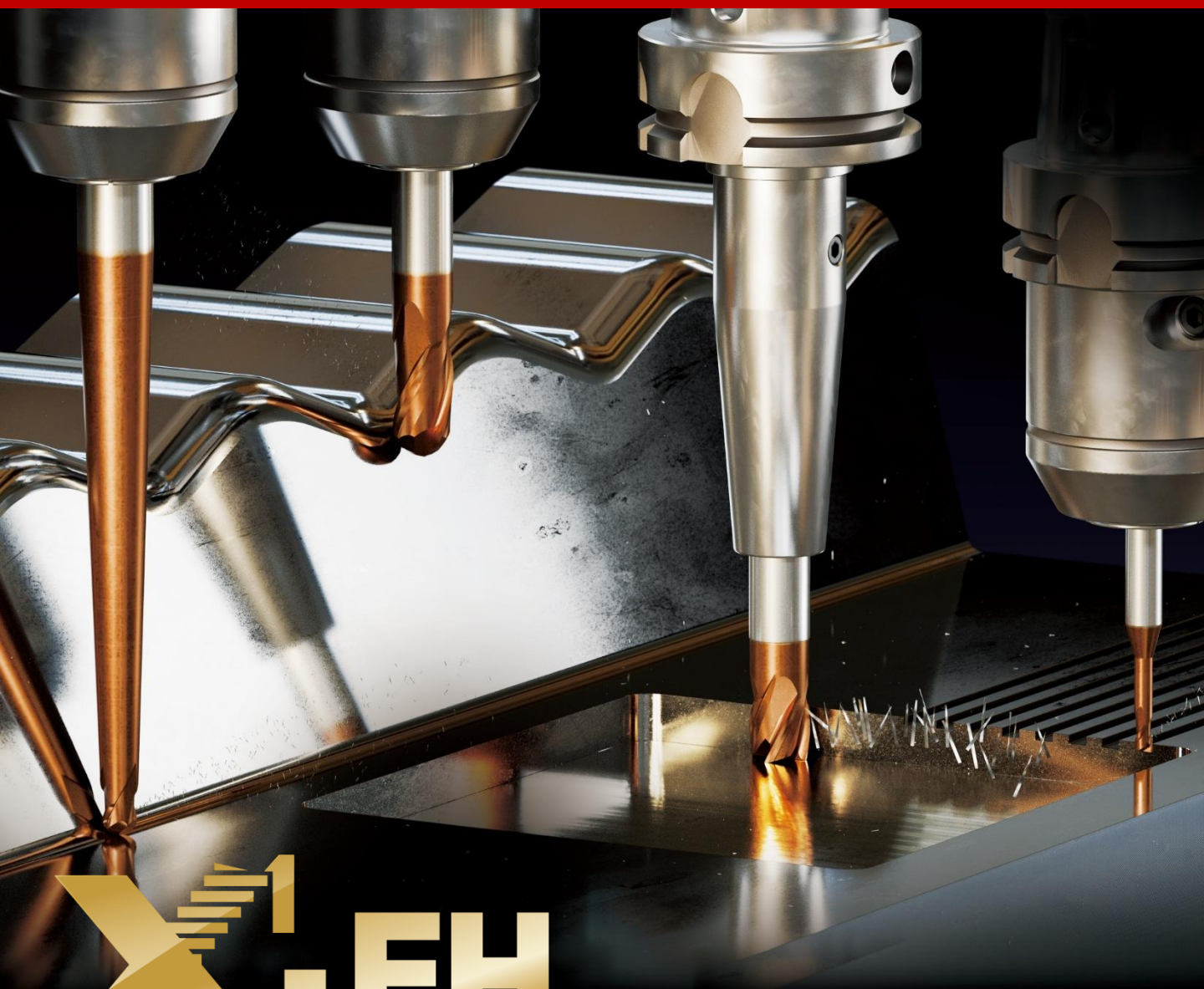


New Product Announcement

Metric

June 4th, 2025_NPAE 2501



X¹-EH

**FINE-FINISHING SOLID CARBIDE END MILLS
FOR HIGH HARDENED STEEL**

■ NOW AVAILABLE BEYOND 2FLUTE

VARIANTS IN 3, 4, 6 AND 8FLUTE OPTIONS TO ROUND OUT THE OFFERING.





New Product Announcement

X1-EH

PREMIUM X¹-EH

AWARD WINNING PREMIUM PRODUCT LINE
NOW AVAILABLE BEYOND 2FLUTE VARIANTS IN
3, 4, 6 AND 8FLUTE OPTIONS TO ROUND OUT
THE OFFERING.


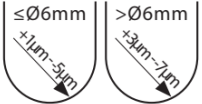





“Building on the fundament of the 2flute, high
Accuracy product lines the X1-EH receives finally
the additional flute variants needed to further
grow and gain market share from competition.”

Main Concept

The X1-EH expansion consists out of 2 components:

- The expected increase in flute and shape variants targeting HRc 50-70 hardness
- The addition of a modified gashing to now target HRc 40-60 hardness

“X1” stands for exceptional capabilities. In the case of “X1-EH”, this exceptional capability shows itself in exceptional accuracy, exceptional tool life and exceptional surface finishes. This is why the new 40-60 product lines (HPK44, HPK45, HPK46 and HPK47) were added under X1-EH and not introduced independently. The new 40-60 product line carries the same exceptional standards as the original X1-EH product, only applied to a different material hardness.

Flutes	SERIES	TYPE	OD Range		HRc Range		Accuracy	Helix	Applications
			min	max	40-60	50-70			
2	 HPI90 HPK44	Ball Nose	R0.05	R10.0	○	●			
	 HPI91 HPK45	Ball Nose for Rib Processing	R0.05	R6.0	○	●			
	 HPI92 HPK47	Ball Nose for Rib Processing with Taper Neck	R0.05	R6.0	○	●			
	 HPK10 HPK46	Ball Nose with Neck	R0.5	R12.5	○	●			
					●	○			
					○	●			

Per definition, ISO-H covers the hardness range from HRc 42 (cutting group 40) to HRc 70 (cutting group 39.3), so adding a product to cover materials down to HRc 40 makes sense.



New Product Announcement

X1-EH

Product Features

As already known from the initial launch of X1-EH:

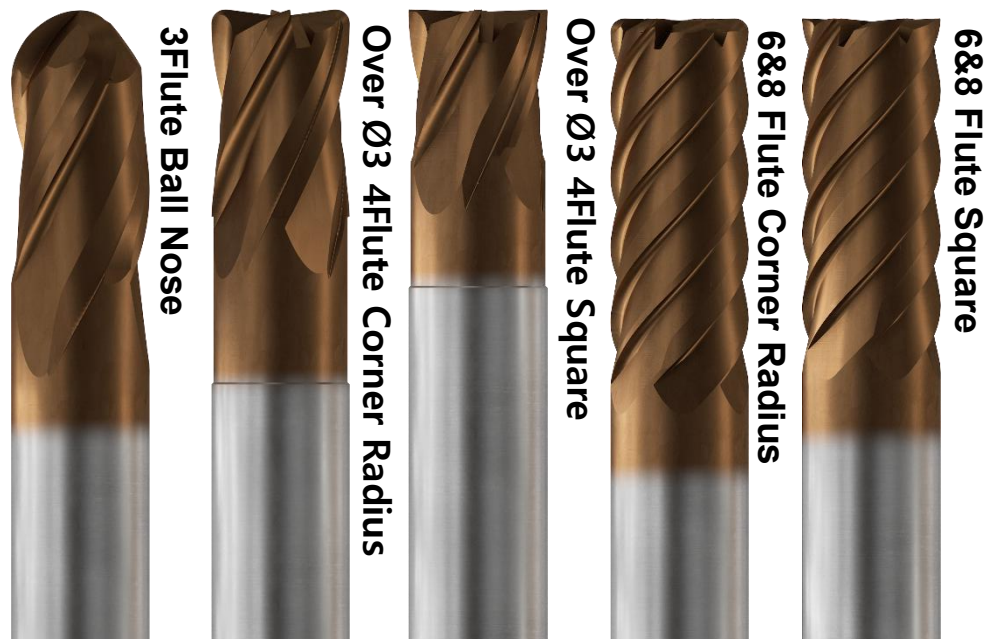
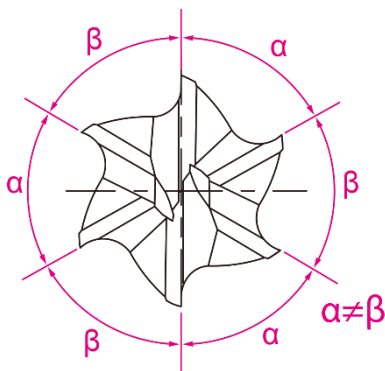
- The new C-Coating
- The new substrate for $\varnothing 6\text{mm}$ and below
- The h4 shank accuracy for $\varnothing 6\text{mm}$ and below
- The improved gashing and reinforced back of the 2-flute ball nose
- The improved consistency and tolerance of the cutting edge prep
- The highly accurate ball nose and corner radius tolerances

Were, of course, kept for all additional items.

In addition, the 4, 6 and 8 flute square and corner radius milling cutters feature important macro-geometry improvements:

- Unequal flute indexing to minimize vibrations resulting in improved surface quality
- Variable helix on all 4-flute tools to further suppress unfavorable harmonics resulting in longer tool life

Unequal Indexing





New Product Announcement

X1-EH

Work Material

- The existing and new X1-EH end mills will continue to target hard steels – 50 to 70HRc:

◎ : Excellent ○ : Good

ISO	P												M			K								
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20			
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21			
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230			
Recommended					○			○	○		○	○												
ISO	N									S							H							
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

- Only the X1-EH series HPK44, HPK45, HPK46 and HPK47 target softer steels – 40 to 60HRc:

◎ : Excellent ○ : Good

ISO	P												M			K								
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20			
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21			
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230			
Recommended					○			○	◎		○	◎												
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Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel				Chilled Cast Iron	Hardened Cast Iron	
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	◎	◎

Target Customers

- Customers searching for an alternative to high priced Japanese tooling will benefit the most from X1-EH in general. While the first stage of X1-EH has proven to our customers the exceptional quality, high level of accuracy, and long tool life, the 2nd stage provides the possibility to also cover roughing and semi-finishing applications.
- Channel partners and distributors will enjoy having a genuine alternative to X5070 with a different portfolio and catalog data providing much more detailed information.

Target Market

- Main market is Mold & Die. But also, General Engineering and other adjacent markets could benefit from the expanded offering.

Sales Strategy

- Expanding a well-established product line allows for faster implementation and minimizes the amount of time needed for training and testing. All expansion sizes maintain the current series numbers.



New Product Announcement

X1-EH

New Product Line Summary

- 23 individual product lines expanded from formally 5 allows optimizing almost all processes. X1-EH now offers 1,840 unique items:
- 1.840 EDPs in total providing 125% more items than the original 819 EDPs.

Shape	Series	Description	OD		SKU	OD		SKU
			Min	Max		Min	Max	
Square	HPI88	2 Flutes - Square with Neck Rib	0.1	6	148			
	HPK19	2 Flutes - Square with Neck				0.1	20	27
	HPK20	4 Flutes - Square with Neck Rib				1	6	26
	HPK21	4 Flutes - Square with Neck				1	20	11
	HPK23	Multi Flute (4&6&8)				1	25	29
					Exisiting	148	New	93
Corner Radius	HPK14	2 Flutes Miniature				0.3	2	9
	HPI89	2 Flutes Rib	0.2	3	163	0.2	12	80
	HPK15	2 Flutes with Neck				0.3	20	31
	HPK16	4 Flutes Rib				0.5	6	125
	HPK17	4 Flutes with Neck				1	20	57
	HPK18	6 Flutes				6	20	9
	HPK22	4 Flutes - High Feed				2	16	24
					Exisiting	163	New	335
Ball Nose	HPI90	2 Flutes	0.1	20	22	0.1	20	8
	HPK44	2 Flutes (HRc4060)				0.1	20	30
	HPI91	2 Flutes Rib	0.1	6	256	0.1	12	3
	HPK45	2 Flutes with Rib (HRc4060)				0.1	12	259
	HPK10	2 Flutes with Neck				1	25	17
	HPK46	2 Flutes with Neck (HRc4060)				1	25	17
	HPI92	2 Flutes with Taper Neck	0.1	12	230			
	HPK47	2 Flutes with Taper Neck (HRc4060)				0.1	12	230
	HPK11	3 Flutes				3	20	9
	HPK12	4 Flutes				3	20	9
	HPK13	4 Flutes with Neck				1	12	11
					Exisiting	508	New	593
					Sub-Total	819	Sub-Total	1021
					Total			1,840



New Product Announcement

X1-EH

Marketing Materials

<Brochure>



Download

<Video>



Coming soon, by June.

**If you need further information or have questions, please feel free to reach out to our Headquarter PMs:

Mr. David Shin(soshin@yg1.solutions)

and also, Product Manager for Round Tools in EMEA

Mr. Thilo Mueller (thilo.mueller@yg1.solutions)**

***The official launch date is June 4th.**

- Only the X1-EH series HPK44, HPK45, HPK46, and HPK47 target softer steels (40 to 60 HRc). Scheduled for release in late Autumn.