe – Hardened materials – Matières dures (trempées) – Materiali duri</b>  |                          |               |                   |                            |          |         |          |                    |          |
| <b>8.1 Metallkeramiken – Metal ceramics – Matières dures, à base céramique – Materiali a base ceramica</b>   |                          |               |                   |                            |          |         |          |                    |          |
| -  | Ferrotic                 | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | Ferrotitanit             | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| <b>8.2 Gehärtete Stähle der Werkstoffgruppen 1.5 und 1.6.2 (50 – 65 HRC) – Hardened steels of groups 1.5 and 1.6.2 (50 – 65 HRC) – Aciers traités des groupes de matières 1.5 et 1.6.2 (50 – 65 HRC) – Acciai temprati del gruppo di materiali 1.5 e 1.6.2 (50-65 HRC)</b> |                          |               |                   |                            |          |         |          |                    |          |
| <b>8.2.1 45 – 55 HRC</b>   |                          |               |                   |                            |          |         |          |                    |          |
| -  | HARDOX 500               | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| -  | TOOLOX 44                | -             | -                 | -                          | -        | -       | -        | -                  | -        |
| <b>8.2.2 55 – 60 HRC</b>   |                          |               |                   |                            |          |         |          |                    |          |
| <b>8.2.3 60 – 65 HRC</b>   |                          |               |                   |                            |          |         |          |                    |          |

**Kurzzeichenerklärung**  
**Explication des symboles**

**Explanation of symbols**  
**Spiegazione dei simboli**

|   |   |
|---|---|
|    | Werkstoffgruppe<br>Classification of work materials<br>Groupe de matières<br>Gruppo materiali   |
|    | Vollhartmetall<br>Solid carbide<br>Carbure monobloc<br>Metallo duro integrale   |
|    | Schaftausführung DIN 6535 HA<br>Shank design DIN 6535 HA<br>Queue selon DIN 6535 HA<br>Gambo DIN 6535 HA  |
|    | Schaftausführung DIN 6535 HB<br>Shank design DIN 6535 HB<br>Queue selon DIN 6535 HB<br>Gambo DIN 6535 HB  |
|    | Baumaße DIN 6537 K<br>Dimensions DIN 6537 K<br>Exécution selon DIN 6537 K<br>Dimensioni DIN 6537 K  |
|    | Baumaße DIN 6537 L<br>Dimensions DIN 6537 L<br>Exécution selon DIN 6537 L<br>Dimensioni DIN 6537 L  |
|   | Schaftausführung<br>Shank design<br>Queue selon<br>Gambo  |
|  | Werksnorm<br>Internal standard<br>Norme usine<br>Norme interne  |
|  | Für universellen Einsatz<br>For universal use<br>Pour utilisation universelle<br>Per uso universale   |
|  | Bohrtiefe (IKZ = mit Innenkühlung)<br>Drilling depth (IKZ = with internal coolant)<br>Profondeur de perçage (IKZ = Arrosage centralisé)<br>Profondita' di foratura (IKZ = Lubrificazione interna) |
|  | Drallwinkel<br>Helix angle<br>Angle d'hélice<br>Angolo dell'elica   |
|  | Spitzenwinkel<br>Point angle<br>Angle de pointe<br>Angolo di testa  |
|  | Titan-Aluminiumnitrid<br>Titanium aluminium nitride<br>Nitrure de titane-aluminium<br>Nitruro di Titanio-Alluminio  |

**Allgemeine Geschäftsbedingungen**  
**Conditions générales de vente****General sales conditions**  
**Condizioni generali di vendita****1. Angebot und Auftrag**

Unsere Angebote erfolgen freibleibend. Aufträge und mündliche Vereinbarungen haben nur Gültigkeit, wenn sie von uns schriftlich bestätigt sind. Die Einkaufs- und Geschäftsbedingungen unserer Abnehmer werden von uns nicht anerkannt, auch wenn wir nicht widersprochen haben.

**2. Preise**

Die Grundpreise in unseren jeweils gültigen Listen sind unverbindliche Preisempfehlungen ohne Mehrwertsteuer. Sie gelten ab Bad Homburg und schließen die Kosten für Verpackung, Fracht, Porto und Wertsicherung nicht ein. Es werden jeweils die am Tage der Lieferung gültigen Preise und Zuschläge berechnet.

**3. Zahlungsbedingungen**

Die Zahlung ist innerhalb von 30 Tagen nach Rechnungsdatum ohne Abzug oder innerhalb von 10 Tagen mit 2% Skonto zu leisten. Bei verspäteter Zahlung sind wir berechtigt, Verzugszinsen von 5 Prozentpunkten über dem jeweiligen Basiszinssatz zu verlangen. Wechselspesen gehen zu Lasten des Käufers.

**4. Eigentumsvorbehalt**

- a) Wir behalten uns das Eigentum an allen von uns gelieferten Waren bis zur Erfüllung sämtlicher Forderungen aus der Geschäftsverbindung vor. Bei laufender Rechnung gilt der Eigentumsvorbehalt für die zu sichernde Saldoforderung.
- b) Der Käufer tritt uns im Voraus alle Forderungen aus einem Weiterverkauf der Ware oder sonstigen Geschäften mit der Ware sicherungshalber ab. Wird unsere Ware zusammen mit anderer Ware verkauft, gilt die Abtretung der Forderung nur in Höhe des Wertes unserer Vorbehaltsware.
- c) Der Käufer ist zum Verkauf der Ware und zur Einziehung der abgetretenen Forderung ermächtigt. Wir werden die Forderung nicht einziehen, solange der Käufer seinen Zahlungsverpflichtungen nachkommt. Solange unsere Forderungen nicht erfüllt sind, hat der Käufer die eingezogenen Beträge gesondert aufzubewahren und an uns abzuführen. Auf Verlangen hat der Käufer uns die Drittschuldner der abgetretenen Forderungen und die Forderungshöhe bekanntzugeben, den Drittschuldnern die Abtretung anzuzeigen und uns die notwendigen Unterlagen herauszugeben.
- d) Bei Nichteinhaltung der Zahlungsbedingungen, bei Wechselprotesten und Nichteinlösung von Schecks erlöschen die Rechte des Käufers zur Veräußerung und zum Einzug der abgetretenen Kaufpreisforderung. Wir sind in diesem Falle berechtigt, die von uns gelieferte Ware in unseren Besitz zu nehmen. Ein Rücktritt vom Vertrag ist darin nur zu erblicken, wenn wir dies ausdrücklich erklären. Alle Kosten einer Rücknahme gehen zu Lasten des Käufers. Von eventuellen Pfändungen sind wir unter Bekanntgabe des Pfandgläubigers sofort zu unterrichten. Interventionskosten gehen zu Lasten des Käufers.
- e) Auf Verlangen des Käufers geben wir voll bezahltes Liefergut nach unserer Wahl frei, wenn der Wert der uns gegebenen Sicherheit unsere Forderungen um mehr als 20% übersteigt.

**5. Lieferung**

Lieferzeiten werden so zuverlässig wie möglich eingehalten, sind jedoch nicht verbindlich.

**6. Versand**

Der Versand erfolgt auf Gefahr des Käufers. Die Verpackung wird zu Selbstkosten berechnet. Wenn vom Käufer gewünscht, kann die leere Verpackung nach Gebrauch zurückgegeben werden. Die Kosten für den Rücktransport trägt der Käufer.

**7. Sachmängel**

Mängelansprüche bestehen nicht bei ungeeigneter oder unsachgemäßer Verwendung, fehlerhafter Montage bzw. Inbetriebsetzung, natürlicher Abnutzung, fehlerhafter oder nachlässiger Behandlung u.ä..

**8. Haftung**

Für Schäden – gleich aus welchem Rechtsgrund – haftet der Verkäufer nur bei Vorsatz, grober Fahrlässigkeit, schuldhafter Verletzung von Leben, Körper, Gesundheit und in sonstigen Fällen zwingender Haftung wie z.B. nach dem Produkthaftungsgesetz.

**9. Verjährung**

Sachmängelansprüche und alle sonstigen Ansprüche des Käufers – aus welchem Rechtsgrund auch immer – verjähren in 12 Monaten, soweit nicht rechtlich zwingend längere Fristen gelten.

**10. Rücknahme**

Zur Rücknahme bestellter und richtig gelieferter, mangelfreier Ware sind wir nicht verpflichtet.

Erklären wir uns im Einzelfall schriftlich mit der Rücknahme einverstanden, berechnen wir pauschal 20% des Netto-Verkaufspreises, mindestens jedoch EUR 15,00 zzgl. MwSt als Wiedereinlagerungs- bzw. Warenrücknahmekosten.

Sonderanfertigungen oder speziell beschriftete oder gekennzeichnete Artikel sind von einer Rücknahme ausgeschlossen.

**11. Erfüllungsort, Gerichtsstand, Allgemeines**

Für Lieferung und Zahlung ist Bad Homburg Erfüllungsort. Gerichtsstand ist Frankfurt am Main. Für das Rechtsverhältnis gilt deutsches Recht. Die Unwirksamkeit einzelner Bestimmungen hat auf die Gültigkeit der übrigen Bestimmungen keinen Einfluß.

**WEXO® Präzisionswerkzeuge GmbH**

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61352 Bad Homburg

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