

# Tools – Hole Saws

## Dimensions



## Important Operating Notes

- These saws are unsuitable for hammer drill operation
- Only slight pressure required to start drilling
- Drill with light, steady pressure
- Avoid pendulum movements while drilling
- Follow table of cutting speeds
- Use cooling agents recommended for material
- Arbors are sold separately

*Note: For pushbuttons, use RUKO knockout punches listed in previous pages.*

| RUKO Hole Saws Selection Guide, continued |         |  |         |                    |                      |                 |                     |                      |
|---|---------|--|---------|--------------------|----------------------|-----------------|---------------------|----------------------|
| Part #<br>High Speed<br>Steel             | Price   | Part #<br>High Speed<br>Steel Cobalt 8 | Price   | Diameter<br>(mm) A | Diameter<br>(inch) A | Conduit<br>Size | Pipe Size<br>(inch) | For Arbor<br>Holders |
| <a href="#">106060</a>                    | \$10.50 | <a href="#">126060</a>                 | \$14.00 | 60                 | 2-3/8                | –               | –                   | A2 / A6              |
| <a href="#">106063</a>                    | \$11.00 | not available                          |         | 63                 | 2-15/32              | –               | –                   | A2 / A6              |
| <a href="#">106064</a>                    | \$11.00 | <a href="#">126064</a>                 | \$14.50 | 64                 | 2-1/2                | 2               | 2                   | A2 / A6              |
| <a href="#">106065</a>                    | \$11.50 | not available                          |         | 65                 | 2-9/16               | –               | –                   | A2 / A6              |
| <a href="#">106067</a>                    | \$11.50 | <a href="#">126067</a>                 | \$15.00 | 67                 | 2-5/8                | –               | –                   | A2 / A6              |
| <a href="#">106068</a>                    | \$11.50 | not available                          |         | 68                 | 2-11/16              | –               | –                   | A2 / A6              |
| <a href="#">106070</a>                    | \$11.50 | <a href="#">126070</a>                 | \$15.50 | 70                 | 2-3/4                | –               | –                   | A2 / A6              |
| <a href="#">106073</a>                    | \$12.00 | <a href="#">126073</a>                 | \$16.00 | 73                 | 2-7/8                | –               | –                   | A2 / A6              |
| <a href="#">106076</a>                    | \$12.50 | <a href="#">126076</a>                 | \$16.50 | 76                 | 3                    | 2-1/2           | 2-1/2               | A2 / A6              |
| <a href="#">106079</a>                    | \$14.00 | <a href="#">126079</a>                 | \$18.00 | 79                 | 3-1/8                | –               | –                   | A2 / A6              |
| <a href="#">106083</a>                    | \$15.00 | <a href="#">126083</a>                 | \$19.50 | 83                 | 3-1/4                | –               | –                   | A2 / A6              |
| <a href="#">106086</a>                    | \$15.50 | <a href="#">126086</a>                 | \$20.00 | 86                 | 3-3/8                | –               | –                   | A2 / A6              |
| <a href="#">106089</a>                    | \$15.50 | <a href="#">126089</a>                 | \$20.50 | 89                 | 3-1/2                | –               | –                   | A2 / A6              |
| <a href="#">106092</a>                    | \$16.50 | <a href="#">126092</a>                 | \$21.50 | 92                 | 3-5/8                | 3               | 3                   | A2 / A6              |
| <a href="#">106095</a>                    | \$17.50 | <a href="#">126095</a>                 | \$23.00 | 95                 | 3-3/4                | –               | –                   | A2 / A6              |
| <a href="#">106098</a>                    | \$18.50 | <a href="#">126098</a>                 | \$24.50 | 98                 | 3-7/8                | –               | –                   | A2 / A6              |
| <a href="#">106102</a>                    | \$20.00 | <a href="#">126102</a>                 | \$26.00 | 102                | 4                    | –               | –                   | A2 / A6              |
| <a href="#">106105</a>                    | \$21.00 | not available                          |         | 105                | 4-1/8                | 3-1/2           | 3-1/2               | A2 / A6              |
| <a href="#">106108</a>                    | \$22.00 | <a href="#">126108</a>                 | \$28.50 | 108                | 4-1/4                | –               | –                   | A2 / A6              |
| <a href="#">106111</a>                    | \$23.50 | <a href="#">126111</a>                 | \$30.00 | 111                | 4-3/8                | –               | –                   | A2 / A6              |
| <a href="#">106114</a>                    | \$24.00 | <a href="#">126114</a>                 | \$31.00 | 114                | 4-1/2                | 4               | 4                   | A2 / A6              |
| <a href="#">106121</a>                    | \$24.50 | <a href="#">126121</a>                 | \$32.00 | 121                | 4-3/4                | –               | –                   | A2 / A6              |
| <a href="#">106127</a>                    | \$26.50 | <a href="#">126127</a>                 | \$35.00 | 127                | 5                    | –               | –                   | A2 / A6              |
| <a href="#">106133</a>                    | \$30.50 | not available                          |         | 133                | 5-1/4                | –               | –                   | A2 / A6              |
| <a href="#">106140</a>                    | \$30.50 | <a href="#">126140</a>                 | \$40.00 | 140                | 5-1/2                | –               | 5                   | A2 / A6              |
| <a href="#">106152</a>                    | \$35.00 | <a href="#">126152</a>                 | \$45.00 | 152                | 6                    | –               | –                   | A2 / A6              |
| <a href="#">106160</a>                    | \$39.00 | <a href="#">126160</a>                 | \$50.00 | 160                | 6-5/16               | –               | –                   | A2 / A6              |
| <a href="#">106168</a>                    | \$43.50 | <a href="#">126168</a>                 | \$56.00 | 168                | 6-5/8                | –               | –                   | A2 / A6              |
| <a href="#">106177</a>                    | \$48.00 | not available                          |         | 177                | 6-31/32              | –               | –                   | A2 / A6              |
| <a href="#">106200</a>                    | \$53.00 | <a href="#">126200</a>                 | \$68.00 | 210                | 8-1/4                | –               | –                   | A2 / A6              |

# Tools – Hole Saws

## Arbor Holders with Pilot Drill

To select the correct arbor size, find the arbors that are compatible with your hole saw diameter.

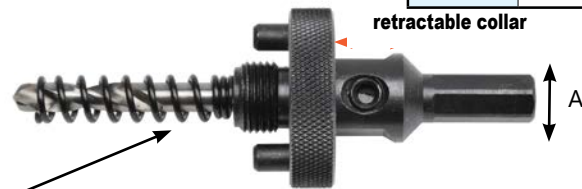
From those, choose one with a shank size that fits into your drill chuck.

Arbors include HSS pilot bit, ejector spring and 4 mm allen wrench.



Part Numbers [106202](#), [106209](#)

| RUKO Arbor Holders with Pilot Drill for HSS Hole Saws |         |  |                    |                         |             |                   |
|---|---------|--|--------------------|-------------------------|-------------|-------------------|
| Part # High Speed Steel                               | Price   | Hole Saws Diameter (inch)                                    | Arbor Holders Type | Shank Diameter (inch) A | Shank Shape | Thread            |
| <a href="#">106201</a>                                | \$7.50  | 9/16 - 1-3/16  | A1                 | 7/16                    | Hex         | 1/2in x 20 thread |
| <a href="#">106202</a>                                | \$14.00 | 1-1/4 - 8-1/4  | A2                 | 7/16                    | Hex         | 5/8in x 18 thread |
| <a href="#">106209</a>                                | \$14.00 | 1-1/4 - 8-1/4  | A6                 | 3/8                     | Hex         | 5/8in x 18 thread |
| <a href="#">106210</a>                                | \$10.00 | Part Numbers <a href="#">106201</a> , <a href="#">106210</a> |                    |                         | Hex         | 1/2in x 20 thread |



Pilot drill: 6.35 mm (1/4") x 82 mm (3-1/4")



Pilot drill: 6.35 mm (1/4") x 82 mm (3-1/4")

## Pilot Drills



| RUKO Pilot Drill for HSS and HSS Co8 Hole Saws |        |                                  |        |                    |   |
|--|--------|----------------------------------|--------|--------------------|---|
| Part # High Speed Steel                        | Price  | Part # High Speed Steel Cobalt 8 | Price  | Arbor Holders Type | Description   |
| <a href="#">106206</a>                         | \$4.50 | <a href="#">126206</a>           | \$8.25 | A1, A2, A5, A6     | Pilot drill HSS / HSS Co 5, ground, Ø 6.35 mm x 82 mm and split point in accordance with DIN 1412 C |

# Tools – Hole Saw Kits

Bi-Metal hole saw kits include either 6, 10 or 15 High-speed steel or Colbalt 8 hole saws of various sizes in a plastic case.



[106304](#)

| RUKO Bi-Metal Hole Saw Kits |          |                           |          |              |  |                 |           |
|-----------------------------|----------|---------------------------|----------|--------------|--|-----------------|-----------|
| Part # HSS Varied Tooth     | Price    | Part # HSS-Co8 Fine Tooth | Price    | Type         | Hole Saw Diameters Included inches (mm)  | Arbors Included | Pcs / Pkg |
| <a href="#">106302</a>      | \$90.00  | <a href="#">126302</a>    | \$92.00  | Electricians | 7/8, 1-1/8, 1-3/8, 1-3/4, 2, 2-11/16 (22.0, 29.0, 35.0, 44.0, 51.0, 68.0)  | A2, A4          | 8         |
| <a href="#">106304</a>      | \$124.00 | <a href="#">126304</a>    | \$137.00 | Super        | 7/8, 1, 1-1/4, 1-3/8, 1-5/8, 1-3/4, 2, 2-1/8, 2-3/8, 2-1/2 (22.0, 25.0, 32.0, 35.0, 41.0, 44.0, 51.0, 54.0, 60.0, 64.0)  | A2, A4          | 12        |
| <a href="#">106318</a>      | \$237.00 | <a href="#">126318*</a>   | \$277.00 | Premium      | 5/8, 3/4, 13/16, 15/16, 1, 1-1/8, 1-1/4, 1-7/16, 1-9/16, 1-7/8, 2, 2-1/8, 2-3/8, 2-7/8, 3-1/4 (16.0, 19.0, 21.0, 24.0, 25.0, 29.0, 32.0, 37.0, 40.0, 48.0, 51.0, 54.0, 60.0, 73.0, 83.0) | A1, A2          | 19        |

\*Includes 1/4" pilot drill and 11.81 inch long extension



# Tools – Hole Saws

## Recommended Cutting Speeds

| RUKO Hole Saws Recommended Cutting Speeds |      |  |                                 |                           |                |                                   |                 |                |                |
|---|------|--|---------------------------------|---------------------------|----------------|-----------------------------------|-----------------|----------------|----------------|
| Material                                  |      | High carbon structural steel up to 101,521 psi | Alloyed steel up to 145,037 psi | Cast iron over 36,259 psi | CuZn alloy     | Aluminium alloy up to 11% Silicon | Thermo-plastics | Duro-plastics  | Wood           |
| Vc = m/min                                |      | 30   | 20                              | 10                        | 35             | 30                                | 20              | 15             | 40             |
| Coolant                                   |      | Cutting spray                                  | Cutting spray                   | Compressed air            | Compressed air | Cutting spray                     | Water           | Compressed air | Compressed air |
| Ø inch                                    | Ø mm | r.p.m.   | r.p.m.                          | r.p.m.                    | r.p.m.         | r.p.m.                            | r.p.m.          | r.p.m.         | r.p.m.         |
| 9/16                                      | 14   | 682  | 455                             | 227                       | 796            | 682                               | 455             | 341            | 910            |
| 5/8                                       | 16   | 597  | 398                             | 199                       | 697            | 597                               | 398             | 299            | 796            |
| 11/16                                     | 17   | 562  | 375                             | 187                       | 656            | 562                               | 375             | 281            | 749            |
| 3/4                                       | 19   | 503  | 335                             | 168                       | 587            | 503                               | 335             | 251            | 670            |
| 25/32                                     | 20   | 477  | 318                             | 159                       | 557            | 477                               | 318             | 239            | 637            |
| 13/16                                     | 21   | 455  | 303                             | 152                       | 531            | 455                               | 303             | 227            | 607            |
| 7/8                                       | 22   | 434  | 290                             | 145                       | 507            | 434                               | 290             | 217            | 579            |
| 15/16                                     | 24   | 398  | 265                             | 133                       | 464            | 398                               | 265             | 199            | 531            |
| 1   | 25   | 382  | 255                             | 127                       | 446            | 382                               | 255             | 191            | 510            |
| 1-1/16                                    | 27   | 354  | 236                             | 118                       | 413            | 354                               | 236             | 177            | 472            |
| 1-1/8                                     | 29   | 329  | 220                             | 110                       | 384            | 329                               | 220             | 165            | 439            |
| 1-3/16                                    | 30   | 318  | 212                             | 106                       | 372            | 318                               | 212             | 159            | 425            |
| 1-1/4                                     | 32   | 299  | 199                             | 100                       | 348            | 299                               | 199             | 149            | 398            |
| 1-5/16                                    | 33   | 290  | 193                             | 97                        | 338            | 290                               | 193             | 145            | 386            |
| 1-3/8                                     | 35   | 273  | 182                             | 91                        | 318            | 273                               | 182             | 136            | 364            |
| 1-13/32                                   | 36   | 265  | 177                             | 88                        | 310            | 265                               | 177             | 133            | 354            |
| 1-7/16                                    | 37   | 258  | 172                             | 86                        | 301            | 258                               | 172             | 129            | 344            |
| 1-1/2                                     | 38   | 251  | 168                             | 84                        | 293            | 251                               | 168             | 126            | 335            |
| 1-9/16                                    | 40   | 239  | 159                             | 80                        | 279            | 239                               | 159             | 119            | 318            |
| 1-5/8                                     | 41   | 233  | 155                             | 78                        | 272            | 233                               | 155             | 117            | 311            |
| 1-11/16                                   | 43   | 222  | 148                             | 74                        | 259            | 222                               | 148             | 111            | 296            |
| 1-3/4                                     | 44   | 217  | 145                             | 72                        | 253            | 217                               | 145             | 109            | 290            |
| 1-13/16                                   | 46   | 208  | 138                             | 69                        | 242            | 208                               | 138             | 104            | 277            |
| 1-7/8                                     | 48   | 199  | 133                             | 66                        | 232            | 199                               | 133             | 100            | 265            |
| 2   | 51   | 187  | 125                             | 62                        | 219            | 187                               | 125             | 94             | 250            |
| 2-1/16                                    | 52   | 184  | 122                             | 61                        | 214            | 184                               | 122             | 92             | 245            |
| 2-1/8                                     | 54   | 177  | 118                             | 59                        | 206            | 177                               | 118             | 88             | 236            |
| 2-11/64                                   | 55   | 174  | 116                             | 58                        | 203            | 174                               | 116             | 87             | 231            |
| 2-1/4                                     | 57   | 168  | 112                             | 56                        | 196            | 168                               | 112             | 84             | 223            |
| 2-5/16                                    | 59   | 162  | 108                             | 54                        | 189            | 162                               | 108             | 81             | 216            |
| 2-3/8                                     | 60   | 159  | 106                             | 53                        | 186            | 159                               | 106             | 80             | 212            |
| 2-15/32                                   | 63   | 152  | 101                             | 51                        | 177            | 152                               | 101             | 76             | 202            |
| 2-1/2                                     | 64   | 149  | 100                             | 50                        | 174            | 149                               | 100             | 75             | 199            |
| 2-9/16                                    | 65   | 147  | 98                              | 49                        | 171            | 147                               | 98              | 73             | 196            |
| 2-5/8                                     | 67   | 143  | 95                              | 48                        | 166            | 143                               | 95              | 71             | 190            |
| 2-11/16                                   | 68   | 141  | 94                              | 47                        | 164            | 141                               | 94              | 70             | 187            |
| 2-3/4                                     | 70   | 136  | 91                              | 45                        | 159            | 136                               | 91              | 68             | 182            |
| 2-7/8                                     | 73   | 131  | 87                              | 44                        | 153            | 131                               | 87              | 65             | 175            |
| 3   | 76   | 126  | 84                              | 42                        | 147            | 126                               | 84              | 63             | 168            |
| 3-1/8                                     | 79   | 121  | 81                              | 40                        | 141            | 121                               | 81              | 60             | 161            |
| 3-1/4                                     | 83   | 115  | 77                              | 38                        | 134            | 115                               | 77              | 58             | 153            |
| 3-3/8                                     | 86   | 111  | 74                              | 37                        | 130            | 111                               | 74              | 56             | 148            |
| 3-1/2                                     | 89   | 107  | 72                              | 36                        | 125            | 107                               | 72              | 54             | 143            |



# Tools – Hole Saws – Recommended Cutting Speeds, continued

| RUKO Hole Saws Recommended Cutting Speeds, continued |  |                                 |                           |                |                                   |                 |                |                |        |
|--|--|---------------------------------|---------------------------|----------------|-----------------------------------|-----------------|----------------|----------------|--------|
| Material   | High carbon structural steel up to 101,521 psi | Alloyed steel up to 145,037 psi | Cast iron over 36,259 psi | CuZn alloy     | Aluminium alloy up to 11% Silicon | Thermo-plastics | Duro-plastics  | Wood           |        |
| Vc = m/min   | 30   | 20                              | 10                        | 35             | 30                                | 20              | 15             | 40             |        |
| Coolant  | Cutting spray                                  | Cutting spray                   | Compressed air            | Compressed air | Cutting spray                     | Water           | Compressed air | Compressed air |        |
| Ø inch   | Ø mm   | r.p.m.                          | r.p.m.                    | r.p.m.         | r.p.m.                            | r.p.m.          | r.p.m.         | r.p.m.         | r.p.m. |
| 3-5/8  | 92   | 104                             | 69                        | 35             | 121                               | 104             | 69             | 52             | 138    |
| 3-3/4  | 95   | 101                             | 67                        | 34             | 117                               | 101             | 67             | 50             | 134    |
| 3-7/8  | 98   | 97                              | 65                        | 32             | 114                               | 97              | 65             | 49             | 130    |
| 4  | 102  | 94                              | 62                        | 31             | 109                               | 94              | 62             | 47             | 125    |
| 4-1/8  | 105  | 91                              | 61                        | 30             | 106                               | 91              | 61             | 45             | 121    |
| 4-1/4  | 108  | 88                              | 59                        | 29             | 103                               | 88              | 59             | 44             | 118    |
| 4-3/8  | 111  | 86                              | 57                        | 29             | 100                               | 86              | 57             | 43             | 115    |
| 4-1/2  | 114  | 84                              | 56                        | 28             | 98                                | 84              | 56             | 42             | 112    |
| 4-3/4  | 121  | 79                              | 53                        | 26             | 92                                | 79              | 53             | 39             | 105    |
| 5  | 127  | 75                              | 50                        | 25             | 88                                | 75              | 50             | 38             | 100    |
| 5-1/4  | 133  | 72                              | 48                        | 24             | 84                                | 72              | 48             | 36             | 96     |
| 5-1/2  | 140  | 68                              | 45                        | 23             | 80                                | 68              | 45             | 34             | 91     |
| 6  | 152  | 63                              | 42                        | 21             | 73                                | 63              | 42             | 31             | 84     |
| 6-5/16   | 160  | 60                              | 40                        | 20             | 70                                | 60              | 40             | 30             | 80     |
| 6-5/8  | 168  | 57                              | 38                        | 19             | 66                                | 57              | 38             | 28             | 76     |
| 6-31/32  | 177  | 54                              | 36                        | 18             | 63                                | 54              | 36             | 27             | 72     |
| 8-1/4  | 210  | 45                              | 30                        | 15             | 53                                | 45              | 30             | 23             | 61     |

Note: Vc equals the recommended maximum linear speed of hole saw for each material.



## Tools – Jig Saw Blades

RUKO T-shank jig saw blades in 5 or 20 piece sets for a variety of applications.

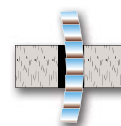
Fits power tools by Bosch®, Atlas Copco®, AEG®, Makita®, Metabo®, Black and Decker® and Hitachi®.

- All models have a wavy side set to prevent clamping of the saw blade in the work piece.
- Narrow blades (7.1 mm height) are suitable for profiled cuts.
- Bi-metal blades have a high-speed steel (HSS) cutting edge and high carbon steel (HCS) spine. This makes them highly flexible with high cutting performance and long service life for conditions where the saw blade is subjected to extreme stresses.



3218009



















Wavy Side Set



| Jig Saw Blades |          |         |              |               |  |  |
|----------------|----------|---------|--------------|---------------|--|--|
| Part #         | Pcs/ Pkg | Price   | Construction | Tooth Spacing | Recommended Applications   | Dimensions Length x Height x Thickness         |
| <b>3218009</b> | 5        | \$7.25  | HSS          | 24 teeth/in   | Metals up to 5/64in [2mm]<br>Fiberglass up to 5/32in [4mm]<br>Hard plastics, hard fabrics, pressed materials and insulation materials up to 5/16in [8mm] | 77.0 x 7.1 x 1.0 mm<br>[3.03 x 9/32 x 0.04 in] |
| <b>3238009</b> | 20       | \$27.50 |              |               |  |  |
| <b>3218011</b> | 5        | \$7.25  | HSS          | 14 teeth/in   | Mild steel up to 5/16in [4mm]<br>Stainless steel up to 7/64in [3mm]<br>Non-ferrous metals up to 3/8in [9.5 mm]   | 77.0 x 7.9 x 1.0 mm<br>[3.03 x 5/16 x 0.04 in] |
| <b>3238011</b> | 20       | \$27.50 |              |               |  |  |
| <b>3218033</b> | 5        | \$10.50 | Bi-metal     | 21 teeth/in   | Mild steel, stainless steel and non-ferrous metals<br>1/16 to 5/32in [1.5 to 4 mm]   | 77.0 x 7.9 x 1.0 mm<br>[3.03 x 5/16 x 0.04 in] |
| <b>3238033</b> | 20       | \$40.50 |              |               |  |  |

Note - Competitive blade specifications may vary.

# Tools – Deburring Tools

| Deburring Tools        |             |         |  |   |   |
|------------------------|-------------|---------|--|---|---|
| Part #                 | Pcs/<br>Pkg | Price   | Description  | Common Uses   |   |
| <a href="#">107010</a> | 1           | \$6.25  | Universal deburring Handle, with spare blade storage compartment | -   |    |
| <a href="#">107011</a> | 1           |         | Steel blade holder for B blades                                  | -   |    |
| <a href="#">107012</a> | 1           | \$11.50 | Deburring blade - B10  | HSS blade most commonly used for internal and external deburring work on long-chipping materials such as steel, aluminum, plastics etc.                       |    |
| <a href="#">107014</a> | 1           | \$11.50 | Deburring blade - B20  | HSS blade used for short-chipping materials such as brass and cast iron. Can be used in both directions.  |    |
| <a href="#">107015</a> | 1           | \$13.00 | Deburring blade - B30  | HSS blade suitable for the simultaneous deburring of inside and outside bores in material up to 5/32" thick.  |    |
| <a href="#">107016</a> | 1           | \$9.50  | Deburring blade - B50  | Scriber with carbide-tipped point, regrindable.   |    |
| <a href="#">107019</a> | 1           | \$4.00  | Steel blade holder for C blades                                  | -   |    |
| <a href="#">107020</a> | 1           | \$10.50 | Deburring blade - C40  | Small HSS triangular scraper for precision work on surfaces up to 5/32" wide.   |    |
| <a href="#">107021</a> | 1           | \$13.50 | Deburring blade - C42  | Large HSS triangular scraper for precision work on surfaces up to 5/16" wide.   |   |
| <a href="#">107025</a> | 1           | \$4.00  | Steel blade holder for E blades                                  | -   |  |
| <a href="#">107026</a> | 1           | \$13.00 | Deburring blade - E100   | HSS blade with B 10 cutting edge, long shank only. For internal and external deburring work on long-chipping materials such as steel, aluminum, plastics etc. |  |
| <a href="#">107027</a> | 1           | \$13.00 | Deburring blade - E200   | HSS blade with B 20 cutting edge, long shank only. For short-chipping materials such as brass and cast iron. Usable in both directions.                       |  |
| <a href="#">107028</a> | 1           | \$13.00 | Deburring blade - E300   | HSS blade with B 30 cutting edge, long shank only. For simultaneous deburring of internal and external bores in materials up to 5/32" thick.                  |  |
| <a href="#">107029</a> | 1           | \$13.00 | Deburring blade - E350   | HSS blade suitable for deburring straight edges, keyways etc.   |  |
| <a href="#">107031</a> | 1           | \$4.00  | Steel blade holder for F countersinks                            | -   |  |
| <a href="#">107032</a> | 1           | \$10.00 | Countersink F12  | HSS countersink for deburring holes up to 1/2" Dia  |  |
| <a href="#">107033</a> | 1           | \$17.00 | Countersink F20  | HSS countersink for deburring holes up to 3/4" Dia  |  |
| <a href="#">107034</a> | 1           | \$33.50 | Countersink F30  | HSS countersink for deburring holes up to 1-3/16" Dia   |  |
| <a href="#">107054</a> | 1           | \$10.00 | Deburring tool with changeable E100 Blade                        | Internal and External deburring on long-chipping materials such as steel, aluminum and plastic.   |  |