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HARVI™ IV

8-Flute End Mills



Durable, high performance
solid end milling solutions

HARVI IV

8-Flute End Mills

The latest addition to Kennametal's HARVI family of high-performance and versatile end mills

With a unique design that offers higher metal removal rates and feed rates than 7-flute end mills and more versatility than traditional 9-flute end mills, HARVI IV 8-Flute End Mills keep you cutting in difficult-to-machine materials. Rough and finish with one reliable tool in high-temp alloys, stainless steels, steels and hardened materials while achieving powerful chip evacuation from internal coolant channels.

Diameter range 3/8-1", 10-25mm

Length range 1.2-4.3xD

Internal through coolant

Chip splitters featured on versions greater than 2xD length of cut

The incredibly versatile HARVI IV 8-Flute End Mills are complemented by our new stainless steels, titanium and other high-temp alloys solid end milling grade KCSM15A. This new grade features an innovative coating technology that's delivering extended tool life for users and the best wear resistance in Kennametal's history of solid carbide end milling.



Industries



Aerospace



Medical

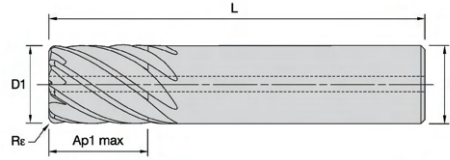


General Engineering



Wind & Solar

METRIC



- Primary
- Secondary

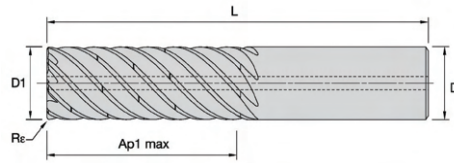
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S		●
H		○

HARVI™ IV

Radiused • 8 Flutes • Internal Coolant • Plain Shank • **METRIC**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Re	
Metric	7104182	HA4R8RA1000R022HAR050IM	10,00	10,00	22,00	72,00	0.5	●
	7104183	HA4R8RA1000R022HAR100IM	10,00	10,00	22,00	72,00	1.0	●
	7104184	HA4R8RA1000R022HAR200IM	10,00	10,00	22,00	72,00	2.0	●
	7104185	HA4R8RA1000R022HAR250IM	10,00	10,00	22,00	72,00	2.5	●
	7104186	HA4R8RA1000R022HAR300IM	10,00	10,00	22,00	72,00	3.0	●
	7104188	HA4R8RA1200R026HAR050IM	12,00	12,00	26,00	83,00	0.5	●
	7104189	HA4R8RA1200R026HAR100IM	12,00	12,00	26,00	83,00	1.0	●
	7104190	HA4R8RA1200R026HAR200IM	12,00	12,00	26,00	83,00	2.0	●
	7104191	HA4R8RA1200R026HAR250IM	12,00	12,00	26,00	83,00	2.5	●
	7104192	HA4R8RA1200R026HAR300IM	12,00	12,00	26,00	83,00	3.0	●
	7104194	HA4R8RA1600R032HAR050IM	16,00	16,00	32,00	92,00	0.5	●
	7104195	HA4R8RA1600R032HAR100IM	16,00	16,00	32,00	92,00	1.0	●
	7104196	HA4R8RA1600R032HAR200IM	16,00	16,00	32,00	92,00	2.0	●
	7104197	HA4R8RA1600R032HAR250IM	16,00	16,00	32,00	92,00	2.5	●
	7104198	HA4R8RA1600R032HAR300IM	16,00	16,00	32,00	92,00	3.0	●
	7104199	HA4R8RA1600R032HAR400IM	16,00	16,00	32,00	92,00	4.0	●
	7104201	HA4R8RA2000R038HAR050IM	20,00	20,00	38,00	104,00	0.5	●
	7104202	HA4R8RA2000R038HAR100IM	20,00	20,00	38,00	104,00	1.0	●
	7104203	HA4R8RA2000R038HAR200IM	20,00	20,00	38,00	104,00	2.0	●
	7104204	HA4R8RA2000R038HAR250IM	20,00	20,00	38,00	104,00	2.5	●
	7104205	HA4R8RA2000R038HAR300IM	20,00	20,00	38,00	104,00	3.0	●
	7104206	HA4R8RA2000R038HAR400IM	20,00	20,00	38,00	104,00	4.0	●
	7104207	HA4R8RA2000R038HAR600IM	20,00	20,00	38,00	104,00	6.0	●
	7104209	HA4R8RA2500R045HAR050IM	25,00	25,00	45,00	121,00	0.5	●
7104210	HA4R8RA2500R045HAR100IM	25,00	25,00	45,00	121,00	1.0	●	
7104211	HA4R8RA2500R045HAR200IM	25,00	25,00	45,00	121,00	2.0	●	
7104212	HA4R8RA2500R045HAR250IM	25,00	25,00	45,00	121,00	2.5	●	
7104213	HA4R8RA2500R045HAR300IM	25,00	25,00	45,00	121,00	3.0	●	
7104214	HA4R8RA2500R045HAR400IM	25,00	25,00	45,00	121,00	4.0	●	



- Primary
- Secondary

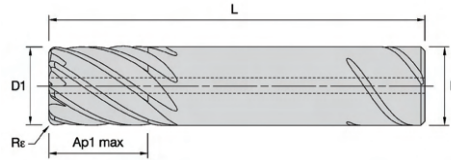
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M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Radiused • 8 Flutes • Chip Splitters • Internal Coolant • Plain Shank • **METRIC**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Re	
Metric	7104255	HA4R8RA1000X040HAR050DM	10,00	10,00	40,00	90,00	0.5	●
	7104256	HA4R8RA1000X040HAR100DM	10,00	10,00	40,00	90,00	1.0	●
	7104257	HA4R8RA1000X040HAR200DM	10,00	10,00	40,00	90,00	2.0	●
	7104258	HA4R8RA1000X040HAR250DM	10,00	10,00	40,00	90,00	2.5	●
	7104259	HA4R8RA1000X040HAR300DM	10,00	10,00	40,00	90,00	3.0	●
	7104271	HA4R8RA1200X048HAR050DM	12,00	12,00	48,00	105,00	0.5	●
	7104272	HA4R8RA1200X048HAR100DM	12,00	12,00	48,00	105,00	1.0	●
	7104273	HA4R8RA1200X048HAR200DM	12,00	12,00	48,00	105,00	2.0	●
	7104274	HA4R8RA1200X048HAR250DM	12,00	12,00	48,00	105,00	2.5	●
	7104275	HA4R8RA1200X048HAR300DM	12,00	12,00	48,00	105,00	3.0	●
	7104277	HA4R8RA1600X064HAR050DM	16,00	16,00	64,00	125,00	0.5	●
	7104278	HA4R8RA1600X064HAR100DM	16,00	16,00	64,00	125,00	1.0	●
	7104279	HA4R8RA1600X064HAR200DM	16,00	16,00	64,00	125,00	2.0	●
	7104280	HA4R8RA1600X064HAR250DM	16,00	16,00	64,00	125,00	2.5	●
	7104281	HA4R8RA1600X064HAR300DM	16,00	16,00	64,00	125,00	3.0	●
	7104282	HA4R8RA1600X064HAR400DM	16,00	16,00	64,00	125,00	4.0	●
	7104284	HA4R8RA2000X080HAR050DM	20,00	20,00	80,00	145,00	0.5	●
	7104285	HA4R8RA2000X080HAR100DM	20,00	20,00	80,00	145,00	1.0	●
	7104286	HA4R8RA2000X080HAR200DM	20,00	20,00	80,00	145,00	2.0	●
	7104287	HA4R8RA2000X080HAR250DM	20,00	20,00	80,00	145,00	2.5	●
	7104288	HA4R8RA2000X080HAR300DM	20,00	20,00	80,00	145,00	3.0	●
	7104289	HA4R8RA2000X080HAR400DM	20,00	20,00	80,00	145,00	4.0	●
	7104290	HA4R8RA2000X080HAR600DM	20,00	20,00	80,00	145,00	6.0	●
	7104292	HA4R8RA2500X100HAR050DM	25,00	25,00	100,00	175,00	0.5	●
	7104293	HA4R8RA2500X100HAR100DM	25,00	25,00	100,00	175,00	1.0	●
	7104294	HA4R8RA2500X100HAR200DM	25,00	25,00	100,00	175,00	2.0	●
	7104295	HA4R8RA2500X100HAR250DM	25,00	25,00	100,00	175,00	2.5	●
	7104296	HA4R8RA2500X100HAR300DM	25,00	25,00	100,00	175,00	3.0	●
7104297	HA4R8RA2500X100HAR400DM	25,00	25,00	100,00	175,00	4.0	●	



- Primary
- Secondary

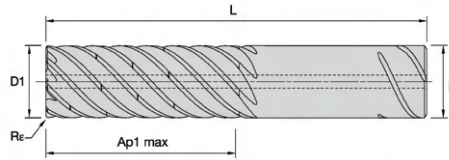
P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Radiused • 8 Flutes • Internal Coolant • Safe-Lock™ Shank • **METRIC**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Re	
Metric	7104216	HA4R8RA1200R026SLR050IM	12,00	12,00	26,00	83,00	0.5	●
	7104217	HA4R8RA1200R026SLR100IM	12,00	12,00	26,00	83,00	1.0	●
	7104218	HA4R8RA1200R026SLR200IM	12,00	12,00	26,00	83,00	2.0	●
	7104219	HA4R8RA1200R026SLR250IM	12,00	12,00	26,00	83,00	2.5	●
	7104220	HA4R8RA1200R026SLR300IM	12,00	12,00	26,00	83,00	3.0	●
	7104222	HA4R8RA1600R032SLR050IM	16,00	16,00	32,00	92,00	0.5	●
	7104223	HA4R8RA1600R032SLR100IM	16,00	16,00	32,00	92,00	1.0	●
	7104224	HA4R8RA1600R032SLR200IM	16,00	16,00	32,00	92,00	2.0	●
	7104225	HA4R8RA1600R032SLR250IM	16,00	16,00	32,00	92,00	2.5	●
	7104226	HA4R8RA1600R032SLR300IM	16,00	16,00	32,00	92,00	3.0	●
	7104227	HA4R8RA1600R032SLR400IM	16,00	16,00	32,00	92,00	4.0	●
	7104229	HA4R8RA2000R038SLR050IM	20,00	20,00	38,00	104,00	0.5	●
	7104230	HA4R8RA2000R038SLR100IM	20,00	20,00	38,00	104,00	1.0	●
	7104231	HA4R8RA2000R038SLR200IM	20,00	20,00	38,00	104,00	2.0	●
	7104232	HA4R8RA2000R038SLR250IM	20,00	20,00	38,00	104,00	2.5	●
	7104233	HA4R8RA2000R038SLR300IM	20,00	20,00	38,00	104,00	3.0	●
	7104234	HA4R8RA2000R038SLR400IM	20,00	20,00	38,00	104,00	4.0	●
	7104235	HA4R8RA2000R038SLR600IM	20,00	20,00	38,00	104,00	6.0	●
	7104237	HA4R8RA2500R045SLR050IM	25,00	25,00	45,00	121,00	0.5	●
	7104238	HA4R8RA2500R045SLR100IM	25,00	25,00	45,00	121,00	1.0	●
	7104239	HA4R8RA2500R045SLR200IM	25,00	25,00	45,00	121,00	2.0	●
	7104240	HA4R8RA2500R045SLR250IM	25,00	25,00	45,00	121,00	2.5	●
	7104251	HA4R8RA2500R045SLR300IM	25,00	25,00	45,00	121,00	3.0	●
	7104252	HA4R8RA2500R045SLR400IM	25,00	25,00	45,00	121,00	4.0	●



- Primary
- Secondary

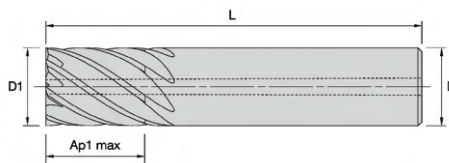
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M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Radiused • 8 Flutes • Chip Splitters • Internal Coolant • Safe-Lock™ Shank • **METRIC**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	R _ε	
Metric	7104299	HA4R8RA1200X048SLR050DM	12,00	12,00	48,00	105,00	0.5	●
	7104300	HA4R8RA1200X048SLR100DM	12,00	12,00	48,00	105,00	1.0	●
	7104301	HA4R8RA1200X048SLR200DM	12,00	12,00	48,00	105,00	2.0	●
	7104302	HA4R8RA1200X048SLR250DM	12,00	12,00	48,00	105,00	2.5	●
	7104303	HA4R8RA1200X048SLR300DM	12,00	12,00	48,00	105,00	3.0	●
	7104305	HA4R8RA1600X064SLR050DM	16,00	16,00	64,00	125,00	0.5	●
	7104306	HA4R8RA1600X064SLR100DM	16,00	16,00	64,00	125,00	1.0	●
	7104307	HA4R8RA1600X064SLR200DM	16,00	16,00	64,00	125,00	2.0	●
	7104308	HA4R8RA1600X064SLR250DM	16,00	16,00	64,00	125,00	2.5	●
	7104309	HA4R8RA1600X064SLR300DM	16,00	16,00	64,00	125,00	3.0	●
	7104313	HA4R8RA1600X064SLR400DM	16,00	16,00	64,00	125,00	4.0	●
	7104315	HA4R8RA2000X080SLR050DM	20,00	20,00	80,00	145,00	0.5	●
	7104316	HA4R8RA2000X080SLR100DM	20,00	20,00	80,00	145,00	1.0	●
	7104317	HA4R8RA2000X080SLR200DM	20,00	20,00	80,00	145,00	2.0	●
	7104318	HA4R8RA2000X080SLR250DM	20,00	20,00	80,00	145,00	2.5	●
	7104319	HA4R8RA2000X080SLR300DM	20,00	20,00	80,00	145,00	3.0	●
	7104320	HA4R8RA2000X080SLR400DM	20,00	20,00	80,00	145,00	4.0	●
	7104321	HA4R8RA2000X080SLR600DM	20,00	20,00	80,00	145,00	6.0	●
	7104323	HA4R8RA2500X100SLR050DM	25,00	25,00	100,00	175,00	0.5	●
	7104324	HA4R8RA2500X100SLR100DM	25,00	25,00	100,00	175,00	1.0	●
7104325	HA4R8RA2500X100SLR200DM	25,00	25,00	100,00	175,00	2.0	●	
7104326	HA4R8RA2500X100SLR250DM	25,00	25,00	100,00	175,00	2.5	●	
7104327	HA4R8RA2500X100SLR300DM	25,00	25,00	100,00	175,00	3.0	●	
7104328	HA4R8RA2500X100SLR400DM	25,00	25,00	100,00	175,00	4.0	●	



- Primary
- Secondary

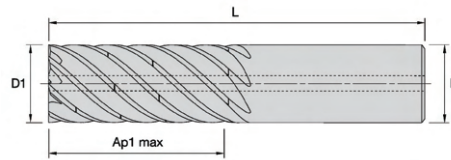
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M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Square End • 8 Flutes • Internal Coolant • Plain Shank • **METRIC**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	
Metric	7104187	HA4R8SE1000R022HAIM	10,00	10,00	22,00	72,00	●
	7104193	HA4R8SE1200R026HAIM	12,00	12,00	26,00	83,00	●
	7104200	HA4R8SE1600R032HAIM	16,00	16,00	32,00	92,00	●
	7104208	HA4R8SE2000R038HAIM	20,00	20,00	38,00	104,00	●
	7104215	HA4R8SE2500R045HAIM	25,00	25,00	45,00	121,00	●



- Primary
- Secondary

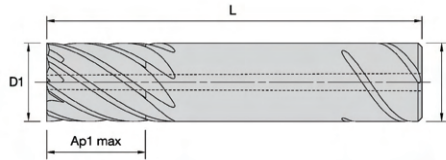
P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Square End • 8 Flutes • Chip Splitters • Internal Coolant • Plain Shank • **METRIC**

	Order Number	Catalog Number	D1	D	Ap1 Max	L	
Metric	7104260	HA4R8SE1000X040HADM	10,00	10,00	40,00	90,00	●
	7104276	HA4R8SE1200X048HADM	12,00	12,00	48,00	105,00	●
	7104283	HA4R8SE1600X064HADM	16,00	16,00	64,00	125,00	●
	7104291	HA4R8SE2000X080HADM	20,00	20,00	80,00	145,00	●
	7104298	HA4R8SE2500X100HADM	25,00	25,00	100,00	175,00	●

KCSM15A



- Primary
- Secondary

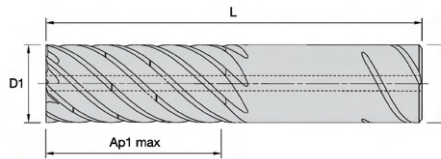
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M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Square End • 8 Flutes • Internal Coolant • Safe-Lock™ Shank • **METRIC**

	Order Number	Catalog Number	D1	D	Ap1 Max	L	
Metric	7104221	HA4R8SE1200R026SLIM	12,00	12,00	26,00	83,00	●
	7104228	HA4R8SE1600R032SLIM	16,00	16,00	32,00	92,00	●
	7104236	HA4R8SE2000R038SLIM	20,00	20,00	38,00	104,00	●
	7104254	HA4R8SE2500R045SLIM	25,00	25,00	45,00	121,00	●

KCSM15A



- Primary
- Secondary

P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Square End • 8 Flutes • Chip Splitters • Internal Coolant • Safe-Lock™ Shank • **METRIC**

	Order Number	Catalog Number	D1	D	Ap1 Max	L	
Metric	7104304	HA4R8SE1200X048SLDM	12,00	12,00	48,00	105,00	●
	7104314	HA4R8SE1600X064SLDM	16,00	16,00	64,00	125,00	●
	7104322	HA4R8SE2000X080SLDM	20,00	20,00	80,00	145,00	●
	7104329	HA4R8SE2500X100SLDM	25,00	25,00	100,00	175,00	●

KCSM15A

HARVI™ IV • Side Milling/Slotting • Application Data • METRIC

Material Group	Max Ae Factor (KAp)	KCSM15A Base Cutting Speed Vc m/min	Feed per Tooth (fz=mm/th)					
			D1 - Diameter (mm)					
			10	12	16	20	25	
P	3	1	130	0,049	0,044	0,067	0,080	0,095
	4	1	100	0,044	0,049	0,059	0,069	0,081
	5	0,8	65	0,038	0,043	0,053	0,063	0,076
	6	0,7	50	0,032	0,036	0,043	0,050	0,060
M	1	1	80	0,049	0,055	0,067	0,080	0,095
	2	0,8	60	0,038	0,043	0,053	0,063	0,076
	3	0,8	60	0,032	0,036	0,043	0,050	0,060
S	1	0,5	50	0,049	0,055	0,067	0,080	0,095
	2	0,5	30	0,038	0,043	0,053	0,063	0,076
	3	0,5	25	0,026	0,030	0,036	0,043	0,051
	4	0,7	45	0,041	0,051	0,061	0,069	0,081
H	1	0,8	80	0,044	0,049	0,059	0,069	0,081
	2	0,5	70	0,037	0,041	0,050	0,059	0,070

NOTE:

These guidelines may require variations to achieve optimum results.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >12 mm diameter. Maximum ramp angle is 2°.

Tools with chip splitters can be used as finishers.

Maximum Cutting Width and Adjustment Factors for Speed & Feed Calculation • METRIC

Maximum cutting width (Ae) for given cutting depth (Ap)

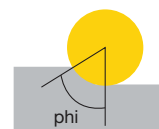
Ap	≤0,125 x D1	>0,125xD1 ≤ 0,5xD1	>0,5xD1 ≤ 1xD1	>1xD1 ≤ 2xD1	>2xD1 ≤ 3xD1	>3xD1 ≤ 4xD1	>4 x D1
Max Ae	100% x D1	50% x D1 x KAp	40% x D1 x KAp	30% x D1 x KAp	20% x D1 x KAp	15% x D1 x KAp	10% x D1 x KAp

Adjustment factors for speed (Vc) and feed (Fz)

Ae/D1	≤2%	>2% ≤ 5%	>5 ≤ 7,5%	>7,5% ≤ 10%	>10% ≤ 15%	>15% ≤ 20%	>20% ≤ 30%	>30% ≤ 40%	>40% ≤ 50%	>50% ≤ 100%
Kv	3	2,5	1,9	1,4	1,35	1,3	1,2	1,1	1	0,9
KFz	3,28	2,3	1,95	1,7	1,5	1,25	1,09	1,02	1	1

Angle of engagement (phi°) relative to cutting width (Ae)

Ae	2%	5%	7,50%	10%	15%	20%	30%	40%	50%	100%
Angle of Engagement - (phi°)	16,26	25,84	31,79	36,87	45,57	53,13	66,42	78,46	90	180



To calculate application specific cutting data, please use KAp, Kv, and Kfz from tables above for adaption of cutting speeds and feeds respectively:

$$\text{Maximum Ae} = \text{KAp} \cdot \text{D1} \cdot \text{Ap1Max/D1}$$

$$\text{Vc new} = \text{Vc} \cdot \text{Kv}$$

$$\text{Fz new} = \text{Fz} \cdot \text{KFz}$$

Sample Calculation

Material: S4

D1: 25 mm

Ap: 2xD1

$$\text{Max Ae: } 30\% \times \text{KAp} \times \text{D1} = 30\% \times 0,7 \times \text{D1} = 21\% \times \text{D1}$$

$$\text{M/Min: Base} \times \text{Kv} = 45 \times 1,2 = 37,5$$

$$\text{Fz: Base} \times \text{KFz} = 0,081 \times 1,09 = 0,088$$

Final cutting data recommendation:

$$\text{Max Ae} = 30\% \cdot 0,7 \cdot 25 = 5,25 \text{ mm}$$

$$\text{Vc new} = 45 \cdot 1,2 = 37,5 \text{ m/min}$$

$$\text{Fz new} = 0,081 \cdot 1,09 = 0,088 \text{ mm/th}$$

Application Data • Minimum Helical Interpolation Diameter • METRIC

Tool. dia. mm	Interpolation dia. mm
10	14,25
12	16,25
16	21,31
20	26,38
25	32,44

Maximum ramp angle is 2° on centerline.

Industries



Aerospace



Medical

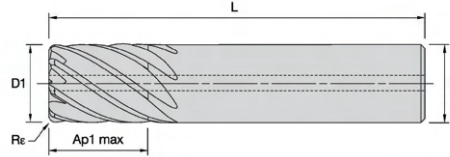


General Engineering



Wind & Solar

INCH



- Primary
- Secondary

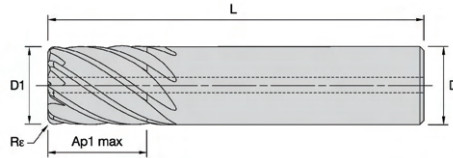
P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Radiused • 8 Flutes • Internal Coolant • Plain Shank • **INCH**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Re	
Inch	7102409	HA4R8RA0375S050HAR015I	3/8	3/8	1/2	2 1/2	0.015	●
	7102410	HA4R8RA0375S050HAR030I	3/8	3/8	1/2	2 1/2	.030	●
	7102421	HA4R8RA0375S050HAR060I	3/8	3/8	1/2	2 1/2	.060	●
	7102423	HA4R8RA0375R075HAR015I	3/8	3/8	3/4	2 1/2	.015	●
	7102424	HA4R8RA0375R075HAR030I	3/8	3/8	3/4	2 1/2	.030	●
	7102425	HA4R8RA0375R075HAR060I	3/8	3/8	3/4	2 1/2	.060	●
	7102427	HA4R8RA0500S063HAR015I	1/2	1/2	5/8	3	0.015	●
	7102428	HA4R8RA0500S063HAR030I	1/2	1/2	5/8	3	0.03	●
	7102429	HA4R8RA0500S063HAR060I	1/2	1/2	5/8	3	.060	●
	7102430	HA4R8RA0500S063HAR090I	1/2	1/2	5/8	3	.090	●
	7102431	HA4R8RA0500S063HAR120I	1/2	1/2	5/8	3	.120	●
	7102433	HA4R8RA0500R100HAR015I	1/2	1/2	1	3	.015	●
	7102434	HA4R8RA0500R100HAR030I	1/2	1/2	1	3	.030	●
	7102435	HA4R8RA0500R100HAR060I	1/2	1/2	1	3	.060	●
	7102436	HA4R8RA0500R100HAR090I	1/2	1/2	1	3	.090	●
	7102437	HA4R8RA0500R100HAR120I	1/2	1/2	1	3	.120	●
	7102439	HA4R8RA0625S075HAR030I	5/8	5/8	3/4	3	0.03	●
	7102440	HA4R8RA0625S075HAR060I	5/8	5/8	3/4	3	0.06	●
	7102441	HA4R8RA0625S075HAR090I	5/8	5/8	3/4	3	0.09	●
	7102442	HA4R8RA0625S075HAR120I	5/8	5/8	3/4	3	0.12	●
	7102443	HA4R8RA0625S075HAR190I	5/8	5/8	3/4	3	0.19	●
	7102448	HA4R8RA0625R125HAR030I	5/8	5/8	1 1/4	3 1/2	.030	●
	7102449	HA4R8RA0625R125HAR060I	5/8	5/8	1 1/4	3 1/2	.060	●
	7102450	HA4R8RA0625R125HAR090I	5/8	5/8	1 1/4	3 1/2	.090	●
	7102451	HA4R8RA0625R125HAR120I	5/8	5/8	1 1/4	3 1/2	.120	●
	7102452	HA4R8RA0625R125HAR190I	5/8	5/8	1 1/4	3 1/2	.190	●
	7102454	HA4R8RA0750S100HAR030I	3/4	3/4	1	3 1/2	.030	●
	7102455	HA4R8RA0750S100HAR060I	3/4	3/4	1	3 1/2	.060	●
	7102456	HA4R8RA0750S100HAR090I	3/4	3/4	1	3 1/2	.090	●
	7102457	HA4R8RA0750S100HAR120I	3/4	3/4	1	3 1/2	.120	●
	7102458	HA4R8RA0750S100HAR190I	3/4	3/4	1	3 1/2	.190	●
	7102460	HA4R8RA0750R163HAR030I	3/4	3/4	1 5/8	4	.030	●
	7102461	HA4R8RA0750R163HAR060I	3/4	3/4	1 5/8	4	.060	●
	7102462	HA4R8RA0750R163HAR090I	3/4	3/4	1 5/8	4	.090	●
	7102463	HA4R8RA0750R163HAR120I	3/4	3/4	1 5/8	4	.120	●
	7102464	HA4R8RA0750R163HAR190I	3/4	3/4	1 5/8	4	.190	●
	7102466	HA4R8RA1000S125HAR030I	1	1	1 1/4	4	.030	●
	7102467	HA4R8RA1000S125HAR060I	1	1	1 1/4	4	.060	●



- Primary
- Secondary

P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

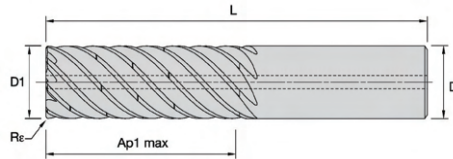
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HARVI™ IV

Radiused • 8 Flutes • Internal Coolant • Plain Shank • **INCH**

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Re	
Inch	7102468	HA4R8RA1000S125HAR120I	1	1	1 1/4	4	.120	●
	7102469	HA4R8RA1000S125HAR190I	1	1	1 1/4	4	.190	●
	7102470	HA4R8RA1000S125HAR250I	1	1	1 1/4	4	.250	●
	7102472	HA4R8RA1000S175HAR030I	1	1	1 3/4	4 1/2	.030	●
	7102473	HA4R8RA1000S175HAR060I	1	1	1 3/4	4 1/2	.060	●
	7102474	HA4R8RA1000S175HAR120I	1	1	1 3/4	4 1/2	.120	●
	7102475	HA4R8RA1000S175HAR190I	1	1	1 3/4	4 1/2	0.19	●
	7102476	HA4R8RA1000S175HAR250I	1	1	1 3/4	4 1/2	.250	●
	7102478	HA4R8RA1000R200HAR030I	1	1	2	5	.030	●
	7102479	HA4R8RA1000R200HAR060I	1	1	2	5	.060	●
	7102480	HA4R8RA1000R200HAR120I	1	1	2	5	.120	●
	7102481	HA4R8RA1000R200HAR190I	1	1	2	5	.190	●
	7102482	HA4R8RA1000R200HAR250I	1	1	2	5	.250	●

KCSM15A



- Primary
- Secondary

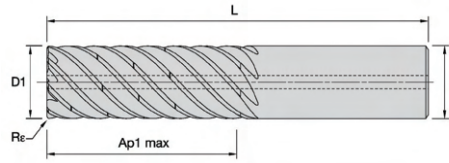
P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Radiused • 8 Flutes • Chip Splitters • Internal Coolant • Plain Shank • **INCH**

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Re	
Inch	7102837	HA4R8RA0375R100HAR030D	3/8	3/8	1	3	.030	●
	7102838	HA4R8RA0375R100HAR060D	3/8	3/8	1	3	.060	●
	7102840	HA4R8RA0375L125HAR015D	3/8	3/8	1 1/4	3	.015	●
	7102851	HA4R8RA0375L125HAR030D	3/8	3/8	1 1/4	3	.030	●
	7102852	HA4R8RA0375L125HAR060D	3/8	3/8	1 1/4	3	.060	●
	7102854	HA4R8RA0375X150HAR030D	3/8	3/8	1 1/2	3 1/2	.030	●
	7102855	HA4R8RA0375X150HAR060D	3/8	3/8	1 1/2	3 1/2	.060	●
	7102857	HA4R8RA0500R125HAR030D	1/2	1/2	1 1/4	3 1/2	.030	●
	7102858	HA4R8RA0500R125HAR060D	1/2	1/2	1 1/4	3 1/2	.060	●
	7102859	HA4R8RA0500R125HAR090D	1/2	1/2	1 1/4	3 1/2	.090	●
	7102860	HA4R8RA0500R125HAR120D	1/2	1/2	1 1/4	3 1/2	.120	●
	7102862	HA4R8RA0500L163HAR015D	1/2	1/2	1 5/8	4	.015	●
	7102863	HA4R8RA0500L163HAR030D	1/2	1/2	1 5/8	4	.030	●
	7102864	HA4R8RA0500L163HAR060D	1/2	1/2	1 5/8	4	.060	●
	7102865	HA4R8RA0500L163HAR090D	1/2	1/2	1 5/8	4	.090	●
	7102866	HA4R8RA0500L163HAR120D	1/2	1/2	1 5/8	4	.120	●
	7102868	HA4R8RA0500X200HAR030D	1/2	1/2	2	4	.030	●
	7102869	HA4R8RA0500X200HAR060D	1/2	1/2	2	4	.060	●
	7102870	HA4R8RA0500X200HAR090D	1/2	1/2	2	4	.090	●
	7102871	HA4R8RA0500X200HAR120D	1/2	1/2	2	4	.120	●

KCSM15A



- Primary
- Secondary

P	 	○
M	 	●
K	 	○
N	 	○
S	 	●
H	 	○

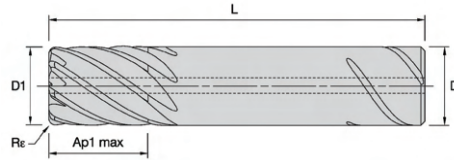
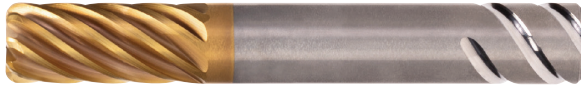
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HARVI™ IV

Radiused • 8 Flutes • Chip Splitters • Internal Coolant • Plain Shank • **INCH**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	R _e	
Inch	7102873	HA4R8RA0625R163HAR030D	5/8	5/8	1 5/8	4	.030	●
	7102874	HA4R8RA0625R163HAR060D	5/8	5/8	1 5/8	4	.060	●
	7102875	HA4R8RA0625R163HAR090D	5/8	5/8	1 5/8	4	.090	●
	7102876	HA4R8RA0625R163HAR120D	5/8	5/8	1 5/8	4	.120	●
	7102877	HA4R8RA0625R163HAR190D	5/8	5/8	1 5/8	4	.190	●
	7102879	HA4R8RA0625L188HAR030D	5/8	5/8	1 7/8	4	.030	●
	7102880	HA4R8RA0625L188HAR060D	5/8	5/8	1 7/8	4	.060	●
	7102881	HA4R8RA0625L188HAR090D	5/8	5/8	1 7/8	4	.090	●
	7102882	HA4R8RA0625L188HAR120D	5/8	5/8	1 7/8	4	.120	●
	7102883	HA4R8RA0625L188HAR190D	5/8	5/8	1 7/8	4	.190	●
	7102885	HA4R8RA0625X250HAR030D	5/8	5/8	2 1/2	5	.030	●
	7102886	HA4R8RA0625X250HAR060D	5/8	5/8	2 1/2	5	.060	●
	7102887	HA4R8RA0625X250HAR090D	5/8	5/8	2 1/2	5	.090	●
	7102888	HA4R8RA0625X250HAR120D	5/8	5/8	2 1/2	5	.120	●
	7102889	HA4R8RA0625X250HAR190D	5/8	5/8	2 1/2	5	.190	●
	7102891	HA4R8RA0750R163HAR030D	3/4	3/4	1 5/8	4	.030	●
	7102892	HA4R8RA0750R163HAR060D	3/4	3/4	1 5/8	4	.060	●
	7102893	HA4R8RA0750R163HAR090D	3/4	3/4	1 5/8	4	.090	●
	7102894	HA4R8RA0750R163HAR120D	3/4	3/4	1 5/8	4	.120	●
	7102895	HA4R8RA0750R163HAR190D	3/4	3/4	1 5/8	4	.190	●
	7102897	HA4R8RA0750L225HAR030D	3/4	3/4	2 1/4	5	.030	●
	7102898	HA4R8RA0750L225HAR060D	3/4	3/4	2 1/4	5	.060	●
	7102899	HA4R8RA0750L225HAR090D	3/4	3/4	2 1/4	5	.090	●
	7102900	HA4R8RA0750L225HAR120D	3/4	3/4	2 1/4	5	.120	●
	7102901	HA4R8RA0750L225HAR190D	3/4	3/4	2 1/4	5	.190	●
	7102903	HA4R8RA0750X325HAR030D	3/4	3/4	3 1/4	6	.030	●
	7102904	HA4R8RA0750X325HAR060D	3/4	3/4	3 1/4	6	.060	●
	7102905	HA4R8RA0750X325HAR090D	3/4	3/4	3 1/4	6	.090	●
	7102907	HA4R8RA0750X325HAR120D	3/4	3/4	3 1/4	6	.120	●
	7102908	HA4R8RA0750X325HAR190D	3/4	3/4	3 1/4	6	.190	●
	7102910	HA4R8RA1000R250HAR030D	1	1	2 1/2	5 1/2	.030	●
	7102911	HA4R8RA1000R250HAR060D	1	1	2 1/2	5 1/2	.060	●
	7102912	HA4R8RA1000R250HAR120D	1	1	2 1/2	5 1/2	.120	●
	7102913	HA4R8RA1000R250HAR190D	1	1	2 1/2	5 1/2	.190	●
	7102914	HA4R8RA1000R250HAR250D	1	1	2 1/2	5 1/2	.250	●
	7102916	HA4R8RA1000L325HAR030D	1	1	3 1/4	6	.030	●
	7102917	HA4R8RA1000L325HAR060D	1	1	3 1/4	6	.060	●
	7102918	HA4R8RA1000L325HAR120D	1	1	3 1/4	6	.120	●
	7102919	HA4R8RA1000L325HAR190D	1	1	3 1/4	6	.190	●
	7102920	HA4R8RA1000L325HAR250D	1	1	3 1/4	6	.250	●
7102922	HA4R8RA1000X400HAR030D	1	1	4	7	.030	●	
7102923	HA4R8RA1000X400HAR060D	1	1	4	7	.060	●	
7102924	HA4R8RA1000X400HAR120D	1	1	4	7	.120	●	
7102926	HA4R8RA1000X400HAR190D	1	1	4	7	.190	●	
7102927	HA4R8RA1000X400HAR250D	1	1	4	7	.250	●	



- Primary
- Secondary

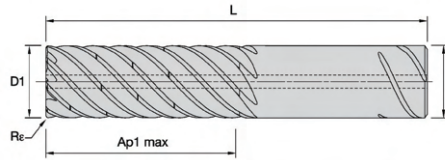
P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Radiused • 8 Flutes • Internal Coolant • Safe-Lock™ Shank • **INCH**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Re	
Inch	7102484	HA4R8RA0500S063SLR015I	1/2	1/2	5/8	3	.015	●
	7102485	HA4R8RA0500S063SLR030I	1/2	1/2	5/8	3	.030	●
	7102486	HA4R8RA0500S063SLR060I	1/2	1/2	5/8	3	.060	●
	7102487	HA4R8RA0500S063SLR090I	1/2	1/2	5/8	3	.090	●
	7102488	HA4R8RA0500S063SLR120I	1/2	1/2	5/8	3	.120	●
	7102490	HA4R8RA0500R100SLR015I	1/2	1/2	1	3	.015	●
	7102511	HA4R8RA0500R100SLR030I	1/2	1/2	1	3	.030	●
	7102512	HA4R8RA0500R100SLR060I	1/2	1/2	1	3	.060	●
	7102513	HA4R8RA0500R100SLR090I	1/2	1/2	1	3	.090	●
	7102514	HA4R8RA0500R100SLR120I	1/2	1/2	1	3	.120	●
	7102516	HA4R8RA0625S075SLR030I	5/8	5/8	3/4	3	.030	●
	7102517	HA4R8RA0625S075SLR060I	5/8	5/8	3/4	3	.060	●
	7102518	HA4R8RA0625S075SLR090I	5/8	5/8	3/4	3	.090	●
	7102519	HA4R8RA0625S075SLR120I	5/8	5/8	3/4	3	.120	●
	7102520	HA4R8RA0625S075SLR190I	5/8	5/8	3/4	3	.190	●
	7102522	HA4R8RA0625R125SLR030I	5/8	5/8	1 1/4	3 1/2	.030	●
	7102523	HA4R8RA0625R125SLR060I	5/8	5/8	1 1/4	3 1/2	.060	●
	7102524	HA4R8RA0625R125SLR090I	5/8	5/8	1 1/4	3 1/2	.090	●
	7102525	HA4R8RA0625R125SLR120I	5/8	5/8	1 1/4	3 1/2	.120	●
	7102526	HA4R8RA0625R125SLR190I	5/8	5/8	1 1/4	3 1/2	.190	●
	7102528	HA4R8RA0750S100SLR030I	3/4	3/4	1	3 1/2	.030	●
	7102529	HA4R8RA0750S100SLR060I	3/4	3/4	1	3 1/2	.060	●
	7102530	HA4R8RA0750S100SLR090I	3/4	3/4	1	3 1/2	.090	●
	7102531	HA4R8RA0750S100SLR120I	3/4	3/4	1	3 1/2	.120	●
	7102532	HA4R8RA0750S100SLR190I	3/4	3/4	1	3 1/2	.190	●
	7102534	HA4R8RA0750R163SLR030I	3/4	3/4	1 5/8	4	.030	●
	7102535	HA4R8RA0750R163SLR060I	3/4	3/4	1 5/8	4	.060	●
	7102536	HA4R8RA0750R163SLR090I	3/4	3/4	1 5/8	4	.090	●
	7102537	HA4R8RA0750R163SLR120I	3/4	3/4	1 5/8	4	.120	●
	7102538	HA4R8RA0750R163SLR190I	3/4	3/4	1 5/8	4	.190	●
	7102540	HA4R8RA1000S125SLR030I	1	1	1 1/4	4	.030	●
	7102541	HA4R8RA1000S125SLR060I	1	1	1 1/4	4	.060	●
	7102542	HA4R8RA1000S125SLR120I	1	1	1 1/4	4	.120	●
	7102543	HA4R8RA1000S125SLR190I	1	1	1 1/4	4	.190	●
	7102544	HA4R8RA1000S125SLR250I	1	1	1 1/4	4	.250	●
	7102546	HA4R8RA1000S175SLR030I	1	1	1 3/4	4 1/2	.030	●
	7102547	HA4R8RA1000S175SLR060I	1	1	1 3/4	4 1/2	.060	●
	7102548	HA4R8RA1000S175SLR120I	1	1	1 3/4	4 1/2	.120	●
	7102549	HA4R8RA1000S175SLR190I	1	1	1 3/4	4 1/2	.190	●
	7102550	HA4R8RA1000S175SLR250I	1	1	1 3/4	4 1/2	.250	●
7102552	HA4R8RA1000R200SLR030I	1	1	2	5	.030	●	
7102553	HA4R8RA1000R200SLR060I	1	1	2	5	.060	●	
7102554	HA4R8RA1000R200SLR120I	1	1	2	5	.120	●	
7102555	HA4R8RA1000R200SLR190I	1	1	2	5	.190	●	
7102556	HA4R8RA1000R200SLR250I	1	1	2	5	.250	●	



- Primary
- Secondary

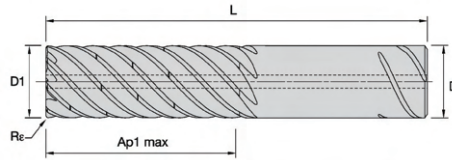
P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Radiused • 8 Flutes • Chip Splitters • Internal Coolant • Safe-Lock™ Shank • **INCH**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Re	
Inch	7102929	HA4R8RA0500R125SLR030D	1/2	1/2	1 1/4	3 1/2	.030	●
	7102930	HA4R8RA0500R125SLR060D	1/2	1/2	1 1/4	3 1/2	.060	●
	7102931	HA4R8RA0500R125SLR090D	1/2	1/2	1 1/4	3 1/2	.090	●
	7102932	HA4R8RA0500R125SLR120D	1/2	1/2	1 1/4	3 1/2	.120	●
	7102934	HA4R8RA0500L163SLR015D	1/2	1/2	1 5/8	4	.015	●
	7102935	HA4R8RA0500L163SLR030D	1/2	1/2	1 5/8	4	.030	●
	7102936	HA4R8RA0500L163SLR060D	1/2	1/2	1 5/8	4	.060	●
	7102937	HA4R8RA0500L163SLR090D	1/2	1/2	1 5/8	4	.090	●
	7102938	HA4R8RA0500L163SLR120D	1/2	1/2	1 5/8	4	.120	●
	7102940	HA4R8RA0500X200SLR030D	1/2	1/2	2	4	.030	●
	7102941	HA4R8RA0500X200SLR060D	1/2	1/2	2	4	.060	●
	7102942	HA4R8RA0500X200SLR090D	1/2	1/2	2	4	.090	●
	7102944	HA4R8RA0500X200SLR120D	1/2	1/2	2	4	.120	●
	7102946	HA4R8RA0625R163SLR030D	5/8	5/8	1 5/8	4	.030	●
	7102947	HA4R8RA0625R163SLR060D	5/8	5/8	1 5/8	4	.060	●
	7102948	HA4R8RA0625R163SLR090D	5/8	5/8	1 5/8	4	.090	●
	7102949	HA4R8RA0625R163SLR120D	5/8	5/8	1 5/8	4	.120	●
	7102950	HA4R8RA0625R163SLR190D	5/8	5/8	1 5/8	4	.190	●
	7102962	HA4R8RA0625L188SLR030D	5/8	5/8	1 7/8	4	.030	●
	7102963	HA4R8RA0625L188SLR060D	5/8	5/8	1 7/8	4	.060	●
	7102964	HA4R8RA0625L188SLR090D	5/8	5/8	1 7/8	4	.090	●
	7102965	HA4R8RA0625L188SLR120D	5/8	5/8	1 7/8	4	.120	●
	7102967	HA4R8RA0625L188SLR190D	5/8	5/8	1 7/8	4	.190	●
	7102969	HA4R8RA0625X250SLR030D	5/8	5/8	2 1/2	5	.030	●
	7102970	HA4R8RA0625X250SLR060D	5/8	5/8	2 1/2	5	.060	●
	7102991	HA4R8RA0625X250SLR090D	5/8	5/8	2 1/2	5	.090	●
	7102992	HA4R8RA0625X250SLR120D	5/8	5/8	2 1/2	5	.120	●
	7102993	HA4R8RA0625X250SLR190D	5/8	5/8	2 1/2	5	.190	●
	7102995	HA4R8RA0750R163SLR030D	3/4	3/4	1 5/8	4	.030	●
	7102996	HA4R8RA0750R163SLR060D	3/4	3/4	1 5/8	4	.060	●
	7102997	HA4R8RA0750R163SLR090D	3/4	3/4	1 5/8	4	.090	●
	7102998	HA4R8RA0750R163SLR120D	3/4	3/4	1 5/8	4	.120	●
	7102999	HA4R8RA0750R163SLR190D	3/4	3/4	1 5/8	4	.190	●
	7103001	HA4R8RA0750L225SLR030D	3/4	3/4	2 1/4	5	.030	●
	7103003	HA4R8RA0750L225SLR060D	3/4	3/4	2 1/4	5	.060	●
	7103004	HA4R8RA0750L225SLR090D	3/4	3/4	2 1/4	5	.090	●
	7103005	HA4R8RA0750L225SLR120D	3/4	3/4	2 1/4	5	.120	●
	7103006	HA4R8RA0750L225SLR190D	3/4	3/4	2 1/4	5	.190	●
	7103009	HA4R8RA0750X325SLR030D	3/4	3/4	3 1/4	6	.030	●
	7103010	HA4R8RA0750X325SLR060D	3/4	3/4	3 1/4	6	.060	●
7103021	HA4R8RA0750X325SLR090D	3/4	3/4	3 1/4	6	.090	●	
7103022	HA4R8RA0750X325SLR120D	3/4	3/4	3 1/4	6	.120	●	
7103023	HA4R8RA0750X325SLR190D	3/4	3/4	3 1/4	6	.190	●	



- Primary
- Secondary

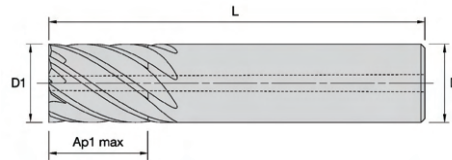
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M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

Continued

HARVI™ IV

Radiused • 8 Flutes • Chip Splitters • Internal Coolant • Safe-Lock™ Shank • **INCH**

	Order Number	Catalog Number	D1	D	Ap1 Max	L	Rε	
Inch	7103025	HA4R8RA1000R250SLR030D	1	1	2 1/2	5 1/2	.030	●
	7103026	HA4R8RA1000R250SLR060D	1	1	2 1/2	5 1/2	.060	●
	7103027	HA4R8RA1000R250SLR120D	1	1	2 1/2	5 1/2	.120	●
	7103029	HA4R8RA1000R250SLR190D	1	1	2 1/2	5 1/2	.190	●
	7103030	HA4R8RA1000R250SLR250D	1	1	2 1/2	5 1/2	.250	●
	7103032	HA4R8RA1000L325SLR030D	1	1	3 1/4	6	.030	●
	7103033	HA4R8RA1000L325SLR060D	1	1	3 1/4	6	.060	●
	7103034	HA4R8RA1000L325SLR120D	1	1	3 1/4	6	.120	●
	7103035	HA4R8RA1000L325SLR190D	1	1	3 1/4	6	.190	●
	7103036	HA4R8RA1000L325SLR250D	1	1	3 1/4	6	.250	●
	7103038	HA4R8RA1000X400SLR030D	1	1	4	7	.030	●
	7103039	HA4R8RA1000X400SLR060D	1	1	4	7	.060	●
	7103040	HA4R8RA1000X400SLR120D	1	1	4	7	.120	●
	7103042	HA4R8RA1000X400SLR190D	1	1	4	7	.190	●
	7103043	HA4R8RA1000X400SLR250D	1	1	4	7	.250	●



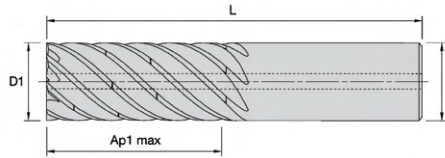
- Primary
- Secondary

P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Square End • 8 Flutes • Internal Coolant • Plain Shank • **INCH**

	Order Number	Catalog Number	D1	D	Ap1 Max	L	
Inch	7102422	HA4R8SE0375S050HAI	3/8	3/8	1/2	2 1/2	●
	7102426	HA4R8SE0375R075HAI	3/8	3/8	3/4	2 1/2	●
	7102432	HA4R8SE0500S063HAI	1/2	1/2	5/8	3	●
	7102438	HA4R8SE0500R100HAI	1/2	1/2	1	3	●
	7102447	HA4R8SE0625S075HAI	5/8	5/8	3/4	3	●
	7102453	HA4R8SE0625R125HAI	5/8	5/8	1 1/4	3 1/2	●
	7102459	HA4R8SE0750S100HAI	3/4	3/4	1	3 1/2	●
	7102465	HA4R8SE0750R163HAI	3/4	3/4	1 5/8	4	●
	7102483	HA4R8SE1000R200HAI	1	1	2	5	●
	7102471	HA4R8SE1000S125HAI	1	1	1 1/4	4	●
	7102477	HA4R8SE1000S175HAI	1	1	1 3/4	4 1/2	●



- Primary
- Secondary

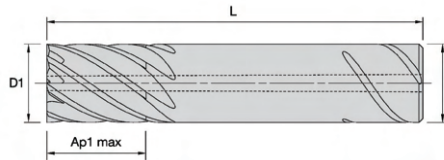
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M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Square End • 8 Flutes • Chip Splitters • Internal Coolant • Plain Shank • **INCH**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	
Inch	7102839	HA4R8SE0375R100HAD	3/8	3/8	1	3	●
	7102853	HA4R8SE0375L125HAD	3/8	3/8	1 1/4	3	●
	7102856	HA4R8SE0375X150HAD	3/8	3/8	1 1/2	3 1/2	●
	7102861	HA4R8SE0500R125HAD	1/2	1/2	1 1/4	3 1/2	●
	7102867	HA4R8SE0500L163HAD	1/2	1/2	1 5/8	4	●
	7102872	HA4R8SE0500X200HAD	1/2	1/2	2	4	●
	7102878	HA4R8SE0625R163HAD	5/8	5/8	1 5/8	4	●
	7102884	HA4R8SE0625L188HAD	5/8	5/8	1 7/8	4	●
	7102890	HA4R8SE0625X250HAD	5/8	5/8	2 1/2	5	●
	7102896	HA4R8SE0750R163HAD	3/4	3/4	1 5/8	4	●
	7102902	HA4R8SE0750L225HAD	3/4	3/4	2 1/4	5	●
	7102909	HA4R8SE0750X325HAD	3/4	3/4	3 1/4	6	●
	7102915	HA4R8SE1000R250HAD	1	1	2 1/2	5 1/2	●
	7102921	HA4R8SE1000L325HAD	1	1	3 1/4	6	●
	7102928	HA4R8SE1000X400HAD	1	1	4	7	●



- Primary
- Secondary

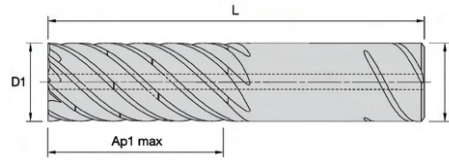
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M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Square End • 8 Flutes • Internal Coolant • Safe-Lock™ Shank • **INCH**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	
Inch	7102489	HA4R8SE0500S063SLI	1/2	1/2	5/8	3	●
	7102515	HA4R8SE0500R100SLI	1/2	1/2	1	3	●
	7102521	HA4R8SE0625S075SLI	5/8	5/8	3/4	3	●
	7102527	HA4R8SE0625R125SLI	5/8	5/8	1 1/4	3 1/2	●
	7102533	HA4R8SE0750S100SLI	3/4	3/4	1	3 1/2	●
	7102539	HA4R8SE0750R163SLI	3/4	3/4	1 5/8	4	●
	7102545	HA4R8SE1000S125SLI	1	1	1 1/4	4	●
	7102551	HA4R8SE1000S175SLI	1	1	1 3/4	4 1/2	●
	7102557	HA4R8SE1000R200SLI	1	1	2	5	●



- Primary
- Secondary

P	Blue	○
M	Yellow	●
K	Red	○
N	Green	○
S	Orange	●
H	Grey	○

HARVI™ IV

Square End • 8 Flutes • Chip Splitters • Internal Coolant • Safe-Lock™ Shank • **INCH**

KCSM15A

	Order Number	Catalog Number	D1	D	Ap1 Max	L	
Inch	7102933	HA4R8SE0500R125SLD	1/2	1/2	1 1/4	3 1/2	●
	7102939	HA4R8SE0500L163SLD	1/2	1/2	1 5/8	4	●
	7102945	HA4R8SE0500X200SLD	1/2	1/2	2	4	●
	7102961	HA4R8SE0625R163SLD	5/8	5/8	1 5/8	4	●
	7102968	HA4R8SE0625L188SLD	5/8	5/8	1 7/8	4	●
	7102994	HA4R8SE0625X250SLD	5/8	5/8	2 1/2	5	●
	7103000	HA4R8SE0750R163SLD	3/4	3/4	1 5/8	4	●
	7103007	HA4R8SE0750L225SLD	3/4	3/4	2 1/4	5	●
	7103024	HA4R8SE0750X325SLD	3/4	3/4	3 1/4	6	●
	7103031	HA4R8SE1000R250SLD	1	1	2 1/2	5 1/2	●
	7103037	HA4R8SE1000L325SLD	1	1	3 1/4	6	●
	7103044	HA4R8SE1000X400SLD	1	1	4	7	●

HARVI™ IV • Side Milling/Slotting • Application Data • **INCH**

Material Group	Max Ae Factor (KAp)	KCSM15A Base Cutting Speed Vc SFM	Recommended Base Feed per Tooth Value (IPT=Inch/tooth)						
			D1 - Diameter						
			frac.	3/8	1/2	5/8	3/4	1	
			dec.	0.375	0.5	0.625	0.75	1	
P	3	1	420	IPT	0.0018	0.0023	0.0027	0.003	0.0037
	4	1	320	IPT	0.0016	0.0021	0.0024	0.0026	0.0031
	5	0.8	210	IPT	0.0014	0.0018	0.0022	0.0024	0.0029
	6	0.7	160	IPT	0.0012	0.0015	0.0018	0.0019	0.0022
M	1	1	275	IPT	0.0018	0.0023	0.0027	0.003	0.0037
	2	0.8	200	IPT	0.0014	0.0018	0.0022	0.0024	0.0029
	3	0.8	200	IPT	0.0012	0.0015	0.0018	0.0019	0.0022
S	1	0.5	160	IPT	0.0018	0.0023	0.0027	0.003	0.0037
	2	0.5	100	IPT	0.0014	0.0018	0.0022	0.0024	0.0029
	3	0.5	80	IPT	0.001	0.0013	0.0014	0.0016	0.002
	4	0.7	160	IPT	0.0016	0.002	0.0024	0.0027	0.0032
H	1	0.8	260	IPT	0.0016	0.0021	0.0024	0.0026	0.0031
	2	0.5	230	IPT	0.0014	0.0018	0.002	0.0022	0.0026

NOTE:

These guidelines may require variations to achieve optimum results.

Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter. Maximum ramp angle is 2°.

Tools with chip splitters can be used as finishers.

Maximum Cutting Width and Adjustment Factors for Speed & Feed Calculation • **INCH**

Maximum cutting width (Ae) for given cutting depth (Ap)

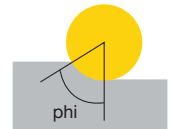
Ap	≤0.125 x D1	>0.125xD1 ≤ .5xD1	>0.5xD1 ≤ 1xD1	>1xD1 ≤ 2xD1	>2xD1 ≤ 3xD1	>3xD1 ≤ 4xD1	>4 x D1
Max Ae	100% x D1	50% x D1 x KAp	40% x D1 x KAp	30% x D1 x KAp	20% x D1 x KAp	15% x D1 x KAp	10% x D1 x KAp

Adjustment factors for speed (Vc) and feed (Fz)

Ae/D1	≤2%	>2% ≤ 5%	>5 ≤ 7.5%	>7.5% ≤ 10%	>10% ≤ 15%	>15% ≤ 20%	>20% ≤ 30%	>30% ≤ 40%	>40% ≤ 50%	>50% ≤ 100%
Kv	3	2.5	1.9	1.4	1.35	1.3	1.2	1.1	1	0.9
KFz	3.28	2.3	1.95	1.7	1.5	1.25	1.09	1.02	1	1

Angle of engagement (phi°) relative to cutting width (Ae)

Ae	2%	5%	7.50%	10%	15%	20%	30%	40%	50%	100%
phi°	16.26	25.84	31.79	36.87	45.57	53.13	66.42	78.46	90	180



To calculate application specific cutting data, please use KAp, Kv, and Kfz from tables above for adaption of cutting speeds and feeds respectively:

$$\text{Maximum Ae} = \text{KAp} * \text{D1} * \text{Ap1Max/D1}$$

$$\text{Vc new} = \text{Vc} * \text{Kv}$$

$$\text{IPT new} = \text{IPT} * \text{KFz}$$

Sample Calculation

Material: S4

D1: 1"

Ap: 2xD1

Max Ae: 30% x Kap x D1	30% x .7 x D1 = 21%xD1
------------------------	------------------------

SFM: Base x Kv	160 x 1.2 = 192
----------------	-----------------

IPT: Base x KFz	.0032 x 1.09 = .0035
-----------------	----------------------

Final cutting data recommendation:

$$\text{Max Ae} = 30\% * 0.7 * 1 = 0.21"$$

$$\text{Vc new} = 160 * 1.2 = 192 \text{ SFM}$$

$$\text{IPT new} = 0.0032 * 1.09 = .0035 \text{ IPT}$$

Application Data • Minimum Helical Interpolation Diameter • **INCH**

Tool. dia. inch	Interpolation dia. inch
3/8	0.54
1/2	0.67
5/8	0.83
3/4	1.00
1	1.29

Maximum ramp angle is 2° on centerline.

HARVI™ IV • Catalog Numbering System

Each character in our catalog number signifies a specific trait of that product. Use the following key columns to easily identify which attributes apply.

HA4R8SE1000X040HADM										
HA4R	8	SE	1000	X	040	HA			D	M
Series	Number of Flutes	Front End Style	Cutting Diameter D1	Flute Section Style	Length of Cut Ap1	Shank Style	Radius		Specific Features	Standard
H1TE = HARVI I TE	1 = 1-Flute	SE = Sharp Edge	Metric = D1 in mm	N = Neck	Metric = Ap1 Max in mm	HA = Plain	Radius Metric	Radius Inch	C = Chip Splitter	M = Metric
HA2L = HARVI II Long	2 = 2-Flute	CH = Chamfer	Inch = D1 in decimal inch	E = Extended Neck	Inch = Ap1 Max in decimal inch	HB = Weldon®	R020 = 0,2mm	R010 = .010"	I = Internal Coolant	Blank = Inch
HA3R = HARVI III	3 = 3-Flute	RA = Radius		S = Short Without Neck		SL = Safe-Lock™	R025 = 0,25mm	R015 = .015"	O = Coolant Grooves in Shank	
HA3A = HARVI III Aero	4 = 4-Flute	BN = Ball Nose		R = Regular Without Neck		DL = DUO-LOCK™	R030 = 0,3mm	R030 = .030"	P = Polished	
HA4R = HARVI IV	5 = 5-Flute	TB = Taper Ball Nose		L = Long Without Neck			R040 = 0,4mm	R060 = .060"	D = Chip Splitter & Internal Coolant	
RSMF = RSM II	6 = 6-Flute	TO = Torroid		X = Extra Long Without Neck			R050 = 0,5mm	R090 = .090"		
KOR = KOR	7 = 7-Flute						R075 = 0,75mm	R120 = .120"		
ALCB = Basic PCD End Mill with Carbide Body	8 = 8-Flute						R100 = 1,0mm	R160 = .160"		
	9 = 9-Flute						R125 = 1,25mm	R250 = .250"		
ALCC = Complex PCD End Mill with Carbide Body	M = Multi-flute						R150 = 1,5mm	R190 = .190"		
ALCR = Roughing PCD End Mill with Carbide Body							R200 = 2,0mm	R375 = .375"		
ALSB = Brazed PCD with Carbide Body							R250 = 2,5mm	R045 = .045"		
ALSR = Helical Brazed PCD with Carbide Body							R300 = 3,0mm			
							R400 = 4,0mm			
							R500 = 5,0mm			
							R600 = 6,0mm			

Level Up with 8 Flutes.

When you're creating in the aerospace and defense, medical, energy and general engineering industries, you need one tool that can withstand the most challenging materials—no more stopping for tool changes between cuts. Prepare to get unfamiliar with downtime.



Our Story Is One of Continuous Innovation

It starts in 1936 with our founder, metallurgist Philip M. McKenna, who after years of research created a tungsten-titanium carbide alloy specifically for cutting tools. That single development not only led to a new class of machining tools that cut faster, lasted longer and drove productivity in everything from the automobile to the airplane, but also led to the opening of McKenna Metals Company in Latrobe, Pennsylvania, United States. Today, that company is Kennametal Inc.—a recognized leader in metalworking serving customers across continents and industries including transportation, construction, aerospace, machining and cutting, energy and general engineering. We have a reputation for building innovative solutions for our customers' most challenging applications. The name Kennametal is synonymous for high-quality, high-performance tools that can withstand the most strenuous conditions and bring ease to a wide range of machining operations. We help our customers' operations run longer, faster and with greater precision. We don't cut corners. We cut metal. Your toughest materials don't stand a chance.

Your toughest materials don't stand a chance.



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