

# DORMER PRAMET

## FORCE LIJN

VHM BOREN  
VOOR HOGE PRESTATIES

# 2020



 **DORMER**



**FORCE**



### VEELZIJDIGE PRODUCTIEBOREN VOOR EEN BREED SCALA AAN MATERIALEN

FORCE X hardmetalen boren zijn ontwikkeld voor hoogwaardige verspaningstoepassingen in een grote verscheidenheid aan materialen. Zoals koolstof en gelegeerde staalsoorten tot 1500 MPa en Gietijzer. FORCE X boren presteren ook goed in Roestvrij Staal en Aluminium waardoor ze een ideale eerste keuze zijn voor toeleveranciers in de verspaningsindustrie.

### KENMERKEN & VOORDELEN

- CTW  - Unieke spaangroefconstructie met een continu verdunde kern en afgeronde hiel.
- Gewijzigde 4-Facet Split Point met grote secundaire dwarssnijkantshoek.
- Hoogwaardig microkorrelig hardmetaalsoort met TiAlN coating.
- 3xD en 5xD, met of zonder koelkanalen.
- 8xD met koelkanalen.

### IN VERGELIJKING MET CONVENTIONELE BOREN ZIJN DE FORCE X:

- Uitzonderlijk economisch - met gemakkelijker en veelvoudig herslijp mogelijkheid die aanzienlijk verhogen van de totale gebruiksduur.
- Continue hoge kwaliteit en prestaties - met uitstekende positioneer-nauwkeurigheid en spaanafvoer, die bijdragen aan een superieure gatkwaliteit qua maatvoering en afwerking.
- Productiever - met hoge boorsnelheden en langere levensduur van het gereedschap.



### RANGE DETAILS

**3xD**



**R457**

met koelkanalen

**R458**

zonder koelkanalen

- 3.00 – 20.00 mm
- 1/8 – 3/4 inch, N30 – N1, A – Z

**5xD**



**R453**

met koelkanalen

**R454**

zonder koelkanalen

- 3.00 – 20.00 mm
- 1/8 – 3/4 inch, N30 – N1, A – Z

**8xD**



**R459**

met koelkanalen

- 3.00 – 16.00 mm
- 1/8 – 5/8 inch



### BEWERKINGSVOORBEELDEN

|                   |       |        | Automatenstaal                  | Gelegeerd staal                 | Gietijzer                       |
|-------------------|-------|--------|---------------------------------|---------------------------------|---------------------------------|
| Werkstukmateriaal |       |        | 1.0718 (11SMnPb30)              | 1.6582 (34CrNiMo6)              | 0.6025 (GG-25)                  |
| Hardheid          |       | HB     | 180                             | 325                             | 215                             |
| Treksterkte       |       | MPa    | 620                             | 1120                            | 260                             |
| Diameter          |       | mm     | 8 (R4578.0)                     | 8 (R4598.0)                     | 8 (R4538.0)                     |
| Gatdiepte         |       | mm     | 3xD (24)                        | 8xD (64)                        | 5xD (40)                        |
| Snij snelheid     | $v_c$ | m/min  | 207                             | 73                              | 77                              |
| Voeding           | f     | mm/omw | 0.26                            | 0.14                            | 0.26                            |
| Koeling           |       |        | Emulsie 8%<br>inwendige koeling | Emulsie 8%<br>inwendige koeling | Emulsie 8%<br>inwendige koeling |

### BOREN VOOR HOGE PRODUCTIEVITEIT IN ROESTVASTSTAAL

FORCE M hardmetalen boren zijn ontworpen om de hoogste prestaties en procesbetrouwbaarheid bij het boren te bieden in roestvaststaal en hittebestendige superlegeringen. FORCE M boren zijn ideaal voor toepassingen waar het noodzakelijk is om een groot aantal gaten te boren met een hoge en constante nauwkeurigheid.

### KENMERKEN & VOORDELEN

- CTW  - Unieke spaangroefconstructie met een continu verdunde kern en afgeronde hiel.
- S vormige 4 vlaks Split Point met nauwkeurig gelepte snijkant en sterker snijhoek ontwerp.
- 3xD en 5xD met koelkanalen.
- 8xD met koelkanalen is op aanvraag leverbaar

### VERGELEKEN MET GANGBARE VHM BOREN BIEDT DE FORCE M:

- Betrouwbare prestaties bij een vloeiend boorproces waardoor materiaalverharding gereduceerd wordt.
- Geoptimaliseerde productiviteit - met excellente spaanvorming en afvoer waardoor een betere krachtenverdeling hogere voedingssnelheden mogelijk maakt.
- Exceptionele standtijd - door sterkere snijhoek en snijkanten om plastische deformatie tegen te gaan.



### RANGE DETAILS

**3XD**



**R467**

met koelkanalen

- 3.00 – 16.00 mm
- 1/8 – 5/8 inch

**5XD**



**R463**

met koelkanalen

- 3.00 – 16.00 mm
- 1/8 – 5/8 inch

**NEW**

**8XD**



**R469**

met koelkanalen

- Op aanvraag leverbaar
- 3.00 – 16.00 mm
  - 1/8 – 5/8 inch





### BEWERKINGSVOORBEELDEN

|                   |       |        | Ferrietisch RVS                 | Austenitisch RVS                | Hooggelegeerd RVS               |
|-------------------|-------|--------|---------------------------------|---------------------------------|---------------------------------|
| Werkstukmateriaal |       |        | 1.4104 (AISI 430F)              | 1.4401 (AISI 316)               | 1.4501 (Super DUPLEX)           |
| Hardheid          |       | HB     | 220                             | 200                             | 240                             |
| Treksterkte       |       | MPa    | 700                             | 750                             | 770                             |
| Diameter          |       | mm     | 8 (R4678.0)                     | 8 (S-R4698.0)                   | 8 (R4638.0)                     |
| Gatdiepte         |       | mm     | 3xD (24)                        | 8xD (64)                        | 5xD (40)                        |
| Snij snelheid     | $v_c$ | m/min  | 99                              | 74                              | 57                              |
| Voeding           | f     | mm/omw | 0.16                            | 0.14                            | 0.12                            |
| Koeling           |       |        | Emulsie 8%<br>inwendige koeling | Emulsie 8%<br>inwendige koeling | Emulsie 8%<br>inwendige koeling |

## HOGE VOEDINGSSNELHEDEN IN ALUMINIUM

FORCE N hardmetalen boren worden aanbevolen voor hogesnelheidsboren in smeed- en gegoten aluminiumlegeringen. De spaangroeven en snijgeometrie zijn speciaal ontworpen om de spaan in kleine, hanteerbare spanen te breken om de spaanafvoer te verbeteren.

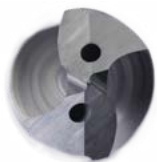
FORCE N boren bieden superieure prestaties en een lange levensduur voor middelgrote en grote productiebedrijven.

## KENMERKEN & VOORDELEN

- Speciale webverduunning met een hogere spiraalhoek dan gebruikelijk.
- Unieke geometrie met convexe snijkanten en een 4-vlaks zelfcentrerende punt.
- Hoogwaardig microkorrelig hardmetaalsoort met gepolijste afwerking.
- Alle Force N boren zijn op aanvraag leverbaar.

### IN VERGELIJKING MET GEBRUIKELIJKE BOREN BIEDT FORCE N:

- Superieure prestaties - bij hoge boorsnelheden en lange standtijd.
- Economische oplossing - die voor alle toepassingen kan worden gebruikt in aluminiumsoorten, van zacht tot abrasief.
- Geoptimaliseerd proces - ontworpen om de boordruk te verlagen en het verbeteren van de kwaliteit van de gaten en het verminderen van de uitgangsbraam die optreedt bij het boren van zachte materialen



## RANGE DETAILS

### NEW

### 5XD



### R445

met koelkanalen

Op aanvraag leverbaar

- 3.00 – 16.00 mm
- 1/8 – 5/8 inch

### NEW

### 8XD



### R448

met koelkanalen

Op aanvraag leverbaar

- 3.00 – 16.00 mm
- 1/8 – 5/8 inch

Up to

### NEW

### 12XD

Langere lengtes zijn op aanvraag leverbaar



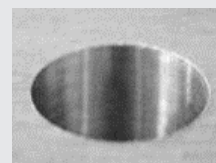


## BEWERKINGSVOORBEELD

|                   |       |        | Kneedaluminium                  | Gietaluminium                   |
|-------------------|-------|--------|---------------------------------|---------------------------------|
| Werkstukmateriaal |       |        | AW 2024-O (3.1355)              | A242.0                          |
| Hardheid          |       | HB     | 50                              | 75                              |
| Treksterkte       |       | MPa    | 200                             | 220                             |
| Diameter          |       | mm     | 8 mm (R4458.0)                  | 8 mm (S-R4488.0)                |
| Gatdiepte         |       | mm     | 5xD (40)                        | 8xD (64)                        |
| Snijnsnelheid     | $v_c$ | m/min  | 357                             | 374                             |
| Voeding           | f     | mm/omw | 0.80                            | 0.33                            |
| Koeling           |       |        | Emulsie 8%<br>inwendige koeling | Emulsie 8%<br>inwendige koeling |



Uitgangsbraam met gebruikelijke boor



Uitgangsbraam met FORCE N boor

## WERKSTUKMATERIAALGROEPEN (WMG)

**ISO** voor het selecteren van een basismateriaal en geometrie voor een breed scala aan werkstukmaterialen

**Algemene definitie**  
d.w.z. staal, roestvast staal...

P M K N S H

**Subgroep** om te navigeren en een gereedschap te selecteren op basis van geschiktheid voor een specifiek assortiment werkstukmaterialen

**Definitie op basis van structuur/samenstelling**  
d.w.z. gewoon koolstofstaal, gelegeerd staal...

P M K N S H

P1

P2

P3

P4

**WMG** het selecteren en bieden van snijcondities binnen een bandbreedte van  $\pm 10\%$

**Definitie op basis van hardheid/treksterkte**  
d.w.z.  $160 < 220 \text{ HB}$ ,  $620 < 900 \text{ n/mm}^2 \dots$

P

P1

P1.1

P1.2

P1.3

P2

P2.1

P2.2

P2.3

P3

P3.1

P3.2

P3.3

P4

P4.1

P4.2

P4.3

## INFORMATIE OVER WERKSTUKMATERIAALCLASSIFICATIE VAN DORMER PRAMET

Werkstukmateriaalgroepen ("WMG") zijn bedoeld om een eenvoudige en betrouwbare keuze van het juiste snijgereedschap en startwaarden voor de verspaningscondities in bepaalde toepassingen te kunnen maken.

Dormer Pramet deelt werkstukmaterialen in zes verschillend gekleurde groepen in;

- **Blauw:** Staal en gietstaal (groep P)
- **Geel:** Roestvast staal (groep M)
- **Rood:** Gietijzer (groep K)
- **Groen:** Non-ferro metalen (groep N)
- **Oranje:** Hittebestendige legeringen (groep S)
- **Grijs:** Geharde materialen (groep H)

Al deze materialen zijn afzonderlijk onderverdeeld in subgroepen op basis van structuur en/of samenstelling. Staal en gietstaal uit groep P zijn bijvoorbeeld onderverdeeld in vier subgroepen, te weten;

- P1 – **Automatenstaal**
- P2 – **Koolstofstaal/ongelegeerd staal**
- P3 – **Gelegeerd staal**
- P4 – **Gereedschapstaal**

Een uiteindelijke verdeling omvat materiaaleigenschappen, zoals hardheid en treksterkte. Dit is bedoeld om onze klanten volledig advies te geven over het gereedschap, inclusief startwaarden voor snijsnelheid en voeding.

De tabel op de volgende pagina bevat een beschrijving van elke werkstukmateriaalgroep en voorbeelden van veelgebruikte benamingen

| ISO | WMG (werkstukmateriaalgroepen) |                                                                                                             | Treksterkte<br>Mpa [N/mm <sup>2</sup> ] | Oude Dormer<br>AMG | Oude Pramet<br>ISO |
|-----|--------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------|--------------------|
| P   | P1                             | P1.1 Automatenstaal, zwavelhoudend met een hardheid van < 220 HB                                            | ≤ 760                                   | 1.1                | P1                 |
|     |                                | P1.2 Automatenstaal, zwavel en fosfor houdend met een hardheid van < 180 HB                                 | ≤ 620                                   | 1.1                | P1                 |
|     |                                | P1.3 Automatenstaal, zwavel, fosfor en lood houdend met een hardheid van < 160 HB                           | ≤ 550                                   | 1.1                | P1                 |
|     | P2                             | P2.1 Laag koolstofstaal met een gehalte van < 0,25% C en een hardheid van < 180 HB                          | ≤ 620                                   | 1.2                | P2                 |
|     |                                | P2.2 Medium koolstofstaal met een gehalte van < 0,55% C en een hardheid van < 240 HB                        | ≤ 830                                   | 1.3                | P2                 |
|     |                                | P2.3 Hoog koolstofstaal met een gehalte van < 0,55% C en een hardheid van < 300 HB                          | ≤ 1030                                  | 1.5                | P3                 |
|     | P3                             | P3.1 Gelegeerd staal met een hardheid van < 180 HB                                                          | ≤ 620                                   | 1.4                | P3                 |
|     |                                | P3.2 Gelegeerd staal met een hardheid van 180 – 260 HB                                                      | > 620 ≤ 900                             | 1.4                | P3                 |
|     |                                | P3.3 Gelegeerd staal met een hardheid van 260 – 360 HB                                                      | > 900 ≤ 1240                            | 1.5                | P4                 |
|     | P4                             | P4.1 Gereedschapstaal met een hardheid van < 26 HRC                                                         | ≤ 900                                   | 1.4                | P3                 |
|     |                                | P4.2 Gereedschapstaal met een hardheid van 26 – 39 RC                                                       | > 900 ≤ 1240                            | 1.5                | P4                 |
|     |                                | P4.3 Gereedschapstaal met een hardheid van 39 – 45 HRC                                                      | > 1250 ≤ 1450                           | 1.6                | H1                 |
| M   | M1                             | M1.1 Roestvast ferritisch staal met een hardheid van < 160 HB                                               | ≤ 520                                   | 2.1                | M1                 |
|     |                                | M1.2 Roestvast ferritisch staal met een hardheid van 160 – 220 HB                                           | > 520 ≤ 700                             | 2.1                | M1                 |
|     |                                | M2.1 Roestvast martensitisch staal met een hardheid van < 200 HB                                            | ≤ 670                                   | 2.3                | M2                 |
|     | M2                             | M2.2 Roestvast martensitisch staal met een hardheid van 200 – 280 HB                                        | > 670 ≤ 950                             | 2.3                | M2                 |
|     |                                | M2.3 Roestvast martensitisch staal met een hardheid van 280 – 380 HB                                        | > 950 ≤ 1300                            | 2.4                | M2                 |
|     |                                | M3.1 Roestvast austenitisch staal met een hardheid van < 200 HB                                             | ≤ 750                                   | 2.2                | M3                 |
|     | M3                             | M3.2 Roestvast austenitisch staal met een hardheid van 200 – 260 HB                                         | > 750 ≤ 870                             | 2.2                | M3                 |
|     |                                | M3.3 Roestvast austenitisch staal met een hardheid van 260 – 300 HB                                         | > 870 ≤ 1040                            | 2.2                | M3                 |
| K   | K1                             | M4.1 Roestvast austenitisch-ferritisch of super-austenitisch staal met een hardheid van < 300 HB            | ≤ 990                                   | 2.3                | M4                 |
|     |                                | M4.2 Roestvast neerslaggehard austenitisch staal met een hardheid van 300 – 380 HB                          | ≤ 1320                                  | 2.4                | M4                 |
|     |                                | K1.1 Ferritisch of ferritisch-perlitisch grijs gietijzer met een hardheid van < 180 HB                      | ≤ 190                                   | 3.1                | K1                 |
|     | K2                             | K1.2 Ferritisch-perlitisch of perlitisch grijs gietijzer met een hardheid van 180 – 240 HB                  | > 190 ≤ 310                             | 3.2                | K1                 |
|     |                                | K1.3 Perlitisch grijs gietijzer met een hardheid van 240 – 280 HB                                           | > 310 ≤ 390                             | 3.2                | K1                 |
|     |                                | K2.1 Ferritisch smeedbaar ijzer met een hardheid van < 160 HB                                               | ≤ 400                                   | 3.3                | K2                 |
|     | K3                             | K2.2 Ferritisch of perlitisch smeedbaar ijzer met een hardheid van 160 – 200 HB                             | > 400 ≤ 550                             | 3.3                | K2                 |
|     |                                | K2.3 Perlitisch smeedbaar ijzer met een hardheid van 200 – 240 HB                                           | > 550 ≤ 660                             | 3.4                | K2                 |
|     |                                | K3.1 Kneedbaar (nodulair/sferoidaal) ijzer, ferritisch met een hardheid van < 180 HB                        | ≤ 560                                   | 3.3                | K3                 |
|     | K4                             | K3.2 Kneedbaar (nodulair/sferoidaal) ijzer, ferritisch of perlitisch met een hardheid van 180 – 220 HB      | > 560 ≤ 680                             | 3.3                | K4                 |
|     |                                | K3.3 Kneedbaar (nodulair/sferoidaal) ijzer, perlitisch met een hardheid van 220 – 260 HB                    | > 680 ≤ 800                             | 3.4                | K4                 |
|     |                                | K4.1 Austenitisch gietijzer met een hardheid van < 180 HB                                                   | ≤ 610                                   |                    |                    |
|     | K5                             | K4.2 Austenitisch gietijzer met een hardheid van 180 – 240 HB                                               | > 610 ≤ 840                             |                    |                    |
|     |                                | K4.3 Austempered nodulair gietijzer met een hardheid van 240 – 280 HB                                       | > 840 ≤ 980                             |                    |                    |
|     |                                | K4.4 Austempered nodulair gietijzer met een hardheid van 280 – 320 HB                                       | > 980 ≤ 1130                            |                    |                    |
|     | K5                             | K4.5 Austempered nodulair gietijzer met een hardheid van 320 – 360 HB                                       | > 1130 ≤ 1280                           |                    |                    |
|     |                                | K5.1 Vermiculair, compact grafietijzer met een hardheid van < 180 HB                                        |                                         |                    |                    |
|     |                                | K5.2 Vermiculair, compact grafietijzer met een hardheid van 180 – 220 HB                                    |                                         |                    |                    |
|     |                                | K5.3 Vermiculair, compact grafietijzer met een hardheid van 220 – 260 HB                                    |                                         |                    |                    |
| N   | N1                             | N1.1 Zuiver aluminium en smeedaluminiumlegeringen met een hardheid van < 60 HB                              | ≤ 240                                   | 7.1                | N1                 |
|     |                                | N1.2 Smeedaluminiumlegeringen met een hardheid van 60 – 100 HB                                              | > 240 ≤ 400                             | 7.1                | N1                 |
|     |                                | N1.3 Smeedaluminiumlegeringen met een hardheid van 100 – 150 HB                                             | > 400 ≤ 590                             | 7.2                | N2                 |
|     | N2                             | N2.1 Gietaluminiumlegeringen met een hardheid van < 75 HB                                                   | ≤ 240                                   | 7.3                | N1                 |
|     |                                | N2.2 Gietaluminiumlegeringen met een hardheid van 75 – 90 HB                                                | > 240 ≤ 270                             | 7.3                | N1                 |
|     |                                | N2.3 Gietaluminiumlegeringen met een hardheid van 90 < 140 HB                                               | > 270 ≤ 440                             | 7.3                | N2                 |
|     | N3                             | N3.1 Automatenmessing met uitstekende bewerkingseigenschappen                                               |                                         | 6.3                | N3                 |
|     |                                | N3.2 Koperlegeringen met korte spanen en goede tot matige bewerkingseigenschappen                           |                                         | 6.2                | N3                 |
|     |                                | N3.3 Elektrolytisch koper en koperlegeringen met lange spanen en matige tot slechte bewerkingseigenschappen |                                         | 6.1                | N4                 |
|     | N4                             | N4.1 Thermoplastische polymeren                                                                             |                                         | 8.1                |                    |
|     |                                | N4.2 Thermohardende polymeren                                                                               |                                         | 8.2                |                    |
|     |                                | N4.3 Versterkte polymeren of composietmaterialen                                                            |                                         | 8.3                |                    |
| S   | S1                             | S1.1 Titanium of titaniumlegeringen met een hardheid van < 200 HB                                           | ≤ 660                                   | 4.1                | S1                 |
|     |                                | S1.2 Titaniumlegeringen met een hardheid van 200 – 280 HB                                                   | > 660 ≤ 950                             | 4.2                | S1                 |
|     |                                | S1.3 Titaniumlegeringen met een hardheid van 280 – 360 HB                                                   | > 950 ≤ 1200                            | 4.3                | S1                 |
|     | S2                             | S2.1 Hoge-temperatuurlegeringen op Fe-basis met een hardheid van < 200 HB                                   | ≤ 690                                   |                    | S2                 |
|     |                                | S2.2 Hoge-temperatuurlegeringen op Fe-basis met een hardheid van 200 – 280 HB                               | > 690 ≤ 970                             |                    | S2                 |
|     | S3                             | S3.1 Hoge-temperatuurlegeringen op Ni-basis met een hardheid < 280 HB                                       | ≤ 940                                   | 5.2                | S3                 |
|     |                                | S3.2 Hoge-temperatuurlegeringen op Ni-basis met een hardheid van 280 – 360 HB                               | > 940 ≤ 1200                            | 5.3                | S3                 |
|     | S4                             | S4.1 Hoge-temperatuurlegeringen op Co-basis met een hardheid van < 240 HB                                   | ≤ 800                                   |                    | S4                 |
|     |                                | S4.2 Hoge-temperatuurlegeringen op Co-basis met een hardheid van 240 – 320 HB                               | > 800 ≤ 1070                            |                    | S4                 |
| H   | H1                             | H1.1 Afgeschrikt gietijzer met een hardheid van < 400 HB                                                    |                                         |                    |                    |
|     | H2                             | H2.1 Gehard gietijzer met een hardheid van < 55 HRC                                                         |                                         |                    | H2                 |
|     |                                | H2.2 Gehard gietijzer met een hardheid van > 55 HRC                                                         |                                         |                    | H2                 |
|     | H3                             | H3.1 Gehard staal met een hardheid van < 51 HRC                                                             |                                         | 1.7                | H3                 |
|     |                                | H3.2 Gehard staal met een hardheid van 51 – 55 HRC                                                          |                                         | 1.7                | H3                 |
|     | H4                             | H4.1 Gehard staal met een hardheid van 55 – 59 HRC                                                          |                                         | 1.8                | H4                 |
|     |                                | H4.2 Gehard staal met een hardheid van > 59 HRC                                                             |                                         | 1.8                | H4                 |

|         |    | FORCE X      | FORCE X      | FORCE X      | FORCE X      | FORCE X      | FORCE M      | FORCE M      | FORCE M      | FORCE N      | FORCE N      |
|---------|----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|         |    | R458         | R457         | R454         | R453         | R459         | R467         | R463         | R469*        | R445*        | R448*        |
|         |    | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 16.00 | 3.00 - 16.00 | 3.00 - 16.00 | 3.00 - 16.00 | 3.00 - 16.00 | 3.00 - 16.00 |
| ISO 513 |    | 13           | 13           | 18           | 18           | 21           | 27           | 30           | 33           | 37           | 40           |
| P       | P1 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
|         | P2 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
|         | P3 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
|         | P4 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
| M       | M1 | ▣            | ▣            | ▣            | ▣            | ▣            | ■            | ■            | ■            |              |              |
|         | M2 | ▣            | ▣            | ▣            | ▣            | ▣            | ■            | ■            | ■            |              |              |
|         | M3 | ▣            | ▣            | ▣            | ▣            | ▣            | ■            | ■            | ■            |              |              |
|         | M4 | ▣            | ▣            | ▣            | ▣            | ▣            | ■            | ■            | ■            |              |              |
| K       | K1 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
|         | K2 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
|         | K3 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
|         | K4 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
|         | K5 | ■            | ■            | ■            | ■            | ■            |              |              |              |              |              |
| N       | N1 | ■            | ■            | ■            | ■            | ■            |              |              |              | ■            | ■            |
|         | N2 | ■            | ■            | ■            | ■            | ■            |              |              |              | ■            | ■            |
|         | N3 | ■            | ■            | ■            | ■            | ▣            |              |              |              |              |              |
|         | N4 |              |              |              |              |              |              |              |              |              |              |
| S       | S1 | ▣            | ■            | ▣            | ■            |              | ■            | ■            | ■            |              |              |
|         | S2 |              |              |              |              |              | ▣            | ▣            | ▣            |              |              |
|         | S3 |              |              |              |              |              | ▣            | ▣            | ▣            |              |              |
|         | S4 |              |              |              |              |              | ▣            | ▣            | ▣            |              |              |
| H       | H1 | ■            | ■            | ■            | ■            |              |              |              |              |              |              |
|         | H2 | ■            | ■            | ■            | ■            |              |              |              |              |              |              |
|         | H3 | ■            | ■            | ■            | ■            |              |              |              |              |              |              |
|         | H4 | ■            | ■            | ■            | ■            |              |              |              |              |              |              |



|               | Ø (D) [mm] |       |        |       |       |       |       |       |       |       |       |       |
|---------------|------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|               | 1          | 2     | 3      | 4     | 5     | 6     | 8     | 10    | 12    | 15    | 16    | 20    |
| D             | 0,016      | 0,038 | 0,053  | 0,060 | 0,068 | 0,078 | 0,098 | 0,119 | 0,130 | 0,149 | 0,155 | 0,188 |
| E             | 0,017      | 0,043 | 0,062  | 0,071 | 0,080 | 0,092 | 0,115 | 0,140 | 0,150 | 0,173 | 0,180 | 0,215 |
| F             | 0,018      | 0,050 | 0,073  | 0,084 | 0,095 | 0,109 | 0,138 | 0,165 | 0,178 | 0,202 | 0,210 | 0,248 |
| G             | 0,019      | 0,056 | 0,084  | 0,096 | 0,109 | 0,126 | 0,160 | 0,190 | 0,205 | 0,231 | 0,240 | 0,280 |
| T             | 0,015      | 0,028 | 0,040  | 0,050 | 0,060 | 0,070 | 0,090 | 0,110 | 0,130 | 0,160 | 0,170 | 0,190 |
| U             | 0,026      | 0,048 | 0,070  | 0,080 | 0,090 | 0,107 | 0,140 | 0,170 | 0,200 | 0,223 | 0,230 | 0,240 |
| V             | 0,038      | 0,069 | 0,100  | 0,115 | 0,130 | 0,153 | 0,200 | 0,250 | 0,280 | 0,310 | 0,320 | 0,340 |
| W             | 0,049      | 0,089 | 0,130  | 0,150 | 0,170 | 0,200 | 0,260 | 0,330 | 0,380 | 0,418 | 0,430 | 0,450 |
| X             | 0,056      | 0,103 | 0,150  | 1,180 | 0,210 | 0,250 | 0,330 | 0,420 | 0,480 | 0,533 | 0,550 | 0,580 |
| Y             | 0,068      | 0,124 | 0,1080 | 0,220 | 0,260 | 0,317 | 0,430 | 0,550 | 0,700 | 0,700 | 0,700 | 0,740 |
| Z             | 0,094      | 0,172 | 0,250  | 0,325 | 0,400 | 0,533 | 0,800 | 1,000 | 1,100 | 1,175 | 1,200 | 1,200 |
| mm/rev. ± 25% |            |       |        |       |       |       |       |       |       |       |       |       |

$$n = \frac{V_c \times 1000}{\pi \times D}$$

$$Vf = n \times fn$$

- \* Leverbaar op aanvraag
- Uitstekend voor de toepassing
- ☑ Beperkt toepasbaar

**FORCE X**





**R458** • Force X Spiraalboor 3×D, voor gebruik in een breed scala aan materialen.

**R457** • Force X Spiraalboor met koelkanalen 3×D, voor gebruik in een breed scala aan materialen.

| R458 | P1.1   | P1.2   | P1.3   | P2.1   | P2.2   | P2.3   | P3.1   | P3.2   | P3.3   | P4.1  | P4.2  | P4.3  | M1.1  | M1.2  | M2.1  | M2.2  | M2.3  | M3.1  | M3.2  |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      | ■ 143W | ■ 160W | ■ 166W | ■ 122W | ■ 108W | ■ 95V  | ■ 106V | ■ 86V  | ■ 72V  | ■ 63V | ■ 54V | ■ 44U | ■ 60U | ■ 51U | ■ 54U | ■ 44U | ■ 37T | ■ 33T | ■ 28T |
|      | M3.3   | M4.1   | M4.2   | K1.1   | K1.2   | K1.3   | K2.1   | K2.2   | K2.3   | K3.1  | K3.2  | K3.3  | K4.1  | K4.2  | K4.3  | K4.4  | K4.5  | K5.1  | K5.2  |
|      | ■ 26T  | ■ 24T  | ■ 21T  | ■ 88W  | ■ 65W  | ■ 49W  | ■ 78V  | ■ 64V  | ■ 51V  | ■ 70V | ■ 54V | ■ 43V | ■ 65V | ■ 49V | ■ 36V | ■ 30V | ■ 26V | ■ 73V | ■ 55V |
|      | K5.3   | N1.1   | N1.2   | N1.3   | N2.1   | N2.2   | N2.3   | N3.1   | N3.2   | N3.3  | S1.1  | S1.2  | S1.3  | H1.1  | H2.1  | H2.2  | H3.1  | H3.2  | H4.1  |
|      | ■ 42V  | ■ 200W | ■ 150W | ■ 100W | ■ 246V | ■ 222V | ■ 160V | ■ 298V | ■ 176V | ■ 88V | ■ 44U | ■ 36U | ■ 32T | ■ 45U | ■ 26U | ■ 24U | ■ 30U | ■ 24U | ■ 20U |
|      | H4.2   |        |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       |       |       |

| R457 | P1.1   | P1.2   | P1.3   | P2.1   | P2.2   | P2.3   | P3.1   | P3.2   | P3.3   | P4.1   | P4.2  | P4.3  | M1.1  | M1.2  | M2.1  | M2.2  | M2.3  | M3.1  | M3.2  |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      | ■ 179W | ■ 200W | ■ 207W | ■ 153W | ■ 135W | ■ 119V | ■ 133V | ■ 107V | ■ 90V  | ■ 79V  | ■ 67V | ■ 55U | ■ 75V | ■ 64V | ■ 67V | ■ 55V | ■ 46U | ■ 41V | ■ 35V |
|      | M3.3   | M4.1   | M4.2   | K1.1   | K1.2   | K1.3   | K2.1   | K2.2   | K2.3   | K3.1   | K3.2  | K3.3  | K4.1  | K4.2  | K4.3  | K4.4  | K4.5  | K5.1  | K5.2  |
|      | ■ 32V  | ■ 30U  | ■ 26U  | ■ 110W | ■ 81W  | ■ 61W  | ■ 98V  | ■ 80V  | ■ 64V  | ■ 87V  | ■ 67V | ■ 54V | ■ 81V | ■ 61V | ■ 45V | ■ 38V | ■ 32V | ■ 91V | ■ 69V |
|      | K5.3   | N1.1   | N1.2   | N1.3   | N2.1   | N2.2   | N2.3   | N3.1   | N3.2   | N3.3   | S1.1  | S1.2  | S1.3  | H1.1  | H2.1  | H2.2  | H3.1  | H3.2  | H4.1  |
|      | ■ 53V  | ■ 250W | ■ 188W | ■ 125W | ■ 308V | ■ 277V | ■ 200V | ■ 373W | ■ 220W | ■ 110W | ■ 55V | ■ 45V | ■ 40U | ■ 56U | ■ 33U | ■ 30U | ■ 37U | ■ 30U | ■ 25U |
|      | H4.2   |        |        |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       |       |

| R458 | HM | DIN 6537 K | 3XD | 140° | TiAIN | DIN 6535HA | CTW |  |  |  |  |
|------|----|------------|-----|------|-------|------------|-----|--|--|--|--|
| R457 | HM | DIN 6537 K | 3XD | 140° | TiAIN | DIN 6535HA | CTW |  |  |  |  |

**DORMER**



| R458                                                                                  | R457                                                                                  |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |
| <b>FORCE X</b>                                                                        | <b>FORCE X</b>                                                                        |
| 3.00 - 20.00                                                                          | 3.00 - 20.00                                                                          |

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R458     | R457     |
|--------|------|----------------|------|------|------|------|----------|----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |          |          |
|        | 3.00 | 0.1181         | 20   | 62   | 36   | 6    | R4583.0  | R4573.0  |
|        | 3.10 | 0.1220         | 20   | 62   | 36   | 6    | R4583.1  | R4573.1  |
| 1/8    | 3.18 | 0.1250         | 20   | 62   | 36   | 6    | R4581/8  | R4571/8  |
|        | 3.20 | 0.1260         | 20   | 62   | 36   | 6    | R4583.2  | R4573.2  |
| 30     | 3.26 | 0.1283         | 20   | 62   | 36   | 6    | R458N30  |          |
|        | 3.30 | 0.1299         | 20   | 62   | 36   | 6    | R4583.3  | R4573.3  |
|        | 3.40 | 0.1339         | 20   | 62   | 36   | 6    | R4583.4  | R4573.4  |
| 29     | 3.45 | 0.1360         | 20   | 62   | 36   | 6    | R458N29  |          |
|        | 3.50 | 0.1378         | 20   | 62   | 36   | 6    | R4583.5  | R4573.5  |
|        | 3.57 | 0.1406         | 20   | 62   | 36   | 6    | R458N28  |          |
| 9/64   | 3.57 | 0.1406         | 20   | 62   | 36   | 6    | R4589/64 | R4579/64 |
|        | 3.60 | 0.1417         | 20   | 62   | 36   | 6    | R4583.6  | R4573.6  |

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R458      | R457      |
|--------|------|----------------|------|------|------|------|-----------|-----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |           |
| 27     | 3.66 | 0.1441         | 20   | 62   | 36   | 6    | R458N27   |           |
|        | 3.70 | 0.1457         | 20   | 62   | 36   | 6    | R4583.7   | R4573.7   |
| 26     | 3.73 | 0.1469         | 24   | 66   | 36   | 6    | R458N26   | R457N26   |
| 25     | 3.80 | 0.1496         | 24   | 66   | 36   | 6    | R4583.8   | R4573.8   |
| 24     | 3.86 | 0.1520         | 24   | 66   | 36   | 6    | R458N24   | R457N24   |
|        | 3.90 | 0.1535         | 24   | 66   | 36   | 6    | R4583.9   | R4573.9   |
| 23     | 3.91 | 0.1539         | 24   | 66   | 36   | 6    | R458N23   |           |
| 5/32   | 3.97 | 0.1563         | 24   | 66   | 36   | 6    | R4585/32  | R4575/32  |
| 22     | 3.99 | 0.1571         | 24   | 66   | 36   | 6    | R458N22   |           |
|        | 4.00 | 0.1575         | 24   | 66   | 36   | 6    | R4584.0   | R4574.0   |
| 21     | 4.04 | 0.1591         | 24   | 66   | 36   | 6    | R458N21   |           |
|        | 4.05 | 0.1594         | 24   | 66   | 36   | 6    |           | R4574.05  |
| 20     | 4.09 | 0.1610         | 24   | 66   | 36   | 6    | R458N20   |           |
|        | 4.10 | 0.1614         | 24   | 66   | 36   | 6    | R4584.1   | R4574.1   |
|        | 4.20 | 0.1654         | 24   | 66   | 36   | 6    | R4584.2   | R4574.2   |
| 19     | 4.22 | 0.1661         | 24   | 66   | 36   | 6    | R458N19   | R457N19   |
|        | 4.30 | 0.1693         | 24   | 66   | 36   | 6    | R4584.3   | R4574.3   |
| 18     | 4.31 | 0.1697         | 24   | 66   | 36   | 6    | R458N18   |           |
| 11/64  | 4.37 | 0.1719         | 24   | 66   | 36   | 6    | R45811/64 | R45711/64 |
| 17     | 4.39 | 0.1728         | 24   | 66   | 36   | 6    | R458N17   | R457N17   |
|        | 4.40 | 0.1732         | 24   | 66   | 36   | 6    | R4584.4   | R4574.4   |
|        | 4.50 | 0.1772         | 24   | 66   | 36   | 6    | R4584.5   | R4574.5   |
| 16     | 4.50 | 0.1772         | 24   | 66   | 36   | 6    | R458N16   |           |
| 15     | 4.57 | 0.1799         | 24   | 66   | 36   | 6    | R458N15   | R457N15   |
|        | 4.60 | 0.1811         | 24   | 66   | 36   | 6    | R4584.6   | R4574.6   |
| 14     | 4.62 | 0.1819         | 24   | 66   | 36   | 6    | R458N14   | R457N14   |
| 13     | 4.70 | 0.1850         | 24   | 66   | 36   | 6    | R4584.7   | R4574.7   |
| 3/16   | 4.76 | 0.1875         | 28   | 66   | 36   | 6    | R4583/16  | R4573/16  |
|        | 4.80 | 0.1890         | 28   | 66   | 36   | 6    | R4584.8   | R4574.8   |
| 12     | 4.80 | 0.1890         | 28   | 66   | 36   | 6    | R458N12   |           |
| 11     | 4.85 | 0.1909         | 28   | 66   | 36   | 6    | R458N11   |           |
|        | 4.90 | 0.1929         | 28   | 66   | 36   | 6    | R4584.9   | R4574.9   |
| 10     | 4.92 | 0.1937         | 28   | 66   | 36   | 6    | R458N10   |           |
| 9      | 4.98 | 0.1961         | 28   | 66   | 36   | 6    | R458N9    | R457N9    |
|        | 5.00 | 0.1969         | 28   | 66   | 36   | 6    | R4585.0   | R4575.0   |
|        | 5.05 | 0.1988         | 28   | 66   | 36   | 6    |           | R4575.05  |
| 8      | 5.06 | 0.1992         | 28   | 66   | 36   | 6    | R458N8    |           |
|        | 5.10 | 0.2008         | 28   | 66   | 36   | 6    | R4585.1   | R4575.1   |
| 7      | 5.11 | 0.2010         | 28   | 66   | 36   | 6    | R458N7    |           |
| 13/64  | 5.16 | 0.2031         | 28   | 66   | 36   | 6    | R45813/64 | R45713/64 |
| 6      | 5.18 | 0.2039         | 28   | 66   | 36   | 6    | R458N6    |           |
|        | 5.20 | 0.2047         | 28   | 66   | 36   | 6    | R4585.2   | R4575.2   |
| 5      | 5.22 | 0.2055         | 28   | 66   | 36   | 6    | R458N5    |           |
|        | 5.30 | 0.2087         | 28   | 66   | 36   | 6    | R4585.3   | R4575.3   |
| 4      | 5.31 | 0.2091         | 28   | 66   | 36   | 6    | R458N4    | R457N4    |
|        | 5.40 | 0.2126         | 28   | 66   | 36   | 6    | R4585.4   | R4575.4   |
| 3      | 5.41 | 0.2130         | 28   | 66   | 36   | 6    | R458N3    |           |
|        | 5.50 | 0.2165         | 28   | 66   | 36   | 6    | R4585.5   | R4575.5   |
| 7/32   | 5.56 | 0.2188         | 28   | 66   | 36   | 6    | R4587/32  | R4577/32  |
|        | 5.60 | 0.2205         | 28   | 66   | 36   | 6    | R4585.6   | R4575.6   |
| 2      | 5.61 | 0.2209         | 28   | 66   | 36   | 6    | R458N2    | R457N2    |
|        | 5.70 | 0.2244         | 28   | 66   | 36   | 6    | R4585.7   | R4575.7   |
| 1      | 5.79 | 0.2280         | 28   | 66   | 36   | 6    | R458N1    |           |
|        | 5.80 | 0.2283         | 28   | 66   | 36   | 6    | R4585.8   | R4575.8   |
|        | 5.90 | 0.2323         | 28   | 66   | 36   | 6    | R4585.9   | R4575.9   |
| A      | 5.94 | 0.2339         | 28   | 66   | 36   | 6    | R458A     | R457A     |
| 15/64  | 5.95 | 0.2344         | 28   | 66   | 36   | 6    | R45815/64 | R45715/64 |
|        | 6.00 | 0.2362         | 28   | 66   | 36   | 6    | R4586.0   | R4576.0   |
| B      | 6.05 | 0.2380         | 34   | 79   | 36   | 8    | R458B     | R457B     |
|        | 6.05 | 0.2382         | 34   | 79   | 36   | 8    |           | R4576.05  |
|        | 6.10 | 0.2402         | 34   | 79   | 36   | 8    | R4586.1   | R4576.1   |
| C      | 6.15 | 0.2421         | 34   | 79   | 36   | 8    | R458C     | R457C     |
|        | 6.20 | 0.2441         | 34   | 79   | 36   | 8    | R4586.2   | R4576.2   |
| D      | 6.25 | 0.2461         | 34   | 79   | 36   | 8    | R458D     | R457D     |

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R458      | R457      |
|--------|------|----------------|------|------|------|------|-----------|-----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |           |
|        | 6.30 | 0.2480         | 34   | 79   | 36   | 8    | R4586.3   | R4576.3   |
| 1/4    | 6.35 | 0.2500         | 34   | 79   | 36   | 8    | R4581/4   | R4571/4   |
| E      | 6.35 | 0.2500         | 34   | 79   | 36   | 8    | R458E     | R457E     |
|        | 6.40 | 0.2520         | 34   | 79   | 36   | 8    | R4586.4   | R4576.4   |
|        | 6.50 | 0.2559         | 34   | 79   | 36   | 8    | R4586.5   | R4576.5   |
| F      | 6.53 | 0.2571         | 34   | 79   | 36   | 8    | R458F     | R457F     |
|        | 6.60 | 0.2598         | 34   | 79   | 36   | 8    | R4586.6   | R4576.6   |
| G      | 6.63 | 0.2610         | 34   | 79   | 36   | 8    | R458G     | R457G     |
|        | 6.70 | 0.2638         | 34   | 79   | 36   | 8    | R4586.7   | R4576.7   |
| 17/64  | 6.75 | 0.2656         | 34   | 79   | 36   | 8    | R45817/64 | R45717/64 |
| H      | 6.76 | 0.2661         | 34   | 79   | 36   | 8    | R458H     | R457H     |
|        | 6.80 | 0.2677         | 34   | 79   | 36   | 8    | R4586.8   | R4576.8   |
|        | 6.90 | 0.2717         | 34   | 79   | 36   | 8    | R4586.9   | R4576.9   |
| I      | 6.91 | 0.2720         | 34   | 79   | 36   | 8    | R458I     | R457I     |
|        | 7.00 | 0.2756         | 34   | 79   | 36   | 8    | R4587.0   | R4577.0   |
| J      | 7.04 | 0.2772         | 34   | 79   | 36   | 8    | R458J     |           |
| J      | 7.04 | 0.2772         | 41   | 79   | 36   | 8    |           | R457J     |
|        | 7.10 | 0.2795         | 41   | 79   | 36   | 8    | R4587.1   | R4577.1   |
| K      | 7.14 | 0.2811         | 41   | 79   | 36   | 8    | R458K     | R457K     |
| 9/32   | 7.14 | 0.2813         | 41   | 79   | 36   | 8    | R4589/32  | R4579/32  |
|        | 7.20 | 0.2835         | 41   | 79   | 36   | 8    | R4587.2   | R4577.2   |
|        | 7.30 | 0.2874         | 41   | 79   | 36   | 8    | R4587.3   | R4577.3   |
| L      | 7.37 | 0.2902         | 41   | 79   | 36   | 8    | R458L     | R457L     |
|        | 7.40 | 0.2913         | 41   | 79   | 36   | 8    | R4587.4   | R4577.4   |
| M      | 7.49 | 0.2949         | 41   | 79   | 36   | 8    | R458M     | R457M     |
|        | 7.50 | 0.2953         | 41   | 79   | 36   | 8    | R4587.5   | R4577.5   |
| 19/64  | 7.54 | 0.2969         | 41   | 79   | 36   | 8    | R45819/64 | R45719/64 |
|        | 7.60 | 0.2992         | 41   | 79   | 36   | 8    | R4587.6   | R4577.6   |
| N      | 7.67 | 0.3020         | 41   | 79   | 36   | 8    | R458N     | R457N     |
|        | 7.70 | 0.3031         | 41   | 79   | 36   | 8    | R4587.7   | R4577.7   |
|        | 7.80 | 0.3071         | 41   | 79   | 36   | 8    | R4587.8   | R4577.8   |
|        | 7.90 | 0.3110         | 41   | 79   | 36   | 8    | R4587.9   | R4577.9   |
| 5/16   | 7.94 | 0.3125         | 41   | 79   | 36   | 8    | R4585/16  | R4575/16  |
|        | 8.00 | 0.3150         | 41   | 79   | 36   | 8    | R4588.0   | R4578.0   |
| O      | 8.03 | 0.3161         | 47   | 89   | 40   | 10   | R4580     | R4570     |
|        | 8.05 | 0.3169         | 47   | 89   | 40   | 10   |           | R4578.05  |
|        | 8.10 | 0.3189         | 47   | 89   | 40   | 10   | R4588.1   | R4578.1   |
|        | 8.20 | 0.3228         | 47   | 89   | 40   | 10   | R4588.2   | R4578.2   |
| P      | 8.20 | 0.3228         | 47   | 89   | 40   | 10   | R458P     | R457P     |
|        | 8.30 | 0.3268         | 47   | 89   | 40   | 10   | R4588.3   | R4578.3   |
| 21/64  | 8.33 | 0.3281         | 47   | 89   | 40   | 10   | R45821/64 | R45721/64 |
|        | 8.40 | 0.3307         | 47   | 89   | 40   | 10   | R4588.4   | R4578.4   |
| Q      | 8.43 | 0.3319         | 47   | 89   | 40   | 10   |           | R457Q     |
|        | 8.50 | 0.3346         | 47   | 89   | 40   | 10   | R4588.5   | R4578.5   |
|        | 8.60 | 0.3386         | 47   | 89   | 40   | 10   | R4588.6   | R4578.6   |
| R      | 8.61 | 0.3390         | 47   | 89   | 40   | 10   | R458R     | R457R     |
|        | 8.70 | 0.3425         | 47   | 89   | 40   | 10   | R4588.7   | R4578.7   |
| 11/32  | 8.73 | 0.3438         | 47   | 89   | 40   | 10   | R45811/32 | R45711/32 |
|        | 8.80 | 0.3465         | 47   | 89   | 40   | 10   | R4588.8   | R4578.8   |
| S      | 8.84 | 0.3480         | 47   | 89   | 40   | 10   | R458S     | R457S     |
|        | 8.90 | 0.3504         | 47   | 89   | 40   | 10   | R4588.9   | R4578.9   |
|        | 9.00 | 0.3543         | 47   | 89   | 40   | 10   | R4589.0   | R4579.0   |
| T      | 9.09 | 0.3579         | 47   | 89   | 40   | 10   | R458T     | R457T     |
|        | 9.10 | 0.3583         | 47   | 89   | 40   | 10   | R4589.1   | R4579.1   |
| 23/64  | 9.13 | 0.3594         | 47   | 89   | 40   | 10   | R45823/64 | R45723/64 |
|        | 9.20 | 0.3622         | 47   | 89   | 40   | 10   | R4589.2   | R4579.2   |
|        | 9.30 | 0.3661         | 47   | 89   | 40   | 10   | R4589.3   | R4579.3   |
| U      | 9.35 | 0.3681         | 47   | 89   | 40   | 10   | R458U     |           |
|        | 9.40 | 0.3701         | 47   | 89   | 40   | 10   | R4589.4   | R4579.4   |
|        | 9.50 | 0.3740         | 47   | 89   | 40   | 10   | R4589.5   | R4579.5   |
| 3/8    | 9.53 | 0.3750         | 47   | 89   | 40   | 10   | R4583/8   | R4573/8   |
| V      | 9.58 | 0.3772         | 47   | 89   | 40   | 10   | R458V     | R457V     |
|        | 9.60 | 0.3780         | 47   | 89   | 40   | 10   | R4589.6   | R4579.6   |
|        | 9.70 | 0.3819         | 47   | 89   | 40   | 10   | R4589.7   | R4579.7   |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R458      | R457      |
|--------|-------|----------------|------|------|------|------|-----------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |           |
|        | 9.80  | 0.3858         | 47   | 89   | 40   | 10   | R4589.8   | R4579.8   |
| W      | 9.80  | 0.3858         | 47   | 89   | 40   | 10   | R458W     | R457W     |
|        | 9.90  | 0.3898         | 47   | 89   | 40   | 10   | R4589.9   | R4579.9   |
| 25/64  | 9.92  | 0.3906         | 47   | 89   | 40   | 10   | R45825/64 | R45725/64 |
|        | 10.00 | 0.3937         | 47   | 89   | 40   | 10   | R45810.0  | R45710.0  |
|        | 10.05 | 0.3957         | 55   | 102  | 45   | 12   |           | R45710.05 |
| X      | 10.08 | 0.3969         | 55   | 102  | 45   | 12   | R458X     | R457X     |
|        | 10.10 | 0.3976         | 55   | 102  | 45   | 12   | R45810.1  | R45710.1  |
|        | 10.20 | 0.4016         | 55   | 102  | 45   | 12   | R45810.2  | R45710.2  |
| Y      | 10.26 | 0.4039         | 55   | 102  | 45   | 12   | R458Y     | R457Y     |
|        | 10.30 | 0.4055         | 55   | 102  | 45   | 12   | R45810.3  | R45710.3  |
| 13/32  | 10.32 | 0.4063         | 55   | 102  | 45   | 12   | R45813/32 | R45713/32 |
|        | 10.40 | 0.4094         | 55   | 102  | 45   | 12   | R45810.4  | R45710.4  |
| Z      | 10.49 | 0.4130         | 55   | 102  | 45   | 12   | R458Z     | R457Z     |
|        | 10.50 | 0.4134         | 55   | 102  | 45   | 12   | R45810.5  | R45710.5  |
|        | 10.60 | 0.4173         | 55   | 102  | 45   | 12   | R45810.6  | R45710.6  |
|        | 10.70 | 0.4213         | 55   | 102  | 45   | 12   | R45810.7  |           |
| 27/64  | 10.72 | 0.4219         | 55   | 102  | 45   | 12   | R45827/64 | R45727/64 |
|        | 10.80 | 0.4252         | 55   | 102  | 45   | 12   | R45810.8  | R45710.8  |
|        | 10.90 | 0.4291         | 55   | 102  | 45   | 12   | R45810.9  |           |
|        | 11.00 | 0.4331         | 55   | 102  | 45   | 12   | R45811.0  | R45711.0  |
|        | 11.10 | 0.4370         | 55   | 102  | 45   | 12   | R45811.1  |           |
| 7/16   | 11.11 | 0.4375         | 55   | 102  | 45   | 12   | R4587/16  | R4577/16  |
|        | 11.20 | 0.4409         | 55   | 102  | 45   | 12   | R45811.2  | R45711.2  |
|        | 11.30 | 0.4449         | 55   | 102  | 45   | 12   | R45811.3  | R45711.3  |
|        | 11.40 | 0.4488         | 55   | 102  | 45   | 12   | R45811.4  | R45711.4  |
|        | 11.50 | 0.4528         | 55   | 102  | 45   | 12   | R45811.5  | R45711.5  |
| 29/64  | 11.51 | 0.4531         | 55   | 102  | 45   | 12   | R45829/64 | R45729/64 |
|        | 11.60 | 0.4567         | 55   | 102  | 45   | 12   | R45811.6  | R45711.6  |
|        | 11.70 | 0.4606         | 55   | 102  | 45   | 12   | R45811.7  |           |
|        | 11.80 | 0.4646         | 55   | 102  | 45   | 12   | R45811.8  | R45711.8  |
|        | 11.90 | 0.4685         | 55   | 102  | 45   | 12   | R45811.9  |           |
| 15/32  | 11.91 | 0.4688         | 55   | 102  | 45   | 12   | R45815/32 | R45715/32 |
|        | 12.00 | 0.4724         | 55   | 102  | 45   | 12   | R45812.0  | R45712.0  |
|        | 12.05 | 0.4744         | 60   | 107  | 45   | 14   |           | R45712.05 |
|        | 12.10 | 0.4764         | 60   | 107  | 45   | 14   | R45812.1  | R45712.1  |
|        | 12.20 | 0.4803         | 60   | 107  | 45   | 14   | R45812.2  | R45712.2  |
| 31/64  | 12.30 | 0.4844         | 60   | 107  | 45   | 14   | R45831/64 | R45731/64 |
|        | 12.50 | 0.4921         | 60   | 107  | 45   | 14   | R45812.5  | R45712.5  |
|        | 12.70 | 0.5000         | 60   | 107  | 45   | 14   | R45812.7  | R45712.7  |
| 1/2    | 12.70 | 0.5000         | 60   | 107  | 45   | 14   | R4581/2   | R4571/2   |
|        | 12.80 | 0.5039         | 60   | 107  | 45   | 14   | R45812.8  | R45712.8  |
|        | 13.00 | 0.5118         | 60   | 107  | 45   | 14   | R45813.0  | R45713.0  |
| 33/64  | 13.10 | 0.5156         | 60   | 107  | 45   | 14   | R45833/64 | R45733/64 |
|        | 13.30 | 0.5236         | 60   | 107  | 45   | 14   | R45813.3  | R45713.3  |
| 17/32  | 13.49 | 0.5313         | 60   | 107  | 45   | 14   | R45817/32 | R45717/32 |
|        | 13.50 | 0.5315         | 60   | 107  | 45   | 14   | R45813.5  | R45713.5  |
|        | 13.80 | 0.5433         | 60   | 107  | 45   | 14   | R45813.8  | R45713.8  |
| 35/64  | 13.89 | 0.5469         | 60   | 107  | 45   | 14   | R45835/64 | R45735/64 |
|        | 14.00 | 0.5512         | 60   | 107  | 45   | 14   | R45814.0  | R45714.0  |
|        | 14.25 | 0.5610         | 65   | 115  | 48   | 16   | R45814.25 | R45714.25 |
| 9/16   | 14.29 | 0.5625         | 65   | 115  | 48   | 16   | R4589/16  | R4579/16  |
|        | 14.50 | 0.5709         | 65   | 115  | 48   | 16   | R45814.5  | R45714.5  |
| 37/64  | 14.68 | 0.5781         | 65   | 115  | 48   | 16   | R45837/64 | R45737/64 |
|        | 14.80 | 0.5827         | 65   | 115  | 48   | 16   | R45814.8  | R45714.8  |
|        | 15.00 | 0.5906         | 65   | 115  | 48   | 16   | R45815.0  | R45715.0  |
| 19/32  | 15.08 | 0.5938         | 65   | 115  | 48   | 16   | R45819/32 | R45719/32 |
|        | 15.10 | 0.5945         | 65   | 115  | 48   | 16   | R45815.1  | R45715.1  |
|        | 15.30 | 0.6024         | 65   | 115  | 48   | 16   | R45815.3  | R45715.3  |
| 39/64  | 15.48 | 0.6094         | 65   | 115  | 48   | 16   | R45839/64 | R45739/64 |
|        | 15.50 | 0.6102         | 65   | 115  | 48   | 16   | R45815.5  | R45715.5  |
|        | 15.80 | 0.6220         | 65   | 115  | 48   | 16   | R45815.8  | R45715.8  |
| 5/8    | 15.88 | 0.6250         | 65   | 115  | 48   | 16   | R4585/8   | R4575/8   |
|        | 16.00 | 0.6299         | 65   | 115  | 48   | 16   | R45816.0  | R45716.0  |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R458      | R457      |
|--------|-------|----------------|------|------|------|------|-----------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |           |
| 41/64  | 16.27 | 0.6406         | 73   | 123  | 48   | 18   | R45841/64 | R45741/64 |
|        | 16.50 | 0.6496         | 73   | 123  | 48   | 18   | R45816.5  | R45716.5  |
| 21/32  | 16.67 | 0.6563         | 73   | 123  | 48   | 18   | R45821/32 | R45721/32 |
|        | 17.00 | 0.6693         | 73   | 123  | 48   | 18   | R45817.0  | R45717.0  |
| 43/64  | 17.07 | 0.6720         | 73   | 123  | 48   | 18   | R45843/64 | R45743/64 |
| 11/16  | 17.46 | 0.6874         | 73   | 123  | 48   | 18   | R45811/16 | R45711/16 |
|        | 17.50 | 0.6890         | 73   | 123  | 48   | 18   | R45817.5  | R45717.5  |
|        | 17.80 | 0.7008         | 73   | 123  | 48   | 18   | R45817.8  |           |
| 45/64  | 17.86 | 0.7031         | 73   | 123  | 48   | 18   | R45845/64 | R45745/64 |
|        | 18.00 | 0.7087         | 73   | 123  | 48   | 18   | R45818.0  | R45718.0  |
| 23/32  | 18.26 | 0.7189         | 79   | 131  | 50   | 20   | R45823/32 | R45723/32 |
|        | 18.50 | 0.7283         | 79   | 131  | 50   | 20   | R45818.5  | R45718.5  |
| 47/64  | 18.65 | 0.7343         | 79   | 131  | 50   | 20   | R45847/64 | R45747/64 |
|        | 18.80 | 0.7402         | 79   | 131  | 50   | 20   |           | R45718.8  |
|        | 19.00 | 0.7480         | 79   | 131  | 50   | 20   | R45819.0  | R45719.0  |
|        | 19.05 | 0.7500         | 79   | 131  | 50   | 20   | R4583/4   |           |
| 3/4    | 19.05 | 0.7500         | 79   | 131  | 50   | 20   |           | R4573/4   |
|        | 19.50 | 0.7677         | 79   | 131  | 50   | 20   | R45819.5  | R45719.5  |
|        | 19.80 | 0.7795         | 79   | 131  | 50   | 20   | R45819.8  | R45719.8  |
|        | 20.00 | 0.7874         | 79   | 131  | 50   | 20   | R45820.0  | R45720.0  |

# R454

- Force X Spiraalboor 5×D, voor gebruik in een breed scala aan materialen.

# R453

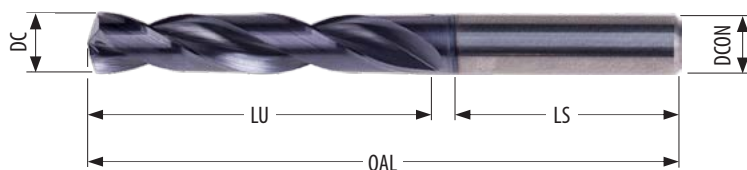
- Force X Spiraalboor met koelkanalen 5×D, voor gebruik in een breed scala aan materialen.

|      |        |        |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       |       |       |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| R454 | P1.1   | P1.2   | P1.3   | P2.1   | P2.2   | P2.3   | P3.1   | P3.2   | P3.3   | P4.1  | P4.2  | P4.3  | M1.1  | M1.2  | M2.1  | M2.2  | M2.3  | M3.1  | M3.2  |
|      | ■ 134V | ■ 150V | ■ 155V | ■ 115V | ■ 101V | ■ 89V  | ■ 100V | ■ 80V  | ■ 68V  | ■ 59V | ■ 50V | ■ 41U | ▣ 56U | ▣ 48U | ▣ 50U | ▣ 41U | ▣ 35T | ▣ 31T | ▣ 26T |
|      | M3.3   | M4.1   | M4.2   | K1.1   | K1.2   | K1.3   | K2.1   | K2.2   | K2.3   | K3.1  | K3.2  | K3.3  | K4.1  | K4.2  | K4.3  | K4.4  | K4.5  | K5.1  | K5.2  |
|      | ▣ 24T  | ▣ 23T  | ▣ 20T  | ■ 83W  | ■ 61W  | ■ 46W  | ■ 74V  | ■ 60V  | ■ 48V  | ■ 65V | ■ 50V | ■ 41V | ■ 61V | ■ 46V | ■ 34V | ■ 29V | ■ 24V | ■ 68V | ■ 52V |
|      | K5.3   | N1.1   | N1.2   | N1.3   | N2.1   | N2.2   | N2.3   | N3.1   | N3.2   | N3.3  | S1.1  | S1.2  | S1.3  | H1.1  | H2.1  | H2.2  | H3.1  | H3.2  | H4.1  |
|      | ■ 40V  | ■ 188W | ■ 141W | ■ 94W  | ■ 231V | ■ 208V | ■ 150V | ■ 280V | ■ 165V | ■ 83V | ▣ 41U | ▣ 34U | ▣ 30T | ■ 42U | ■ 25U | ■ 23U | ■ 28U | ■ 23U | ■ 19U |
|      | H4.2   |        |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       |       |       |
|      | ■ 16U  |        |        |        |        |        |        |        |        |       |       |       |       |       |       |       |       |       |       |

|      |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|
| R453 | P1.1  | P1.2  | P1.3  | P2.1  | P2.2  | P2.3  | P3.1  | P3.2  | P3.3  | P4.1  | P4.2 | P4.3 | M1.1 | M1.2 | M2.1 | M2.2 | M2.3 | M3.1 | M3.2 |
|      | ■170V | ■190V | ■197V | ■145V | ■128V | ■113V | ■126V | ■102V | ■86V  | ■75V  | ■64V | ■52U | ▣71V | ▣61V | ▣64V | ▣52V | ▣44U | ▣39V | ▣33V |
|      | M3.3  | M4.1  | M4.2  | K1.1  | K1.2  | K1.3  | K2.1  | K2.2  | K2.3  | K3.1  | K3.2 | K3.3 | K4.1 | K4.2 | K4.3 | K4.4 | K4.5 | K5.1 | K5.2 |
|      | ▣30V  | ▣29U  | ▣25U  | ■105W | ■77W  | ■58W  | ■93V  | ■76V  | ■61V  | ■83V  | ■64V | ■51V | ■77V | ■58V | ■43V | ■36V | ■30V | ■86V | ■66V |
|      | K5.3  | N1.1  | N1.2  | N1.3  | N2.1  | N2.2  | N2.3  | N3.1  | N3.2  | N3.3  | S1.1 | S1.2 | S1.3 | H1.1 | H2.1 | H2.2 | H3.1 | H3.2 | H4.1 |
|      | ■50V  | ■238W | ■179W | ■119W | ■293V | ■263V | ■190V | ■354W | ■209W | ■105W | ■52V | ■43V | ■38U | ■53U | ■31U | ■29U | ■35U | ■29U | ■24U |
|      | H4.2  |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |
|      | ■20U  |       |       |       |       |       |       |       |       |       |      |      |      |      |      |      |      |      |      |

|      |    |            |     |      |       |            |     |  |  |  |  |
|------|----|------------|-----|------|-------|------------|-----|--|--|--|--|
| R454 | HM | DIN 6537 L | 5XD | 140° | TiAIN | DIN 6535HA | CTW |  |  |  |  |
| R453 | HM | DIN 6537 L | 5XD | 140° | TiAIN | DIN 6535HA | CTW |  |  |  |  |

**DORMER**



| R454                                                                                  | R453                                                                                  |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |
| FORCE X                                                                               | FORCE X                                                                               |
| 3.00 - 20.00                                                                          | 3.00 - 20.00                                                                          |

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R454     | R453     |
|--------|------|----------------|------|------|------|------|----------|----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |          |          |
|        | 3.00 | 0.1181         | 28   | 66   | 36   | 6    | R4543.0  | R4533.0  |
|        | 3.10 | 0.1220         | 28   | 66   | 36   | 6    | R4543.1  | R4533.1  |
| 1/8    | 3.18 | 0.1250         | 28   | 66   | 36   | 6    | R4541/8  | R4531/8  |
|        | 3.20 | 0.1260         | 28   | 66   | 36   | 6    | R4543.2  | R4533.2  |
| 30     | 3.26 | 0.1283         | 28   | 66   | 36   | 6    |          | R453N30  |
|        | 3.30 | 0.1299         | 28   | 66   | 36   | 6    | R4543.3  | R4533.3  |
|        | 3.40 | 0.1339         | 28   | 66   | 36   | 6    | R4543.4  | R4533.4  |
| 29     | 3.45 | 0.1360         | 28   | 66   | 36   | 6    | R454N29  | R453N29  |
|        | 3.50 | 0.1378         | 28   | 66   | 36   | 6    | R4543.5  | R4533.5  |
| 28     | 3.57 | 0.1406         | 28   | 66   | 36   | 6    | R454N28  | R453N28  |
| 9/64   | 3.57 | 0.1406         | 28   | 66   | 36   | 6    | R4549/64 | R4539/64 |
|        | 3.60 | 0.1417         | 28   | 66   | 36   | 6    | R4543.6  | R4533.6  |



| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R454      | R453      |
|--------|------|----------------|------|------|------|------|-----------|-----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |           |
| 27     | 3.66 | 0.1441         | 28   | 66   | 36   | 6    | R454N27   | R453N27   |
|        | 3.70 | 0.1457         | 28   | 66   | 36   | 6    | R4543.7   | R4533.7   |
| 26     | 3.73 | 0.1469         | 36   | 74   | 36   | 6    | R454N26   | R453N26   |
| 25     | 3.80 | 0.1496         | 36   | 74   | 36   | 6    | R4543.8   | R4533.8   |
| 24     | 3.86 | 0.1520         | 36   | 74   | 36   | 6    | R454N24   | R453N24   |
|        | 3.90 | 0.1535         | 36   | 74   | 36   | 6    | R4543.9   | R4533.9   |
| 23     | 3.91 | 0.1539         | 36   | 74   | 36   | 6    | R454N23   | R453N23   |
| 5/32   | 3.97 | 0.1563         | 36   | 74   | 36   | 6    | R4545/32  | R4535/32  |
| 22     | 3.99 | 0.1571         | 36   | 74   | 36   | 6    | R454N22   | R453N22   |
|        | 4.00 | 0.1575         | 36   | 74   | 36   | 6    | R4544.0   | R4534.0   |
| 21     | 4.04 | 0.1591         | 36   | 74   | 36   | 6    | R454N21   | R453N21   |
|        | 4.05 | 0.1594         | 36   | 74   | 36   | 6    |           | R4534.05  |
| 20     | 4.09 | 0.1610         | 36   | 74   | 36   | 6    | R454N20   | R453N20   |
|        | 4.10 | 0.1614         | 36   | 74   | 36   | 6    | R4544.1   | R4534.1   |
|        | 4.20 | 0.1654         | 36   | 74   | 36   | 6    | R4544.2   | R4534.2   |
| 19     | 4.22 | 0.1661         | 36   | 74   | 36   | 6    | R454N19   | R453N19   |
|        | 4.30 | 0.1693         | 36   | 74   | 36   | 6    | R4544.3   | R4534.3   |
| 18     | 4.31 | 0.1697         | 36   | 74   | 36   | 6    | R454N18   | R453N18   |
| 11/64  | 4.37 | 0.1719         | 36   | 74   | 36   | 6    | R45411/64 | R45311/64 |
| 17     | 4.39 | 0.1728         | 36   | 74   | 36   | 6    | R454N17   | R453N17   |
|        | 4.40 | 0.1732         | 36   | 74   | 36   | 6    | R4544.4   | R4534.4   |
|        | 4.50 | 0.1772         | 36   | 74   | 36   | 6    | R4544.5   | R4534.5   |
| 16     | 4.50 | 0.1772         | 36   | 74   | 36   | 6    | R454N16   | R453N16   |
| 15     | 4.57 | 0.1799         | 36   | 74   | 36   | 6    | R454N15   | R453N15   |
|        | 4.60 | 0.1811         | 36   | 74   | 36   | 6    | R4544.6   | R4534.6   |
| 14     | 4.62 | 0.1819         | 36   | 74   | 36   | 6    | R454N14   | R453N14   |
| 13     | 4.70 | 0.1850         | 36   | 74   | 36   | 6    | R4544.7   | R4534.7   |
| 3/16   | 4.76 | 0.1875         | 44   | 82   | 36   | 6    | R4543/16  | R4533/16  |
| 12     | 4.80 | 0.1890         | 44   | 82   | 36   | 6    | R4544.8   | R453N12   |
| 11     | 4.85 | 0.1909         | 44   | 82   | 36   | 6    | R454N11   | R453N11   |
|        | 4.90 | 0.1929         | 44   | 82   | 36   | 6    | R4544.9   | R4534.9   |
| 10     | 4.92 | 0.1937         | 44   | 82   | 36   | 6    | R454N10   | R453N10   |
| 9      | 4.98 | 0.1961         | 44   | 82   | 36   | 6    | R454N9    | R453N9    |
|        | 5.00 | 0.1969         | 44   | 82   | 36   | 6    | R4545.0   | R4535.0   |
|        | 5.05 | 0.1988         | 44   | 82   | 36   | 6    |           | R4535.05  |
| 8      | 5.06 | 0.1992         | 44   | 82   | 36   | 6    | R454N8    | R453N8    |
|        | 5.10 | 0.2008         | 44   | 82   | 36   | 6    | R4545.1   | R4535.1   |
| 7      | 5.11 | 0.2010         | 44   | 82   | 36   | 6    | R454N7    | R453N7    |
| 13/64  | 5.16 | 0.2031         | 44   | 82   | 36   | 6    | R45413/64 | R45313/64 |
| 6      | 5.18 | 0.2039         | 44   | 82   | 36   | 6    | R454N6    | R453N6    |
|        | 5.20 | 0.2047         | 44   | 82   | 36   | 6    | R4545.2   | R4535.2   |
| 5      | 5.22 | 0.2055         | 44   | 82   | 36   | 6    | R454N5    | R453N5    |
|        | 5.30 | 0.2087         | 44   | 82   | 36   | 6    |           | R4535.3   |
| 4      | 5.31 | 0.2091         | 44   | 82   | 36   | 6    | R454N4    | R453N4    |
|        | 5.40 | 0.2126         | 44   | 82   | 36   | 6    |           | R4535.4   |
| 3      | 5.41 | 0.2130         | 44   | 82   | 36   | 6    | R454N3    | R453N3    |
|        | 5.50 | 0.2165         | 44   | 82   | 36   | 6    | R4545.5   | R4535.5   |
| 7/32   | 5.56 | 0.2188         | 44   | 82   | 36   | 6    | R4547/32  | R4537/32  |
|        | 5.60 | 0.2205         | 44   | 82   | 36   | 6    | R4545.6   | R4535.6   |
| 2      | 5.61 | 0.2209         | 44   | 82   | 36   | 6    | R454N2    | R453N2    |
|        | 5.70 | 0.2244         | 44   | 82   | 36   | 6    | R4545.7   | R4535.7   |
| 1      | 5.79 | 0.2280         | 44   | 82   | 36   | 6    | R454N1    | R453N1    |
|        | 5.80 | 0.2283         | 44   | 82   | 36   | 6    | R4545.8   | R4535.8   |
|        | 5.90 | 0.2323         | 44   | 82   | 36   | 6    |           | R4535.9   |
| A      | 5.94 | 0.2339         | 44   | 82   | 36   | 6    | R454A     | R453A     |
| 15/64  | 5.95 | 0.2344         | 44   | 82   | 36   | 6    | R45415/64 | R45315/64 |
|        | 6.00 | 0.2362         | 44   | 82   | 36   | 6    | R4546.0   | R4536.0   |
| B      | 6.05 | 0.2380         | 53   | 91   | 36   | 8    | R454B     | R453B     |
|        | 6.05 | 0.2382         | 53   | 91   | 36   | 8    |           | R4536.05  |
|        | 6.10 | 0.2402         | 53   | 91   | 36   | 8    | R4546.1   | R4536.1   |
| C      | 6.15 | 0.2421         | 53   | 91   | 36   | 8    | R454C     | R453C     |
|        | 6.20 | 0.2441         | 53   | 91   | 36   | 8    | R4546.2   | R4536.2   |
| D      | 6.25 | 0.2461         | 53   | 91   | 36   | 8    | R454D     | R453D     |
|        | 6.30 | 0.2480         | 53   | 91   | 36   | 8    | R4546.3   | R4536.3   |

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R454      | R453      |
|--------|------|----------------|------|------|------|------|-----------|-----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |           |
| 1/4    | 6.35 | 0.2500         | 53   | 91   | 36   | 8    | R4541/4   | R4531/4   |
| E      | 6.35 | 0.2500         | 53   | 91   | 36   | 8    | R454E     | R453E     |
|        | 6.40 | 0.2520         | 53   | 91   | 36   | 8    | R4546.4   | R4536.4   |
|        | 6.50 | 0.2559         | 53   | 91   | 36   | 8    | R4546.5   | R4536.5   |
| F      | 6.53 | 0.2571         | 53   | 91   | 36   | 8    | R454F     | R453F     |
|        | 6.60 | 0.2598         | 53   | 91   | 36   | 8    | R4546.6   | R4536.6   |
| G      | 6.63 | 0.2610         | 53   | 91   | 36   | 8    | R454G     | R453G     |
|        | 6.70 | 0.2638         | 53   | 91   | 36   | 8    | R4546.7   | R4536.7   |
| 17/64  | 6.75 | 0.2656         | 53   | 91   | 36   | 8    | R45417/64 | R45317/64 |
| H      | 6.76 | 0.2661         | 53   | 91   | 36   | 8    |           | R453H     |
|        | 6.80 | 0.2677         | 53   | 91   | 36   | 8    | R4546.8   | R4536.8   |
|        | 6.90 | 0.2717         | 53   | 91   | 36   | 8    | R4546.9   | R4536.9   |
| I      | 6.91 | 0.2720         | 53   | 91   | 36   | 8    | R454I     | R453I     |
|        | 7.00 | 0.2756         | 53   | 91   | 36   | 8    | R4547.0   | R4537.0   |
| J      | 7.04 | 0.2772         | 53   | 91   | 36   | 8    | R454J     | R453J     |
|        | 7.10 | 0.2795         | 53   | 91   | 36   | 8    | R4547.1   | R4537.1   |
| K      | 7.14 | 0.2811         | 53   | 91   | 36   | 8    | R454K     | R453K     |
| 9/32   | 7.14 | 0.2813         | 53   | 91   | 36   | 8    | R4549/32  | R4539/32  |
|        | 7.20 | 0.2835         | 53   | 91   | 36   | 8    |           | R4537.2   |
|        | 7.30 | 0.2874         | 53   | 91   | 36   | 8    | R4547.3   | R4537.3   |
| L      | 7.37 | 0.2902         | 53   | 91   | 36   | 8    | R454L     |           |
|        | 7.40 | 0.2913         | 53   | 91   | 36   | 8    | R4547.4   | R4537.4   |
| M      | 7.49 | 0.2949         | 53   | 91   | 36   | 8    | R454M     | R453M     |
|        | 7.50 | 0.2953         | 53   | 91   | 36   | 8    | R4547.5   | R4537.5   |
| 19/64  | 7.54 | 0.2969         | 53   | 91   | 36   | 8    | R45419/64 | R45319/64 |
|        | 7.60 | 0.2992         | 53   | 91   | 36   | 8    | R4547.6   | R4537.6   |
| N      | 7.67 | 0.3020         | 53   | 91   | 36   | 8    | R454N     | R453N     |
|        | 7.70 | 0.3031         | 53   | 91   | 36   | 8    | R4547.7   | R4537.7   |
|        | 7.80 | 0.3071         | 53   | 91   | 36   | 8    | R4547.8   | R4537.8   |
|        | 7.90 | 0.3110         | 53   | 91   | 36   | 8    | R4547.9   | R4537.9   |
| 5/16   | 7.94 | 0.3125         | 53   | 91   | 36   | 8    | R4545/16  | R4535/16  |
|        | 8.00 | 0.3150         | 53   | 91   | 36   | 8    | R4548.0   | R4538.0   |
| O      | 8.03 | 0.3161         | 61   | 103  | 40   | 10   | R454O     | R453O     |
|        | 8.05 | 0.3169         | 61   | 103  | 40   | 10   |           | R4538.05  |
|        | 8.10 | 0.3189         | 61   | 103  | 40   | 10   | R4548.1   | R4538.1   |
|        | 8.20 | 0.3228         | 61   | 103  | 40   | 10   | R4548.2   | R4538.2   |
| P      | 8.20 | 0.3228         | 61   | 103  | 40   | 10   | R454P     | R453P     |
|        | 8.30 | 0.3268         | 61   | 103  | 40   | 10   |           | R4538.3   |
| 21/64  | 8.33 | 0.3281         | 61   | 103  | 40   | 10   | R45421/64 | R45321/64 |
|        | 8.40 | 0.3307         | 61   | 103  | 40   | 10   | R4548.4   | R4538.4   |
| Q      | 8.43 | 0.3319         | 61   | 103  | 40   | 10   |           | R453Q     |
|        | 8.50 | 0.3346         | 61   | 103  | 40   | 10   | R4548.5   | R4538.5   |
|        | 8.60 | 0.3386         | 61   | 103  | 40   | 10   | R4548.6   | R4538.6   |
| R      | 8.61 | 0.3390         | 61   | 103  | 40   | 10   | R454R     | R453R     |
|        | 8.70 | 0.3425         | 61   | 103  | 40   | 10   | R4548.7   | R4538.7   |
| 11/32  | 8.73 | 0.3438         | 61   | 103  | 40   | 10   | R45411/32 | R45311/32 |
|        | 8.80 | 0.3465         | 61   | 103  | 40   | 10   | R4548.8   | R4538.8   |
| S      | 8.84 | 0.3480         | 61   | 103  | 40   | 10   | R454S     | R453S     |
|        | 8.90 | 0.3504         | 61   | 103  | 40   | 10   | R4548.9   | R4538.9   |
|        | 9.00 | 0.3543         | 61   | 103  | 40   | 10   | R4549.0   | R4539.0   |
| T      | 9.09 | 0.3579         | 61   | 103  | 40   | 10   | R454T     | R453T     |
|        | 9.10 | 0.3583         | 61   | 103  | 40   | 10   | R4549.1   | R4539.1   |
| 23/64  | 9.13 | 0.3594         | 61   | 103  | 40   | 10   | R45423/64 | R45323/64 |
|        | 9.20 | 0.3622         | 61   | 103  | 40   | 10   |           | R4539.2   |
|        | 9.30 | 0.3661         | 61   | 103  | 40   | 10   | R4549.3   | R4539.3   |
| U      | 9.35 | 0.3681         | 61   | 103  | 40   | 10   | R454U     | R453U     |
|        | 9.40 | 0.3701         | 61   | 103  | 40   | 10   | R4549.4   | R4539.4   |
|        | 9.50 | 0.3740         | 61   | 103  | 40   | 10   | R4549.5   | R4539.5   |
| 3/8    | 9.53 | 0.3750         | 61   | 103  | 40   | 10   | R4543/8   | R4533/8   |
| V      | 9.58 | 0.3772         | 61   | 103  | 40   | 10   | R454V     | R453V     |
|        | 9.60 | 0.3780         | 61   | 103  | 40   | 10   | R4549.6   | R4539.6   |
|        | 9.70 | 0.3819         | 61   | 103  | 40   | 10   | R4549.7   | R4539.7   |
|        | 9.80 | 0.3858         | 61   | 103  | 40   | 10   | R4549.8   | R4539.8   |
| W      | 9.80 | 0.3858         | 61   | 103  | 40   | 10   | R454W     | R453W     |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R454      | R453      |
|--------|-------|----------------|------|------|------|------|-----------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |           |
|        | 9.90  | 0.3898         | 61   | 103  | 40   | 10   | R4549.9   | R4539.9   |
| 25/64  | 9.92  | 0.3906         | 61   | 103  | 40   | 10   | R45425/64 | R45325/64 |
|        | 10.00 | 0.3937         | 61   | 103  | 40   | 10   | R45410.0  | R45310.0  |
|        | 10.05 | 0.3957         | 70   | 118  | 45   | 12   |           | R45310.05 |
| X      | 10.08 | 0.3969         | 70   | 118  | 45   | 12   | R454X     | R453X     |
|        | 10.10 | 0.3976         | 70   | 118  | 45   | 12   | R45410.1  | R45310.1  |
|        | 10.20 | 0.4016         | 70   | 118  | 45   | 12   | R45410.2  | R45310.2  |
| Y      | 10.26 | 0.4039         | 70   | 118  | 45   | 12   | R454Y     | R453Y     |
|        | 10.30 | 0.4055         | 70   | 118  | 45   | 12   | R45410.3  | R45310.3  |
| 13/32  | 10.32 | 0.4063         | 70   | 118  | 45   | 12   | R45413/32 | R45313/32 |
|        | 10.40 | 0.4094         | 70   | 118  | 45   | 12   | R45410.4  | R45310.4  |
| Z      | 10.49 | 0.4130         | 70   | 118  | 45   | 12   | R454Z     | R453Z     |
|        | 10.50 | 0.4134         | 70   | 118  | 45   | 12   | R45410.5  | R45310.5  |
|        | 10.60 | 0.4173         | 70   | 118  | 45   | 12   | R45410.6  | R45310.6  |
| 27/64  | 10.72 | 0.4219         | 70   | 118  | 45   | 12   | R45427/64 | R45327/64 |
|        | 10.80 | 0.4252         | 70   | 118  | 45   | 12   |           | R45310.8  |
|        | 11.00 | 0.4331         | 70   | 118  | 45   | 12   | R45411.0  | R45311.0  |
| 7/16   | 11.11 | 0.4375         | 70   | 118  | 45   | 12   | R4547/16  | R4537/16  |
|        | 11.20 | 0.4409         | 70   | 118  | 45   | 12   | R45411.2  | R45311.2  |
|        | 11.30 | 0.4449         | 70   | 118  | 45   | 12   |           | R45311.3  |
|        | 11.40 | 0.4488         | 70   | 118  | 45   | 12   | R45411.4  | R45311.4  |
|        | 11.50 | 0.4528         | 70   | 118  | 45   | 12   | R45411.5  | R45311.5  |
| 29/64  | 11.51 | 0.4531         | 70   | 118  | 45   | 12   | R45429/64 | R45329/64 |
|        | 11.60 | 0.4567         | 70   | 118  | 45   | 12   | R45411.6  | R45311.6  |
|        | 11.80 | 0.4646         | 70   | 118  | 45   | 12   | R45411.8  | R45311.8  |
| 15/32  | 11.91 | 0.4688         | 70   | 118  | 45   | 12   | R45415/32 | R45315/32 |
|        | 12.00 | 0.4724         | 70   | 118  | 45   | 12   | R45412.0  | R45312.0  |
|        | 12.05 | 0.4744         | 76   | 124  | 45   | 14   |           | R45312.05 |
|        | 12.10 | 0.4764         | 76   | 124  | 45   | 14   | R45412.1  |           |
|        | 12.20 | 0.4803         | 76   | 124  | 45   | 14   | R45412.2  | R45312.2  |
| 31/64  | 12.30 | 0.4844         | 76   | 124  | 45   | 14   | R45431/64 | R45331/64 |
|        | 12.50 | 0.4921         | 76   | 124  | 45   | 14   | R45412.5  | R45312.5  |
|        | 12.70 | 0.5000         | 76   | 124  | 45   | 14   | R45412.7  | R45312.7  |
| 1/2    | 12.70 | 0.5000         | 76   | 124  | 45   | 14   | R4541/2   | R4531/2   |
|        | 12.80 | 0.5039         | 76   | 124  | 45   | 14   | R45412.8  | R45312.8  |
|        | 13.00 | 0.5118         | 76   | 124  | 45   | 14   | R45413.0  | R45313.0  |
| 33/64  | 13.10 | 0.5156         | 76   | 124  | 45   | 14   | R45433/64 | R45333/64 |
|        | 13.30 | 0.5236         | 76   | 124  | 45   | 14   |           | R45313.3  |
| 17/32  | 13.49 | 0.5313         | 76   | 124  | 45   | 14   | R45417/32 | R45317/32 |
|        | 13.50 | 0.5315         | 76   | 124  | 45   | 14   | R45413.5  | R45313.5  |
|        | 13.80 | 0.5433         | 76   | 124  | 45   | 14   | R45413.8  | R45313.8  |
| 35/64  | 13.89 | 0.5469         | 76   | 124  | 45   | 14   | R45435/64 | R45335/64 |
|        | 14.00 | 0.5512         | 76   | 124  | 45   | 14   | R45414.0  | R45314.0  |
|        | 14.25 | 0.5610         | 82   | 133  | 48   | 16   | R45414.25 | R45314.25 |
| 9/16   | 14.29 | 0.5625         | 82   | 133  | 48   | 16   | R4549/16  | R4539/16  |
|        | 14.50 | 0.5709         | 82   | 133  | 48   | 16   | R45414.5  | R45314.5  |
| 37/64  | 14.68 | 0.5781         | 82   | 133  | 48   | 16   | R45437/64 | R45337/64 |
|        | 14.80 | 0.5827         | 82   | 133  | 48   | 16   | R45414.8  | R45314.8  |
|        | 15.00 | 0.5906         | 82   | 133  | 48   | 16   | R45415.0  | R45315.0  |
| 19/32  | 15.08 | 0.5938         | 82   | 133  | 48   | 16   | R45419/32 | R45319/32 |
|        | 15.10 | 0.5945         | 82   | 133  | 48   | 16   | R45415.1  | R45315.1  |
|        | 15.30 | 0.6024         | 82   | 133  | 48   | 16   |           | R45315.3  |
| 39/64  | 15.48 | 0.6094         | 82   | 133  | 48   | 16   | R45439/64 | R45339/64 |
|        | 15.50 | 0.6102         | 82   | 133  | 48   | 16   | R45415.5  | R45315.5  |
|        | 15.80 | 0.6220         | 82   | 133  | 48   | 16   | R45415.8  | R45315.8  |
| 5/8    | 15.88 | 0.6250         | 82   | 133  | 48   | 16   | R4545/8   | R4535/8   |
|        | 16.00 | 0.6299         | 82   | 133  | 48   | 16   | R45416.0  | R45316.0  |
| 41/64  | 16.27 | 0.6406         | 91   | 143  | 48   | 18   | R45441/64 | R45341/64 |
|        | 16.50 | 0.6496         | 91   | 143  | 48   | 18   | R45416.5  | R45316.5  |
| 21/32  | 16.67 | 0.6563         | 91   | 143  | 48   | 18   | R45421/32 | R45321/32 |
|        | 17.00 | 0.6693         | 91   | 143  | 48   | 18   | R45417.0  | R45317.0  |
| 43/64  | 17.07 | 0.6720         | 91   | 143  | 48   | 18   | R45443/64 | R45343/64 |
| 11/16  | 17.46 | 0.6874         | 91   | 143  | 48   | 18   | R45411/16 | R45311/16 |
|        | 17.50 | 0.6890         | 91   | 143  | 48   | 18   | R45417.5  | R45317.5  |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R454             | R453             |
|--------|-------|----------------|------|------|------|------|------------------|------------------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |                  |                  |
|        | 17.80 | 0.7008         | 91   | 143  | 48   | 18   | <b>R45417.8</b>  | <b>R45317.8</b>  |
| 45/64  | 17.86 | 0.7031         | 91   | 143  | 48   | 18   | <b>R45445/64</b> | <b>R45345/64</b> |
|        | 18.00 | 0.7087         | 91   | 143  | 48   | 18   | <b>R45418.0</b>  | <b>R45318.0</b>  |
| 23/32  | 18.26 | 0.7189         | 99   | 143  | 48   | 20   |                  | <b>R45323/32</b> |
| 23/32  | 18.26 | 0.7189         | 99   | 153  | 50   | 20   | <b>R45423/32</b> |                  |
|        | 18.50 | 0.7283         | 99   | 153  | 50   | 20   | <b>R45418.5</b>  | <b>R45318.5</b>  |
| 47/64  | 18.65 | 0.7343         | 99   | 153  | 50   | 20   | <b>R45447/64</b> | <b>R45347/64</b> |
|        | 19.00 | 0.7480         | 99   | 153  | 50   | 20   | <b>R45419.0</b>  | <b>R45319.0</b>  |
| 3/4    | 19.05 | 0.7500         | 99   | 153  | 50   | 20   | <b>R4543/4</b>   | <b>R4533/4</b>   |
|        | 19.50 | 0.7677         | 99   | 153  | 50   | 20   | <b>R45419.5</b>  | <b>R45319.5</b>  |
|        | 19.80 | 0.7795         | 99   | 153  | 50   | 20   | <b>R45419.8</b>  | <b>R45319.8</b>  |
|        | 20.00 | 0.7874         | 99   | 153  | 50   | 20   | <b>R45420.0</b>  | <b>R45320.0</b>  |

# R459 • Force X Spiraalboor met koelkanalen 8×D, voor gebruik in een breed scala aan materialen.

|      |        |        |        |        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |       |
|------|--------|--------|--------|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| R459 | P1.1   | P1.2   | P1.3   | P2.1   | P2.2   | P2.3  | P3.1   | P3.2  | P3.3  | P4.1  | P4.2  | P4.3  | M1.1  | M1.2  | M2.1  | M2.2  | M2.3  | M3.1  | M3.2  |
|      | ■ 143V | ■ 160V | ■ 166V | ■ 122V | ■ 108U | ■ 95U | ■ 106U | ■ 86U | ■ 72U | ■ 63U | ■ 54U | ■ 44T | ■ 60V | ■ 51V | ■ 54V | ■ 44V | ■ 37U | ■ 33V | ■ 28V |
|      | M3.3   | M4.1   | M4.2   | K1.1   | K1.2   | K1.3  | K2.1   | K2.2  | K2.3  | K3.1  | K3.2  | K3.3  | K4.1  | K4.2  | K4.3  | K4.4  | K4.5  | K5.1  | K5.2  |
|      | ■ 26V  | ■ 24U  | ■ 21U  | ■ 88W  | ■ 65W  | ■ 49W | ■ 78V  | ■ 64V | ■ 51V | ■ 70V | ■ 54V | ■ 43V | ■ 65V | ■ 49V | ■ 36V | ■ 30V | ■ 26V | ■ 73V | ■ 55V |
|      | K5.3   | N1.1   | N1.2   | N1.3   | N2.1   | N2.2  | N2.3   | N3.1  | N3.2  | N3.3  |       |       |       |       |       |       |       |       |       |

|      |    |        |     |      |       |             |     |  |  |  |  |  |  |  |  |  |  |  |  |
|------|----|--------|-----|------|-------|-------------|-----|--|--|--|--|--|--|--|--|--|--|--|--|
| R459 | HM | DORMER | 8XD | 140° | TiAIN | DIN 6535 HA | CTW |  |  |  |  |  |  |  |  |  |  |  |  |
|------|----|--------|-----|------|-------|-------------|-----|--|--|--|--|--|--|--|--|--|--|--|--|

DORMER



R459



FORCE X

3.00 - 16.00

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R459      |
|--------|------|----------------|------|------|------|------|-----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
| 1/8    | 3.00 | 0.1181         | 37   | 79   | 36   | 6    | R4593.0   |
|        | 3.10 | 0.1220         | 37   | 79   | 36   | 6    | R4593.1   |
|        | 3.18 | 0.1250         | 37   | 79   | 36   | 6    | R4591/8   |
|        | 3.20 | 0.1260         | 37   | 79   | 36   | 6    | R4593.2   |
|        | 3.30 | 0.1299         | 37   | 79   | 36   | 6    | R4593.3   |
| 9/64   | 3.40 | 0.1339         | 37   | 79   | 36   | 6    | R4593.4   |
|        | 3.50 | 0.1378         | 37   | 79   | 36   | 6    | R4593.5   |
|        | 3.57 | 0.1406         | 37   | 79   | 36   | 6    | R4599/64  |
|        | 3.60 | 0.1417         | 37   | 79   | 36   | 6    | R4593.6   |
|        | 3.70 | 0.1457         | 37   | 79   | 36   | 6    | R4593.7   |
| 5/32   | 3.80 | 0.1496         | 48   | 90   | 36   | 6    | R4593.8   |
|        | 3.90 | 0.1535         | 48   | 90   | 36   | 6    | R4593.9   |
|        | 3.97 | 0.1563         | 48   | 90   | 36   | 6    | R4595/32  |
|        | 4.00 | 0.1575         | 48   | 90   | 36   | 6    | R4594.0   |
|        | 4.10 | 0.1614         | 48   | 90   | 36   | 6    | R4594.1   |
| 11/64  | 4.20 | 0.1654         | 48   | 90   | 36   | 6    | R4594.2   |
|        | 4.30 | 0.1693         | 48   | 90   | 36   | 6    | R4594.3   |
|        | 4.37 | 0.1719         | 48   | 90   | 36   | 6    | R45911/64 |
|        | 4.40 | 0.1732         | 48   | 90   | 36   | 6    | R4594.4   |
|        | 4.50 | 0.1772         | 48   | 90   | 36   | 6    | R4594.5   |
| 3/16   | 4.60 | 0.1811         | 48   | 90   | 36   | 6    | R4594.6   |
|        | 4.70 | 0.1850         | 62   | 104  | 36   | 6    | R4594.7   |
|        | 4.76 | 0.1875         | 62   | 104  | 36   | 6    | R4593/16  |
|        | 4.80 | 0.1890         | 62   | 104  | 36   | 6    | R4594.8   |
|        | 4.90 | 0.1929         | 62   | 104  | 36   | 6    | R4594.9   |
| 13/64  | 5.00 | 0.1969         | 62   | 104  | 36   | 6    | R4595.0   |
|        | 5.10 | 0.2008         | 62   | 104  | 36   | 6    | R4595.1   |
|        | 5.16 | 0.2031         | 62   | 104  | 36   | 6    | R45913/64 |
|        | 5.20 | 0.2047         | 62   | 104  | 36   | 6    | R4595.2   |
|        | 5.30 | 0.2087         | 62   | 104  | 36   | 6    | R4595.3   |
|        | 5.40 | 0.2126         | 62   | 104  | 36   | 6    | R4595.4   |
|        | 5.50 | 0.2165         | 62   | 104  | 36   | 6    | R4595.5   |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R459      |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
| 7/32   | 5.56  | 0.2188         | 62   | 104  | 36   | 6    | R4597/32  |
|        | 5.60  | 0.2205         | 62   | 104  | 36   | 6    | R4595.6   |
|        | 5.70  | 0.2244         | 62   | 104  | 36   | 6    | R4595.7   |
|        | 5.80  | 0.2283         | 62   | 104  | 36   | 6    | R4595.8   |
|        | 5.90  | 0.2323         | 62   | 104  | 36   | 6    | R4595.9   |
| 15/64  | 5.95  | 0.2344         | 62   | 104  | 36   | 6    | R45915/64 |
|        | 6.00  | 0.2362         | 62   | 104  | 36   | 6    | R4596.0   |
|        | 6.10  | 0.2402         | 84   | 126  | 36   | 8    | R4596.1   |
|        | 6.20  | 0.2441         | 84   | 126  | 36   | 8    | R4596.2   |
|        | 6.30  | 0.2480         | 84   | 126  | 36   | 8    | R4596.3   |
| 1/4    | 6.35  | 0.2500         | 84   | 126  | 36   | 8    | R4591/4   |
|        | 6.40  | 0.2520         | 84   | 126  | 36   | 8    | R4596.4   |
|        | 6.50  | 0.2559         | 84   | 126  | 36   | 8    | R4596.5   |
|        | 6.60  | 0.2598         | 84   | 126  | 36   | 8    | R4596.6   |
|        | 6.70  | 0.2638         | 84   | 126  | 36   | 8    | R4596.7   |
| 17/64  | 6.75  | 0.2656         | 84   | 126  | 36   | 8    | R45917/64 |
|        | 6.80  | 0.2677         | 84   | 126  | 36   | 8    | R4596.8   |
|        | 6.90  | 0.2717         | 84   | 126  | 36   | 8    | R4596.9   |
|        | 7.00  | 0.2756         | 84   | 126  | 36   | 8    | R4597.0   |
|        | 7.10  | 0.2795         | 84   | 126  | 36   | 8    | R4597.1   |
| 9/32   | 7.14  | 0.2813         | 84   | 126  | 36   | 8    | R4599/32  |
|        | 7.20  | 0.2835         | 84   | 126  | 36   | 8    | R4597.2   |
|        | 7.30  | 0.2874         | 84   | 126  | 36   | 8    | R4597.3   |
|        | 7.40  | 0.2913         | 84   | 126  | 36   | 8    | R4597.4   |
|        | 7.50  | 0.2953         | 84   | 126  | 36   | 8    | R4597.5   |
| 19/64  | 7.54  | 0.2969         | 84   | 126  | 36   | 8    | R45919/64 |
|        | 7.60  | 0.2992         | 84   | 126  | 36   | 8    | R4597.6   |
|        | 7.70  | 0.3031         | 84   | 126  | 36   | 8    | R4597.7   |
|        | 7.80  | 0.3071         | 84   | 126  | 36   | 8    | R4597.8   |
|        | 7.90  | 0.3110         | 84   | 126  | 36   | 8    | R4597.9   |
| 5/16   | 7.94  | 0.3125         | 84   | 126  | 36   | 8    | R4595/16  |
|        | 8.00  | 0.3150         | 84   | 126  | 36   | 8    | R4598.0   |
|        | 8.10  | 0.3189         | 106  | 152  | 40   | 10   | R4598.1   |
|        | 8.20  | 0.3228         | 106  | 152  | 40   | 10   | R4598.2   |
|        | 8.30  | 0.3268         | 106  | 152  | 40   | 10   | R4598.3   |
| 21/64  | 8.33  | 0.3281         | 106  | 152  | 40   | 10   | R45921/64 |
|        | 8.40  | 0.3307         | 106  | 152  | 40   | 10   | R4598.4   |
|        | 8.50  | 0.3346         | 106  | 152  | 40   | 10   | R4598.5   |
|        | 8.60  | 0.3386         | 106  | 152  | 40   | 10   | R4598.6   |
|        | 8.70  | 0.3425         | 106  | 152  | 40   | 10   | R4598.7   |
| 11/32  | 8.73  | 0.3438         | 106  | 152  | 40   | 10   | R45911/32 |
|        | 8.80  | 0.3465         | 106  | 152  | 40   | 10   | R4598.8   |
|        | 8.90  | 0.3504         | 106  | 152  | 40   | 10   | R4598.9   |
|        | 9.00  | 0.3543         | 106  | 152  | 40   | 10   | R4599.0   |
|        | 9.10  | 0.3583         | 106  | 152  | 40   | 10   | R4599.1   |
| 23/64  | 9.13  | 0.3594         | 106  | 152  | 40   | 10   | R45923/64 |
|        | 9.20  | 0.3622         | 106  | 152  | 40   | 10   | R4599.2   |
|        | 9.30  | 0.3661         | 106  | 152  | 40   | 10   | R4599.3   |
|        | 9.40  | 0.3701         | 106  | 152  | 40   | 10   | R4599.4   |
|        | 9.50  | 0.3740         | 106  | 152  | 40   | 10   | R4599.5   |
| 3/8    | 9.53  | 0.3750         | 106  | 152  | 40   | 10   | R4593/8   |
|        | 9.60  | 0.3780         | 106  | 152  | 40   | 10   | R4599.6   |
|        | 9.70  | 0.3819         | 106  | 152  | 40   | 10   | R4599.7   |
|        | 9.80  | 0.3858         | 106  | 152  | 40   | 10   | R4599.8   |
|        | 9.90  | 0.3898         | 106  | 152  | 40   | 10   | R4599.9   |
| 25/64  | 9.92  | 0.3906         | 106  | 152  | 40   | 10   | R45925/64 |
|        | 10.00 | 0.3937         | 106  | 152  | 40   | 10   | R45910.0  |
|        | 10.20 | 0.4016         | 128  | 180  | 45   | 12   | R45910.2  |
|        | 10.30 | 0.4055         | 128  | 180  | 45   | 12   | R45910.3  |
|        | 10.32 | 0.4063         | 128  | 180  | 45   | 12   | R45913/32 |
| 13/32  | 10.40 | 0.4094         | 128  | 180  | 45   | 12   | R45910.4  |
|        | 10.50 | 0.4134         | 128  | 180  | 45   | 12   | R45910.5  |
|        | 10.72 | 0.4219         | 128  | 180  | 45   | 12   | R45927/64 |
| 27/64  | 10.80 | 0.4252         | 128  | 180  | 45   | 12   | R45910.8  |



| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R459      |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
|        | 11.00 | 0.4331         | 128  | 180  | 45   | 12   | R45911.0  |
| 7/16   | 11.11 | 0.4375         | 128  | 180  | 45   | 12   | R4597/16  |
|        | 11.20 | 0.4409         | 128  | 180  | 45   | 12   | R45911.2  |
|        | 11.30 | 0.4449         | 128  | 180  | 45   | 12   | R45911.3  |
|        | 11.50 | 0.4528         | 128  | 180  | 45   | 12   | R45911.5  |
| 29/64  | 11.51 | 0.4531         | 128  | 180  | 45   | 12   | R45929/64 |
|        | 11.80 | 0.4646         | 128  | 180  | 45   | 12   | R45911.8  |
| 15/32  | 11.91 | 0.4688         | 128  | 180  | 45   | 12   | R45915/32 |
|        | 12.00 | 0.4724         | 128  | 180  | 45   | 12   | R45912.0  |
|        | 12.20 | 0.4803         | 151  | 202  | 48   | 14   | R45912.2  |
| 31/64  | 12.30 | 0.4844         | 151  | 202  | 48   | 14   | R45931/64 |
|        | 12.50 | 0.4921         | 151  | 202  | 48   | 14   | R45912.5  |
| 1/2    | 12.70 | 0.5000         | 151  | 202  | 48   | 14   | R4591/2   |
|        | 12.80 | 0.5039         | 151  | 202  | 48   | 14   | R45912.8  |
|        | 13.00 | 0.5118         | 151  | 202  | 48   | 14   | R45913.0  |
| 33/64  | 13.10 | 0.5156         | 151  | 202  | 48   | 14   | R45933/64 |
| 17/32  | 13.49 | 0.5313         | 151  | 202  | 48   | 14   | R45917/32 |
|        | 13.50 | 0.5315         | 151  | 202  | 48   | 14   | R45913.5  |
| 35/64  | 13.89 | 0.5469         | 151  | 202  | 48   | 14   | R45935/64 |
|        | 14.00 | 0.5512         | 151  | 202  | 48   | 14   | R45914.0  |
|        | 14.25 | 0.5610         | 172  | 227  | 48   | 16   | R45914.25 |
| 9/16   | 14.29 | 0.5625         | 172  | 227  | 48   | 16   | R4599/16  |
|        | 14.50 | 0.5709         | 172  | 227  | 48   | 16   | R45914.5  |
| 37/64  | 14.68 | 0.5781         | 172  | 227  | 48   | 16   | R45937/64 |
|        | 15.00 | 0.5906         | 172  | 227  | 48   | 16   | R45915.0  |
| 19/32  | 15.08 | 0.5938         | 172  | 227  | 48   | 16   | R45919/32 |
|        | 15.10 | 0.5945         | 172  | 227  | 48   | 16   | R45915.1  |
| 39/64  | 15.48 | 0.6094         | 172  | 227  | 48   | 16   | R45939/64 |
|        | 15.50 | 0.6102         | 172  | 227  | 48   | 16   | R45915.5  |
| 5/8    | 15.88 | 0.6250         | 172  | 227  | 48   | 16   | R4595/8   |
|        | 16.00 | 0.6299         | 172  | 227  | 48   | 16   | R45916.0  |

**FORCE M**

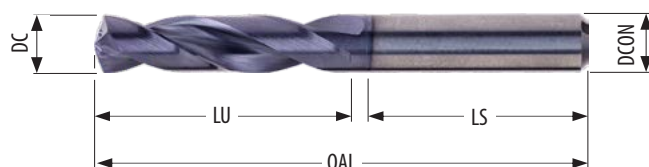


# R467 • Force M Spiraalboor met koelkanalen 3×D, specifiek voor roestvaste staalsoorten uit de ISO M groep.

| R467 | M1.1   | M1.2  | M2.1   | M2.2  | M2.3  | M3.1  | M3.2  | M3.3  | M4.1  | M4.2  | S1.1  | S1.2  | S1.3  | S2.1  | S2.2  | S3.1  | S3.2  | S4.1  | S4.2  |
|------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      | ■ 117G | ■ 99G | ■ 104G | ■ 85G | ■ 71E | ■ 87G | ■ 75G | ■ 68F | ■ 60F | ■ 52E | ■ 55V | ■ 45V | ■ 40U | ■ 60U | ■ 56U | ■ 45U | ■ 40U | ■ 35U | ■ 32U |

| R467 | HM | DIN 6537 K | 3XD | 140° | TiAlN | DIN 6535 HA | CTW |  |  |  |
|------|----|------------|-----|------|-------|-------------|-----|--|--|--|
|------|----|------------|-----|------|-------|-------------|-----|--|--|--|

**DORMER**



**R467**



**FORCE M**

3.00 - 16.00

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R467             |
|--------|------|----------------|------|------|------|------|------------------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |                  |
|        | 3.00 | 0.1181         | 20   | 62   | 36   | 6    | <b>R4673.0</b>   |
|        | 3.10 | 0.1220         | 20   | 62   | 36   | 6    | <b>R4673.1</b>   |
| 1/8    | 3.18 | 0.1250         | 20   | 62   | 36   | 6    | <b>R4671/8</b>   |
|        | 3.20 | 0.1260         | 20   | 62   | 36   | 6    | <b>R4673.2</b>   |
|        | 3.30 | 0.1299         | 20   | 62   | 36   | 6    | <b>R4673.3</b>   |
|        | 3.40 | 0.1339         | 20   | 62   | 36   | 6    | <b>R4673.4</b>   |
| 29     | 3.45 | 0.1360         | 20   | 62   | 36   | 6    | <b>R467N29</b>   |
|        | 3.50 | 0.1378         | 20   | 62   | 36   | 6    | <b>R4673.5</b>   |
| 9/64   | 3.57 | 0.1406         | 20   | 62   | 36   | 6    | <b>R4679/64</b>  |
|        | 3.60 | 0.1417         | 20   | 62   | 36   | 6    | <b>R4673.6</b>   |
|        | 3.70 | 0.1457         | 20   | 62   | 36   | 6    | <b>R4673.7</b>   |
|        | 3.80 | 0.1496         | 24   | 66   | 36   | 6    | <b>R4673.8</b>   |
|        | 3.90 | 0.1535         | 24   | 66   | 36   | 6    | <b>R4673.9</b>   |
| 5/32   | 3.97 | 0.1563         | 24   | 66   | 36   | 6    | <b>R4675/32</b>  |
|        | 4.00 | 0.1575         | 24   | 66   | 36   | 6    | <b>R4674.0</b>   |
|        | 4.05 | 0.1594         | 24   | 66   | 36   | 6    | <b>R4674.05</b>  |
|        | 4.10 | 0.1614         | 24   | 66   | 36   | 6    | <b>R4674.1</b>   |
|        | 4.20 | 0.1654         | 24   | 66   | 36   | 6    | <b>R4674.2</b>   |
|        | 4.30 | 0.1693         | 24   | 66   | 36   | 6    | <b>R4674.3</b>   |
| 11/64  | 4.37 | 0.1719         | 24   | 66   | 36   | 6    | <b>R46711/64</b> |
|        | 4.40 | 0.1732         | 24   | 66   | 36   | 6    | <b>R4674.4</b>   |
|        | 4.50 | 0.1772         | 24   | 66   | 36   | 6    | <b>R4674.5</b>   |
|        | 4.60 | 0.1811         | 24   | 66   | 36   | 6    | <b>R4674.6</b>   |
|        | 4.70 | 0.1850         | 24   | 66   | 36   | 6    | <b>R4674.7</b>   |
| 3/16   | 4.76 | 0.1875         | 28   | 66   | 36   | 6    | <b>R4673/16</b>  |
|        | 4.80 | 0.1890         | 28   | 66   | 36   | 6    | <b>R4674.8</b>   |
|        | 4.90 | 0.1929         | 28   | 66   | 36   | 6    | <b>R4674.9</b>   |
|        | 5.00 | 0.1969         | 28   | 66   | 36   | 6    | <b>R4675.0</b>   |
|        | 5.05 | 0.1988         | 28   | 66   | 36   | 6    | <b>R4675.05</b>  |
|        | 5.10 | 0.2008         | 28   | 66   | 36   | 6    | <b>R4675.1</b>   |
| 7      | 5.11 | 0.2010         | 28   | 66   | 36   | 6    | <b>R467N7</b>    |
| 13/64  | 5.16 | 0.2031         | 28   | 66   | 36   | 6    | <b>R46713/64</b> |
|        | 5.20 | 0.2047         | 28   | 66   | 36   | 6    | <b>R4675.2</b>   |
| 5      | 5.22 | 0.2055         | 28   | 66   | 36   | 6    | <b>R467N5</b>    |
|        | 5.30 | 0.2087         | 28   | 66   | 36   | 6    | <b>R4675.3</b>   |
|        | 5.40 | 0.2126         | 28   | 66   | 36   | 6    | <b>R4675.4</b>   |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R467      |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
|        | 5.50  | 0.2165         | 28   | 66   | 36   | 6    | R4675.5   |
| 7/32   | 5.56  | 0.2188         | 28   | 66   | 36   | 6    | R4677/32  |
|        | 5.60  | 0.2205         | 28   | 66   | 36   | 6    | R4675.6   |
|        | 5.70  | 0.2244         | 28   | 66   | 36   | 6    | R4675.7   |
|        | 5.80  | 0.2283         | 28   | 66   | 36   | 6    | R4675.8   |
|        | 5.90  | 0.2323         | 28   | 66   | 36   | 6    | R4675.9   |
| 15/64  | 5.95  | 0.2344         | 28   | 66   | 36   | 6    | R46715/64 |
|        | 6.00  | 0.2362         | 28   | 66   | 36   | 6    | R4676.0   |
|        | 6.05  | 0.2382         | 34   | 79   | 36   | 8    | R4676.05  |
|        | 6.10  | 0.2402         | 34   | 79   | 36   | 8    | R4676.1   |
|        | 6.20  | 0.2441         | 34   | 79   | 36   | 8    | R4676.2   |
|        | 6.30  | 0.2480         | 34   | 79   | 36   | 8    | R4676.3   |
| 1/4    | 6.35  | 0.2500         | 34   | 79   | 36   | 8    | R4671/4   |
|        | 6.40  | 0.2520         | 34   | 79   | 36   | 8    | R4676.4   |
|        | 6.50  | 0.2559         | 34   | 79   | 36   | 8    | R4676.5   |
|        | 6.60  | 0.2598         | 34   | 79   | 36   | 8    | R4676.6   |
|        | 6.70  | 0.2638         | 34   | 79   | 36   | 8    | R4676.7   |
| 17/64  | 6.75  | 0.2656         | 34   | 79   | 36   | 8    | R46717/64 |
|        | 6.80  | 0.2677         | 34   | 79   | 36   | 8    | R4676.8   |
|        | 6.90  | 0.2717         | 34   | 79   | 36   | 8    | R4676.9   |
|        | 7.00  | 0.2756         | 34   | 79   | 36   | 8    | R4677.0   |
|        | 7.10  | 0.2795         | 41   | 79   | 36   | 8    | R4677.1   |
| 9/32   | 7.14  | 0.2813         | 41   | 79   | 36   | 8    | R4679/32  |
|        | 7.20  | 0.2835         | 41   | 79   | 36   | 8    | R4677.2   |
|        | 7.30  | 0.2874         | 41   | 79   | 36   | 8    | R4677.3   |
|        | 7.40  | 0.2913         | 41   | 79   | 36   | 8    | R4677.4   |
|        | 7.50  | 0.2953         | 41   | 79   | 36   | 8    | R4677.5   |
| 19/64  | 7.54  | 0.2969         | 41   | 79   | 36   | 8    | R46719/64 |
|        | 7.60  | 0.2992         | 41   | 79   | 36   | 8    | R4677.6   |
|        | 7.70  | 0.3031         | 41   | 79   | 36   | 8    | R4677.7   |
|        | 7.80  | 0.3071         | 41   | 79   | 36   | 8    | R4677.8   |
|        | 7.90  | 0.3110         | 41   | 79   | 36   | 8    | R4677.9   |
| 5/16   | 7.94  | 0.3125         | 41   | 79   | 36   | 8    | R4675/16  |
|        | 8.00  | 0.3150         | 41   | 79   | 36   | 8    | R4678.0   |
|        | 8.05  | 0.3169         | 47   | 89   | 40   | 10   | R4678.05  |
|        | 8.10  | 0.3189         | 47   | 89   | 40   | 10   | R4678.1   |
|        | 8.20  | 0.3228         | 47   | 89   | 40   | 10   | R4678.2   |
|        | 8.30  | 0.3268         | 47   | 89   | 40   | 10   | R4678.3   |
| 21/64  | 8.33  | 0.3281         | 47   | 89   | 40   | 10   | R46721/64 |
|        | 8.40  | 0.3307         | 47   | 89   | 40   | 10   | R4678.4   |
|        | 8.50  | 0.3346         | 47   | 89   | 40   | 10   | R4678.5   |
|        | 8.60  | 0.3386         | 47   | 89   | 40   | 10   | R4678.6   |
|        | 8.70  | 0.3425         | 47   | 89   | 40   | 10   | R4678.7   |
| 11/32  | 8.73  | 0.3438         | 47   | 89   | 40   | 10   | R46711/32 |
|        | 8.80  | 0.3465         | 47   | 89   | 40   | 10   | R4678.8   |
|        | 8.90  | 0.3504         | 47   | 89   | 40   | 10   | R4678.9   |
|        | 9.00  | 0.3543         | 47   | 89   | 40   | 10   | R4679.0   |
|        | 9.10  | 0.3583         | 47   | 89   | 40   | 10   | R4679.1   |
| 23/64  | 9.13  | 0.3594         | 47   | 89   | 40   | 10   | R46723/64 |
|        | 9.20  | 0.3622         | 47   | 89   | 40   | 10   | R4679.2   |
|        | 9.30  | 0.3661         | 47   | 89   | 40   | 10   | R4679.3   |
|        | 9.40  | 0.3701         | 47   | 89   | 40   | 10   | R4679.4   |
|        | 9.50  | 0.3740         | 47   | 89   | 40   | 10   | R4679.5   |
| 3/8    | 9.53  | 0.3750         | 47   | 89   | 40   | 10   | R4673/8   |
|        | 9.60  | 0.3780         | 47   | 89   | 40   | 10   | R4679.6   |
|        | 9.70  | 0.3819         | 47   | 89   | 40   | 10   | R4679.7   |
|        | 9.80  | 0.3858         | 47   | 89   | 40   | 10   | R4679.8   |
|        | 9.90  | 0.3898         | 47   | 89   | 40   | 10   | R4679.9   |
| 25/64  | 9.92  | 0.3906         | 47   | 89   | 40   | 10   | R46725/64 |
|        | 10.00 | 0.3937         | 47   | 89   | 40   | 10   | R46710.0  |
|        | 10.05 | 0.3957         | 55   | 102  | 45   | 12   | R46710.05 |
|        | 10.10 | 0.3976         | 55   | 102  | 45   | 12   | R46710.1  |
|        | 10.20 | 0.4016         | 55   | 102  | 45   | 12   | R46710.2  |
|        | 10.30 | 0.4055         | 55   | 102  | 45   | 12   | R46710.3  |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R467      |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
| 13/32  | 10.32 | 0.4063         | 55   | 102  | 45   | 12   | R46713/32 |
|        | 10.40 | 0.4094         | 55   | 102  | 45   | 12   | R46710.4  |
|        | 10.50 | 0.4134         | 55   | 102  | 45   | 12   | R46710.5  |
|        | 10.60 | 0.4173         | 55   | 102  | 45   | 12   | R46710.6  |
| 27/64  | 10.72 | 0.4219         | 55   | 102  | 45   | 12   | R46727/64 |
|        | 10.80 | 0.4252         | 55   | 102  | 45   | 12   | R46710.8  |
|        | 10.90 | 0.4291         | 55   | 102  | 45   | 12   | R46710.9  |
|        | 11.00 | 0.4331         | 55   | 102  | 45   | 12   | R46711.0  |
| 7/16   | 11.11 | 0.4375         | 55   | 102  | 45   | 12   | R4677/16  |
|        | 11.20 | 0.4409         | 55   | 102  | 45   | 12   | R46711.2  |
|        | 11.30 | 0.4449         | 55   | 102  | 45   | 12   | R46711.3  |
|        | 11.40 | 0.4488         | 55   | 102  | 45   | 12   | R46711.4  |
| 29/64  | 11.50 | 0.4528         | 55   | 102  | 45   | 12   | R46711.5  |
|        | 11.51 | 0.4531         | 55   | 102  | 45   | 12   | R46729/64 |
|        | 11.60 | 0.4567         | 55   | 102  | 45   | 12   | R46711.6  |
|        | 11.80 | 0.4646         | 55   | 102  | 45   | 12   | R46711.8  |
| 15/32  | 11.91 | 0.4688         | 55   | 102  | 45   | 12   | R46715/32 |
|        | 12.00 | 0.4724         | 55   | 102  | 45   | 12   | R46712.0  |
|        | 12.05 | 0.4744         | 60   | 107  | 45   | 14   | R46712.05 |
|        | 12.10 | 0.4764         | 60   | 107  | 45   | 14   | R46712.1  |
| 31/64  | 12.20 | 0.4803         | 60   | 107  | 45   | 14   | R46712.2  |
|        | 12.30 | 0.4844         | 60   | 107  | 45   | 14   | R46731/64 |
|        | 12.50 | 0.4921         | 60   | 107  | 45   | 14   | R46712.5  |
|        | 12.70 | 0.5000         | 60   | 107  | 45   | 14   | R46712.7  |
| 1/2    | 12.70 | 0.5000         | 60   | 107  | 45   | 14   | R4671/2   |
|        | 12.80 | 0.5039         | 60   | 107  | 45   | 14   | R46712.8  |
|        | 13.00 | 0.5118         | 60   | 107  | 45   | 14   | R46713.0  |
|        | 13.10 | 0.5156         | 60   | 107  | 45   | 14   | R46733/64 |
| 33/64  | 13.30 | 0.5236         | 60   | 107  | 45   | 14   | R46713.3  |
|        | 13.49 | 0.5313         | 60   | 107  | 45   | 14   | R46717/32 |
|        | 13.50 | 0.5315         | 60   | 107  | 45   | 14   | R46713.5  |
|        | 13.80 | 0.5433         | 60   | 107  | 45   | 14   | R46713.8  |
| 35/64  | 13.89 | 0.5469         | 60   | 107  | 45   | 14   | R46735/64 |
|        | 14.00 | 0.5512         | 60   | 107  | 45   | 14   | R46714.0  |
|        | 14.25 | 0.5610         | 65   | 115  | 48   | 16   | R46714.25 |
|        | 14.29 | 0.5625         | 65   | 115  | 48   | 16   | R4679/16  |
| 9/16   | 14.50 | 0.5709         | 65   | 115  | 48   | 16   | R46714.5  |
|        | 14.68 | 0.5781         | 65   | 115  | 48   | 16   | R46737/64 |
|        | 14.80 | 0.5827         | 65   | 115  | 48   | 16   | R46714.8  |
|        | 15.00 | 0.5906         | 65   | 115  | 48   | 16   | R46715.0  |
| 19/32  | 15.08 | 0.5938         | 65   | 115  | 48   | 16   | R46719/32 |
|        | 15.10 | 0.5945         | 65   | 115  | 48   | 16   | R46715.1  |
|        | 15.30 | 0.6024         | 65   | 115  | 48   | 16   | R46715.3  |
|        | 15.48 | 0.6094         | 65   | 115  | 48   | 16   | R46739/64 |
| 39/64  | 15.50 | 0.6102         | 65   | 115  | 48   | 16   | R46715.5  |
|        | 15.80 | 0.6220         | 65   | 115  | 48   | 16   | R46715.8  |
|        | 15.88 | 0.6250         | 65   | 115  | 48   | 16   | R4675/8   |
|        | 16.00 | 0.6299         | 65   | 115  | 48   | 16   | R46716.0  |

# R463 • Force M Spiraalboor met koelkanalen 5×D, specifiek voor roestvaste staalsoorten uit de ISO M groep.

|      |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| R463 | M1.1   | M1.2  | M2.1  | M2.2  | M2.3  | M3.1  | M3.2  | M3.3  | M4.1  | M4.2  | S1.1  | S1.2  | S1.3  | S2.1  | S2.2  | S3.1  | S3.2  | S4.1  | S4.2  |
|      | ■ 111G | ■ 94G | ■ 99G | ■ 81G | ■ 67E | ■ 83G | ■ 71G | ■ 65F | ■ 57F | ■ 49E | ■ 52V | ■ 43V | ■ 38U | ■ 57U | ■ 53U | ■ 43U | ■ 38U | ■ 33U | ■ 30U |

|      |    |            |     |      |       |             |     |  |  |  |
|------|----|------------|-----|------|-------|-------------|-----|--|--|--|
| R463 | HM | DIN 6537 L | 5XD | 140° | TiAlN | DIN 6535 HA | CTW |  |  |  |
|------|----|------------|-----|------|-------|-------------|-----|--|--|--|

**DORMER**



**R463**



**FORCE M**

3.00 - 16.00

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R463             |
|--------|------|----------------|------|------|------|------|------------------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |                  |
| 1/8    | 3.00 | 0.1181         | 28   | 66   | 36   | 6    | <b>R4633.0</b>   |
|        | 3.10 | 0.1220         | 28   | 66   | 36   | 6    | <b>R4633.1</b>   |
|        | 3.18 | 0.1250         | 28   | 66   | 36   | 6    | <b>R4631/8</b>   |
|        | 3.20 | 0.1260         | 28   | 66   | 36   | 6    | <b>R4633.2</b>   |
|        | 3.30 | 0.1299         | 28   | 66   | 36   | 6    | <b>R4633.3</b>   |
| 29     | 3.40 | 0.1339         | 28   | 66   | 36   | 6    | <b>R4633.4</b>   |
|        | 3.45 | 0.1360         | 28   | 66   | 36   | 6    | <b>R463N29</b>   |
|        | 3.50 | 0.1378         | 28   | 66   | 36   | 6    | <b>R4633.5</b>   |
|        | 3.57 | 0.1406         | 28   | 66   | 36   | 6    | <b>R4639/64</b>  |
| 9/64   | 3.60 | 0.1417         | 28   | 66   | 36   | 6    | <b>R4633.6</b>   |
|        | 3.70 | 0.1457         | 28   | 66   | 36   | 6    | <b>R4633.7</b>   |
|        | 3.80 | 0.1496         | 36   | 74   | 36   | 6    | <b>R4633.8</b>   |
|        | 3.90 | 0.1535         | 36   | 74   | 36   | 6    | <b>R4633.9</b>   |
|        | 3.97 | 0.1563         | 36   | 74   | 36   | 6    | <b>R4635/32</b>  |
| 5/32   | 4.00 | 0.1575         | 36   | 74   | 36   | 6    | <b>R4634.0</b>   |
|        | 4.05 | 0.1594         | 36   | 74   | 36   | 6    | <b>R4634.05</b>  |
|        | 4.10 | 0.1614         | 36   | 74   | 36   | 6    | <b>R4634.1</b>   |
|        | 4.20 | 0.1654         | 36   | 74   | 36   | 6    | <b>R4634.2</b>   |
|        | 4.30 | 0.1693         | 36   | 74   | 36   | 6    | <b>R4634.3</b>   |
| 11/64  | 4.37 | 0.1719         | 36   | 74   | 36   | 6    | <b>R46311/64</b> |
|        | 4.40 | 0.1732         | 36   | 74   | 36   | 6    | <b>R4634.4</b>   |
|        | 4.50 | 0.1772         | 36   | 74   | 36   | 6    | <b>R4634.5</b>   |
|        | 4.60 | 0.1811         | 36   | 74   | 36   | 6    | <b>R4634.6</b>   |
|        | 4.70 | 0.1850         | 36   | 74   | 36   | 6    | <b>R4634.7</b>   |
| 3/16   | 4.76 | 0.1875         | 44   | 82   | 36   | 6    | <b>R4633/16</b>  |
|        | 4.80 | 0.1890         | 44   | 82   | 36   | 6    | <b>R4634.8</b>   |
|        | 4.90 | 0.1929         | 44   | 82   | 36   | 6    | <b>R4634.9</b>   |
|        | 5.00 | 0.1969         | 44   | 82   | 36   | 6    | <b>R4635.0</b>   |
|        | 5.05 | 0.1988         | 44   | 82   | 36   | 6    | <b>R4635.05</b>  |
| 7      | 5.10 | 0.2008         | 44   | 82   | 36   | 6    | <b>R4635.1</b>   |
|        | 5.11 | 0.2010         | 44   | 82   | 36   | 6    | <b>R463N7</b>    |
|        | 5.16 | 0.2031         | 44   | 82   | 36   | 6    | <b>R46313/64</b> |
|        | 5.20 | 0.2047         | 44   | 82   | 36   | 6    | <b>R4635.2</b>   |
|        | 5.22 | 0.2055         | 44   | 82   | 36   | 6    | <b>R463N5</b>    |
| 5      | 5.30 | 0.2087         | 44   | 82   | 36   | 6    | <b>R4635.3</b>   |
|        | 5.40 | 0.2126         | 44   | 82   | 36   | 6    | <b>R4635.4</b>   |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R463      |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
| 7/32   | 5.50  | 0.2165         | 44   | 82   | 36   | 6    | R4635.5   |
|        | 5.56  | 0.2188         | 44   | 82   | 36   | 6    | R4637/32  |
|        | 5.60  | 0.2205         | 44   | 82   | 36   | 6    | R4635.6   |
|        | 5.70  | 0.2244         | 44   | 82   | 36   | 6    | R4635.7   |
|        | 5.80  | 0.2283         | 44   | 82   | 36   | 6    | R4635.8   |
| 15/64  | 5.90  | 0.2323         | 44   | 82   | 36   | 6    | R4635.9   |
|        | 5.95  | 0.2344         | 44   | 82   | 36   | 6    | R46315/64 |
|        | 6.00  | 0.2362         | 44   | 82   | 36   | 6    | R4636.0   |
|        | 6.05  | 0.2382         | 53   | 91   | 36   | 8    | R4636.05  |
|        | 6.10  | 0.2402         | 53   | 91   | 36   | 8    | R4636.1   |
| 1/4    | 6.20  | 0.2441         | 53   | 91   | 36   | 8    | R4636.2   |
|        | 6.30  | 0.2480         | 53   | 91   | 36   | 8    | R4636.3   |
|        | 6.35  | 0.2500         | 53   | 91   | 36   | 8    | R4631/4   |
|        | 6.40  | 0.2520         | 53   | 91   | 36   | 8    | R4636.4   |
|        | 6.50  | 0.2559         | 53   | 91   | 36   | 8    | R4636.5   |
| 17/64  | 6.60  | 0.2598         | 53   | 91   | 36   | 8    | R4636.6   |
|        | 6.70  | 0.2638         | 53   | 91   | 36   | 8    | R4636.7   |
|        | 6.75  | 0.2656         | 53   | 91   | 36   | 8    | R46317/64 |
|        | 6.80  | 0.2677         | 53   | 91   | 36   | 8    | R4636.8   |
|        | 6.90  | 0.2717         | 53   | 91   | 36   | 8    | R4636.9   |
| 9/32   | 7.00  | 0.2756         | 53   | 91   | 36   | 8    | R4637.0   |
|        | 7.10  | 0.2795         | 53   | 91   | 36   | 8    | R4637.1   |
|        | 7.14  | 0.2813         | 53   | 91   | 36   | 8    | R4639/32  |
|        | 7.20  | 0.2835         | 53   | 91   | 36   | 8    | R4637.2   |
|        | 7.30  | 0.2874         | 53   | 91   | 36   | 8    | R4637.3   |
| 19/64  | 7.40  | 0.2913         | 53   | 91   | 36   | 8    | R4637.4   |
|        | 7.50  | 0.2953         | 53   | 91   | 36   | 8    | R4637.5   |
|        | 7.54  | 0.2969         | 53   | 91   | 36   | 8    | R46319/64 |
|        | 7.60  | 0.2992         | 53   | 91   | 36   | 8    | R4637.6   |
|        | 7.70  | 0.3031         | 53   | 91   | 36   | 8    | R4637.7   |
| 5/16   | 7.80  | 0.3071         | 53   | 91   | 36   | 8    | R4637.8   |
|        | 7.90  | 0.3110         | 53   | 91   | 36   | 8    | R4637.9   |
|        | 7.94  | 0.3125         | 53   | 91   | 36   | 8    | R4635/16  |
|        | 8.00  | 0.3150         | 53   | 91   | 36   | 8    | R4638.0   |
|        | 8.05  | 0.3169         | 61   | 103  | 40   | 10   | R4638.05  |
| 21/64  | 8.10  | 0.3189         | 61   | 103  | 40   | 10   | R4638.1   |
|        | 8.20  | 0.3228         | 61   | 103  | 40   | 10   | R4638.2   |
|        | 8.30  | 0.3268         | 61   | 103  | 40   | 10   | R4638.3   |
|        | 8.33  | 0.3281         | 61   | 103  | 40   | 10   | R46321/64 |
|        | 8.40  | 0.3307         | 61   | 103  | 40   | 10   | R4638.4   |
| 11/32  | 8.50  | 0.3346         | 61   | 103  | 40   | 10   | R4638.5   |
|        | 8.60  | 0.3386         | 61   | 103  | 40   | 10   | R4638.6   |
|        | 8.70  | 0.3425         | 61   | 103  | 40   | 10   | R4638.7   |
|        | 8.73  | 0.3438         | 61   | 103  | 40   | 10   | R46311/32 |
|        | 8.80  | 0.3465         | 61   | 103  | 40   | 10   | R4638.8   |
| 23/64  | 8.90  | 0.3504         | 61   | 103  | 40   | 10   | R4638.9   |
|        | 9.00  | 0.3543         | 61   | 103  | 40   | 10   | R4639.0   |
|        | 9.10  | 0.3583         | 61   | 103  | 40   | 10   | R4639.1   |
|        | 9.13  | 0.3594         | 61   | 103  | 40   | 10   | R46323/64 |
|        | 9.20  | 0.3622         | 61   | 103  | 40   | 10   | R4639.2   |
| 3/8    | 9.30  | 0.3661         | 61   | 103  | 40   | 10   | R4639.3   |
|        | 9.40  | 0.3701         | 61   | 103  | 40   | 10   | R4639.4   |
|        | 9.50  | 0.3740         | 61   | 103  | 40   | 10   | R4639.5   |
|        | 9.53  | 0.3750         | 61   | 103  | 40   | 10   | R4633/8   |
|        | 9.60  | 0.3780         | 61   | 103  | 40   | 10   | R4639.6   |
| 25/64  | 9.70  | 0.3819         | 61   | 103  | 40   | 10   | R4639.7   |
|        | 9.80  | 0.3858         | 61   | 103  | 40   | 10   | R4639.8   |
|        | 9.90  | 0.3898         | 61   | 103  | 40   | 10   | R4639.9   |
|        | 9.92  | 0.3906         | 61   | 103  | 40   | 10   | R46325/64 |
|        | 10.00 | 0.3937         | 61   | 103  | 40   | 10   | R46310.0  |
|        | 10.05 | 0.3957         | 70   | 118  | 45   | 12   | R46310.05 |
|        | 10.10 | 0.3976         | 70   | 118  | 45   | 12   | R46310.1  |
|        | 10.20 | 0.4016         | 70   | 118  | 45   | 12   | R46310.2  |
|        | 10.30 | 0.4055         | 70   | 118  | 45   | 12   | R46310.3  |



| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R463      |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
| 13/32  | 10.32 | 0.4063         | 70   | 118  | 45   | 12   | R46313/32 |
|        | 10.40 | 0.4094         | 70   | 118  | 45   | 12   | R46310.4  |
|        | 10.50 | 0.4134         | 70   | 118  | 45   | 12   | R46310.5  |
|        | 10.60 | 0.4173         | 70   | 118  | 45   | 12   | R46310.6  |
| 27/64  | 10.72 | 0.4219         | 70   | 118  | 45   | 12   | R46327/64 |
|        | 10.80 | 0.4252         | 70   | 118  | 45   | 12   | R46310.8  |
|        | 10.90 | 0.4291         | 70   | 118  | 45   | 12   | R46310.9  |
|        | 11.00 | 0.4331         | 70   | 118  | 45   | 12   | R46311.0  |
| 7/16   | 11.11 | 0.4375         | 70   | 118  | 45   | 12   | R4637/16  |
|        | 11.20 | 0.4409         | 70   | 118  | 45   | 12   | R46311.2  |
|        | 11.30 | 0.4449         | 70   | 118  | 45   | 12   | R46311.3  |
|        | 11.40 | 0.4488         | 70   | 118  | 45   | 12   | R46311.4  |
| 29/64  | 11.50 | 0.4528         | 70   | 118  | 45   | 12   | R46311.5  |
|        | 11.51 | 0.4531         | 70   | 118  | 45   | 12   | R46329/64 |
|        | 11.60 | 0.4567         | 70   | 118  | 45   | 12   | R46311.6  |
|        | 11.80 | 0.4646         | 70   | 118  | 45   | 12   | R46311.8  |
| 15/32  | 11.91 | 0.4688         | 70   | 118  | 45   | 12   | R46315/32 |
|        | 12.00 | 0.4724         | 70   | 118  | 45   | 12   | R46312.0  |
|        | 12.05 | 0.4744         | 76   | 124  | 45   | 14   | R46312.05 |
|        | 12.20 | 0.4803         | 76   | 124  | 45   | 14   | R46312.2  |
| 31/64  | 12.30 | 0.4844         | 76   | 124  | 45   | 14   | R46331/64 |
|        | 12.50 | 0.4921         | 76   | 124  | 45   | 14   | R46312.5  |
|        | 12.70 | 0.5000         | 76   | 124  | 45   | 14   | R46312.7  |
|        | 12.70 | 0.5000         | 76   | 124  | 45   | 14   | R4631/2   |
| 33/64  | 12.80 | 0.5039         | 76   | 124  | 45   | 14   | R46312.8  |
|        | 13.00 | 0.5118         | 76   | 124  | 45   | 14   | R46313.0  |
|        | 13.10 | 0.5156         | 76   | 124  | 45   | 14   | R46333/64 |
|        | 13.30 | 0.5236         | 76   | 124  | 45   | 14   | R46313.3  |
| 17/32  | 13.49 | 0.5313         | 76   | 124  | 45   | 14   | R46317/32 |
|        | 13.50 | 0.5315         | 76   | 124  | 45   | 14   | R46313.5  |
|        | 13.80 | 0.5433         | 76   | 124  | 45   | 14   | R46313.8  |
|        | 13.89 | 0.5469         | 76   | 124  | 45   | 14   | R46335/64 |
| 35/64  | 14.00 | 0.5512         | 76   | 124  | 45   | 14   | R46314.0  |
|        | 14.25 | 0.5610         | 82   | 133  | 48   | 16   | R46314.25 |
|        | 14.29 | 0.5625         | 82   | 133  | 48   | 16   | R4639/16  |
|        | 14.50 | 0.5709         | 82   | 133  | 48   | 16   | R46314.5  |
| 37/64  | 14.68 | 0.5781         | 82   | 133  | 48   | 16   | R46337/64 |
|        | 14.80 | 0.5827         | 82   | 133  | 48   | 16   | R46314.8  |
|        | 15.00 | 0.5906         | 82   | 133  | 48   | 16   | R46315.0  |
|        | 15.08 | 0.5938         | 82   | 133  | 48   | 16   | R46319/32 |
| 19/32  | 15.10 | 0.5945         | 82   | 133  | 48   | 16   | R46315.1  |
|        | 15.30 | 0.6024         | 82   | 133  | 48   | 16   | R46315.3  |
|        | 15.48 | 0.6094         | 82   | 133  | 48   | 16   | R46339/64 |
|        | 15.50 | 0.6102         | 82   | 133  | 48   | 16   | R46315.5  |
| 5/8    | 15.80 | 0.6220         | 82   | 133  | 48   | 16   | R46315.8  |
|        | 15.88 | 0.6250         | 82   | 133  | 48   | 16   | R4635/8   |
|        | 16.00 | 0.6299         | 82   | 133  | 48   | 16   | R46316.0  |
|        |       |                |      |      |      |      |           |

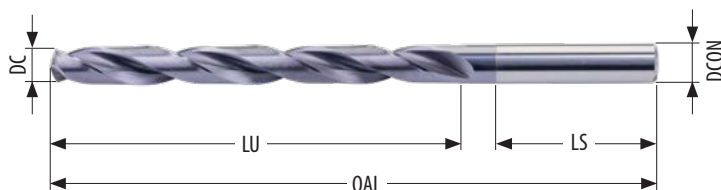
# R469

Force M boor met koelkanalen 8xD, specifiek voor roestvaste staalsoorten uit de ISO M groep.

| R469 | M1.1  | M1.2  | M2.1  | M2.2  | M2.3  | M3.1  | M3.2  | M3.3  | M4.1  | M4.2  | S1.1  | S1.2  | S1.3  | S2.1  | S2.2  | S3.1  | S3.2  | S4.1  | S4.2  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      | ■ 94F | ■ 79F | ■ 83F | ■ 68F | ■ 57D | ■ 70F | ■ 60F | ■ 54E | ■ 48E | ■ 42D | ■ 44U | ■ 36U | ■ 32U | ■ 48T | ■ 45T | ■ 36T | ■ 32T | ■ 28T | ■ 26T |

| R469 | HM | DORMER | 8XD | 140° | TiAIN | DIN 6535HA | CTW |  |  |
|------|----|--------|-----|------|-------|------------|-----|--|--|
|------|----|--------|-----|------|-------|------------|-----|--|--|

**DORMER**



**NEW**

**R469**

**FORCE M**

3.00 - 16.00

\*All items available upon request

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R469*     |
|--------|------|----------------|------|------|------|------|-----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
| 1/8    | 3.00 | 0.1181         | 37   | 79   | 36   | 6    | R4693.0   |
|        | 3.10 | 0.1220         | 37   | 79   | 36   | 6    | R4693.1   |
|        | 3.18 | 0.1250         | 37   | 79   | 36   | 6    | R4691/8   |
|        | 3.20 | 0.1260         | 37   | 79   | 36   | 6    | R4693.2   |
|        | 3.30 | 0.1299         | 37   | 79   | 36   | 6    | R4693.3   |
|        | 3.40 | 0.1339         | 37   | 79   | 36   | 6    | R4693.4   |
| 9/64   | 3.50 | 0.1378         | 37   | 79   | 36   | 6    | R4693.5   |
|        | 3.57 | 0.1406         | 37   | 79   | 36   | 6    | R4699/64  |
|        | 3.60 | 0.1417         | 37   | 79   | 36   | 6    | R4693.6   |
|        | 3.70 | 0.1457         | 37   | 79   | 36   | 6    | R4693.7   |
|        | 3.80 | 0.1496         | 48   | 90   | 36   | 6    | R4693.8   |
|        | 3.90 | 0.1535         | 48   | 90   | 36   | 6    | R4693.9   |
| 5/32   | 3.97 | 0.1563         | 48   | 90   | 36   | 6    | R4695/32  |
|        | 4.00 | 0.1575         | 48   | 90   | 36   | 6    | R4694.0   |
|        | 4.10 | 0.1614         | 48   | 90   | 36   | 6    | R4694.1   |
|        | 4.20 | 0.1654         | 48   | 90   | 36   | 6    | R4694.2   |
|        | 4.30 | 0.1693         | 48   | 90   | 36   | 6    | R4694.3   |
|        | 4.37 | 0.1719         | 48   | 90   | 36   | 6    | R46911/64 |
| 11/64  | 4.40 | 0.1732         | 48   | 90   | 36   | 6    | R4694.4   |
|        | 4.50 | 0.1772         | 48   | 90   | 36   | 6    | R4694.5   |
|        | 4.60 | 0.1811         | 48   | 90   | 36   | 6    | R4694.6   |
|        | 4.70 | 0.1850         | 62   | 104  | 36   | 6    | R4694.7   |
|        | 4.76 | 0.1875         | 62   | 104  | 36   | 6    | R4693/16  |
|        | 4.80 | 0.1890         | 62   | 104  | 36   | 6    | R4694.8   |
| 3/16   | 4.90 | 0.1929         | 62   | 104  | 36   | 6    | R4694.9   |
|        | 5.00 | 0.1969         | 62   | 104  | 36   | 6    | R4695.0   |
|        | 5.10 | 0.2008         | 62   | 104  | 36   | 6    | R4695.1   |
|        | 5.16 | 0.2031         | 62   | 104  | 36   | 6    | R46913/64 |
|        | 5.20 | 0.2047         | 62   | 104  | 36   | 6    | R4695.2   |
|        | 5.30 | 0.2087         | 62   | 104  | 36   | 6    | R4695.3   |
| 13/64  | 5.40 | 0.2126         | 62   | 104  | 36   | 6    | R4695.4   |
|        | 5.50 | 0.2165         | 62   | 104  | 36   | 6    | R4695.5   |
|        | 5.56 | 0.2188         | 62   | 104  | 36   | 6    | R4697/32  |
|        | 5.60 | 0.2205         | 62   | 104  | 36   | 6    | R4695.6   |
|        | 5.70 | 0.2244         | 62   | 104  | 36   | 6    | R4695.7   |
|        | 5.80 | 0.2283         | 62   | 104  | 36   | 6    | R4695.8   |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R469*     |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
|        | 5.90  | 0.2323         | 62   | 104  | 36   | 6    | R4695.9   |
| 15/64  | 5.95  | 0.2344         | 62   | 104  | 36   | 6    | R46915/64 |
|        | 6.00  | 0.2362         | 62   | 104  | 36   | 6    | R4696.0   |
|        | 6.10  | 0.2402         | 84   | 126  | 36   | 8    | R4696.1   |
|        | 6.20  | 0.2441         | 84   | 126  | 36   | 8    | R4696.2   |
|        | 6.30  | 0.2480         | 84   | 126  | 36   | 8    | R4696.3   |
| 1/4    | 6.35  | 0.2500         | 84   | 126  | 36   | 8    | R4691/4   |
|        | 6.40  | 0.2520         | 84   | 126  | 36   | 8    | R4696.4   |
|        | 6.50  | 0.2559         | 84   | 126  | 36   | 8    | R4696.5   |
|        | 6.60  | 0.2598         | 84   | 126  | 36   | 8    | R4696.6   |
|        | 6.70  | 0.2638         | 84   | 126  | 36   | 8    | R4696.7   |
| 17/64  | 6.75  | 0.2656         | 84   | 126  | 36   | 8    | R46917/64 |
|        | 6.80  | 0.2677         | 84   | 126  | 36   | 8    | R4696.8   |
|        | 6.90  | 0.2717         | 84   | 126  | 36   | 8    | R4696.9   |
|        | 7.00  | 0.2756         | 84   | 126  | 36   | 8    | R4697.0   |
|        | 7.10  | 0.2795         | 84   | 126  | 36   | 8    | R4697.1   |
| 9/32   | 7.14  | 0.2813         | 84   | 126  | 36   | 8    | R4699/32  |
|        | 7.20  | 0.2835         | 84   | 126  | 36   | 8    | R4697.2   |
|        | 7.30  | 0.2874         | 84   | 126  | 36   | 8    | R4697.3   |
|        | 7.40  | 0.2913         | 84   | 126  | 36   | 8    | R4697.4   |
|        | 7.50  | 0.2953         | 84   | 126  | 36   | 8    | R4697.5   |
| 19/64  | 7.54  | 0.2969         | 84   | 126  | 36   | 8    | R46919/64 |
|        | 7.60  | 0.2992         | 84   | 126  | 36   | 8    | R4697.6   |
|        | 7.70  | 0.3031         | 84   | 126  | 36   | 8    | R4697.7   |
|        | 7.80  | 0.3071         | 84   | 126  | 36   | 8    | R4697.8   |
|        | 7.90  | 0.3110         | 84   | 126  | 36   | 8    | R4697.9   |
| 5/16   | 7.94  | 0.3125         | 84   | 126  | 36   | 8    | R4695/16  |
|        | 8.00  | 0.3150         | 84   | 126  | 36   | 8    | R4698.0   |
|        | 8.10  | 0.3189         | 106  | 152  | 40   | 10   | R4698.1   |
|        | 8.20  | 0.3228         | 106  | 152  | 40   | 10   | R4698.2   |
|        | 8.30  | 0.3268         | 106  | 152  | 40   | 10   | R4698.3   |
| 21/64  | 8.33  | 0.3281         | 106  | 152  | 40   | 10   | R46921/64 |
|        | 8.40  | 0.3307         | 106  | 152  | 40   | 10   | R4698.4   |
|        | 8.50  | 0.3346         | 106  | 152  | 40   | 10   | R4698.5   |
|        | 8.60  | 0.3386         | 106  | 152  | 40   | 10   | R4698.6   |
|        | 8.70  | 0.3425         | 106  | 152  | 40   | 10   | R4698.7   |
| 11/32  | 8.73  | 0.3438         | 106  | 152  | 40   | 10   | R46911/32 |
|        | 8.80  | 0.3465         | 106  | 152  | 40   | 10   | R4698.8   |
|        | 8.90  | 0.3504         | 106  | 152  | 40   | 10   | R4698.9   |
|        | 9.00  | 0.3543         | 106  | 152  | 40   | 10   | R4699.0   |
|        | 9.10  | 0.3583         | 106  | 152  | 40   | 10   | R4699.1   |
| 23/64  | 9.13  | 0.3594         | 106  | 152  | 40   | 10   | R46923/64 |
|        | 9.20  | 0.3622         | 106  | 152  | 40   | 10   | R4699.2   |
|        | 9.30  | 0.3661         | 106  | 152  | 40   | 10   | R4699.3   |
|        | 9.40  | 0.3701         | 106  | 152  | 40   | 10   | R4699.4   |
|        | 9.50  | 0.3740         | 106  | 152  | 40   | 10   | R4699.5   |
| 3/8    | 9.53  | 0.3750         | 106  | 152  | 40   | 10   | R4693/8   |
|        | 9.60  | 0.3780         | 106  | 152  | 40   | 10   | R4699.6   |
|        | 9.70  | 0.3819         | 106  | 152  | 40   | 10   | R4699.7   |
|        | 9.80  | 0.3858         | 106  | 152  | 40   | 10   | R4699.8   |
|        | 9.90  | 0.3898         | 106  | 152  | 40   | 10   | R4699.9   |
| 25/64  | 9.92  | 0.3906         | 106  | 152  | 40   | 10   | R46925/64 |
|        | 10.00 | 0.3937         | 106  | 152  | 40   | 10   | R46910.0  |
|        | 10.20 | 0.4016         | 128  | 180  | 45   | 12   | R46910.2  |
|        | 10.30 | 0.4055         | 128  | 180  | 45   | 12   | R46910.3  |
| 13/32  | 10.32 | 0.4063         | 128  | 180  | 45   | 12   | R46913/32 |
|        | 10.40 | 0.4094         | 128  | 180  | 45   | 12   | R46910.4  |
|        | 10.50 | 0.4134         | 128  | 180  | 45   | 12   | R46910.5  |
| 27/64  | 10.72 | 0.4219         | 128  | 180  | 45   | 12   | R46927/64 |
|        | 10.80 | 0.4252         | 128  | 180  | 45   | 12   | R46910.8  |
|        | 11.00 | 0.4331         | 128  | 180  | 45   | 12   | R46911.0  |
| 7/16   | 11.11 | 0.4375         | 128  | 180  | 45   | 12   | R4697/16  |
|        | 11.20 | 0.4409         | 128  | 180  | 45   | 12   | R46911.2  |
|        | 11.30 | 0.4449         | 128  | 180  | 45   | 12   | R46911.3  |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R469*     |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
|        | 11.50 | 0.4528         | 128  | 180  | 45   | 12   | R46911.5  |
| 29/64  | 11.51 | 0.4531         | 128  | 180  | 45   | 12   | R46929/64 |
|        | 11.80 | 0.4646         | 128  | 180  | 45   | 12   | R46911.8  |
| 15/32  | 11.91 | 0.4688         | 128  | 180  | 45   | 12   | R46915/32 |
|        | 12.00 | 0.4724         | 128  | 180  | 45   | 12   | R46912.0  |
|        | 12.20 | 0.4803         | 151  | 202  | 48   | 14   | R46912.2  |
| 31/64  | 12.30 | 0.4844         | 151  | 202  | 48   | 14   | R46931/64 |
|        | 12.50 | 0.4921         | 151  | 202  | 48   | 14   | R46912.5  |
| 1/2    | 12.70 | 0.5000         | 151  | 202  | 48   | 14   | R4691/2   |
|        | 12.80 | 0.5039         | 151  | 202  | 48   | 14   | R46912.8  |
|        | 13.00 | 0.5118         | 151  | 202  | 48   | 14   | R46913.0  |
| 33/64  | 13.10 | 0.5156         | 151  | 202  | 48   | 14   | R46933/64 |
| 17/32  | 13.49 | 0.5313         | 151  | 202  | 48   | 14   | R46917/32 |
|        | 13.50 | 0.5315         | 151  | 202  | 48   | 14   | R46913.5  |
| 35/64  | 13.89 | 0.5469         | 151  | 202  | 48   | 14   | R46935/64 |
|        | 14.00 | 0.5512         | 151  | 202  | 48   | 14   | R46914.0  |
|        | 14.25 | 0.5610         | 172  | 227  | 48   | 16   | R46914.25 |
| 9/16   | 14.29 | 0.5625         | 172  | 227  | 48   | 16   | R4699/16  |
|        | 14.50 | 0.5709         | 172  | 227  | 48   | 16   | R46914.5  |
| 37/64  | 14.68 | 0.5781         | 172  | 227  | 48   | 16   | R46937/64 |
|        | 15.00 | 0.5906         | 172  | 227  | 48   | 16   | R46915.0  |
| 19/32  | 15.08 | 0.5938         | 172  | 227  | 48   | 16   | R46919/32 |
|        | 15.10 | 0.5945         | 172  | 227  | 48   | 16   | R46915.1  |
| 39/64  | 15.48 | 0.6094         | 172  | 227  | 48   | 16   | R46939/64 |
|        | 15.50 | 0.6102         | 172  | 227  | 48   | 16   | R46915.5  |
| 5/8    | 15.88 | 0.6250         | 172  | 227  | 48   | 16   | R4695/8   |
|        | 16.00 | 0.6299         | 172  | 227  | 48   | 16   | R46916.0  |

***FORCE N***



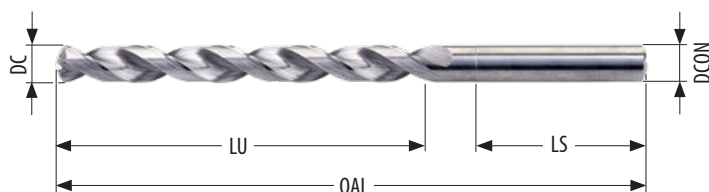
# R445

Force N boor met koelkanalen 8xD, specifiek voor aluminiumlegeringen uit de ISO N groep.

|      |        |        |        |        |        |        |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------|--------|--------|--------|--------|--------|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| R445 | N1.1   | N1.2   | N1.3   | N2.1   | N2.2   | N2.3   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|      | ■ 303Y | ■ 229Y | ■ 152Y | ■ 374X | ■ 336X | ■ 242X |  |  |  |  |  |  |  |  |  |  |  |  |  |

|      |    |        |     |      |  |            |   |  |  |  |  |  |  |  |  |  |  |  |  |
|------|----|--------|-----|------|--|------------|---|--|--|--|--|--|--|--|--|--|--|--|--|
| R445 | HM | DORMER | 5XD | 130° |  | DIN 6535HA | N |  |  |  |  |  |  |  |  |  |  |  |  |
|------|----|--------|-----|------|--|------------|---|--|--|--|--|--|--|--|--|--|--|--|--|

**DORMER**



**NEW**

**R445**



**FORCE N**

3.00 - 16.00

\*All items available upon request

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R445*     |
|--------|------|----------------|------|------|------|------|-----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
|        | 3.00 | 0.1181         | 28   | 66   | 36   | 6    | R4453.0   |
|        | 3.10 | 0.1220         | 28   | 66   | 36   | 6    | R4453.1   |
| 1/8    | 3.18 | 0.1250         | 28   | 66   | 36   | 6    | R4451/8   |
|        | 3.20 | 0.1260         | 28   | 66   | 36   | 6    | R4453.2   |
|        | 3.30 | 0.1299         | 28   | 66   | 36   | 6    | R4453.3   |
|        | 3.40 | 0.1339         | 28   | 66   | 36   | 6    | R4453.4   |
| 29     | 3.45 | 0.1360         | 28   | 66   | 36   | 6    | R445N29   |
|        | 3.50 | 0.1378         | 28   | 66   | 36   | 6    | R4453.5   |
| 9/64   | 3.57 | 0.1406         | 28   | 66   | 36   | 6    | R4459/64  |
|        | 3.60 | 0.1417         | 28   | 66   | 36   | 6    | R4453.6   |
|        | 3.70 | 0.1457         | 28   | 66   | 36   | 6    | R4453.7   |
|        | 3.80 | 0.1496         | 36   | 74   | 36   | 6    | R4453.8   |
|        | 3.90 | 0.1535         | 36   | 74   | 36   | 6    | R4453.9   |
| 5/32   | 3.97 | 0.1563         | 36   | 74   | 36   | 6    | R4455/32  |
|        | 4.00 | 0.1575         | 36   | 74   | 36   | 6    | R4454.0   |
|        | 4.05 | 0.1594         | 36   | 74   | 36   | 6    | R4454.05  |
|        | 4.10 | 0.1614         | 36   | 74   | 36   | 6    | R4454.1   |
|        | 4.20 | 0.1654         | 36   | 74   | 36   | 6    | R4454.2   |
|        | 4.30 | 0.1693         | 36   | 74   | 36   | 6    | R4454.3   |
| 11/64  | 4.37 | 0.1719         | 36   | 74   | 36   | 6    | R44511/64 |
|        | 4.40 | 0.1732         | 36   | 74   | 36   | 6    | R4454.4   |
|        | 4.50 | 0.1772         | 36   | 74   | 36   | 6    | R4454.5   |
|        | 4.60 | 0.1811         | 36   | 74   | 36   | 6    | R4454.6   |
|        | 4.70 | 0.1850         | 36   | 74   | 36   | 6    | R4454.7   |
| 3/16   | 4.76 | 0.1875         | 44   | 82   | 36   | 6    | R4453/16  |
|        | 4.80 | 0.1890         | 44   | 82   | 36   | 6    | R4454.8   |
|        | 4.90 | 0.1929         | 44   | 82   | 36   | 6    | R4454.9   |
|        | 5.00 | 0.1969         | 44   | 82   | 36   | 6    | R4455.0   |
|        | 5.05 | 0.1988         | 44   | 82   | 36   | 6    | R4455.05  |
|        | 5.10 | 0.2008         | 44   | 82   | 36   | 6    | R4455.1   |
| 7      | 5.11 | 0.2010         | 44   | 82   | 36   | 6    | R445N7    |
| 13/64  | 5.16 | 0.2031         | 44   | 82   | 36   | 6    | R44513/64 |
|        | 5.20 | 0.2047         | 44   | 82   | 36   | 6    | R4455.2   |
| 5      | 5.22 | 0.2055         | 44   | 82   | 36   | 6    | R445N5    |
|        | 5.30 | 0.2087         | 44   | 82   | 36   | 6    | R4455.3   |
|        | 5.40 | 0.2126         | 44   | 82   | 36   | 6    | R4455.4   |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R445*     |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
|        | 5.50  | 0.2165         | 44   | 82   | 36   | 6    | R4455.5   |
| 7/32   | 5.56  | 0.2188         | 44   | 82   | 36   | 6    | R4457/32  |
|        | 5.60  | 0.2205         | 44   | 82   | 36   | 6    | R4455.6   |
|        | 5.70  | 0.2244         | 44   | 82   | 36   | 6    | R4455.7   |
|        | 5.80  | 0.2283         | 44   | 82   | 36   | 6    | R4455.8   |
|        | 5.90  | 0.2323         | 44   | 82   | 36   | 6    | R4455.9   |
| 15/64  | 5.95  | 0.2344         | 44   | 82   | 36   | 6    | R44515/64 |
|        | 6.00  | 0.2362         | 44   | 82   | 36   | 6    | R4456.0   |
|        | 6.05  | 0.2382         | 53   | 91   | 36   | 8    | R4456.05  |
|        | 6.10  | 0.2402         | 53   | 91   | 36   | 8    | R4456.1   |
|        | 6.20  | 0.2441         | 53   | 91   | 36   | 8    | R4456.2   |
|        | 6.30  | 0.2480         | 53   | 91   | 36   | 8    | R4456.3   |
| 1/4    | 6.35  | 0.2500         | 53   | 91   | 36   | 8    | R4451/4   |
|        | 6.40  | 0.2520         | 53   | 91   | 36   | 8    | R4456.4   |
|        | 6.50  | 0.2559         | 53   | 91   | 36   | 8    | R4456.5   |
|        | 6.60  | 0.2598         | 53   | 91   | 36   | 8    | R4456.6   |
|        | 6.70  | 0.2638         | 53   | 91   | 36   | 8    | R4456.7   |
| 17/64  | 6.75  | 0.2656         | 53   | 91   | 36   | 8    | R44517/64 |
|        | 6.80  | 0.2677         | 53   | 91   | 36   | 8    | R4456.8   |
|        | 6.90  | 0.2717         | 53   | 91   | 36   | 8    | R4456.9   |
|        | 7.00  | 0.2756         | 53   | 91   | 36   | 8    | R4457.0   |
|        | 7.10  | 0.2795         | 53   | 91   | 36   | 8    | R4457.1   |
| 9/32   | 7.14  | 0.2813         | 53   | 91   | 36   | 8    | R4459/32  |
|        | 7.20  | 0.2835         | 53   | 91   | 36   | 8    | R4457.2   |
|        | 7.30  | 0.2874         | 53   | 91   | 36   | 8    | R4457.3   |
|        | 7.40  | 0.2913         | 53   | 91   | 36   | 8    | R4457.4   |
|        | 7.50  | 0.2953         | 53   | 91   | 36   | 8    | R4457.5   |
| 19/64  | 7.54  | 0.2969         | 53   | 91   | 36   | 8    | R44519/64 |
|        | 7.60  | 0.2992         | 53   | 91   | 36   | 8    | R4457.6   |
|        | 7.70  | 0.3031         | 53   | 91   | 36   | 8    | R4457.7   |
|        | 7.80  | 0.3071         | 53   | 91   | 36   | 8    | R4457.8   |
|        | 7.90  | 0.3110         | 53   | 91   | 36   | 8    | R4457.9   |
| 5/16   | 7.94  | 0.3125         | 53   | 91   | 36   | 8    | R4455/16  |
|        | 8.00  | 0.3150         | 53   | 91   | 36   | 8    | R4458.0   |
|        | 8.05  | 0.3169         | 61   | 103  | 40   | 10   | R4458.05  |
|        | 8.10  | 0.3189         | 61   | 103  | 40   | 10   | R4458.1   |
|        | 8.20  | 0.3228         | 61   | 103  | 40   | 10   | R4458.2   |
|        | 8.30  | 0.3268         | 61   | 103  | 40   | 10   | R4458.3   |
| 21/64  | 8.33  | 0.3281         | 61   | 103  | 40   | 10   | R44521/64 |
|        | 8.40  | 0.3307         | 61   | 103  | 40   | 10   | R4458.4   |
|        | 8.50  | 0.3346         | 61   | 103  | 40   | 10   | R4458.5   |
|        | 8.60  | 0.3386         | 61   | 103  | 40   | 10   | R4458.6   |
|        | 8.70  | 0.3425         | 61   | 103  | 40   | 10   | R4458.7   |
| 11/32  | 8.73  | 0.3438         | 61   | 103  | 40   | 10   | R44511/32 |
|        | 8.80  | 0.3465         | 61   | 103  | 40   | 10   | R4458.8   |
|        | 8.90  | 0.3504         | 61   | 103  | 40   | 10   | R4458.9   |
|        | 9.00  | 0.3543         | 61   | 103  | 40   | 10   | R4459.0   |
|        | 9.10  | 0.3583         | 61   | 103  | 40   | 10   | R4459.1   |
| 23/64  | 9.13  | 0.3594         | 61   | 103  | 40   | 10   | R44523/64 |
|        | 9.20  | 0.3622         | 61   | 103  | 40   | 10   | R4459.2   |
|        | 9.30  | 0.3661         | 61   | 103  | 40   | 10   | R4459.3   |
|        | 9.40  | 0.3701         | 61   | 103  | 40   | 10   | R4459.4   |
|        | 9.50  | 0.3740         | 61   | 103  | 40   | 10   | R4459.5   |
| 3/8    | 9.53  | 0.3750         | 61   | 103  | 40   | 10   | R4453/8   |
|        | 9.60  | 0.3780         | 61   | 103  | 40   | 10   | R4459.6   |
|        | 9.70  | 0.3819         | 61   | 103  | 40   | 10   | R4459.7   |
|        | 9.80  | 0.3858         | 61   | 103  | 40   | 10   | R4459.8   |
|        | 9.90  | 0.3898         | 61   | 103  | 40   | 10   | R4459.9   |
| 25/64  | 9.92  | 0.3906         | 61   | 103  | 40   | 10   | R44525/64 |
|        | 10.00 | 0.3937         | 61   | 103  | 40   | 10   | R44510.0  |
|        | 10.05 | 0.3957         | 70   | 118  | 45   | 12   | R44510.05 |
|        | 10.10 | 0.3976         | 70   | 118  | 45   | 12   | R44510.1  |
|        | 10.20 | 0.4016         | 70   | 118  | 45   | 12   | R44510.2  |
|        | 10.30 | 0.4055         | 70   | 118  | 45   | 12   | R44510.3  |



| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R445*     |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
| 13/32  | 10.32 | 0.4063         | 70   | 118  | 45   | 12   | R44513/32 |
|        | 10.40 | 0.4094         | 70   | 118  | 45   | 12   | R44510.4  |
|        | 10.50 | 0.4134         | 70   | 118  | 45   | 12   | R44510.5  |
|        | 10.60 | 0.4173         | 70   | 118  | 45   | 12   | R44510.6  |
| 27/64  | 10.72 | 0.4219         | 70   | 118  | 45   | 12   | R44527/64 |
|        | 10.80 | 0.4252         | 70   | 118  | 45   | 12   | R44510.8  |
|        | 10.90 | 0.4291         | 70   | 118  | 45   | 12   | R44510.9  |
|        | 11.00 | 0.4331         | 70   | 118  | 45   | 12   | R44511.0  |
| 7/16   | 11.11 | 0.4375         | 70   | 118  | 45   | 12   | R4457/16  |
|        | 11.20 | 0.4409         | 70   | 118  | 45   | 12   | R44511.2  |
|        | 11.30 | 0.4449         | 70   | 118  | 45   | 12   | R44511.3  |
|        | 11.40 | 0.4488         | 70   | 118  | 45   | 12   | R44511.4  |
| 29/64  | 11.50 | 0.4528         | 70   | 118  | 45   | 12   | R44511.5  |
|        | 11.51 | 0.4531         | 70   | 118  | 45   | 12   | R44529/64 |
|        | 11.60 | 0.4567         | 70   | 118  | 45   | 12   | R44511.6  |
|        | 11.80 | 0.4646         | 70   | 118  | 45   | 12   | R44511.8  |
| 15/32  | 11.91 | 0.4688         | 70   | 118  | 45   | 12   | R44515/32 |
|        | 12.00 | 0.4724         | 70   | 118  | 45   | 12   | R44512.0  |
|        | 12.05 | 0.4744         | 76   | 124  | 45   | 14   | R44512.05 |
|        | 12.20 | 0.4803         | 76   | 124  | 45   | 14   | R44512.2  |
| 31/64  | 12.30 | 0.4844         | 76   | 124  | 45   | 14   | R44531/64 |
|        | 12.50 | 0.4921         | 76   | 124  | 45   | 14   | R44512.5  |
| 1/2    | 12.70 | 0.5000         | 76   | 124  | 45   | 14   | R4451/2   |
|        | 12.70 | 0.5000         | 76   | 124  | 45   | 14   | R44512.7  |
|        | 12.80 | 0.5039         | 76   | 124  | 45   | 14   | R44512.8  |
|        | 13.00 | 0.5118         | 76   | 124  | 45   | 14   | R44513.0  |
| 33/64  | 13.10 | 0.5156         | 76   | 124  | 45   | 14   | R44533/64 |
|        | 13.30 | 0.5236         | 76   | 124  | 45   | 14   | R44513.3  |
| 17/32  | 13.49 | 0.5313         | 76   | 124  | 45   | 14   | R44517/32 |
|        | 13.50 | 0.5315         | 76   | 124  | 45   | 14   | R44513.5  |
|        | 13.80 | 0.5433         | 76   | 124  | 45   | 14   | R44513.8  |
| 35/64  | 13.89 | 0.5469         | 76   | 124  | 45   | 14   | R44535/64 |
|        | 14.00 | 0.5512         | 76   | 124  | 45   | 14   | R44514.0  |
|        | 14.25 | 0.5610         | 82   | 133  | 48   | 16   | R44514.25 |
| 9/16   | 14.29 | 0.5625         | 82   | 133  | 48   | 16   | R4459/16  |
|        | 14.50 | 0.5709         | 82   | 133  | 48   | 16   | R44514.5  |
| 37/64  | 14.68 | 0.5781         | 82   | 133  | 48   | 16   | R44537/64 |
|        | 14.80 | 0.5827         | 82   | 133  | 48   | 16   | R44514.8  |
|        | 15.00 | 0.5906         | 82   | 133  | 48   | 16   | R44515.0  |
| 19/32  | 15.08 | 0.5938         | 82   | 133  | 48   | 16   | R44519/32 |
|        | 15.10 | 0.5945         | 82   | 133  | 48   | 16   | R44515.1  |
|        | 15.30 | 0.6024         | 82   | 133  | 48   | 16   | R44515.3  |
| 39/64  | 15.48 | 0.6094         | 82   | 133  | 48   | 16   | R44539/64 |
|        | 15.50 | 0.6102         | 82   | 133  | 48   | 16   | R44515.5  |
|        | 15.80 | 0.6220         | 82   | 133  | 48   | 16   | R44515.8  |
| 5/8    | 15.88 | 0.6250         | 82   | 133  | 48   | 16   | R4455/8   |
|        | 16.00 | 0.6299         | 82   | 133  | 48   | 16   | R44516.0  |

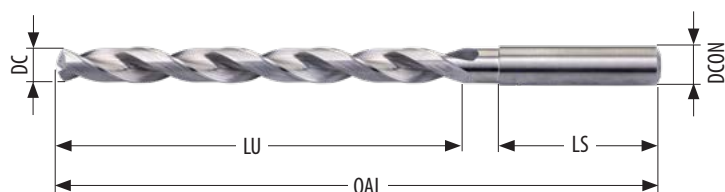
# R448

Force N boor met koelkanalen 8xD, specifiek voor aluminiumlegeringen uit de ISO N groep.

|      |        |        |        |        |        |        |  |  |  |  |  |  |  |  |  |  |  |  |
|------|--------|--------|--------|--------|--------|--------|--|--|--|--|--|--|--|--|--|--|--|--|
| R448 | N1.1   | N1.2   | N1.3   | N2.1   | N2.2   | N2.3   |  |  |  |  |  |  |  |  |  |  |  |  |
|      | ■ 357Z | ■ 269Z | ■ 179Y | ■ 440X | ■ 395X | ■ 285X |  |  |  |  |  |  |  |  |  |  |  |  |

|      |    |            |     |      |  |             |   |  |  |  |  |
|------|----|------------|-----|------|--|-------------|---|--|--|--|--|
| R448 | HM | DIN 6537 L | 8XD | 130° |  | DIN 6535 HA | N |  |  |  |  |
|------|----|------------|-----|------|--|-------------|---|--|--|--|--|

**DORMER**



**NEW**

**R448**



**FORCE N**

3.00 - 16.00

\*All items available upon request

| DC     | DC   | DC             | LU   | OAL  | LS   | DCON | R448*     |
|--------|------|----------------|------|------|------|------|-----------|
| [inch] | [mm] | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
| 1/8    | 3.00 | 0.1181         | 37   | 79   | 36   | 6    | R4483.0   |
|        | 3.10 | 0.1220         | 37   | 79   | 36   | 6    | R4483.1   |
|        | 3.18 | 0.1250         | 37   | 79   | 36   | 6    | R4481/8   |
|        | 3.20 | 0.1260         | 37   | 79   | 36   | 6    | R4483.2   |
|        | 3.30 | 0.1299         | 37   | 79   | 36   | 6    | R4483.3   |
| 9/64   | 3.40 | 0.1339         | 37   | 79   | 36   | 6    | R4483.4   |
|        | 3.50 | 0.1378         | 37   | 79   | 36   | 6    | R4483.5   |
|        | 3.57 | 0.1406         | 37   | 79   | 36   | 6    | R4489/64  |
|        | 3.60 | 0.1417         | 37   | 79   | 36   | 6    | R4483.6   |
|        | 3.70 | 0.1457         | 37   | 79   | 36   | 6    | R4483.7   |
| 5/32   | 3.80 | 0.1496         | 48   | 90   | 36   | 6    | R4483.8   |
|        | 3.90 | 0.1535         | 48   | 90   | 36   | 6    | R4483.9   |
|        | 3.97 | 0.1563         | 48   | 90   | 36   | 6    | R4485/32  |
|        | 4.00 | 0.1575         | 48   | 90   | 36   | 6    | R4484.0   |
|        | 4.10 | 0.1614         | 48   | 90   | 36   | 6    | R4484.1   |
| 11/64  | 4.20 | 0.1654         | 48   | 90   | 36   | 6    | R4484.2   |
|        | 4.30 | 0.1693         | 48   | 90   | 36   | 6    | R4484.3   |
|        | 4.37 | 0.1719         | 48   | 90   | 36   | 6    | R44811/64 |
|        | 4.40 | 0.1732         | 48   | 90   | 36   | 6    | R4484.4   |
|        | 4.50 | 0.1772         | 48   | 90   | 36   | 6    | R4484.5   |
| 3/16   | 4.60 | 0.1811         | 48   | 90   | 36   | 6    | R4484.6   |
|        | 4.70 | 0.1850         | 62   | 104  | 36   | 6    | R4484.7   |
|        | 4.76 | 0.1875         | 62   | 104  | 36   | 6    | R4483/16  |
|        | 4.80 | 0.1890         | 62   | 104  | 36   | 6    | R4484.8   |
|        | 4.90 | 0.1929         | 62   | 104  | 36   | 6    | R4484.9   |
| 7/32   | 5.00 | 0.1969         | 62   | 104  | 36   | 6    | R4485.0   |
|        | 5.10 | 0.2008         | 62   | 104  | 36   | 6    | R4485.1   |
|        | 5.16 | 0.2031         | 62   | 104  | 36   | 6    | R44813/64 |
|        | 5.20 | 0.2047         | 62   | 104  | 36   | 6    | R4485.2   |
|        | 5.30 | 0.2087         | 62   | 104  | 36   | 6    | R4485.3   |
|        | 5.40 | 0.2126         | 62   | 104  | 36   | 6    | R4485.4   |
|        | 5.50 | 0.2165         | 62   | 104  | 36   | 6    | R4485.5   |
|        | 5.56 | 0.2188         | 62   | 104  | 36   | 6    | R4487/32  |
|        | 5.60 | 0.2205         | 62   | 104  | 36   | 6    | R4485.6   |
|        | 5.70 | 0.2244         | 62   | 104  | 36   | 6    | R4485.7   |
|        | 5.80 | 0.2283         | 62   | 104  | 36   | 6    | R4485.8   |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R448*     |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
|        | 5.90  | 0.2323         | 62   | 104  | 36   | 6    | R4485.9   |
| 15/64  | 5.95  | 0.2344         | 62   | 104  | 36   | 6    | R44815/64 |
|        | 6.00  | 0.2362         | 62   | 104  | 36   | 6    | R4486.0   |
|        | 6.10  | 0.2402         | 84   | 126  | 36   | 8    | R4486.1   |
|        | 6.20  | 0.2441         | 84   | 126  | 36   | 8    | R4486.2   |
|        | 6.30  | 0.2480         | 84   | 126  | 36   | 8    | R4486.3   |
| 1/4    | 6.35  | 0.2500         | 84   | 126  | 36   | 8    | R4481/4   |
|        | 6.40  | 0.2520         | 84   | 126  | 36   | 8    | R4486.4   |
|        | 6.50  | 0.2559         | 84   | 126  | 36   | 8    | R4486.5   |
|        | 6.60  | 0.2598         | 84   | 126  | 36   | 8    | R4486.6   |
|        | 6.70  | 0.2638         | 84   | 126  | 36   | 8    | R4486.7   |
| 17/64  | 6.75  | 0.2656         | 84   | 126  | 36   | 8    | R44817/64 |
|        | 6.80  | 0.2677         | 84   | 126  | 36   | 8    | R4486.8   |
|        | 6.90  | 0.2717         | 84   | 126  | 36   | 8    | R4486.9   |
|        | 7.00  | 0.2756         | 84   | 126  | 36   | 8    | R4487.0   |
|        | 7.10  | 0.2795         | 84   | 126  | 36   | 8    | R4487.1   |
| 9/32   | 7.14  | 0.2813         | 84   | 126  | 36   | 8    | R4489/32  |
|        | 7.20  | 0.2835         | 84   | 126  | 36   | 8    | R4487.2   |
|        | 7.30  | 0.2874         | 84   | 126  | 36   | 8    | R4487.3   |
|        | 7.40  | 0.2913         | 84   | 126  | 36   | 8    | R4487.4   |
|        | 7.50  | 0.2953         | 84   | 126  | 36   | 8    | R4487.5   |
| 19/64  | 7.54  | 0.2969         | 84   | 126  | 36   | 8    | R44819/64 |
|        | 7.60  | 0.2992         | 84   | 126  | 36   | 8    | R4487.6   |
|        | 7.70  | 0.3031         | 84   | 126  | 36   | 8    | R4487.7   |
|        | 7.80  | 0.3071         | 84   | 126  | 36   | 8    | R4487.8   |
|        | 7.90  | 0.3110         | 84   | 126  | 36   | 8    | R4487.9   |
| 5/16   | 7.94  | 0.3125         | 84   | 126  | 36   | 8    | R4485/16  |
|        | 8.00  | 0.3150         | 84   | 126  | 36   | 8    | R4488.0   |
|        | 8.10  | 0.3189         | 106  | 152  | 40   | 10   | R4488.1   |
|        | 8.20  | 0.3228         | 106  | 152  | 40   | 10   | R4488.2   |
|        | 8.30  | 0.3268         | 106  | 152  | 40   | 10   | R4488.3   |
| 21/64  | 8.33  | 0.3281         | 106  | 152  | 40   | 10   | R44821/64 |
|        | 8.40  | 0.3307         | 106  | 152  | 40   | 10   | R4488.4   |
|        | 8.50  | 0.3346         | 106  | 152  | 40   | 10   | R4488.5   |
|        | 8.60  | 0.3386         | 106  | 152  | 40   | 10   | R4488.6   |
|        | 8.70  | 0.3425         | 106  | 152  | 40   | 10   | R4488.7   |
| 11/32  | 8.73  | 0.3438         | 106  | 152  | 40   | 10   | R44811/32 |
|        | 8.80  | 0.3465         | 106  | 152  | 40   | 10   | R4488.8   |
|        | 8.90  | 0.3504         | 106  | 152  | 40   | 10   | R4488.9   |
|        | 9.00  | 0.3543         | 106  | 152  | 40   | 10   | R4489.0   |
|        | 9.10  | 0.3583         | 106  | 152  | 40   | 10   | R4489.1   |
| 23/64  | 9.13  | 0.3594         | 106  | 152  | 40   | 10   | R44823/64 |
|        | 9.20  | 0.3622         | 106  | 152  | 40   | 10   | R4489.2   |
|        | 9.30  | 0.3661         | 106  | 152  | 40   | 10   | R4489.3   |
|        | 9.40  | 0.3701         | 106  | 152  | 40   | 10   | R4489.4   |
|        | 9.50  | 0.3740         | 106  | 152  | 40   | 10   | R4489.5   |
| 3/8    | 9.53  | 0.3750         | 106  | 152  | 40   | 10   | R4483/8   |
|        | 9.60  | 0.3780         | 106  | 152  | 40   | 10   | R4489.6   |
|        | 9.70  | 0.3819         | 106  | 152  | 40   | 10   | R4489.7   |
|        | 9.80  | 0.3858         | 106  | 152  | 40   | 10   | R4489.8   |
|        | 9.90  | 0.3898         | 106  | 152  | 40   | 10   | R4489.9   |
| 25/64  | 9.92  | 0.3906         | 106  | 152  | 40   | 10   | R44825/64 |
|        | 10.00 | 0.3937         | 106  | 152  | 40   | 10   | R44810.0  |
|        | 10.20 | 0.4016         | 128  | 180  | 45   | 12   | R44810.2  |
|        | 10.30 | 0.4055         | 128  | 180  | 45   | 12   | R44810.3  |
| 13/32  | 10.32 | 0.4063         | 128  | 180  | 45   | 12   | R44813/32 |
|        | 10.40 | 0.4094         | 128  | 180  | 45   | 12   | R44810.4  |
|        | 10.50 | 0.4134         | 128  | 180  | 45   | 12   | R44810.5  |
| 27/64  | 10.72 | 0.4219         | 128  | 180  | 45   | 12   | R44827/64 |
|        | 10.80 | 0.4252         | 128  | 180  | 45   | 12   | R44810.8  |
|        | 11.00 | 0.4331         | 128  | 180  | 45   | 12   | R44811.0  |
| 7/16   | 11.11 | 0.4375         | 128  | 180  | 45   | 12   | R4487/16  |
|        | 11.20 | 0.4409         | 128  | 180  | 45   | 12   | R44811.2  |
|        | 11.30 | 0.4449         | 128  | 180  | 45   | 12   | R44811.3  |

| DC     | DC    | DC             | LU   | OAL  | LS   | DCON | R448*     |
|--------|-------|----------------|------|------|------|------|-----------|
| [inch] | [mm]  | decimal [inch] | [mm] | [mm] | [mm] | [mm] |           |
|        | 11.50 | 0.4528         | 128  | 180  | 45   | 12   | R44811.5  |
| 29/64  | 11.51 | 0.4531         | 128  | 180  | 45   | 12   | R44829/64 |
|        | 11.80 | 0.4646         | 128  | 180  | 45   | 12   | R44811.8  |
| 15/32  | 11.91 | 0.4688         | 128  | 180  | 45   | 12   | R44815/32 |
|        | 12.00 | 0.4724         | 128  | 180  | 45   | 12   | R44812.0  |
|        | 12.20 | 0.4803         | 151  | 202  | 48   | 14   | R44812.2  |
| 31/64  | 12.30 | 0.4844         | 151  | 202  | 48   | 14   | R44831/64 |
|        | 12.50 | 0.4921         | 151  | 202  | 48   | 14   | R44812.5  |
| 1/2    | 12.70 | 0.5000         | 151  | 202  | 48   | 14   | R4481/2   |
|        | 12.80 | 0.5039         | 151  | 202  | 48   | 14   | R44812.8  |
|        | 13.00 | 0.5118         | 151  | 202  | 48   | 14   | R44813.0  |
| 33/64  | 13.10 | 0.5156         | 151  | 202  | 48   | 14   | R44833/64 |
| 17/32  | 13.49 | 0.5313         | 151  | 202  | 48   | 14   | R44817/32 |
|        | 13.50 | 0.5315         | 151  | 202  | 48   | 14   | R44813.5  |
| 35/64  | 13.89 | 0.5469         | 151  | 202  | 48   | 14   | R44835/64 |
|        | 14.00 | 0.5512         | 151  | 202  | 48   | 14   | R44814.0  |
|        | 14.25 | 0.5610         | 172  | 227  | 48   | 16   | R44814.25 |
| 9/16   | 14.29 | 0.5625         | 172  | 227  | 48   | 16   | R4489/16  |
|        | 14.50 | 0.5709         | 172  | 227  | 48   | 16   | R44814.5  |
| 37/64  | 14.68 | 0.5781         | 172  | 227  | 48   | 16   | R44837/64 |
|        | 15.00 | 0.5906         | 172  | 227  | 48   | 16   | R44815.0  |
| 19/32  | 15.08 | 0.5938         | 172  | 227  | 48   | 16   | R44819/32 |
|        | 15.10 | 0.5945         | 172  | 227  | 48   | 16   | R44815.1  |
| 39/64  | 15.48 | 0.6094         | 172  | 227  | 48   | 16   | R44839/64 |
|        | 15.50 | 0.6102         | 172  | 227  | 48   | 16   | R44815.5  |
| 5/8    | 15.88 | 0.6250         | 172  | 227  | 48   | 16   | R4485/8   |
|        | 16.00 | 0.6299         | 172  | 227  | 48   | 16   | R44816.0  |

# TECHNISCHE INFORMATIE

---

## HET BOREN VAN HELLENDE OPPERVlakKEN

|                                             |                                                                       |                                                     |                                        |
|---------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------|
|                                             |                                                                       |                                                     |                                        |
| <p>Binnenkomen met gereduceerde voeding</p> | <p>Center voor het boren<br/>Binnenkomen met gereduceerde voeding</p> | <p>Een vlak oppervlak frezen vooraleer te boren</p> | <p>Uitgang met gereduceerd voeding</p> |

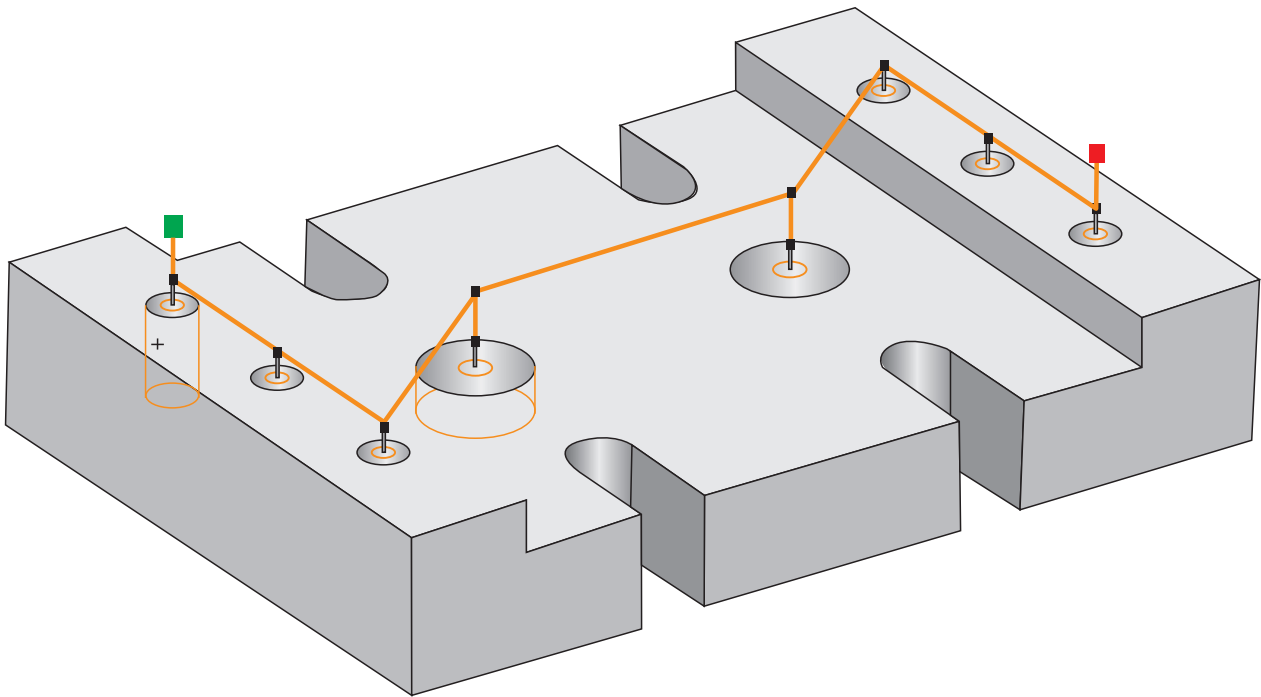
## REDUCEER VOEDING

|                         |                         |                         |
|-------------------------|-------------------------|-------------------------|
|                         |                         |                         |
| <p>Reduceer voeding</p> | <p>Reduceer voeding</p> | <p>Reduceer voeding</p> |

## ONREGELMATIGE OPPERVlakKEN BOREN

|                                        |                                                                                 |                                                        |
|----------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------|
|                                        |                                                                                 |                                                        |
| <p>Bij kruisgaten reduceer voeding</p> | <p>Gebruik industrieel papier (ca. 0,5-1 mm) dik geplaatst tussen de platen</p> | <p>Opboren van bestaand gat wordt NIET aanbevolen.</p> |

## CENTERVLAK



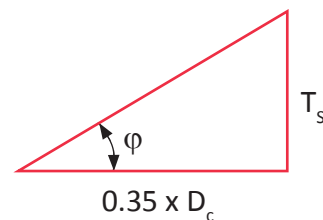
Met de toenemende nauwkeurigheid van productieboeren is centreren niet zo gebruikelijk als het vroeger was. Echter, wanneer je het nodig hebt om te zorgen voor een nauwkeurige positionering van de gaten en om te vermijden dat boren verlopen dan biedt het een zeer effectieve oplossing. Aancenteren is een bijzonder aanbevolen handeling voor het boren van diepe gaten.

Centreerboren zijn ontworpen om zeer stabiel een nauwkeurige centrering aan te brengen ten behoeve van een spiraalboor. Het primaire doel

van een centreerboor is het aanbrengen van een putje in het werkstukmateriaal waardoor de spiraalboor niet verloopt en het gat geboord wordt op de juiste positie.

Idealieter is de diameter van dit putje maximaal 70% van de diameter die het gat moet worden. De in te stellen diepte kan met de onderstaande formule worden berekend waarbij  $D_c$  de diameter is van de uiteindelijke gatdiameter en dus niet van de centreerboor.

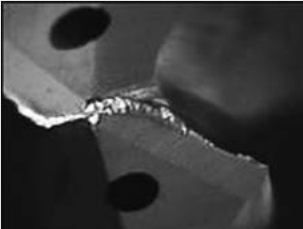
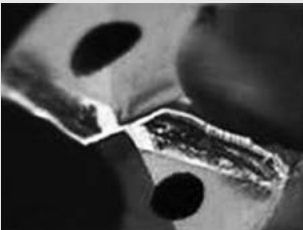
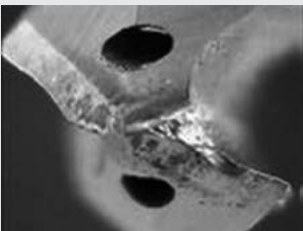
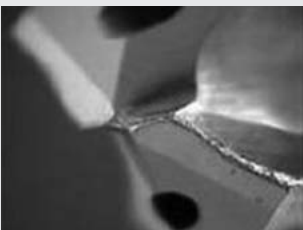
$$T_s = 0.35 \times D_c \times \tan \varphi$$



**Aanbevolen centreerboor bij de FORCE boren is de R125!**



**FAILURE MODES**

| PROBLEEM                                                                                                                          | OORZAAK                                                                                                                                                                                                                        | OPLOSSING                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Opbouw snijkant</b><br>                       | <ol style="list-style-type: none"> <li>1. Te lage snijsnelheid en snijkantstemperatuur</li> <li>2. Te grote negatieve snijkantsfase</li> <li>3. Geen coating</li> <li>4. Te laag oliepercentage in de koelvloeistof</li> </ol> | <ol style="list-style-type: none"> <li>1. Verhoog de snijsnelheid of gebruik externe koeling</li> <li>2. Scherpere snijkant nodig</li> <li>3. Zorg voor gecoate snijkant</li> <li>4. Verhoog oliepercentage</li> </ol> |
| <b>Uitbrokkelen van de snijhoek</b><br>          | <ol style="list-style-type: none"> <li>1. Onstabiele opspanning</li> <li>2. Te veel slingering</li> <li>3. Onderbroken snede</li> <li>4. Onvoldoende koeling, thermo shock</li> <li>5. Onstabiele opspanhouder</li> </ol>      | <ol style="list-style-type: none"> <li>1. Check opspanning</li> <li>2. Check rondloopnauwkeuringheid</li> <li>3. Verlaag voeding</li> <li>4. Check koelmiddeltoevoer</li> <li>5. Check gereedschaphouder</li> </ol>    |
| <b>Grote slijtage van de snijkant</b><br>      | <ol style="list-style-type: none"> <li>1. Snijsnelheid te hoog</li> <li>2. Voeding te laag</li> <li>3. Basismateriaal te zacht</li> <li>4. Te weinig koeling</li> </ol>                                                        | <ol style="list-style-type: none"> <li>1. Verlaag de snijsnelheid</li> <li>2. Verhoog de voeding</li> <li>3. Kies een hardere boor</li> <li>4. Verhoog de koelmiddeltoevoer</li> </ol>                                 |
| <b>Uitbrokkelen van de snijkant</b><br>        | <ol style="list-style-type: none"> <li>1. Onstabiele onstandigheden</li> <li>2. Maximum toegestane slijtage overschreden</li> <li>3. Te hard basismateriaal</li> </ol>                                                         | <ol style="list-style-type: none"> <li>1. Check de setup</li> <li>2. Vervang de boor eerder</li> <li>3. Kies een zachtere boor</li> </ol>                                                                              |
| <b>Grote slijtage van de geleiderand</b><br>   | <ol style="list-style-type: none"> <li>1. Slingering te groot</li> <li>2. Te lage koeldruk</li> <li>3. Snijsnelheid te hoog</li> <li>4. Abrasief werkstukmateriaal</li> </ol>                                                  | <ol style="list-style-type: none"> <li>1. Check rondloopnauwkeuringheid</li> <li>2. Gebruik zuivere olie of een vettere emulsie</li> <li>3. Verlaag snijsnelheid</li> <li>4. Kies een hardere boor</li> </ol>          |
| <b>Grote slijtage van de dwarssnijkant</b><br> | <ol style="list-style-type: none"> <li>1. Snijsnelheid te laag</li> <li>2. Voeding te hoog</li> <li>3. Dwarssnijkant te klein</li> </ol>                                                                                       | <ol style="list-style-type: none"> <li>1. Verhoog de snijsnelheid</li> <li>2. Verlaag de voeding</li> <li>3. Check geometrie</li> </ol>                                                                                |







# SIMPLY RELIABLE

De spaan is een duidelijke en ongecompliceerde vorm met een verhaal. Als professional kunt u de kwaliteit van het werk beoordelen door alleen kijken naar de spaan. Het geeft een duidelijk en consistent signaal en dat is waarom we het gebruiken als een symbool voor het zijn van 'Simply Reliable'.

## Argentina

T: 54 (11) 6777-6777  
F: 54 (11) 4441-4467  
info.ar@dormerpramet.com

## Austria

T: +31 10 2080 240  
info.at@dormerpramet.com

## Belgium & Luxembourg

T: +32 3 440 59 01  
info.be@dormerpramet.com

## Brazil

T: +55 11 5660 3000  
info.br@dormerpramet.com

## Canada

T: (888) 336 7637  
En Français: (888) 368 8457  
F: (905) 542 7000  
cs.canada@dormerpramet.com

## China

T: +86 21 2416 0508  
info.cn@dormerpramet.com

## Croatia

T: +385 98 407 489  
info.hr@dormerpramet.com

## Czech Republic

T: +420 583 381 111  
F: +420 583 215 401  
info.cz@dormerpramet.com

## Denmark

T: 808 82106  
info.se@dormerpramet.com

## Finland

T: 0205 44 7003  
info.fi@dormerpramet.com

## France

T: +33 (0)2 47 62 57 01  
F: +33 (0)2 47 62 52 00  
info.fr@dormerpramet.com

## Germany

T: +49 9131 933 08 70  
F: +49 9131 933 08 742  
info.de@dormerpramet.com

## Hungary

T: +36-96 / 522-846  
F: +36-96 / 522-847  
info.hu@dormerpramet.com

## India

T: +91 11 4601 5686  
info.in@dormerpramet.com

## Italy

T: +39 02 30 70 54 44  
info.it@dormerpramet.com

## Kazakhstan

T: +7 771 305 11 45  
info.kz@dormerpramet.com

## Mexico

T: +52 (555) 7293981  
F: +52 (555) 7293981  
cs.mexico@dormerpramet.com

## Netherlands

T: +31 10 2080 240  
info.nl@dormerpramet.com

## Norway

T: 800 10 113  
info.se@dormerpramet.com

## Poland

T: +48 32 78-15-890  
F: +48 32 78-60-406  
info.pl@dormerpramet.com

## Portugal

T: +351 21 424 54 21  
info.pt@dormerpramet.com

## Romania

T: +4(0)730 015 885  
info.ro@dormerpramet.com

## Russia

T: +7 (495) 775 10 28  
Φ: +7 (499) 763 38 90  
info.ru@dormerpramet.com

## Slovakia

T: +421 (41) 764 54 60  
F: +421 (41) 763 74 49  
info.sk@dormerpramet.com

## Slovenia

T: +385 98 407 489  
info.si@dormerpramet.com

## Spain

T: +34 935717722  
info.es@dormerpramet.com

## Sweden

responsible for Iceland  
T: +46 35 16 52 96  
info.se@dormerpramet.com

## Switzerland

T: +31 10 2080 240  
info.ch@dormerpramet.com

## Turkey

T: +90 533 212 45 47  
info.tr@dormerpramet.com

## Ukraine

T: +38 056 736 30 21  
F: +38 067 220 97 48  
info.ua@dormerpramet.com

## United Kingdom

responsible for Ireland  
T: 0870 850 4466  
F: 0870 850 8866  
info.uk@dormerpramet.com

## United States of America

T: (800) 877-3745  
F: (847) 783-5760  
cs@dormerpramet.com

## Other countries

### South America

T: +55 11 5660 3000  
info.br@dormerpramet.com

### Adria

T: +420 583 381 527  
F: +420 583 381 401  
info.rcee@dormerpramet.com

### Rest of the World

Dormer Pramet International UK  
T: +44 1246 571338  
F: +44 1246 571339  
info.int@dormerpramet.com

### Dormer Pramet International CZ

T: +420 583 381 520  
F: +420 583 215 401  
info.int.cz@dormerpramet.com

DOR-BRO-FORCE-2020-NL