

PRODUCT
NEWS

PN-E-011

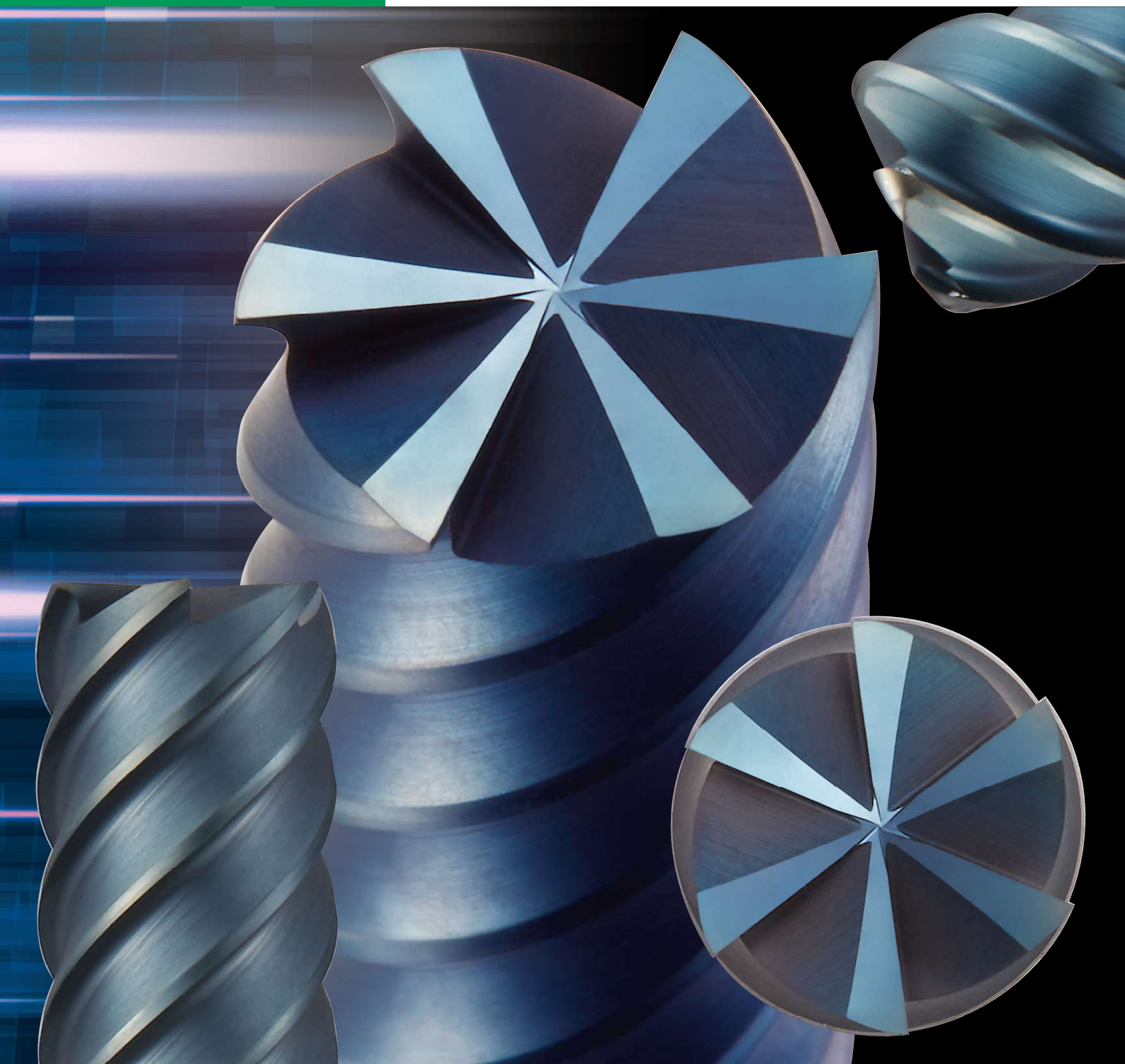
NEW PRODUCT

 **DIJET**[®]

One-Cut **70**
Applicable for 70HRC

"DH COATING" Solid Carbide End Mill for high hardened die steel up to 70HRC.

SEH Type



DIJET GmbH • www.dijet.de

One-Cut70

Applicable for 70HRC

Features 1

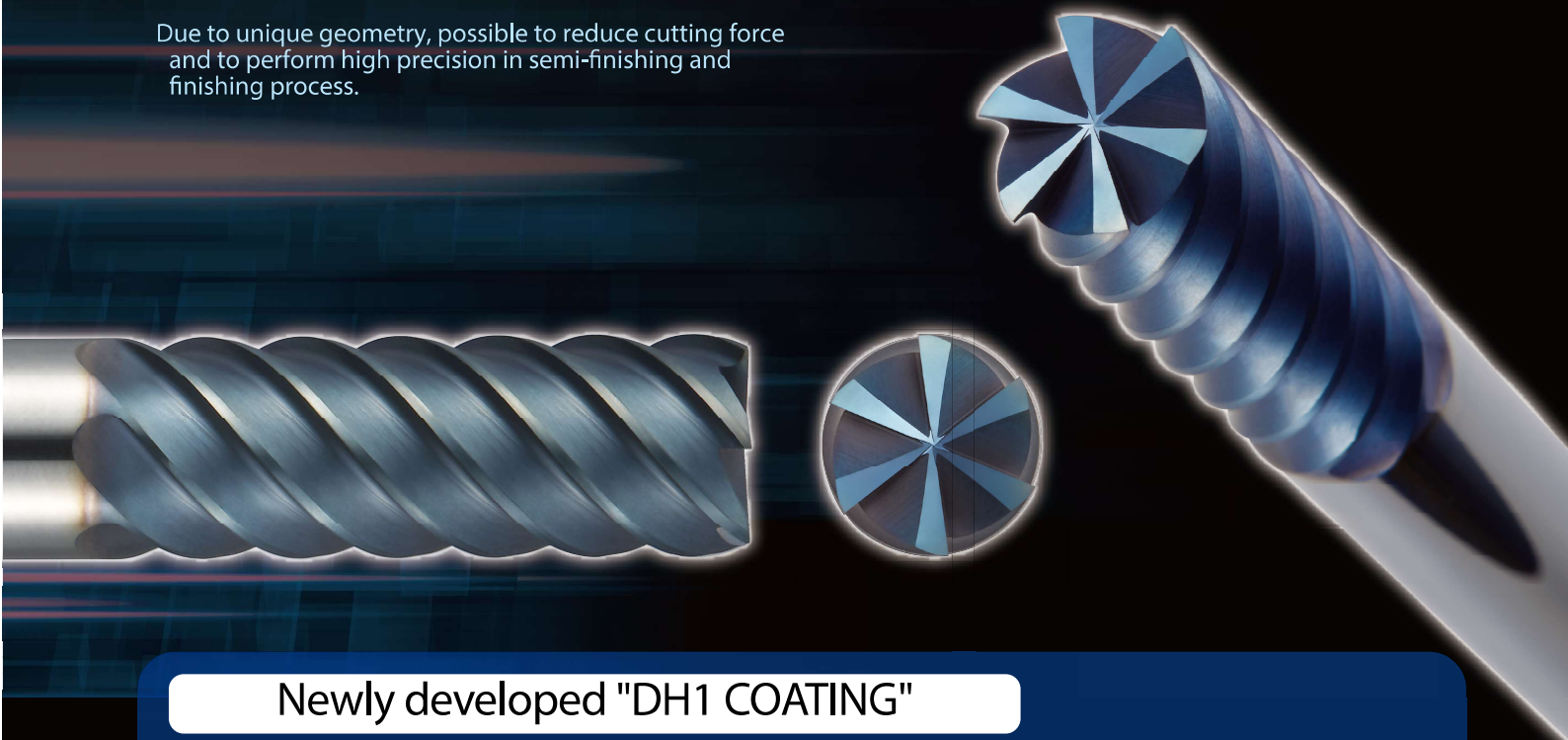
Adopting high rigid design achieves high speed and high efficient machining.

Features 2

Due to unique geometry, possible to reduce cutting force and to perform high precision in semi-finishing and finishing process.

Features 3

Adopting PVD coated grade "DH102" gives stable and high precision machining on high hardened materials. "DH1 COATING", multi nano-layer PVD coating perform longer tool life on high hardened materials.



Newly developed "DH1 COATING"

DH1 COATING gives stable and high-performance machining on high hardened materials even with high speed dry condition, due to higher hardness and higher oxidation resistance than the

Characteristic value of various PVD coatings

	DH1Coat	DV Coat	DZ Coat
Hardness (Hv)	3,500~3,700	3,300~3,500	2,800~2,900
Oxidization temperature (°C)	1,100~1,200	1,000~1,100	700~800
Coefficient of friction	0.5	0.65	0.6

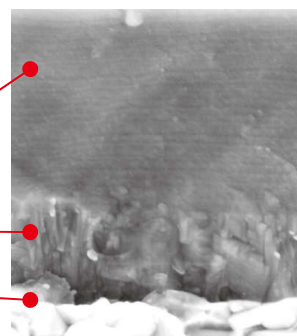
Features of DH1 coating

- DH1 is AlCr based hard coating, which significantly improved hardness and oxidation residence.
- Super multi layer coating makes it possible to restrain crack propagation.
- It is suitable for high hardened materials from semi finishing to finishing process.

High hardness • High oxidation residence layer

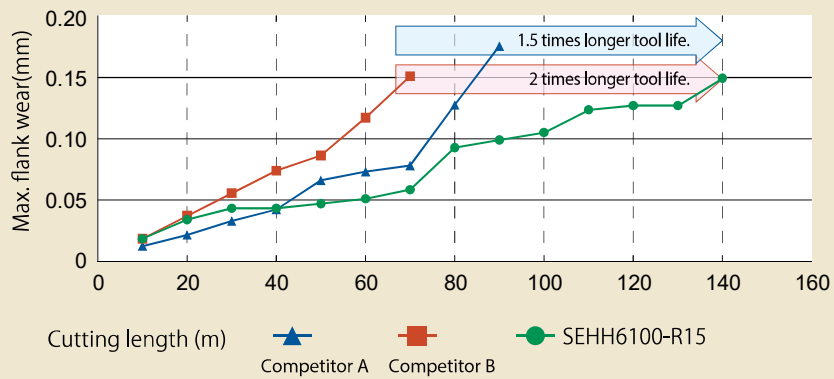
High adhesion • Toughness layer

Exclusive base metal



Cutting performance

Tool life comparison

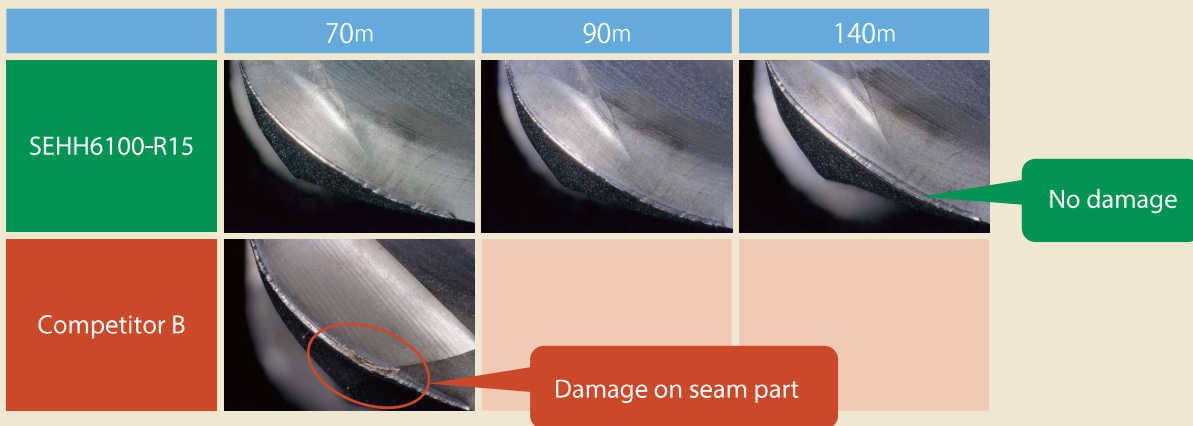


Material : 1.2379 (60HRC)

● Tool dia. : $\phi 10\text{mm}$
Tool No. : SEHH6100-R15

● Cutting conditions :
 $V_c=150\text{m/min}$, $f=0.6\text{mm/rev}$,
 $a_p=3\text{mm}$, $a_e=0.3\text{mm}$

Down cut
Air blow

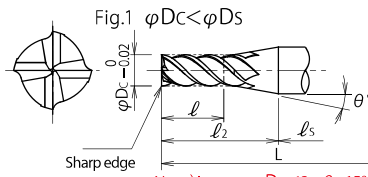


Line up

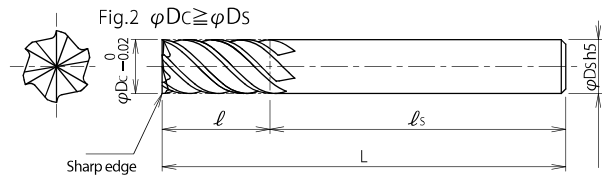
● SEHS/SEHH type (Square type/Short, Regular length of cut) **NEW**



- For high hardened die steel up to 70HRC.
- Short, Regular length of cut
- 4, 6 flutes / Helix angle 50°



Note) In case $\phi Dc < 3$: $\theta = 15^\circ$. In case $\phi Dc \geq 3$: $\theta = 10^\circ$

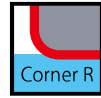


Cat. No.		Stock	Grade	No. of flutes	Dimensions (mm)						Fig.	
					ϕDc	l	l_2	l_s	L	ϕDs		
Short	SEHS4010	☐	DH102	4	1	2	12	48	60	6	1	
	SEHS4020	☐		4	2	4	12	48	60	6	1	
	SEHS4030	☐		4	3	7	17	43	60	6	1	
	SEHS4040	☐		4	4	9	16	44	60	6	1	
	SEHS4050	☐		4	5	12	16	44	60	6	1	
	SEHS6060	☐		6	6	13	—	47	60	6	2	
Regular	SEHH4010	●	DH102	4	1	3.5	13	47	60	6	1	
	SEHH4015	☐		4	1.5	5	14	46	60	6	1	
	SEHH4020	●		4	2	7	15	45	60	6	1	
	SEHH4025	☐		4	2.5	8	15	45	60	6	1	
	SEHH4030	●		4	3	10	20	40	60	6	1	
	SEHH4035	☐		4	3.5	12	20	40	60	6	1	
	SEHH4040	●		4	4	12	19	41	60	6	1	
	SEHH4045	☐		4	4.5	15	20	40	60	6	1	
	SEHH4050	●		4	5	15	19	41	60	6	1	
	SEHH4055	☐		4	5.5	15	18	42	60	6	1	
	SEHH6060	●		6	6	15	—	45	60	6	2	
	SEHH6065	☐		6	6.5	20	25	50	75	8	1	
	SEHH6070	●		6	7	20	24	51	75	8	1	
	SEHH6075	☐		6	7.5	20	22	53	75	8	1	
	SEHH6080	●		6	8	20	—	55	75	8	2	
	SEHH6085	☐		6	8.5	25	30	50	80	10	1	
	SEHH6090	☐		6	9	25	29	51	80	10	1	
	SEHH6095	☐		6	9.5	25	27	53	80	10	1	
	SEHH6100	●		6	10	25	—	55	80	10	2	
	SEHH6105	☐		6	10.5	30	35	65	100	12	1	
	SEHH6110	☐		6	11	30	34	66	100	12	1	
	SEHH6120	●		6	12	30	—	70	100	12	2	
	SEHH6130	☐		6	13	35	45	60	105	16	1	
	SEHH6140	☐		6	14	35	42	63	105	16	1	
	SEHH6150	☐		6	15	40	44	66	110	16	1	
	SEHH6160	●		6	16	40	—	70	110	16	2	
	SEHH6180	☐		6	18	40	47	73	120	20	1	
	SEHH6200	●		6	20	45	—	80	125	20	2	

● : Standard stock items, ☐ : Stock in Japan

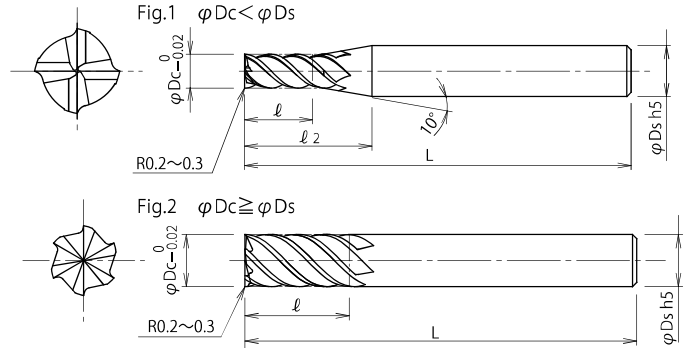
Note) Please refer to page 9 about recommendation of cutting conditions.

● SEHH type (Square type/Regular length of cut with R0.2)



Adapted micro corner radius on the cutting edge solve the chipping problems

- For high hardened die steel up to 70 HRC
- Regular length of cut
- 4, 6 flutes / Helix angle 50°
- R0.2 Corner radius



Cat. No.	Stock	Grade	No. of flutes	Dimensions (mm)					Fig.	
				ϕD_c	ℓ	$\ell 2$	L	ϕD_s		
SEHH4030-R02	☐	DH102	4	3	10	20	60	6	1	
SEHH4040-R02	☐		4	4	12	19	60	6	1	
SEHH4050-R02	☐		4	5	15	19	60	6	1	
SEHH6060-R02	☐		6	6	15	—	60	6	2	
SEHH6070-R02	☐		6	7	20	24	75	8	1	
SEHH6080-R02	☐		6	8	20	—	75	8	2	
SEHH6090-R02	☐		6	9	25	29	80	10	1	
SEHH6100-R02	☐		6	10	25	—	80	10	2	
SEHH6120-R02	☐		6	12	30	—	100	12	2	
SEHH6160-R02	☐		6	16	40	—	110	16	2	
SEHH6200-R02	☐		6	20	45	—	125	20	2	

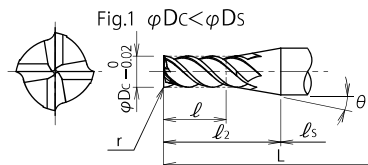
● : Standard stock items, ☐ : Stock in Japan

Note) Please refer to page 9 about recommendation of cutting conditions.

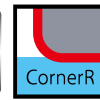
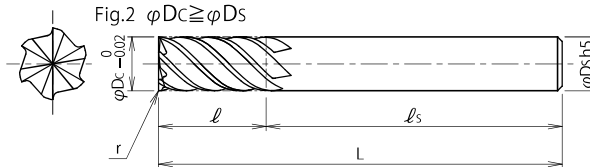
Line up

● SEHH-R type (Radius type/Regular length of cut)

- For high hardened die steel up to 70HRC.
- Regular length of cut
- 4, 6 flutes / Helix angle 50°



Note) In case $\phi D_c < 3$: $\theta = 15^\circ$ In case $\phi D_c \geq 3$: $\theta = 10^\circ$



Cat. No.	Stock	Grade	No. of flutes	Dimensions (mm)							Fig.	
				ϕD_c	r	ℓ	ℓ_2	ℓ_s	L	ϕD_s		
SEHH4030-R03	●	DH102	4	3	0.3	10	20	40	60	6	1	
SEHH4030-R05	●		4	3	0.5	10	20	40	60	6	1	
SEHH4040-R03	●		4	4	0.3	12	19	41	60	6	1	
SEHH4040-R05	●		4	4	0.5	12	19	41	60	6	1	
SEHH4050-R03	●		4	5	0.3	15	19	41	60	6	1	
SEHH4050-R05	●		4	5	0.5	15	—	41	60	6	1	
SEHH6060-R03	●		6	6	0.3	15	—	45	60	6	2	
SEHH6060-R05	●		6	6	0.5	15	—	45	60	6	2	
SEHH6060-R10	●		6	6	1	15	—	45	60	6	2	
SEHH6080-R03	●		6	8	0.3	20	—	55	75	8	2	
SEHH6080-R05	●		6	8	0.5	20	—	55	75	8	2	
SEHH6080-R10	●		6	8	1	20	—	55	75	8	2	
SEHH6100-R03	●		6	10	0.3	25	—	55	80	10	2	
SEHH6100-R05	●		6	10	0.5	25	—	55	80	10	2	
SEHH6100-R10	●		6	10	1	25	—	55	80	10	2	
SEHH6100-R15	●		6	10	1.5	25	—	55	80	10	2	
SEHH6120-R03	●		6	12	0.3	30	—	70	100	12	2	
SEHH6120-R05	●		6	12	0.5	30	—	70	100	12	2	
SEHH6120-R10	●		6	12	1	30	—	70	100	12	2	
SEHH6120-R15	●		6	12	1.5	30	—	70	100	12	2	
SEHH6160-R03	●		6	16	0.3	40	—	70	110	16	2	
SEHH6160-R05	●		6	16	0.5	40	—	70	110	16	2	
SEHH6160-R10	●		6	16	1	40	—	70	110	16	2	
SEHH6160-R15	●		6	16	1.5	40	—	70	110	16	2	
SEHH6200-R03	●		6	20	0.3	45	—	80	125	20	2	
SEHH6200-R05	●		6	20	0.5	45	—	80	125	20	2	
SEHH6200-R10	●		6	20	1	45	—	80	125	20	2	
SEHH6200-R15	●		6	20	1.5	45	—	80	125	20	2	

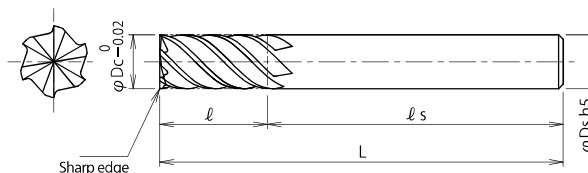
●: Standard stock items, □: Stock in Japan

Note) Please refer to page 9 about recommendation of cutting conditions.

● SEHM type (Square type/Middle length of cut) **NEW**



- For high hardened die steel up to 70HRC.
- Middle length of cut
- 6 flutes / Helix angle 50°



Cat. No.	Stock	Grade	No. of flutes	Dimensions (mm)					
				φDc	ℓ	ℓs	L	φDs	
SEHM6060	☐	DH102	6	6	20	45	65	6	
SEHM6080	☐		6	8	28	52	80	8	
SEHM6100	☐		6	10	35	55	90	10	
SEHM6120	☐		6	12	45	65	110	12	
SEHM6160	☐		6	16	55	65	120	16	
SEHM6200	☐		6	20	60	80	140	20	

●: Standard stock items, ☐: Stock in Japan

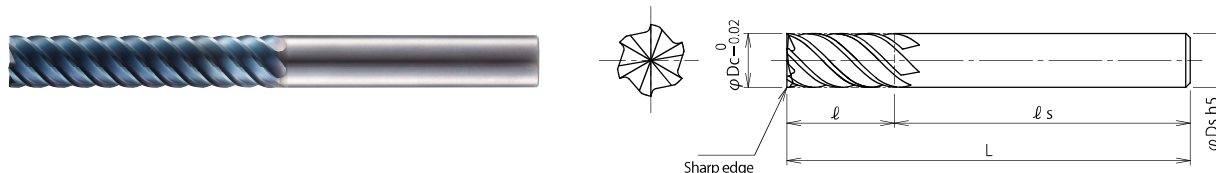
Note) Please refer to page 10 about recommendation of cutting conditions.

Line up

● SEHL type (Square type/Long length of cut) **NEW**



- For high hardened die steel up to 70HRC.
- Long length of cut
- 6 flutes / Helix angle 50°



Cat. No.	Stock	Grade	No. of flutes	Dimensions (mm)					
				ϕD_c	ℓ	ℓ_s	L	ϕD_s	
SEHL6060	☐	DH102	6	6	26	44	70	6	
SEHL6080	☐		6	8	36	54	90	8	
SEHL6100	☐		6	10	46	54	100	10	
SEHL6120	☐		6	12	56	64	120	12	
SEHL6160	☐		6	16	66	69	135	16	
SEHL6200	☐		6	20	76	79	155	20	

● : Standard stock items, ☐ : Stock in Japan

Note) Please refer to page 10 about recommendation of cutting conditions.

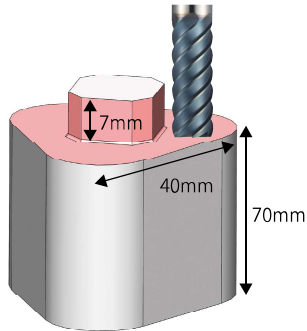
Cutting data

① Machining on High hardened material

Shaving

Metal removal rate

: $Q=0.138\text{cm}^3/\text{min}$



Result

From roughing to semi-finishing.

After finished 6 works, Competitor A, G & K showed large wear, but SEHH showed normal wear (still able to continue).

Namely, SEHH showed good surface roughness & achieved longer tool life.

Work	Part name		Mold parts
	Material		1.2379
	Hardness		59-61HRC
Tool	Tool No.		SEHH6080-R10
	Grade		DH102
Cutting conditions	Spindle speed Cutting speed	n	2,189 (min ⁻¹)
		V_c	54 (m/min)
	Feed speed	V_f	658 (mm/min)
		f	0.3 (mm/rev)
	a_p		0.1 (mm)
	a_e		2.1 (mm)
	Coolant		Air blow
	Machine		Double-column MC

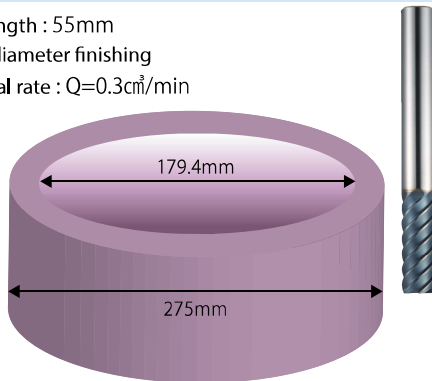
3648

② Machining on High hardened material

Overhung length : 55mm

Inner/outer diameter finishing

Metal removal rate : $Q=0.3\text{cm}^3/\text{min}$



Result

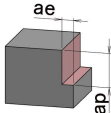
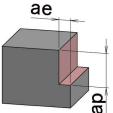
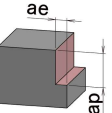
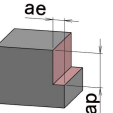
After finished 60 works, Conventional tool showed chipping, but SEHH showed normal wear (still able to continue).

Work	Part name		Machine parts
	Material		SKD11 1.2379
	Hardness		50HRC (Heat treatment)
Tool	Tool No.		SEHH6080
	Grade		DH102
Cutting conditions	Spindle speed Cutting speed	n	3,800 (min ⁻¹)
		V_c	95.5 (m/min)
	Feed speed	V_f	380 (mm/min)
		f	0.1 (mm/rev)
	a_p		4 (mm)
	a_e		0.2 (mm)
	Coolant		Wet (water soluble)
	Machine		Vertical MC (BT30)

3690

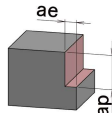
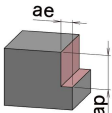
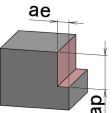
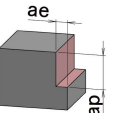
Recommended cutting conditions

SEHS/SEHH/SEHH-R02/SEHH-R type

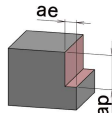
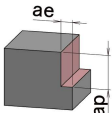
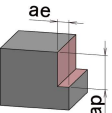
Work materials	Mold Steel (1.2311,P21) 38~43HRC		Hardened die steel (1.2344,1.2379) 42~52HRC		Hardened die steel (1.2344,1.2379) 55~62HRC		High speed tool steel (1.3343) 63~70HRC	
Type of machining	 $a_p \leq 1.5D_c$ $a_e \leq 0.05D_c$		 $a_p \leq 1.5D_c$ $a_e \leq 0.04D_c$		 $a_p \leq 1.5D_c$ $a_e \leq 0.04D_c$ (MAX.0.6mm)		 $a_p \leq 1.5D_c$ $a_e \leq 0.02D_c$ (MAX.0.4mm)	
ϕD_c (mm) Tool dia.	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
1	40,000	700	25,000	410	20,000	320	10,000	130
2	24,000	950	15,000	560	12,000	430	6,400	220
3	24,000	1,300	15,000	800	12,000	600	6,000	250
4	18,000	1,800	12,000	1,100	9,500	800	5,100	300
6	12,000	2,200	8,000	1,400	6,500	1,100	3,500	420
8	10,000	2,200	6,000	1,400	5,000	1,100	2,500	420
10	8,000	2,200	5,000	1,400	4,000	1,100	2,000	420
12	6,500	1,900	4,000	1,200	3,300	900	1,700	350
16	5,000	1,480	3,000	930	2,500	700	1,300	260
20	3,800	1,150	2,300	730	2,000	550	1,000	200

Attention for use: (1) Above cutting conditions are for general guidance.
 (2) The figures to be adjusted according to machining shape, purpose and rigidity of machine and work clamping.
 (3) Recommend to use down cutting with air blow or mist coolant.

SEHM type

Work materials	Mold Steel (1.2311,P21) 38~43HRC		Hardened die steel (1.2344,1.2379) 42~52HRC		Hardened die steel (1.2344,1.2379) 55~62HRC		High speed tool steel (1.3343) 63~70HRC	
Type of machining	 $ap \leq 2.25Dc$ $ae \leq 0.03Dc$		 $ap \leq 2.25Dc$ $ae \leq 0.025Dc$		 $ap \leq 2.25Dc$ $ae \leq 0.025Dc$		 $ap \leq 2.25Dc$ $ae \leq 0.01Dc$	
ϕDc (mm) Tool dia.	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
6	10,600	1,900	6,400	1,200	5,300	1,000	2,700	320
8	8,000	1,900	4,800	1,200	4,000	1,000	2,000	360
10	6,400	1,900	3,800	1,200	3,200	1,000	1,600	380
12	5,300	1,600	3,200	1,000	2,700	800	1,300	240
16	4,000	1,200	2,400	700	2,000	600	1,000	180
20	3,200	1,000	1,900	600	1,600	500	800	140

SEHL type

Work materials	Mold Steel (1.2311,P21) 38~43HRC		Hardened die steel (1.2344,1.2379) 42~52HRC		Hardened die steel (1.2344,1.2379) 55~62HRC	
Type of machining	 $ap \leq 3Dc$ $ae \leq 0.01Dc$		 $ap \leq 3Dc$ $ae \leq 0.01Dc$		 $ap \leq 3Dc$ $ae \leq 0.01Dc$	
ϕDc (mm) Tool dia.	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
6	3,180	760	2,650	480	2,100	380
8	2,390	720	1,990	480	1,590	380
10	1,910	690	1,590	480	1,270	380
12	1,590	670	1,330	480	1,060	380
16	1,190	570	1,000	420	800	340
20	950	510	800	380	640	310

Attention for use:

- (1) Above cutting conditions are for general guidance.
- (2) The figures to be adjusted according to machining shape, purpose and rigidity of machine and work clamping.
- (3) Recommend to use down cutting with air blow or mist coolant.



HEADQUARTER

DIJET Industrial Co.Ltd.

1-1-18, Kami-Higashi,
Hirano-ku, Osaka 547-0002, Japan

PHONE +81-6-6791-6781

FAX +81-6-6793-1221

MAIN OFFICE EUROPE

DIJET GmbH

Immermannstraße 9
40210 Düsseldorf, Germany

PHONE +49-211-50088820

FAX +49-211-50088823

www.dijet.de



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DIJET GmbH

Web : www.dijet.de