

Addition of  
new chipbreakers  
and new grade  
**UH6400**

## Chipbreaker System for Heavy Cutting

**HV·HX·HZ·RR·RBS**

**HAS·HBS·HCS·HDS·HXD**



**Specially designed  
for heavy cutting  
from stainless  
steels to hard  
steels.**

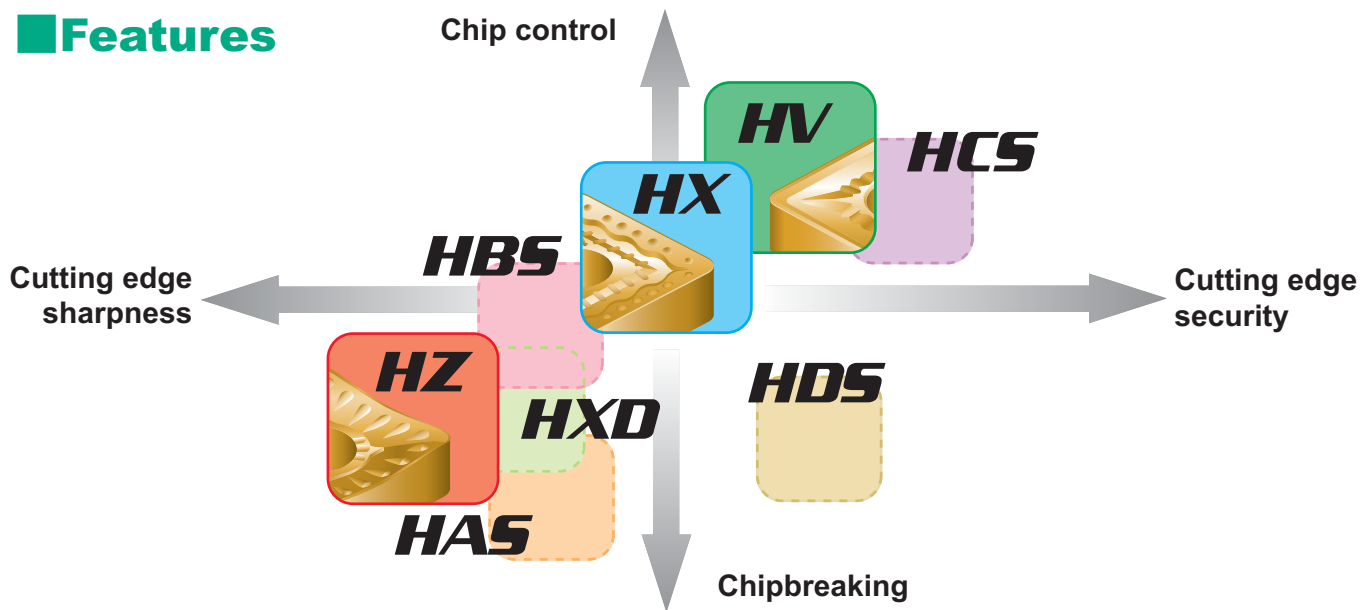
Extreme sharpness and superior chip control combined with CVD coated grade **UH6400** specially designed for heavy cutting.

# Chipbreaker System for Heavy Cutting


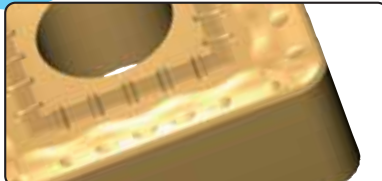

## HV·HX·HZ·RR·RBS

## HAS·HBS·HCS·HDS·HXD



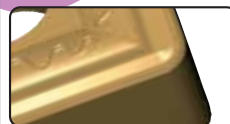
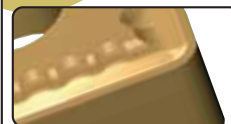
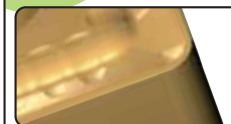
### Features



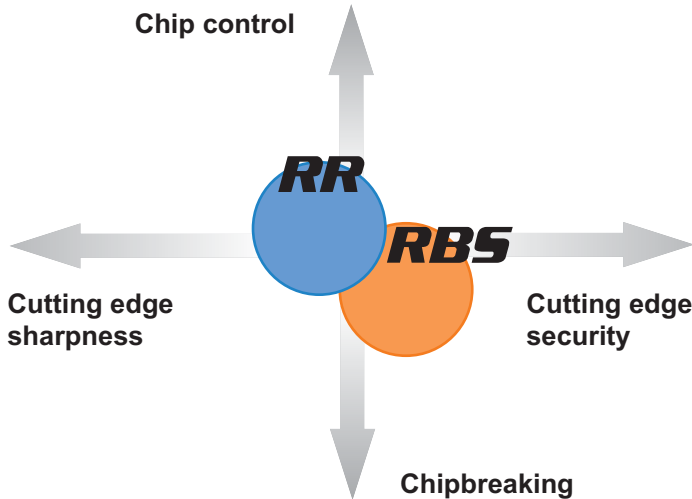
### Main chipbreakers

<p><b>HZ breaker</b> <b>Sharp edge</b> For small depth of cut and low feed</p>  <ul style="list-style-type: none"> <li>● Low cutting resistance thanks to positive land and a curved edge.</li> <li>● Superior chip control with no increase in cutting resistance thanks to teardrop dots.</li> </ul> <p>Cutting edge profile</p>	<p><b>HX breaker</b> <b>General-purpose machining</b> For medium depth of cut and medium feed</p>  <ul style="list-style-type: none"> <li>● Superior chip control thanks to changeable land and a wavy chipbreaker.</li> <li>● Balance of sharpness and cutting edge strength thanks to a straight cutting edge and chamfer.</li> </ul> <p>Cutting edge profile</p>	<p><b>HV breaker</b> <b>Strong edge</b> For large depth of cut and high feed</p>  <ul style="list-style-type: none"> <li>● High cutting edge strength thanks to wide land and large chamfer.</li> <li>● Chip jamming is prevented by a wide chipbreaker.</li> </ul> <p>Cutting edge profile</p>
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### Supplementary chipbreakers

<p><b>HAS breaker</b></p>  <ul style="list-style-type: none"> <li>● Balance of sharpness and cutting edge strength thanks to changeable land.</li> <li>● Superior chip control thanks to a narrow chipbreaker.</li> <li>● An insert with a double-sided chipbreaker for heavy cutting.</li> </ul> <p>Cutting edge profile</p>	<p><b>HBS breaker</b></p>  <ul style="list-style-type: none"> <li>● Low cutting resistance thanks to narrow land, for machining mild steel and stainless steel. Also strong cutting edge due to large chamfer combined with narrow land.</li> </ul> <p>Cutting edge profile</p>	<p><b>HCS breaker</b></p>  <ul style="list-style-type: none"> <li>● A double groove type chipbreaker. One groove near a cutting edge is for chip control at small depth of cut. The other inside groove is for chip control at large depth of cut.</li> <li>● High cutting edge strength thanks to large chamfer and wide land.</li> </ul> <p>Cutting edge profile</p>	<p><b>HDS breaker</b></p>  <ul style="list-style-type: none"> <li>● High cutting edge strength is remained for machining at large depth of cut.</li> <li>● Superior chip control thanks to a narrow chipbreaker.</li> <li>● Available in both single- and double-sided types.</li> </ul> <p>Cutting edge profile</p>	<p><b>HXD breaker</b></p>  <ul style="list-style-type: none"> <li>● Balance of sharpness and cutting edge strength thanks to changeable land.</li> <li>● Ideally suited to semi-heavy cutting thanks to a combination of small chamfer and wide land.</li> </ul> <p>Cutting edge profile</p>
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Round chipbreakers



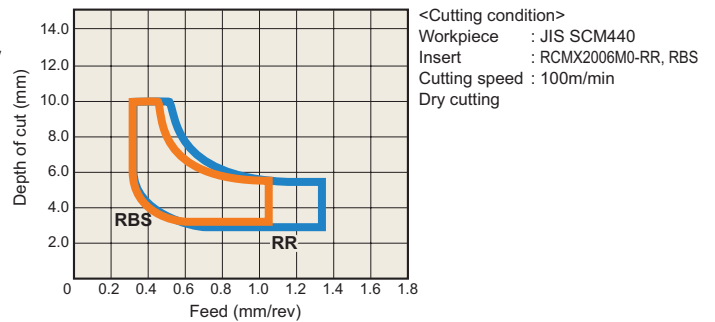
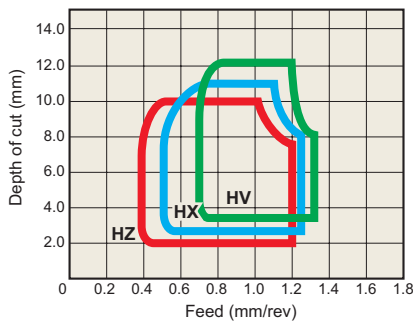
**RR breaker** **General-purpose machining**  
 For medium depth of cut and medium feed

- Chip jamming at large depth of cut is prevented by a wide groove chipbreaker.
- Improved chip control and reduced cutting resistance at small depth of cut thanks to small dimples.

**RBS breaker** **Strong edge**  
 For medium depth of cut and medium feed

- Ideally suited to cutting mild steel thanks to a wide groove chipbreaker and a sharp angle chipbreaker.
- High cutting edge strength thanks to large chamfer.

Effective chip control range



Recommended grade and effective chip control range

Cutting Conditions	Workpiece			
	Stainless Steel	Mild Steel	Hard Steel	
		180HB → 280HB → 350HB		
Continuous cutting ↑ ↓ Interrupted cutting	Finish cutting	HZ (UE6010) HZ (UE6020)	HX (UE6020)	HV (UE6020)
	Rough cutting	HZ (US735)	HX (UH6400)	HV (UH6400)

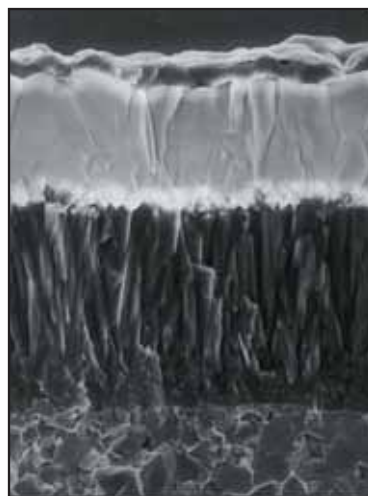
UE6020



- Good balance of wear resistance and fracture resistance. High plastic deformation resistance.
- Recommended for relatively high cutting speeds or machining in which a workpiece is hard and deformation of a cutting edge is likely to cause problems.

UH6400 <sup>NEW</sup>

UH6400, a grade specially designed for heavy cutting, ensures lengthened tool life from interrupted cutting of mill scale to continuous cutting of non-mill scale.



Coating

Triple-layer structure that attaches weight to function of each layer offers unmatched wear resistance. In addition, a very smooth coating surface prevents welding chipping.

Substrate

Cemented carbide having slanted surface structure provides high resistance to fracturing and thermal cracks even under harsh machining conditions.

Cutting edge geometry

Cutting edge geometry that is optimized for heavy cutting has improved fracture resistance without losing wear resistance.

# Main Chipbreaker System

**HV·HX·HZ**  
**RR·RBS**

## INSERTS

Geometry	Class	Order number	Dimensions (mm)			Coated						
			D1	S1	Re	UE6005	UE6010	UE6020	UE6035	NEW UH6400	US7020	US735
<b>CNMM.....-HV</b> 	M	<b>CNMM190616-HV</b>	19.05	6.35	1.6	☐	●	●	☐	●		
		<b>190624-HV</b>	19.05	6.35	2.4	☐	●	●	☐	●		
		<b>250724-HV</b>	25.4	7.94	2.4	☐	●	●	☐	●		
		<b>250924-HV</b>	25.4	9.52	2.4	☐	●	●	☐	●		
<b>SNMM.....-HV</b> 	M	<b>SNMM190616-HV</b>	19.05	6.35	1.6	☐	●	●	☐	●		
		<b>190624-HV</b>	19.05	6.35	2.4	☐	●	●	☐	●		
		<b>250724-HV</b>	25.4	7.94	2.4	☐	●	●	☐	●		
		<b>250924-HV</b>	25.4	9.52	2.4	☐	●	●	☐	●		
<b>TNMM.....-HV</b> 	M	<b>TNMM330924-HV</b>	19.05	9.52	2.4	☐	☐	☐	☐			
<b>CNMM.....-HX</b> 	M	<b>CNMM160612-HX</b>	15.875	6.35	1.2		☐	☐	☐			
		<b>160616-HX</b>	15.875	6.35	1.6		☐	☐	☐			
		<b>190612-HX</b>	19.05	6.35	1.2		●	●	☐	●		
		<b>190616-HX</b>	19.05	6.35	1.6		●	●	☐	●		
		<b>190624-HX</b>	19.05	6.35	2.4		●	●	☐	●		
		<b>250724-HX</b>	25.4	7.94	2.4		●	●	☐	●		
		<b>250732-HX</b>	25.4	7.94	3.2		☐	☐	☐	●		
		<b>250924-HX</b>	25.4	9.52	2.4		●	●	☐	●		
<b>250932-HX</b>	25.4	9.52	3.2		☐	☐	☐	●				
<b>SNMM.....-HX</b> 	M	<b>SNMM150612-HX</b>	15.875	6.35	1.2		☐	☐	☐			
		<b>190612-HX</b>	19.05	6.35	1.2		●	●	☐	●		
		<b>190616-HX</b>	19.05	6.35	1.6		●	●	☐	●		
		<b>190624-HX</b>	19.05	6.35	2.4		●	●	☐	●		
		<b>250724-HX</b>	25.4	7.94	2.4		●	●	☐	●		
		<b>250732-HX</b>	25.4	7.94	3.2		☐	☐	☐	●		
		<b>250924-HX</b>	25.4	9.52	2.4		●	●	☐	●		
		<b>250932-HX</b>	25.4	9.52	3.2		☐	☐	☐	●		
<b>CNMM.....-HZ</b> 	M	<b>CNMM120408-HZ</b>	12.7	4.76	0.8		●	●			☐	☐
		<b>120412-HZ</b>	12.7	4.76	1.2		●	●			☐	☐
		<b>160612-HZ</b>	15.875	6.35	1.2		●	●			☐	☐
		<b>160616-HZ</b>	15.875	6.35	1.6		●	●			☐	☐
		<b>190612-HZ</b>	19.05	6.35	1.2		●	●		●	☐	☐
		<b>190616-HZ</b>	19.05	6.35	1.6		●	●		●	☐	☐
		<b>190624-HZ</b>	19.05	6.35	2.4		●	●		●	☐	☐
<b>DNMM.....-HZ</b> 	M	<b>DNMM150408-HZ</b>	12.7	4.76	0.8		●	●			☐	☐
		<b>150412-HZ</b>	12.7	4.76	1.2		●	●			☐	☐
		<b>150416-HZ</b>	12.7	4.76	1.6		●	●			☐	☐
		<b>150608-HZ</b>	12.7	6.35	0.8		●	●			☐	☐
		<b>150612-HZ</b>	12.7	6.35	1.2		●	●			☐	☐
		<b>150616-HZ</b>	12.7	6.35	1.6		●	●			☐	☐

Geometry	Class	Order number	Dimensions (mm)			Coated						
			D1	S1	Re	UE6005	UE6010	UE6020	UE6035	NEW UH6400	US7020	US735
<b>SNMM.....-HZ</b> 	M	<b>SNMM120408-HZ</b>	12.7	4.76	0.8		●	●			□	□
		<b>120412-HZ</b>	12.7	4.76	1.2		●	●			□	□
		<b>150612-HZ</b>	15.875	6.35	1.2		●	●			□	□
		<b>190612-HZ</b>	19.05	6.35	1.2		●	●		●	□	□
		<b>190616-HZ</b>	19.05	6.35	1.6		●	●		●	□	□
		<b>190624-HZ</b>	19.05	6.35	2.4		□	□		●	□	□
<b>TNMM.....-HZ</b> 	M	<b>TNMM160408-HZ</b>	9.525	4.76	0.8		●	●			□	□
		<b>220408-HZ</b>	12.7	4.76	0.8		●	●			□	□
		<b>220412-HZ</b>	12.7	4.76	1.2		●	●			□	□
		<b>220416-HZ</b>	12.7	4.76	1.6		●	●			□	□
<b>RCMX.....-RR</b> 	M	<b>RCMX1606M0-RR</b>	16	6.35	5.2		□	□		●		
		<b>2006M0-RR</b>	20	6.35	6.5		□	□		●		
		<b>2507M0-RR</b>	25	7.94	7.2		□	□		●		
		<b>3209M0-RR</b>	32	9.52	9.5		□	□		●		
<b>RCMX.....-RBS</b> 	M	<b>RCMX1606M0-RBS</b>	16	6.35	5.2					●		
		<b>2006M0-RBS</b>	20	6.35	6.5					●		
		<b>2507M0-RBS</b>	25	7.94	7.2					●		
		<b>3209M0-RBS</b>	32	9.52	9.5					●		

## Recommended Cutting Conditions

### ● HV breaker

Workpiece	Hardness	Grade	Cutting Speed (m/min)
P Mild Steel (SS400,S10C)	≤180HB	<b>UE6005</b>	250(210-280)
		<b>UE6010</b>	210(180-250)
		<b>UE6020</b>	140(110-180)
		<b>UH6400</b>	105( 65-135)
Carbon Steel, Alloy Steel (S45C, SCM440)	180-280HB	<b>UE6005</b>	180(140-210)
		<b>UE6010</b>	140(110-180)
		<b>UE6020</b>	110( 70-150)
		<b>UH6400</b>	85( 55-125)

### ● HX breaker

Workpiece	Hardness	Grade	Cutting Speed (m/min)
P Mild Steel (SS400,S10C)	≤180HB	<b>UE6010</b>	210(180-250)
		<b>UE6020</b>	140(110-180)
		<b>UH6400</b>	105( 65-135)
Carbon Steel, Alloy Steel (S45C, SCM440)	180-280HB	<b>UE6010</b>	140(110-180)
		<b>UE6020</b>	110( 70-150)
		<b>UH6400</b>	85( 55-125)

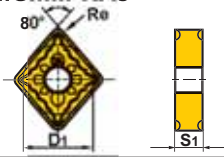
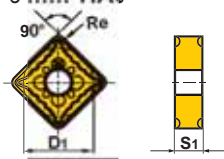
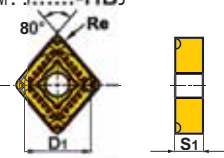
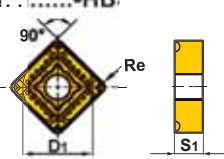
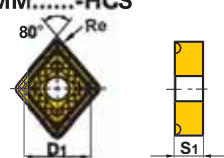
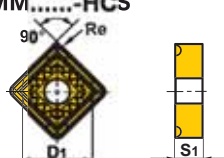
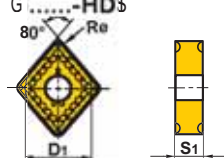
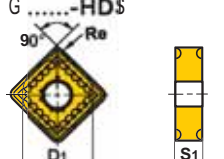
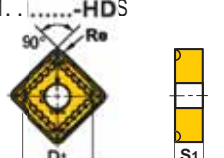
### ● HZ breaker

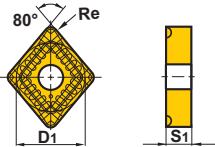
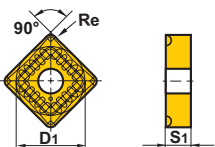
Workpiece	Hardness	Grade	Cutting Speed (m/min)
P Mild Steel (SS400,S10C)	≤180HB	<b>UE6010</b>	210(180-250)
		<b>UE6020</b>	140(110-180)
		<b>UH6400</b>	105( 65-135)
Carbon Steel, Alloy Steel (S45C, SCM440)	180-280HB	<b>UE6010</b>	140(110-180)
		<b>UE6020</b>	110( 70-150)
		<b>UH6400</b>	85( 55-125)
M Stainless Steels (SUS304)	180-220HB	<b>US7020</b>	120( 80-150)
		<b>US735</b>	70( 50- 80)

# Supplementary Chipbreaker System

**HAS·HBS·HCS**  
**HDS·HXD**

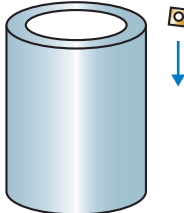
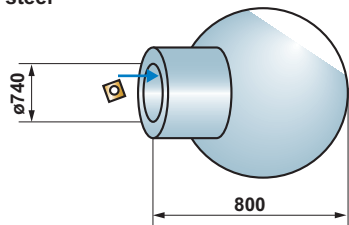
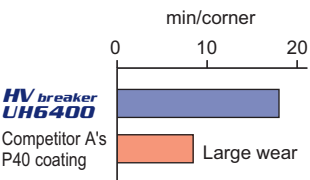
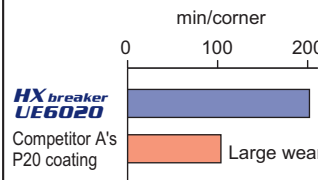
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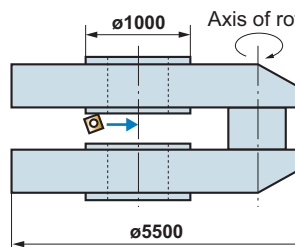
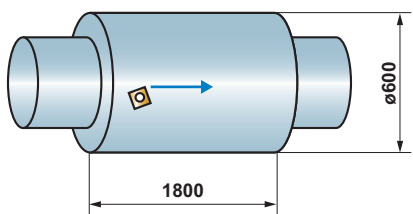
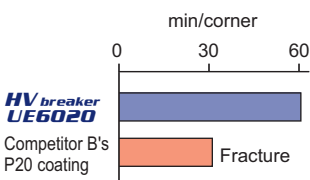
Geometry	Class	Order number	Dimensions (mm)			Coated			
			D1	S1	Re	UE6010	UE6020	UH6400 <small>NEW</small>	US735
<b>CNMG.....HAS</b> 	M	C NM G 250924 -HA S	25.4	9.52	2.4				
<b>SNM G.....HAS</b> 	M	SNM G 250924 -HA S	25.4	9.52	2.4				
<b>C NMM.....HBS</b> 	M	C NMM 250924 -HBS	25.4	9.52	2.4				
<b>SNMM.....HBS</b> 	M	SNMM 250924 -HBS	25.4	9.52	2.4				
<b>CNMM.....HCS</b> 	M	C NMM 250924 -HC S	25.4	9.52	2.4				
<b>SNMM.....HCS</b> 	M	SNMM 250924 -HC S	25.4	9.52	2.4				
<b>C NM G.....HDS</b> 	M	C NM G 250924 -HD S	25.4	9.52	2.4				
<b>SNM G.....HDS</b> 	M	SNM G 250924 -HD S	25.4	9.52	2.4				
<b>SNMM.....HDS</b> 	M	SNMM 250924 -HD S	25.4	9.52	2.4				

Geometry	Class	Order number	Dimensions (mm)			Coated			
			D1	S1	Re	UE6010	UE6020	UH6400 <sup>NEW</sup>	US735
<b>CNMM.....-HXD</b> 	M	<b>CNMM190612-HXD</b>	19.05	6.35	1.2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<b>190616-HXD</b>	19.05	6.35	1.6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<b>190624-HXD</b>	19.05	6.35	2.4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<b>250924-HXD</b>	25.4	9.52	2.4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>SNMM.....-HXD</b> 	M	<b>SNMM190612-HXD</b>	19.05	6.35	1.2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<b>190616-HXD</b>	19.05	6.35	1.6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<b>190624-HXD</b>	19.05	6.35	2.4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<b>250924-HXD</b>	25.4	9.52	2.4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**HV·HX·HZ·RR·RBS**  
**HAS·HBS·HCS·HDS·HXD**

Application Examples

Insert (Grade)	SNMM250924-HV (UH6400)	SNMM250924-HX (UE6020)
Workpiece	Alloy steel  Heavy interrupted cutting	Forging steel 
Cutting Conditions	Cutting Speed (m/min)	85
	Feed (mm/rev)	1.2
	Depth of Cut (mm)	0 – 10.0
Coolant	Dry cutting	Dry cutting
Result	 The <b>UH6400</b> chipbreaker experienced frank wear and tool life has been about twice as long as a rival's product, while the rival's product suffered wear and chipping.	 The <b>HX</b> chipbreaker generates low cutting forces. It also features excellent chip control and long tool life when rough cutting at high feed rates.

Insert (Grade)	SNMM250724-HV (UE6020)	CNMM190612-HZ (UE6020)
Workpiece	Cast steel 	Carbon steel (JIS S45C) 
Cutting Conditions	Cutting Speed (m/min)	70.8 – 164
	Feed (mm/rev)	1.43
	Depth of Cut (mm)	7 – 8
Coolant	Dry cutting	Dry cutting
Result	 The <b>HV</b> chipbreaker performed reliably. The cutting edge did not chip nor did it fracture during heavy interrupted cutting.	A conventional product (competitor B's P20) is characterized by · High Cutting Force · Inferior Chip control · Poor surface roughness However, the <b>HZ</b> breaker performed without failure and improved chip flow, tool life, and overall productivity.

For your safety

●Do not touch cutting or chips without wearing gloves. ●Use tools under recommended cutting conditions, and exchange tools before excessive wear occurs. ●Chips become extremely hot, scattered over and may be stretched. Ensure safety guards and goggles are used. ●In case of using non-water soluble oil, make sure to have a fire prevention countermeasure. ●Use the provided wrench spanner, and ensure the inserts and spare parts are damped securely.

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(Tools specifications subject to change without notice.)