

# RAISE **YOUR** STANDARDS

**OFFER**  
**EXTENDED**  
TO **JUNE 30, 2021**

**KOR 5™**  
FROM  
**\$41.00**

**HARVI™ I TE**  
FROM  
**\$22.00**

**HARVI™ III**  
FROM  
**\$41.00**

**5-FLUTES**

**MAXIMUM MRR  
IN ALUMINUM**

**4-FLUTES**

**MAXIMUM VERSATILITY  
MAXIMUM PRODUCTIVITY**

**6-FLUTES**

**MAXIMUM PRODUCTIVITY  
IN TITANIUM**

**HELP SUPPORT VETERANS BY USING  
KENNAMETAL END MILLS**

Valid from August 1, 2020 to June 30, 2021

[Kennametal.com/TitanPromo](http://Kennametal.com/TitanPromo)



***KENAMETAL WILL DONATE ONE DOLLAR  
OF EACH PROMOTIONAL END MILL SALE  
TO WORKSHOPS FOR WARRIORS®***



WORKSHOP FOR WARRIORS IS A NONPROFIT ORGANIZATION THAT TRAINS AND CERTIFIES VETERANS AND  
TRANSITIONING SERVICE MEMBERS FOR CAREERS IN ADVANCED MANUFACTURING.

TO LEARN ABOUT ENROLLMENT OR DONATING, VISIT: [WFW.ORG](http://WFW.ORG)



## Materials

P M K S H

## Applications



**HARVI™ I TE**  
FROM  
**\$22.00**

Asymmetrical divided flutes and variable helix.

Twisted end face.

Chip gashes within the flutes.

Faceted eccentric relief with AVF-technology.



Promo Number	Description	Promotional Price
<b>HARVI I TE • RADIUSSED • 4 FLUTES • STRAIGHT SHANK</b>		
6862747	HARVI I TE 1/4 x 1/4 x 3/4 x 2 1/2 R.015	\$22.00
6862748	HARVI I TE 3/8 x 3/8 x 7/8 x 2 1/2 R.015	\$41.00
6827274	HARVI I TE 3/8 x 3/8 x 1 x 3; R.015	\$41.00
6862749	HARVI I TE 1/2 x 1/2 x 1 x 3 R.015	\$56.00
6862750	HARVI I TE 1/2 x 1/2 x 1 x 3 R.03	\$56.00
6827273	HARVI I TE 1/2 x 1/2 x 1 1/4 x 3 1/4; R.015	\$56.00
6862751	HARVI I TE 1/2 x 1/2 x 1 1/4 x 3 1/4 R.03	\$56.00
<b>HARVI I TE • RADIUSSED • 4 FLUTES • WELDON SHANK</b>		
6862752	HARVI I TE 1/2 x 1/2 x 1 x 3 R.015	\$56.00
6862753	HARVI I TE 1/2 x 1/2 x 1 x 3 R.03	\$56.00
6862754	HARVI I TE 1/2 x 1/2 x 1 1/4 x 3 1/4 R.015	\$56.00
6862755	HARVI I TE 1/2 x 1/2 x 1 1/4 x 3 1/4 R.03	\$56.00
<b>HARVI I TE • SQUARE END • 4 FLUTES • STRAIGHT SHANK</b>		
6862756	HARVI I TE 1/4 x 1/4 x 3/4 x 2 1/2 S	\$22.00
6862757	HARVI I TE 1/2 x 1/2 x 1 x 3 S	\$56.00
<b>HARVI I TE • SQUARE END • 4 FLUTES • WELDON SHANK</b>		
6862758	HARVI I TE 1/2 x 1/2 x 1 1/4 x 3 1/4 S	\$56.00

\* Returns will be refunded at promotional order price.

Material Group		Application Data			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.					
		KCSM15		D1 – Diameter						
		ap	ae	ap	Cutting Speed – vc SFM		frac. dec.	1/4	3/8	1/2
			min	max						
P	0	1.5 x D1	0.5 x D1	1.25 x D1	490	660	IPT	.0020	.0030	.0037
	1	1.5 x D1	0.5 x D1	1.25 x D1	490	660	IPT	.0020	.0030	.0037
	2	1.5 x D1	0.5 x D1	1.25 x D1	460	620	IPT	.0020	.0030	.0037
	3	1.5 x D1	0.5 x D1	1.25 x D1	390	520	IPT	.0017	.0025	.0032
	4	1.5 x D1	0.5 x D1	1.25 x D1	300	490	IPT	.0015	.0022	.0028
	5	1.5 x D1	0.5 x D1	1.25 x D1	200	330	IPT	.0014	.0020	.0025
M	6	1.5 x D1	0.5 x D1	1.25 x D1	160	250	IPT	.0011	.0017	.0021
	1	1.5 x D1	0.5 x D1	1.25 x D1	300	380	IPT	.0017	.0025	.0032
	2	1.5 x D1	0.5 x D1	1.25 x D1	200	260	IPT	.0014	.0020	.0025
K	3	1.5 x D1	0.5 x D1	1.00 x D1	200	230	IPT	.0011	.0017	.0021
	1	1.5 x D1	0.5 x D1	1.00 x D1	390	490	IPT	.0020	.0030	.0037
	2	1.5 x D1	0.5 x D1	1.00 x D1	360	460	IPT	.0017	.0025	.0032
S	3	1.5 x D1	0.5 x D1	1.00 x D1	360	430	IPT	.0014	.0020	.0025
	1	1.5 x D1	0.3 x D1	0.75 x D1	160	300	IPT	.0017	.0025	.0032
	2	1.5 x D1	0.3 x D1	0.75 x D1	160	260	IPT	.0014	.0020	.0025
H	3	1.5 x D1	0.5 x D1	1.25 x D1	80	130	IPT	.0009	.0013	.0017
	4	1.5 x D1	0.5 x D1	1.25 x D1	160	200	IPT	.0012	.0019	.0023
	1	1.5 x D1	0.5 x D1	1.00 x D1	260	460	IPT	.0015	.0022	.0028
	2	1.5 x D1	0.2 x D1	1.00 x D1	230	390	IPT	.0011	.0017	.0021

NOTE: Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.  
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.  
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.  
For tools with reach >5 x D1, reduce fz by 30%.  
Slot milling applications – for longest reach (L3) tools, reduce ae by 30%.

## ADJUSTMENT FACTOR FOR FEED AND SPEED CALCULATION

To calculate application-specific cutting data, please use KV coefficient table to the right for adaptation of cutting speed and KFz for feed respectively.

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

$$Fz_{new} = IPT \cdot KFz$$

### Calculation example:

Application: D1 = 1 inch;  
S4 material group;  
Ae 0.02 inch

Cutting data recommendation: 150 SFM;  
fz = 0.0033 IPT

Adjustment coefficients: Ae = 0.02 = inch equals 2.00%;  
Kv = 2; KFz = 2.4

	Ae/D	0.50%	1.00%	1.60%	2.00%	4.00%	5.00%	8.00%	10.00%	20.00%	30.00%	40.00%	50.00%
<b>Speed factor</b>	Kv	2.9	2.85	2.8	2	1.5	1.45	1.4	1.35	1.25	1.2	1	1
<b>Feed factor</b>	KFz	2.8	2.6	2.5	2.4	2.3	2.2	2	1.7	1.25	1.02	1	1

### Final cutting data recommendation:

Vc new = 150 SFM \* 2 = 300 SFM  
Fz new = .0033 IPT \* 2.4 = .0079 IPT



## Materials

N

## Applications



Ramping



Trochoidal Milling



Side Milling/Shoulder Milling: Roughing



Side Milling/Shoulder Milling: Finishing

**KOR 5™**  
FROM  
**\$41.00**



Internal coolant.

Up to 66% higher table feed in aluminum applications.

Chipbreakers manage chip removal efficiently.

Safe-Lock™ shank prevents end mill pullout.

Promo Number	Description	Promotional Price
<b>KOR 5 DA • SQUARE END • 5 FLUTES • STRAIGHT SHANK</b>		
6827276	KOR5 3/8 x 1 1/8 x 3	\$41.00
<b>KOR 5 DA • SQUARE END • 5 FLUTES • SAFE-LOCK SHANK</b>		
6827275	KOR5 1/2 x 1 1/2 x 3 1/2; SafeLock	\$56.00

\* Returns will be refunded at promotional order price.

Material Group		Application Data							
		K600		Recommended feed per tooth (IPT = inch/th)					
				Cutting Speed – vc SFM			D1 – Diameter		
ap	ae	ap	min	max	frac.	3/8	1/2		
N	1	0.5 x D1	0.5 x D1	0.25 x D1	640	6560	dec.	.3750	.5000
	2	0.5 x D1	0.5 x D1	0.25 x D1	640	4920	IPT	0.0030	0.0050
							IPT	0.0025	0.0045

NOTE: Those guidelines may require variations to achieve optimum results. For better surface finish, reduce feed per tooth.  
For cutting aluminum with high silicon, TiCN coating is recommended.  
Ap for milling machine with ceramic bearings spindle, multiply by 0.5.  
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on >1/2" diameter.

## ADJUSTMENT FACTOR TABLE FOR FEED CALCULATION

To calculate application-specific cutting data, please use above coefficient for adaptation of feed.  
Fz new = IPT \* Feed Multiplier

### Calculation example:

Application: D = 1";

N1 material group;

Ae 0.1"

Cutting data recommendation: 640 SFM;

fz = 0.0090 IPT

Adjustment coefficients: Ae = 0.1" equals 10.00%;

Feed Multiplier = 1.7

### Final cutting data recommendation:

FZ new = .0090 IPT \* 1.7 = .0153 IPT

Ae/D1	100%	50%	40%	30%	20%	10%	5%	2%
Max Ap	.25 x D1	.5 x D1	1 x D1	2 x D1	Ap1 Max	Ap1 Max	Ap1 Max	Ap1 Max
Feed Multiplier	.90	1.00	1.02	1.09	1.25	1.70	2.30	3.60

To Place Your Order:  
Contact Your Local  
Authorized Distributor



## Materials

M S

## Applications



Ramping



Side Milling/Shoulder Milling: Roughing



Trochoidal Milling



Side Milling/Shoulder Milling: Finishing

**HARVI™ III**  
FROM  
**\$41.00**



Center cutting enables axial movement, and expands ramping capabilities.

Unequal flute spacing reduces vibrations. Improves surface finish.

Safe-Lock™ shank prevents end mill pullout.

Eccentric relief grind improves edge stability. Enables higher feed rates.

Promo Number	Description	Promotional Price
<b>HARVI III • SQUARE END • 6 FLUTES • STRAIGHT SHANK</b>		
6827272	HARVI III 3/8 x 3/8 x 1 x 3	\$41.00
6827271	HARVI III 1/2 x 1/2 x 1 1/4 x 3	\$56.00
6862759	HARVI III 1/2 x 1/2 x 1 1/2 x 3 1/2 R.03	\$56.00

\* Returns will be refunded at promotional order price.

Application Data • Roughing								
Material Group	ap	ae	KCSM15		Recommended feed per tooth (IPT = inch/th) for side milling (A).			
			Cutting Speed – vc SFM		frac.	D1 – Diameter		
			min	max		3/8	1/2	
M	1	Ap max	0.4 x D	300	380	dec.	.3750	.5000
	2	Ap max	0.4 x D	200	260	IPT	.0023	.0029
	3	Ap max	0.4 x D	200	230	IPT	.0015	.0019
S	1	Ap max	0.4 x D	160	300	IPT	.0023	.0029
	2	Ap max	0.4 x D	80	130	IPT	.0012	.0015
	3	Ap max	0.4 x D	80	130	IPT	.0012	.0015
4	Ap max	0.4 x D	160	200	IPT	.0017	.0021	

Application Data • Finishing								
Material Group	ap	ae	KCSM15		Recommended feed per tooth (IPT = inch/th) for side milling (A).			
			Cutting Speed – vc SFM		frac.	D1 – Diameter		
			min	max		3/8	1/2	
M	1	Ap max	0.06 x D	560	720	IPT	.0027	.0035
	2	Ap max	0.06 x D	370	500	IPT	.0022	.0028
	3	Ap max	0.06 x D	370	440	IPT	.0018	.0023
S	1	Ap max	0.06 x D	310	560	IPT	.0027	.0035
	2	Ap max	0.06 x D	160	250	IPT	.0015	.0018
	3	Ap max	0.06 x D	160	250	IPT	.0015	.0018
4	Ap max	0.06 x D	310	370	IPT	.0020	.0026	

NOTE: Those guidelines may require variations to achieve optimum results.

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Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

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





**“THESE TOOLS ARE  
THE STANDARD IN MY SHOP.  
FROM GENERAL ENGINEERING  
TO AEROSPACE APPLICATIONS,  
THEY CUT THROUGH IT ALL!”**

– Titan Gilroy



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