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Planing

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ENSHIN

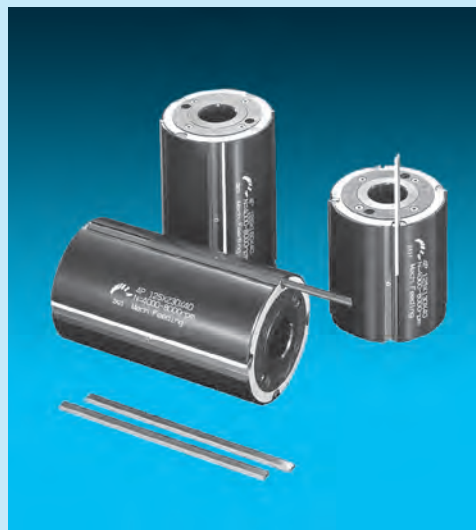
Self-Locking Planer Head

APPLICATION

Fine and rough planing

MACHINE

4-side planer, moulder

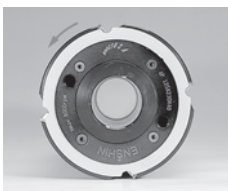


Features & Benefits

- Unique centrifugal self locking system accurately locks the knives in place
- System is easy to handle and a complete knife change does not take longer than 2-3 min
- ENSHIN heads with chamfer or radius knives are available upon request



Tap the wedge gently



Turn the safety stopper ring



Slide out the knife



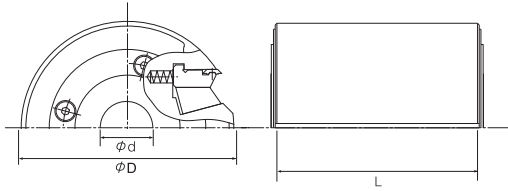
Clamp the setting block between head and clamping wedge to slide in the knife

N (rpm)	Z	S.R (mm)	F (m/min)							
			1	5	10	15	20	25	30	35
6000	2	0.5								
		1								
		1.5								
		2								
		2.5								
		3								
		3.5								
		4								
		4.5								
		5								
	4	0.5								
		1								
		1.5								
		2								
		2.5								
		3								
		3.5								
		4								
		4.5								
		5								

N (rpm)	Z	S.R (mm)	F (m/min)							
			1	5	10	15	20	25	30	35
8000	2	0.5								
		1								
		1.5								
		2								
		2.5								
		3								
		3.5								
		4								
		4.5								
		5								
12000	2	0.5								
		1								
		1.5								
		2								
		2.5								
		3								
		3.5								
		4								
		4.5								
		5								

- Ultra fine planing
- Fine planing
- Rough planing

► ENSHIN Bore Type



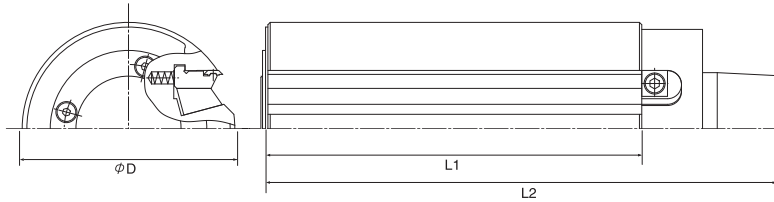
Order no.	Size				n max [1/min]
	D [mm]	L [mm]	d [mm]	z	
1 789-B375-500	125	100	40	4	8000
2 789-A869-500	125	130	40	4	8000
3 789-B078-500	125	150	40	4	8000
4 789-A868-500	125	180	40	4	8000
5 789-A866-500	125	230	40	4	8000
6 789-B630-500	125	100	1 1/2"	4	8000
7 789-B638-500	125	130	1 1/2"	4	8000
8 789-B637-500	125	150	1 1/2"	4	8000
9 789-B636-500	125	230	1 1/2"	4	8000

For up to 8000 RPM it is also possible to mount a regular bore type ENSHIN onto an arbor with PowerLock interface.

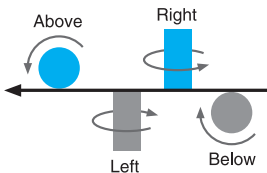
After secure assembly of the arbor and the ENSHIN, the entire system is balanced in order to ensure highest planing quality and work safety.

Regular arbors and hydro arbors are available. For more details please contact Kanefusa.

► ENSHIN PowerLock-Type

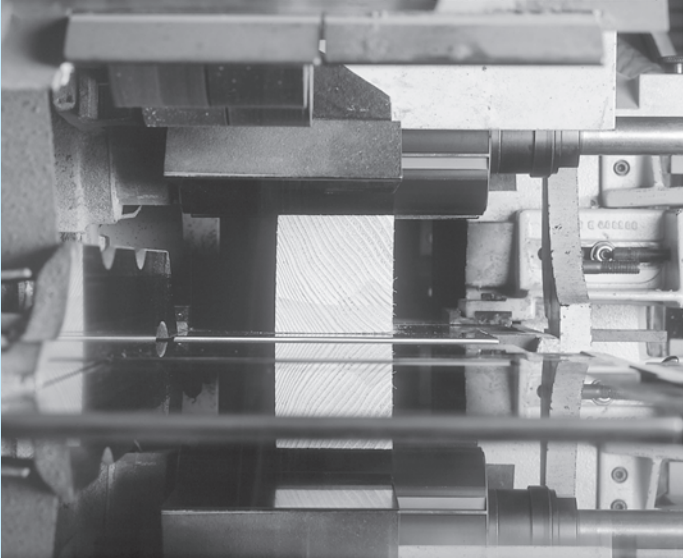


Order no.	Size				n max [1/min]	Type
	D [mm]	L1 [mm]	L2 [mm]	z		
1 788-1213-500	90	80	138	2	12500	Left/Below
2 788-1255-500	90	100	158	2	12500	Left/Below
3 788-1073-500	90	130	188	2	12500	Left/Below
4 788-1297-500	90	150	208	2	12500	Left/Below
5 788-1114-500	90	170	228	2	12500	Left/Below
6 788-1338-500	90	190	248	2	12500	Below
7 788-1370-500	90	210	268	2	12500	Below
8 788-1156-500	90	240	298	2	12500	Below
9 788-1239-500	90	80	138	2	12500	Right/Above
10 788-1271-500	90	100	158	2	12500	Right/Above
11 788-1081-500	90	130	188	2	12500	Right/Above
12 788-1312-500	90	150	208	2	12500	Right/Above
13 788-1122-500	90	170	228	2	12500	Right/Above
14 788-1396-500	90	210	268	2	12500	Above
15 788-1164-500	90	240	298	2	12500	Above



The body diameter (D) of the PowerLock ENSHIN is 90 mm. The mono-block body is pre-manufactured by Weinig S.A. of Switzerland and completed by Kanefusa Corporation Japan. This ensures a highest standard in precision and quality.

Equipped with HS-HP knives, the outer tool diameter will be 92 mm. Because HW knives are wider, the outer tool diameter will be 92.7 mm. Either diameter fits Powermat machines.



ENSHIN

Blades

APPLICATION

For use in ENSHIN planer heads

MATERIAL

Softwoods, hardwoods, tropical woods,
Plastic resin

EDGE MATERIAL

HS-HP (softwoods)

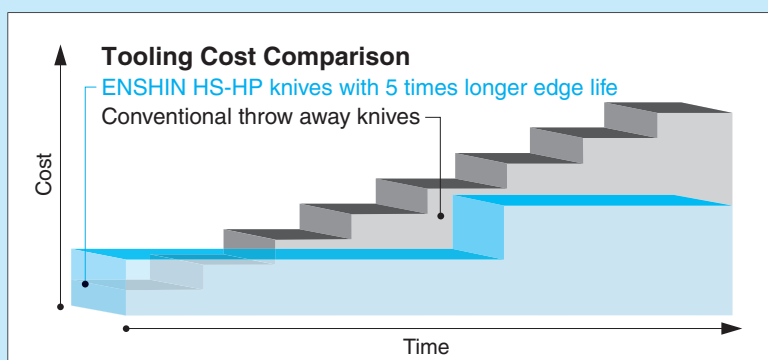
HW (hardwoods, tropical woods, plastic resin)



※HS-HP coating requires a special sharpening method

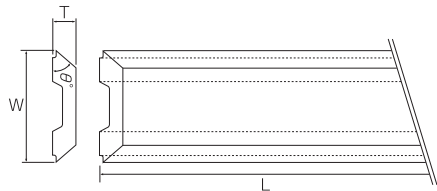
Features & Benefits

- Every knife has two cutting edges of reversible design, which makes the ENSHIN a very economical tool
- Knife quality HS-HP provides up to 5 times longer edge life compared with regular HSS knives
- For planning of hardwoods and tropical timber, carbide knives provide excellent lifetime
- Every knife has a chip breaker and fine lapped cutting edge for smooth surfaces even cutting against the grain
- HS-HP knives are for single use. No edge life reduction and inconsistent cut after grinding



EDGE MATERIAL
HS-HP, HW

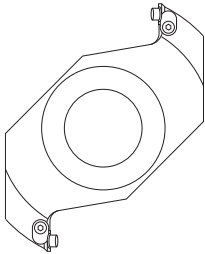
▶ **ENSHIN Knives**



Order no.	Size L [mm] W [mm] T [mm]	Grade
1 797-A483-611	80 × 12 × 2.6	HS-HP
2 797-1022-611	100 × 12 × 2.6	HS-HP
3 797-1329-611	130 × 12 × 2.6	HS-HP
4 797-1527-611	150 × 12 × 2.6	HS-HP
5 797-A527-611	170 × 12 × 2.6	HS-HP
6 797-1824-611	180 × 12 × 2.6	HS-HP
7 797-1923-611	190 × 12 × 2.6	HS-HP
8 797-2129-611	210 × 12 × 2.6	HS-HP
9 797-2327-611	230 × 12 × 2.6	HS-HP
10 797-A595-611	240 × 12 × 2.6	HS-HP
11 797-A423-900	80 × 12.7 × 2.6	HW
12 797-A452-900	100 × 12.7 × 2.6	HW
13 797-A435-900	130 × 12.7 × 2.6	HW
14 797-A443-900	150 × 12.7 × 2.6	HW
15 797-A528-900	170 × 12.7 × 2.6	HW
16 797-A436-900	180 × 12.7 × 2.6	HW
17 797-A470-900	190 × 12.7 × 2.6	HW
18 797-A505-900	210 × 12.7 × 2.6	HW
19 797-A351-900	230 × 12.7 × 2.6	HW
20 797-A481-900	240 × 12.7 × 2.6	HW

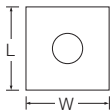
EDGE MATERIAL
HC-UP

► Rebating Reference Engraver Head

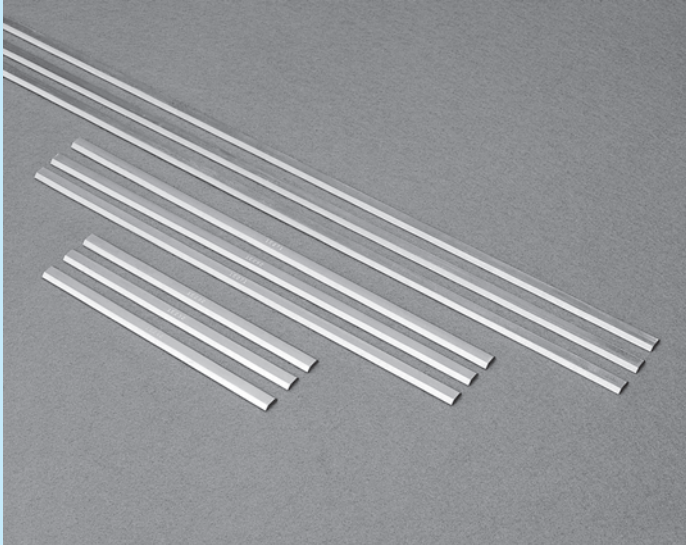


Order no.	Size				
	D [mm]	B [mm]	d [mm]	z	
1 877-C055-400	140	× 12	× 40	× 2	
2 877-0000-400	145	× 12	× 1 1/2"	× 2	

► Knives for Reference Engraver



Order no.	Size			Grade
	L [mm]	W [mm]	T [mm]	
1 781-1210-901	12	× 12	× 1.5	HC-UP



Planer Head with α MT coated inserts

APPLICATION

Planing on solid wood material

MACHINE

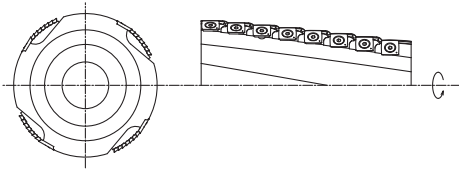
Planer and Moulder machine



► Features & Benefits

- Superb effect on Heavy duty and low noise planing
- Special coated carbide inserts are spirally set for noise reduction both in idling and cutting and for less cutting resistance good for heavy duty cutting
- Carbide inserts are tough against glue lines on laminated timber
- Carbide inserts are economical due to four cutting edges

► Planer Head with α MT coated inserts



Order no.	Size							
	D [mm]		L [mm]		d [mm]		z	
1	125	×	130	×	40	×	4	
2	125	×	160	×	40	×	4	
3	125	×	180	×	40	×	4	

Maximum length of this cutter head is 180mm

Tersa® -System

Blades

APPLICATION

For use in planer heads

MATERIAL

Softwoods, hardwoods, tropical woods

EDGE MATERIAL

HS-HP (softwoods)

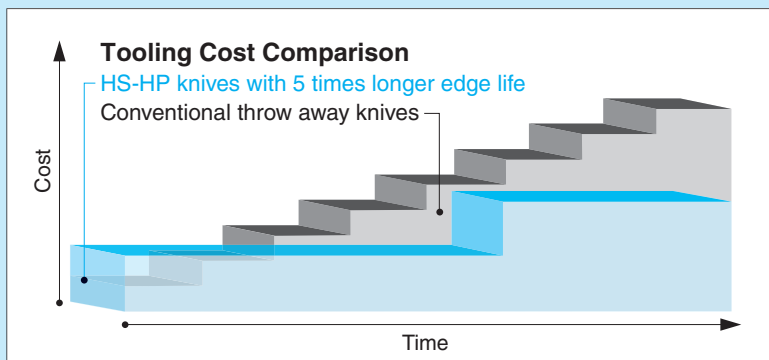
※HS-HP coating requires a special resharpener method

Tersa® is a registered trademark of Samvaz S.A.
Kanfusa Corporation makes no claim of ownership to this trademark



Features & Benefits

- Every knife has two cutting edges of reversible design, which makes very economical tool
- Knife quality HS-HP provides up to 5 times longer edge life compared with regular HSS knives
- Every knife has a chip breaker and fine lapped cutting edge for smooth surfaces even cutting against the grain
- HS-HP knives are for single use. No edge life reduction and inconsistent cut after grinding



EDGE MATERIAL
HS-HP

► Knives for Tersa®-System Planer Heads



Tersa® is a registered trademark of Samvaz S.A.
Kanafusa Corporation makes no claim of ownership to this trademark

Order no.	Size			Grade
	L [mm]	W [mm]	T [mm]	
1 797-A516-611	130	10	2.3	HS-HP
2 797-A518-611	180	10	2.3	HS-HP
3 797-A517-611	230	10	2.3	HS-HP
4 797-7955-611	650	10	2.3	HS-HP

※other lengths are available upon request.

ST-1

Planer Knives

APPLICATION

High speed planing and regular planing

MATERIAL

Softwoods, hardwoods

EDGE MATERIAL

HS-HP



※HS-HP coating requires a special resharping method

Features & Benefits

- Knife quality HS-HP provides up to 5 times longer edge life compared with regular HSS knives
- Longer lifetime increases machine run time and reduces grinding cost
- Because of its self-resharpening properties, consistent high surface quality is achieved, reducing or even eliminating subsequent sanding
- Provides high process reliability

Efficiency study at a user in Austria

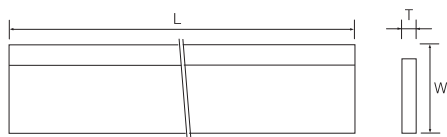
Knife Grade	HSS	ST-1	Knife Grade	HSS	ST-1
Head removals per week	15	3	Regrinds per week	15	3
Set up time [min.]	15	15	Time per regrind [min.]	90	90
Set up time per week [min.]	225	45	Grinding time per week [min.]	1350	270
Set up time per year [hours] (46 weeks)	172.5	35	Grinding time per year [hours] (46 weeks)	1035	207
Time saving per year [hours]		138	Time saving per year [hours]		828

Total time saving per year = 966 hours

The user identified following advantages

- Enormous annual gain in machine uptime
- Increase of feed rate by 8 m /min
- Drastic reduction of grinding cost
- High process reliability and better coordination of work flow due to less machine stops for head removal
- Much better surface finish

► ST-1 Flat Knives



Order no.	L [mm]	Size W [mm]	T [mm]
1 030-D294-619	60	30	3
2 030-B515-619	75	30	3
3 030-B461-619	80	30	3
4 030-B514-619	90	30	3
5 030-C676-619	100	30	3
6 030-C551-619	110	30	3
7 030-C722-619	120	30	3
8 030-D466-619	125	30	3
9 030-C721-619	130	30	3
10 030-D381-619	155	30	3
11 030-C415-619	160	30	3
12 030-C550-619	170	30	3
13 030-C269-619	180	30	3
14 030-C825-619	185	30	3
15 030-C510-619	200	30	3
16 030-C010-619	210	30	3
17 030-C804-619	215	30	3
18 030-B464-619	220	30	3
19 030-C359-619	230	30	3
20 030-C182-619	235	30	3
21 030-C459-619	240	30	3
22 030-C514-619	250	30	3
23 030-C369-619	255	30	3
24 030-C135-619	260	30	3
25 030-D410-619	265	30	3

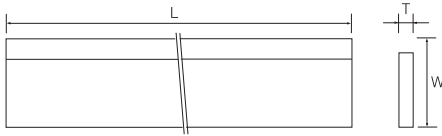
Order no.	L [mm]	Size W [mm]	T [mm]
26 030-0000-619	270	30	3
27 030-C723-619	280	30	3
28 030-C517-619	300	30	3
29 030-C358-619	310	30	3
30 030-C994-619	320	30	3
31 030-C495-619	330	30	3
32 030-C979-619	380	30	3
33 030-C985-619	410	30	3
34 030-D072-619	420	30	3
35 030-C806-619	460	30	3
36 030-E138-619	480	30	3
37 030-C265-619	510	30	3
38 030-C706-619	660	30	3
39 030-D384-619	40	35	3
40 030-C877-619	60	35	3
41 030-B457-619	80	35	3
42 030-C379-619	100	35	3
43 030-D344-619	120	35	3
44 030-C700-619	130	35	3
45 030-C476-619	135	35	3
46 030-0000-619	150	35	3
47 030-C382-619	160	35	3
48 030-E139-619	170	35	3
49 030-C461-619	180	35	3
50 030-D423-619	190	35	3

※other lengths are available upon request.

EDGE MATERIAL

HS-HP

ST-1 Flat Knives



Order no.	L [mm]	Size W [mm]	T [mm]
51 030-D312-619	200	35	3
52 030-C475-619	210	35	3
53 030-C250-619	230	35	3
54 030-C101-619	235	35	3
55 030-C708-619	240	35	3
56 030-D177-619	255	35	3
57 030-C050-619	260	35	3
58 030-D422-619	270	35	3
59 030-E140-619	303	35	3
60 030-E107-619	310	35	3
61 030-C493-619	320	35	3
62 030-C134-619	330	35	3
63 030-D619-619	370	35	3
64 030-D209-619	380	35	3
65 030-C773-619	400	35	3
66 030-D202-619	410	35	3
67 030-D037-619	480	35	3
68 030-C264-619	500	35	3
69 030-0000-619	510	35	3
70 030-C345-619	520	35	3
71 030-C796-619	530	35	3
72 030-C560-619	635	35	3
73 030-E147-619	660	35	3
74 030-E573-619	130.2	50.8	3.96
75 030-E523-619	165.1	50.8	3.96

Order no.	L [mm]	Size W [mm]	T [mm]
76 030-E520-619	203.2	50.8	3.96
77 030-E522-619	254	50.8	3.96
78 030-E521-619	304.8	50.8	3.96
79 030-E519-619	330.2	50.8	3.96
80 030-E566-619	381	50.8	3.96
81 030-E510-619	381	50	4

※other lengths are available upon request.



Global Network

Our world-spanning network guarantees local user satisfaction

P.T. KANEFUSA INDONESIA, and KANEFUSA CHINA CORPORATION are offshore manufacturing sites. To ensure highest product quality, raw materials and semi-finished products are supplied from Japan and processed on state of the art machinery from Japan and Germany.

KANEFUSA USA, INC., KANEFUSA EUROPE B.V., Malaysia Office, P.T. KANEFUSA INDONESIA and KUNSHAN KANEFUSA CORPORATION support our distributor network in commercial and technical issues and carry out grinding services (except KFE, Malaysia Office and KANEFUSA DO BRASIL LTDA.) in order to ensure highest user satisfaction and customer retention.



KANEFUSA EUROPE B.V.



KANEFUSA CHINA CORPORATION
Tianjin Office



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KANEFUSA CORPORATION JAPAN

- Chubu Office Head Office & Factory
- Kansai Office
- Kanto Office
- Sapporo Office
- Sendai Office
- Hiroshima Office
- Takamatsu Office
- Fukuoka Office



P.T. KANEFUSA INDONESIA
Surabaya Service Center

KANEFUSA DO BRASIL LTDA.

History

- | | |
|-------------|---|
| 1896 | The blacksmith Kankichi Kamiya establishes "Uchihamonoshi Kanefusa" (Forging Master of Agricultural Tools) in Goheizou, Nagoya. |
| 1931 | Suzuo Watanabe, son of the founder, succeeds the business of his father and makes extensive improvements to High Speed Steel machine knives. |
| 1937 | Kanefusa Hamono Ltd. is established. |
| 1948 | A new factory is built in Rokuban-cho, Atsuta-ku, Nagoya and the company is renamed Kanefusa Hamono Kogyo Co., Ltd. |
| 1957 | Suzuo Watanabe travels to Europe to research European knife manufacturing and steel refining technologies. |
| 1959 | Kanefusa is the first Japanese machine tool manufacturer to use a High Frequency Induction Heating System for mass production of quality knives. |
| 1964 | A new state of the art factory is built in Ohguchi-cho, Niwa-gun, Aichi Prefecture. |
| 1965 | The main factory in Ohguchi-cho receives JIS certification (JIS = Japan Industrial Standards). |
| 1967 | The first Research and Development Center is completed. |
| 1968 | For product distribution, Kanefusa Knife & Saw Co., Ltd. is established. |
| 1969 | Kanefusa receives the Contribution Award from the Minister of International Trade and Industry. |
| 1970 | The capacity of the heat treatment facility is largely increased. |
| 1971 | Suzuo Watanabe is inaugurated as chairman of the Japan Saw Blade & Knife Industrial Association (JSK).
Kanefusa receives the Contribution Award from the Minister of International Trade and Industry for the second time. |
| 1972 | The production capacity of the T.C.T. saw blade plant is expanded. |
| 1976 | The Ministry of International Trade and Industry acknowledges Kanefusa Hamono Ltd. as a factory of superior industrial standard. |
| 1981 | Hiroshi Watanabe becomes President.
Suzuo Watanabe becomes Chairman.
The production of PCD tooling begins. |
| 1982 | A new cold saw blade plant is completed.
Production and sales of the ACE insert tooling system starts. |
| 1985 | The production capacity of the cold saw blade plant is expanded.
The Head Office moves to Ohguchi-cho, where the Main Factory is located. |



Kankichi Kamiya



Inside the factory in Rokuban-cho (1957)



Prayer for safety before construction of the Main Factory (Early 1960's)



20th Anniversary (1968)



Suzuo Watanabe



FM Cold Saw Blade

1986	P.T. Kanefusa Indonesia, the first offshore production facility, is established in Jakarta, Indonesia. An office in Singapore is set up.
1990	Kanefusa Hamono Ltd. and Kanefusa Knife and Saw Co., Ltd. merge to become KANEFUSA CORPORATION. A new T.C.T. saw blade production site is completed.
1995	Kanefusa Corporation is listed at the Nagoya Stock Exchange, Second Section. The production capacity of P.T. Kanefusa Indonesia is sharply increased.
1996	The new Technical Center for comprehensive Research and Development is completed.
1998	A liaison office in Eindhoven, The Netherlands, is set up.
1999	Kanefusa U.S.A. is established. Kanefusa Head Office and factory receive ISO 9001 certification.
2000	Masato Watanabe becomes President. Hiroshi Watanabe becomes Chairman.
2001	Kanefusa EUROPE B.V. is founded in Eindhoven, The Netherlands.
2002	Kanefusa China Corporation, the second offshore production facility, is established in Kunshan city, near Shanghai.
2003	Kunshan Kanefusa Corporation is set up. Kanefusa Head Office and Factory receive ISO 14001 certification.
2004	Kanefusa China Corporation receives ISO 9001 certification. The office in Singapore moves to Kuala Lumpur, Malaysia. A liaison office in Germany, which is under the jurisdiction of Kanefusa Europe B.V., is established. P.T. Kanefusa Indonesia receives ISO 9001 certification.
2005	Kanefusa China Corporation receives ISO 14001 certification.
2006	Kanefusa Corporation is listed at the Tokyo Stock Exchange, second Section. Kunshan Kanefusa Corporation acquires sales rights in China.
2008	Kanefusa Corporation celebrates its 60th anniversary of the establishment.
2009	Kanefusa India Pvt.Ltd. is established in India.
2010	Kanefusa Do Brasil LTDA. is established in Brasil.
2011	Kanefusa China Corporation merged Kunshan Kanefusa Corporation
2012	「Kanefusa U.S.A.」 New office and service building is completed



Outside view of KFI (1986)



R&D Technical Center (1996)



Ceremony of the 60th Anniversary (2008)



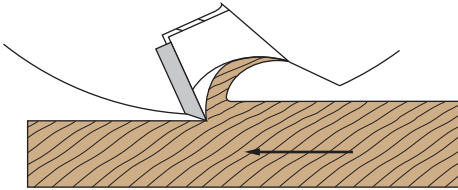
Hiroshi Watanabe



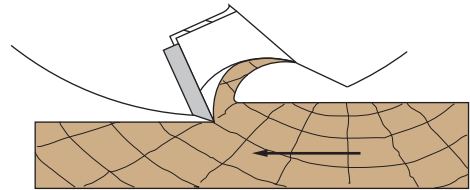
Masato Watanabe

General Technical Information

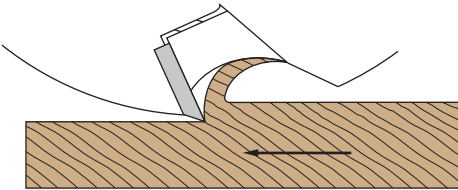
Cutting with grain leaves a smooth surface.



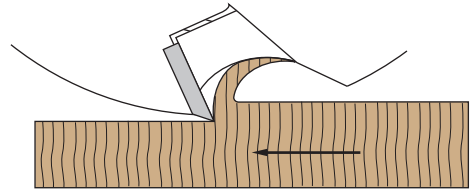
Cutting across grain is easily done but leaves a rough finish.



Cutting against grain gives a raw surface due to pre-splitting of the wood in front of the cutting edge.

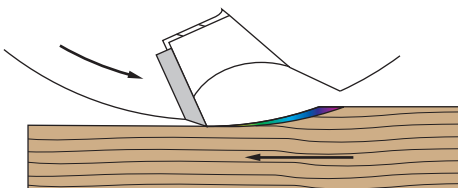


Cutting end grain requires most horsepower and gives rough finish.



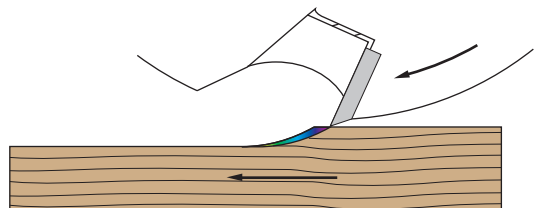
Abrasive Cutting / Cutting against the feed

In abrasive cutting the cutting edge motion is against the feed direction of the material. The cutting edge enters into the work piece shaving and pushing. The cutting process creates a long chip with increasing thickness. The direction of the cutting force is up from the table, trying to lift up the work piece. Especially when machining against the grain, tear-outs are inevitable.



Climb Cutting / Cutting with the feed

In climb cutting the cutting edge motion is with the feed direction of the material. The cutting edge enters into the work piece. The cutting process creates a short chip with decreasing thickness. The direction of the cutting forces are into the material and pre-splitting of the grain is omitted. Smooth surface even when machining against the grain can be achieved.



General Technical Information

Cutting Speed V_c

The cutting speed is the velocity of the blade at its outmost diameter. It is an important performance characteristic of tooling. The cutting speed of the tool should match material cut. The cutting speed can be manipulated by changing the spindle speed or outer tool diameter.

$$V_c = \frac{D \times \pi \times n}{1000 \times 60} \text{ [m/s]}$$

D = Outer tool diameter [mm]

π = Pi (3.141592...)

n = Spindle speed [RPM]

Recommended cutting speeds [m/s]

Type of tool	Cutter	Saw Blades
Cutting edge material	HS-HP, HC-UP HW, DP	HW, HC-UP DP
Softwood	60 - 90	70 - 100
Hardwood	50 - 90	70 - 90
Particleboard, MDF	60 - 90	60 - 90
Laminated boards	40 - 70	60 - 100

Chipload S_z

The chipload is another important performance characteristic. It describes the feed rate per tooth. In a simplified way, the feed rate per tooth is used to describe the cut quality. The feed rate, number of teeth and spindle speed can manipulate the feed per tooth and therefore also the cut quality. In actual situation, the obtained surface is a one-knife finish, since there are many tolerances in the machine, tool and interface, that don't allow running all teeth on the exact same cut circle. Hydro sleeves and jointing enable to reduce the difference between the max and min swing of the knives of a cutter enabling a better cut finish or to run higher feed rates.

$$S_z = \frac{v_f \times 1000}{n \times z} \text{ [mm]}$$

v_f = Feed rate [m/min]

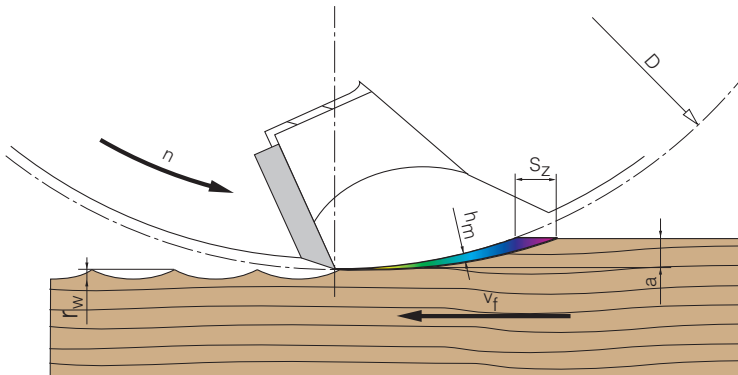
Z = Number of teeth

n = Spindle speed [RPM]

Recommended chiploads [mm]

Type of tool	Cutter	Saw Blades
Solid wood along the grain	0.6 - 2.5	0.2 - 1.5
Solid wood across the grain	0.3 - 0.8	0.1 - 0.2
Particleboard, MDF	0.8 - 1.5	0.05 - 0.2
Plastic laminated board	0.6 - 1.2	0.03 - 0.06

General Technical Information



Cutting Arc Depth

$$r_w = \frac{S_z^2}{4 \times D} \text{ [mm]}$$

S_z = Chipload [mm]

D = Outer tool diameter [mm]

Average Chip Thickness h_m

$$h_m = S_z \times \sqrt{\frac{a}{D}} \text{ [mm]}$$

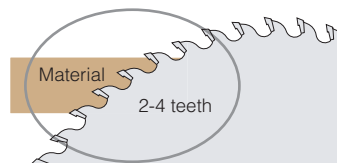
S_z = Chipload [mm]

D = Outer tool diameter [mm]

a = Cutting depth [mm]

Number of Teeth in the Cut

As a rule of the thumb, in case of a saw blade, there should be not more or less than 2-4 teeth at the same time in the material.



Tooth Pitch & Number of Teeth

$$t = \frac{h \times 1.45}{k} \text{ [mm]}$$

t = Tooth pitch [mm]

h = Thickness of the material

k = Number of teeth in cut

$$Z = \frac{D \times \pi}{t}$$



z = Number of teeth

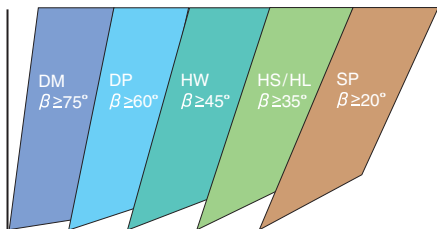
t = Tooth pitch [mm]

D = Outer diameter of the saw blade [mm]

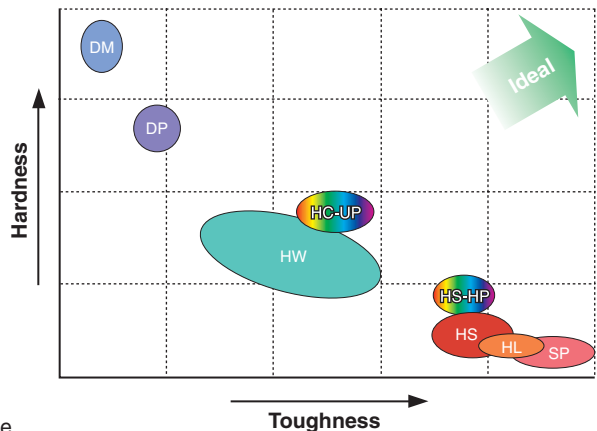
π = Pi (3.141592)

Cutting Edge Materials

Abbreviation	Material	Area of Application	Kanefusa' s Product Range
DM	Single Crystal Diamond (MCD)	Laminate flooring Machining plastics like PMMA	Custom made tooling
DP	Polycrystalline Diamond (PCD)	Various flooring materials Panel based furniture Cement-fiber board Various plastics Non-ferrous metals	Board Pro DIA saw blades DIA-Vtech saw blades Cosmobit router bits Cutters Routers
HC-UP 	Advanced Material Technology treated Tungsten Carbide	Solid wood based products such as - Furniture and chairs - Stairs and windows - Structural lumber	SF-saw blades E-Bit router bits Finger joint cutters Profile cutters and routers
HW	Tungsten Carbide	Panel based products Solid wood products Non-ferrous metals Various plastics	Board Pro saw blades Timber Max saw blades Sash Pro saw blades Yield Pro saw blades
HS-HP 	Advanced Material Technology treated High Speed Steel	Planing, profiling and finger jointing of solid wood	ST-1 knives ENSHIN knives Finger Joint Cutters
HS	High Speed Steel (HSS)	Veneer and chip production	Industrial knives
HL	Alloy Steel	Veneer and chip production	Timber Tec Knives Industrial knives
SP	Tool Steel	Veneer and chip production	Industrial knives



Suitable edge angle [β] according to cutting edge material





<http://www.kanefusa.net>

KANEFUSA CORPORATION

Head Office / Factory

1-1 Nakaoguchi, Ohguchi-cho, Niwa-Gun
Aichi-ken, Japan, Postal Code 480-0192

Tel : +81 587 95 7221

Fax : +81 587 95 7226

E-mail: sales-ex@kanefusa.co.jp

PT. KANEFUSA INDONESIA

EJIP Industrial Park, Plot 8D, Cikarang Selatan,
Bekasi 17550, West Java, Indonesia

Tel : +62 21 897 0360

Fax: +62 21 897 0286

+62 21 897 0287

E-mail : sales@kanefusa.co.id

KANEFUSA EUROPE B.V.

De Witbogt 12, 5652 AG, Eindhoven, The Netherlands

Tel : +31 40 2900901

Fax: +31 40 2900908

E-mail : info@kanefusa.nl

KANEFUSA USA, INC.

621 Dolwick Drive, Erlanger, KY 41018, USA

Tel : +1 859 283 1450

Fax: +1 859 283 5256

E-mail : sales@kanefusa-na.com

KANEFUSA CHINA CORPORATION

NO.50 Zhuzhu Road, Lujia Town Kunshan city, Jiangsu, China

Tel : +86 512 57875072

Fax: +86 512 57875073

E-mail : yy@kanefusa-cn.com

TIANJIN OFFICE

Sanjinglu No.5 Dongli economic development zone Tianjin city CHINA

Tel : +86 22 5823 7633

Fax: +86 22 5823 7632

E-mail : tjkfc03@kanefusa-cn.com

KANEFUSA INDIA PRIVATE LIMITED

Plot No.232, Sector-8, IMT Manesar, Gurgaon,

Haryana PIN 122-050 India

Tel : +91 124 420 8440

Fax: +91 124 420 8441

E-mail : info@kanefusa.co.in

KANEFUSA DO BRASIL LTDA.

Rua Joaquim de Almeida,75,Sao Paulo,SP,Brasil,CEP04050-010

Tel : +55 11 2372 7664

Fax: +55 11 2372 7663

E-mail : vendas@kanefusa.net.br

MALAYSIA OFFICE

Suite 839 Level 8, Pavilion KL 168 Jalan Bukit Bintang

55100 Kuala Lumpur, Malaysia

Tel : +60 3 92057721

Fax: +60 3 92057720

E-mail : kanefusamal@myjaring.net
