



Mini-mills

Data Sheet

Introduction

A range of two and three flute mini-mills available in metric and fractional sizes, short and long series, manufactured in 5% cobalt high speed steel.

The shanks are flatted for location and have the following dimensions:

Metric 6mm tolerance -0.028 , -0.033 mm

Fractional $\frac{1}{4}$ inch tolerance -0.0008 , -0.0010 in

Mini-mills offer a cutting diameter to e8 tolerance and keyway production to p9 tolerance in a single cut, and are suitable for either slot drilling or end milling operations.

The low cost of these cutters means that it is more cost effective to replace them than to re-grind, saving not only money but time too, therefore cutting the cost of production.

e8 tolerance limit:

Up to 3mm dia -0.013 mm to -0.033 mm

3mm to 6mm dia -0.02 mm to -0.038 mm

p9 tolerance limit:

Up to 3mm dia -0.006 mm to -0.031 mm

3mm to 6mm dia -0.012 mm to -0.042 mm

The ranges

HSCo mini-mills flatted shank

Metric

RS stock no.	Dia. mm	Shank Dia. mm	Cut length mm	Overall length mm	Length below chuck mm	No. of flutes
696-336	1.0*	6.0	2.0	24.5	8.5	2
696-342	1.5*	6.0	2.5	24.5	8.5	3
696-358	2.0*	6.0	3.0	25.5	9.5	3
696-364	2.5	6.0	4.0	26.0	10.0	3
696-370	3.0	6.0	4.5	28.0	11.0	3
696-392	3.5	6.0	5.5	30.0	12.0	3
696-409	4.0	6.0	6.5	32.5	12.5	3
696-415	5.0	6.0	7.5	36.0	13.5	3
696-421	6.0	6.0	9.5	36.0	15.0	3

Fractional

RS stock no.	Dia. in	Shank Dia. in	Cut length in	Overall length in	Length below chuck in	No. of flutes
696-437	$\frac{1}{16}$ *	$\frac{1}{4}$	$\frac{3}{32}$	$\frac{31}{32}$	$\frac{11}{32}$	3
696-459	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{16}$	$1\frac{3}{32}$	$\frac{7}{16}$	3
696-471	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{9}{32}$	$1\frac{11}{32}$	$\frac{17}{32}$	3
696-493	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$1\frac{13}{32}$	$\frac{19}{32}$	3

HSCo mini-mills flatted shank – long series

Metric

RS stock no.	Dia. mm	Shank Dia. mm	Cut length mm	Overall length mm	Length below chuck mm	No. of flutes
696-522	1.5*	6.0	4.0	28.0	10.0	3
696-538	2.0*	6.0	4.5	29.0	11.0	3
696-544	2.5	6.0	6.5	32.0	12.5	3
696-550	3.0	6.0	7.5	34.0	14.5	3
695-765	3.5	6.0	8.5	36.5	15.0	3
695-771	4.0	6.0	9.5	39.0	16.0	3
695-787	4.5	6.0	11.0	42.0	17.5	3
695-793	5.0	6.0	12.5	44.5	17.5	3
695-816	6.0	6.0	16.0	44.5	20.5	3

Fractional

RS stock no.	Dia. in	Shank Dia. in	Cut length in	Overall length in	Length below chuck in	No. of flutes
695-822	$\frac{1}{16}$ *	$\frac{1}{4}$	$\frac{5}{32}$	$1\frac{3}{32}$	$\frac{13}{32}$	3
695-838	$\frac{3}{32}$ *	$\frac{1}{4}$	$\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{2}$	3
695-844	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{5}{16}$	$1\frac{11}{32}$	$\frac{9}{16}$	3
695-850	$\frac{5}{32}$	$\frac{1}{4}$	$\frac{3}{8}$	$1\frac{17}{32}$	$\frac{5}{8}$	3
695-866	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{7}{16}$	$1\frac{21}{32}$	$\frac{11}{16}$	3
695-888	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{8}$	$1\frac{3}{4}$	$\frac{13}{16}$	3

Feed per tooth in mm for long series cutters

Dia Letter	1.0	2.0	3.0	4.0	5.0	6.0
G	0.0001	0.0010	0.0010	0.0015	0.0025	0.0045
H	0.0001	0.0010	0.0015	0.0025	0.0035	0.0050
I	0.0001	0.0010	0.0015	0.0025	0.0045	0.0065
J	0.0002	0.0010	0.0015	0.0035	0.0045	0.0075
K	0.0002	0.0010	0.0025	0.0050	0.0060	0.0090
L	0.0002	0.0010	0.0030	0.0050	0.0070	0.0110
M	0.0002	0.0015	0.0035	0.0060	0.0090	0.0140
N	0.0003	0.0020	0.0045	0.0075	0.0110	0.0160
O	0.0003	0.0025	0.0060	0.0100	0.0160	0.0210
P	0.0003	0.0020	0.0060	0.0100	0.0170	0.0220
Q	0.0003	0.0030	0.0080	0.0150	0.0200	0.0300

All feeds are based on slot drilling to a depth of half the diameter, or milling at a quarter the diameter of cutter, with one diameter in depth, for Long Cutters. The feed can be doubled for Short Series cutters.

*These sizes cut to centre.

Application conditions

Example: Number eg. 35 = Mid-range peripheral speed in m/min $\pm 20\%$
Letter eg. I = Feed per tooth in mm $\pm 10\%$

Key: ● Excellent for application ○ Acceptable for application

Application material groups				Short Series	Long Series
		Hardness HB	Tensile strength N/mm ²		
1. Steel	1.1 Magnetic soft steel	≤120	≤400	●40N	●40J
	1.2 Structural steel Case carburising steel	≤200	≤700	●35M	●35I
	1.3 Plain carbon steel	≤250	≤850	●28M	●28I
	1.4 Alloy steel	≤250	≤850	○23M	○23I
	1.5 Alloy steel Hardened and tempered steel	>250 ≤350	>850 ≤1200		
	1.6 Alloy steel Hardened and tempered steel	>350	>1200		
2. Stainless steel	2.1 Free machining Stainless steel	≤250	≤850	●22N	●22K
	2.2 Austenitic	≤250	≤850	○10M	○10J
	2.3 Ferritic + Austenitic Ferric, Martensitic	≤300	≤1000		
3. Cast iron	3.1 Lamellar graphite	≤150	≤500	●32N	●32J
	3.2 Lamellar graphite	>150 ≤300	≤500 ≤1000	●25N	●25J
	3.3 Nodular graphite Malleable cast iron	≤200	≤700	●30M	●30I
	3.4 Nodular graphite Malleable cast iron	>200 ≤300	>700 ≤1000	●30M	●30I
4. Titanium	4.1 Titanium, unalloyed	≤200	≤700	○20L	○20H
	4.2 Titanium, alloyed	≤270	≤900	○12K	○12G
	4.3 Titanium, alloyed	>270 ≤350	>900 ≤1250	○7K	○7G
5. Nickel	5.1 Nickel, unalloyed	≤150	≤500	○18L	○18H
	5.2 Nickel, alloyed	≤270	≤900	○10L	○10H
	5.3 Nickel, alloyed	>270 ≤350	>900 ≤1200	○5K	○5G
6. Copper	6.1 Copper	≤100	≤350	○62M	○62I
	6.2 β-Brass, Bronze	≤200	≤700	○60O	○60K
	6.3 Brass	≤200	≤700	○60O	○60K
	6.4 High strength bronze	≤470	≤1500	○13N	○13J
7. Aluminium magnesium	7.1 Al, Mg, unalloyed	≤100	≤350	○70O	○70K
	7.2 Al alloyed, Si<-5%	≤150	≤500	○62O	○62K
	7.3 Al alloyed, Si>0.5% <10%	≤120	≤400	○42N	○42J
	7.4 Al alloyed, Si>10% Whisker reinforced Al-alloys Mg-alloys	≤120	≤400	○33N	○33J
8. Synthetic materials	8.1 Thermoplastics	-	-	○70N	○70K
	8.2 Thermosetting plastics	-	-	○50N	○50K
	8.3 Reinforced plastic materials	-	-	○34N	○55K
9. Hard materials	9.1 Cermets (metal-ceramics)	≤550	≤1700	○3M	○3I

RS Components shall not be liable for any liability or loss of any nature (howsoever caused and whether or not due to RS Components' negligence) which may result from the use of any information provided in RS technical literature.