| Material Type ● Recommended ○ Suitable | | Hardness HB | 10F, 10L | Recommended Surface Speed in m/min | Recommended feed in mm per revolution Drill Diameter in mm | | | | 2A7 | 6A6 | Recommended Surface Speed in m/min | Recommended feed in mm per revolution Drill Diameter in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 12 | 15 | 16 | 20 | | | | 12 | 15 | 16 | 20 | 25 | 30 | 40 |
| Steel | Free Cutting Steel | ‹ 120 | ● | 35 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | ● | ● | 35 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | 0.334-0.556 | 0.349-0.581 | 0.364-0.606 |
| | Structural Steel | ‹ 200 | ● | 30 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | ● | ● | 30 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | 0.266-0.444 | 0.281-0.469 | 0.299-0.498 |
| | Plain Carbon Steel | ‹ 250 | ● | 27 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | ● | ● | 27 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | 0.233-0.388 | 0.248-0.413 | 0.266-0.444 |
| | Alloy Steel | ‹ 250 | ● | 23 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | ● | ● | 23 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | 0.206-0.344 | 0.221-0.369 | 0.240-0.400 |
| | Alloy Steel - Hardened | 250-350 | ● | 12 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | ● | ● | 12 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 |
| | Alloy Steel - Hardened | › 350 | ● | 10 | 0.098-0.163 | 0.112-0.186 | 0.116-0.194 | 0.141-0.235 | ● | ● | 10 | 0.098-0.163 | 0.112-0.186 | 0.116-0.194 | 0.141-0.235 | 0.158-0.263 | 0.171-0.285 | 0.190-0.316 |
| Stainless Steel | Free machining Stainless Steel | ‹ 250 | ● | 24 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | ● | ● | 24 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 |
| | Austenitic Stainless Steel | ‹ 320 | ● | 11 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | ● | ● | 11 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | 0.233-0.388 | 0.248-0.413 | 0.266-0.444 |
| | Ferritic and Martensitic Stainless Steel | ‹ 300 | ● | 17 | 0.083-0.138 | 0.094-0.156 | 0.098-0.163 | 0.120-0.200 | ● | ● | 17 | 0.083-0.138 | 0.094-0.156 | 0.098-0.163 | 0.120-0.200 | 0.135-0.225 | 0.146-0.244 | 0.165-0.275 |
| Cast Iron | Lamellar Graphite Cast Iron | ‹ 150 | ● | 35 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | ● | ● | 35 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | 0.334-0.556 | 0.349-0.581 | 0.364-0.606 |
| | Lamellar Graphite Cast Iron | 150-300 | ● | 28 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | ● | ● | 28 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | 0.233-0.388 | 0.248-0.413 | 0.266-0.444 |
| | Nodular Graphite, Malleable Cast Iron | ‹ 200 | ● | 22 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | ● | ● | 22 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 |
| | Nodular Graphite, Malleable Cast Iron | 200-300 | ● | 17 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | ● | ● | 17 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 |
| Titanium | Titanium unalloyed | ‹ 200 | ○ | 28 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | ○ | ○ | 28 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | 0.233-0.388 | 0.248-0.413 | 0.266-0.444 |
| | Titanium alloyed | ‹ 270 | ○ | 11 | 0.083-0.138 | 0.094-0.156 | 0.098-0.163 | 0.120-0.200 | ○ | ○ | 11 | 0.083-0.138 | 0.094-0.156 | 0.098-0.163 | 0.120-0.200 | 0.135-0.225 | 0.146-0.244 | 0.165-0.275 |
| | Titanium alloyed | 270-350 | ○ | 6 | 0.045-0.075 | 0.051-0.085 | 0.053-0.089 | 0.065-0.109 | ○ | ○ | 6 | 0.045-0.075 | 0.051-0.085 | 0.053-0.089 | 0.065-0.109 | 0.074-0.123 | 0.079-0.133 | 0.090-0.151 |
| Nickel | Nickel unalloyed | ‹ 150 | ○ | 15 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | ○ | ○ | 15 | 0.154-0.256 | 0.173-0.289 | 0.180-0.300 | 0.210-0.350 | 0.233-0.388 | 0.248-0.413 | 0.266-0.444 |
| | Nickel alloyed | ‹ 270 | ○ | 7 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | ○ | ○ | 7 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 |
| | Nickel alloyed | 270-350 | ○ | 6 | 0.068-0.113 | 0.077-0.129 | 0.081-0.135 | 0.097-0.161 | ○ | ○ | 6 | 0.068-0.113 | 0.077-0.129 | 0.081-0.135 | 0.097-0.161 | 0.108-0.180 | 0.115-0.191 | 0.124-0.206 |
| Copper | Copper | ‹ 100 | ● | 38 | 0.289-0.481 | 0.314-0.524 | 0.323-0.538 | 0.364-0.606 | ○ | ○ | 38 | 0.289-0.481 | 0.314-0.524 | 0.323-0.538 | 0.364-0.606 | 0.394-0.656 | 0.409-0.681 | 0.426-0.710 |
| | Beta Brass, Bronze | ‹ 200 | ● | 40 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | ○ | ○ | 40 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | 0.334-0.556 | 0.349-0.581 | 0.364-0.606 |
| | Alpha Brass | ‹ 200 | ● | 27 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | ○ | ○ | 27 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | 0.266-0.444 | 0.281-0.469 | 0.299-0.498 |
| | High strength Bronze | ‹ 470 | ● | 21 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | ○ | ○ | 21 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | 0.206-0.344 | 0.221-0.369 | 0.240-0.400 |
| Aluminium | Aluminium Magnesium unalloyed | ‹ 100 | ● | 33 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | ● | ● | 33 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | 0.334-0.556 | 0.349-0.581 | 0.364-0.606 |
| | Aluminium Alloy ‹ 5% Si | ‹ 150 | ● | 30 | 0.210-0.350 | 0.233-0.388 | 0.240-0.400 | 0.270-0.450 | ● | ● | 30 | 0.210-0.350 | 0.233-0.388 | 0.240-0.400 | 0.270-0.450 | 0.300-0.500 | 0.315-0.525 | 0.330-0.550 |
| | Aluminium Alloy 5 to 10% Si | ‹ 120 | ● | 30 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | ● | ● | 30 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | 0.266-0.444 | 0.281-0.469 | 0.299-0.498 |
| | Aluminium Alloy › 10% Si | | ● | 27 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | ● | ● | 27 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | 0.206-0.344 | 0.221-0.369 | 0.240-0.400 |
| Synthetic | Duroplastics (short chipping) | - | ● | 35 | 0.263-0.438 | 0.291-0.485 | 0.300-0.500 | 0.338-0.563 | ○ | ○ | 35 | 0.263-0.438 | 0.291-0.485 | 0.300-0.500 | 0.338-0.563 | 0.368-0.613 | 0.383-0.638 | 0.398-0.663 |
| | Thermoplastics (long chipping) | - | ● | 28 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | ○ | ○ | 28 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | 0.334-0.556 | 0.349-0.581 | 0.364-0.606 |
| | Fibre reinforced synthetic materials | - | ● | 20 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | ○ | ○ | 20 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | 0.266-0.444 | 0.281-0.469 | 0.299-0.498 |

| Material Type ● Recommended ○ Suitable | | Hardness HB | 2A1, 2A2 | Recommended Surface Speed in m/min | Recommended feed in mm per revolution Drill Diameter in mm | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 10 | 12 | 15 | 16 | 20 | 25 | 30 | 40 | 50 |
| Steel | Free Cutting Steel | ‹ 120 | ● | 35 | 0.199-0.331 | 0.210-0.350 | 0.233-0.388 | 0.240-0.400 | 0.270-0.450 | 0.300-0.500 | 0.315-0.525 | 0.330-0.550 | 0.345-0.575 |
| | Structural Steel | ‹ 200 | ● | 30 | 0.199-0.331 | 0.210-0.350 | 0.233-0.388 | 0.240-0.400 | 0.270-0.450 | 0.300-0.500 | 0.315-0.525 | 0.330-0.550 | 0.345-0.575 |
| | Plain Carbon Steel | ‹ 250 | ● | 25 | 0.124-0.206 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | 0.206-0.344 | 0.221-0.369 | 0.240-0.400 | 0.257-0.429 |
| | Alloy Steel | ‹ 250 | ● | 23 | 0.124-0.206 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | 0.206-0.344 | 0.221-0.369 | 0.240-0.400 | 0.257-0.429 |
| | Alloy Steel - Hardened | 250-350 | ● | 12 | 0.105-0.175 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 | 0.233-0.388 |
| | Alloy Steel - Hardened | › 350 | ○ | 9 | 0.089-0.149 | 0.068-0.163 | 0.112-0.186 | 0.116-0.194 | 0.141-0.235 | 0.158-0.263 | 0.171-0.285 | 0.190-0.316 | 0.206-0.344 |
| Cast Iron | Lamellar Graphite Cast Iron | ‹ 150 | ● | 30 | 0.199-0.331 | 0.210-0.350 | 0.233-0.388 | 0.240-0.400 | 0.270-0.450 | 0.300-0.500 | 0.315-0.525 | 0.330-0.550 | 0.345-0.575 |
| | Lamellar Graphite Cast Iron | 150-300 | ● | 24 | 0.105-0.175 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 | 0.233-0.388 |
| | Nodular Graphite, Malleable Cast Iron | ‹ 200 | ● | 20 | 0.105-0.175 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 | 0.233-0.388 |
| | Nodular Graphite, Malleable Cast Iron | 200-300 | ● | 14 | 0.105-0.175 | 0.113-0.188 | 0.130-0.216 | 0.135-0.225 | 0.161-0.269 | 0.180-0.300 | 0.195-0.325 | 0.214-0.356 | 0.233-0.388 |
| Copper | Copper | ‹ 100 | ● | 35 | 0.124-0.206 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | 0.206-0.344 | 0.221-0.369 | 0.240-0.400 | 0.257-0.429 |
| | Beta Brass, Bronze | ‹ 200 | ● | 35 | 0.199-0.331 | 0.210-0.350 | 0.233-0.388 | 0.240-0.400 | 0.270-0.450 | 0.300-0.500 | 0.315-0.525 | 0.330-0.550 | 0.345-0.575 |
| | Alpha Brass | ‹ 200 | ● | 18 | 0.112-0.285 | 0.121-0.302 | 0.140-0.349 | 0.144-0.360 | 0.173-0.432 | 0.192-0.480 | 0.211-0.528 | 0.230-0.576 | 0.249-0.624 |
| | High strength Bronze | ‹ 470 | ● | 16 | 0.124-0.206 | 0.134-0.223 | 0.152-0.253 | 0.158-0.263 | 0.186-0.310 | 0.206-0.344 | 0.221-0.369 | 0.240-0.400 | 0.257-0.429 |
| Aluminium | Aluminium Magnesium unalloyed | ‹ 100 | ○ | 26 | 0.224-0.373 | 0.236-0.394 | 0.262-0.436 | 0.270-0.450 | 0.304-0.506 | 0.334-0.556 | 0.349-0.581 | 0.364-0.606 | 0.377-0.629 |
| | Aluminium Alloy ‹ 5% Si | ‹ 150 | ○ | 30 | 0.199-0.331 | 0.210-0.350 | 0.233-0.388 | 0.240-0.400 | 0.270-0.450 | 0.300-0.500 | 0.315-0.525 | 0.330-0.550 | 0.345-0.575 |
| | Aluminium Alloy 5 to 10% Si | ‹ 120 | ○ | 28 | 0.171-0.285 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | 0.266-0.444 | 0.281-0.469 | 0.299-0.498 | 0.314-0.523 |
| | Aluminium Alloy › 10% Si | | ○ | 23 | 0.171-0.285 | 0.182-0.304 | 0.203-0.339 | 0.210-0.350 | 0.240-0.400 | 0.266-0.444 | 0.281-0.469 | 0.299-0.498 | 0.314-0.523 |

Parameters based on ideal conditions. Please adjust parameter accordingly to real applications.
**% Speed and Feed reduction for deep hole drilling:** More than 3 x Drill Diameter - 10%, More than 4 x Drill Diameter - 20%, More than 5 x Drill Diameter - 30%, More than 6 x Drill Diameter - 40%

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CHIPBREAKER DRILLS

# Chipbreaker Drills


## The Chipbreaker Concept

This outstanding development increases drill cutting efficiency by means of greatly improved chip control. A chipbreaker rib is positioned along the length of the flutes, which curls and breaks long chip forming material into small manageable chips for easier evacuation.
There is no clogging of chips in the flutes, as small chips flow freely along the flutes. The chipbreaker drill thus cuts more freely than standard drills.

The small chips also permit coolant to flow more freely to the drill point, giving improved heat dissipation and drilling performance.
As the chipbreaker rib extends down the entire flute length, the chipbreaker form and effect is retained even after conventional sharpening. The chipbreaker rib gives added rigidity, markedly increasing the number of holes per re-grind, even where chip control is not considered important.


## Chipbreaker Coolant Feed Drills

The benefits of providing coolant internally directly to the drill cutting edge include higher cutting speeds (reduced times by up to 75%), higher feed rates, longer tool life (3 to 10 times), and less frequent resharpening. In addition they provide a superior finish.

The coolant assists in clearing chips from the drill point and it's pressure forces the swarf along the flutes of the drill facilitating drilling to greater depths without repeated withdrawal to clear swarf.

Coolant tubes are located away from the drill web, thus not affecting web strength, and connect to all coolant systems.

Coolant can be provided by the normal coolant pump supplied with most machines using soluble oil. However, we recommend using a mist coolant at a pressure of 550 to 800 kPa (80 to 120psi). This method is clean and efficient, eliminating the problem of collecting, filtering and re-using the coolant.

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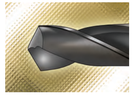
# Chipbreaker Drill Style Variations

Somta offers a range of Straight Shank and Morse Taper Shank Chipbreaker Drills, with variations in point angle, HSS grade, Finish and coolant feed options.

## Point Styles

### 118° & 130° Conical

The conventional chipbreaker drill point angle is 118° or 130°, which is suitable for the majority of high performance applications. 130° is suitable for harder materials.



### 118° Multi-Facet

The 118° multi-Facet point angle requires less thrust than conical therefore generates less heat. It is self centering and therefore ideal for NC Machining.

### 170° Brad

Where through-holes are being drilled and there is a requirement for high operational efficiency without the need for deburring on punch-through, we recommend the use of a 170° brad point angle.

## Coolant Feed Styles

### Normal Chipbreaker

This is the usual configuration of the Chipbreaker Drill, which has no coolant feed.

### Oil Tube Chipbreaker

Coolant is fed through shank cross holes into oil tubes which are inserted into a groove which runs down the length of the flutes. Oil is fed from the tubes at the outer edge of the point diameter directly onto the workpiece, cooling the workpiece and stimulating small chip evacuation. Because the chipbreaker rib breaks up long stringy chips into small pieces there is no chance of chips snagging and removing the coolant tube.


# Material Types

## HSS Material Grades & Finish

### HSS

Most chipbreaker drills are manufactured from standard High Speed Steel material. HSS chipbreakers have a black oxide steam tempered finish.

### HSS-Co5

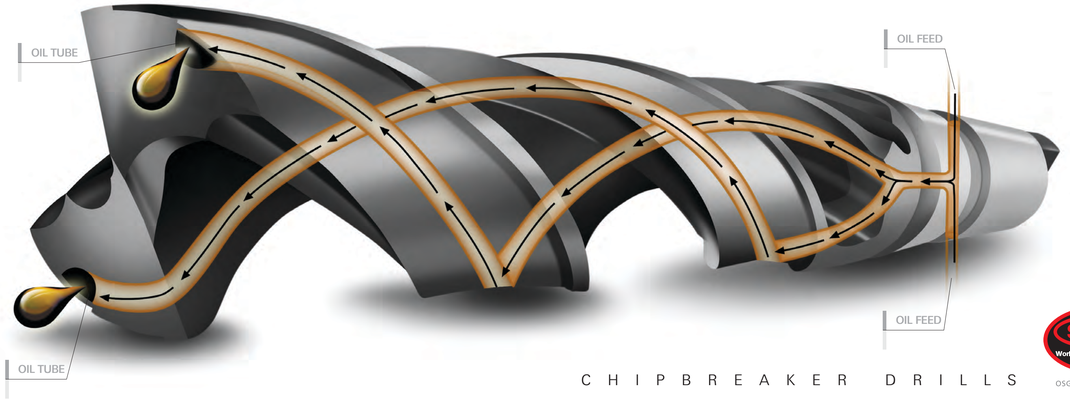
We also offer HSS-Co5 to extend product life even further due to the superiority of HSS-Co5 over HSS. All HSS-Co5 chipbreakers are finished with Gold Oxide surface treatment or are TiAlN coated to differentiate from the HSS steam tempered finish.

## Chipbreaker Product Codes & Features

The following table represents the standard range of Straight Shank & Morse Taper Shank Chipbreaker Drills stocked by Somta.

| Product Code | Coolant Feed Option | Material | Point Style | Shank Type | Finish |
|---|---|---|---|---|---|
| 10F | Oil Tube | HSS-Co5 | 118° Multi-Facet | SS (5xD) | TiAlN |
| 10L | Oil Tube | HSS-Co5 | 118° Multi-Facet | SS (10xD) | TiAlN |
| 2A1 | None | HSS | 118° Conical | MTS | Steam Temper |
| 2A2 | Oil Tube | HSS | 130° Conical | MTS | Steam Temper |
| 2A7 | Oil Tube | HSS-Co5 | 170° Brad | MTS | Gold Oxide |
| 2A9 | Oil Tube | HSS-Co5 | 130° Conical | MTS | TiAlN |

For ordering, specify the product code followed by a 4 digit code to represent the diameter. For example a 30.5mm diameter oil tube HSS-Co5 170° brad point chipbreaker would be ordered as Product Code 2A73050.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