

JIS

JAPANESE INDUSTRIAL STANDARD

**Cutting tools—Vocabulary—
Common terms**

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Cutting tools — Vocabulary
— Common terms

B 0170-1993

1. Scope This Japanese Industrial Standard specifies the basic terms and definitions thereof common to the cutting tools (hereafter referred to as "tools") to be used mainly for cutting metals.

Further, for informative reference, the symbols, quantity symbols, units and English equivalent are given.

2. Classification The classification of the glossary of common terms for cutting tools is given in the following:

- (1) Names of parts of cutting tools and elements of cutting part
- (2) Reference systems
- (3) Angles of cutting part
- (4) Cutting works
- (5) Damage of cutting part
- (6) Types of cutting tools
 - (a) Classification by materials of cutting parts and surface treatments
 - (b) Classification by construction
 - (c) Classification by cutting motions
 - (d) Classification by mounting methods
 - (e) Classification by functions or uses

3. Terms and definitions The terms and definitions are in accordance with the following:

- Remarks
1. Those terms of which part of terms is attached with () may also be omitted of the letters given in ().
 2. The figure is that indicating an example, and it does not express the shape and size.

In addition, the digits given in parentheses in Figure indicate the numbers of the terms.

(1) Name of part of cutting tool and element of cutting part

No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
1001	ボデー	BODÉ	Mainstay of tool and the tool itself is a cutting edge, or a whole body including the part holding blade or tip (see Attached Figs. 1-3 and 1-4).	—	body
1002	シャンク	SYANKU	Grip part to tool. Hold this part during the use of tool (see Attached Figs. 1-1 to 1-3).	—	shank
1003	刃部	HABU	Part undertaking the cutting work of tool directly and composing of the cutting edge, face and flank.	—	cutting part
1004	チップ	TIPPU	Small pieces of the edged tool material to be used by fitting to the body or shank. The cutting part is formed at a part of it. 	—	tip
1005	スローアウェイチップ	SURÔAWEI TIPPU	That tip which is so made as to be capable of continuing the work as it stands without regrinding by replacing to other corner or other tip, when one of the cutting part has reached its tool life, being mounted to the body mechanically. Usually it has plural number of cutting parts of negative rake and positive rake. It is also called "throw away tip" (see Attached Fig. 1-1).   Positive rake type Negative rake type	—	indexable insert, throw away insert

No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
1006	ブレード	BURÊDO	Rather long tip composing the cutting part by being held mechanically by the body or the base metal to which the tip is fixed. This is termed "insert blade", too.	—	blade, insert blade
1007	首 (部)	KUBI (BU)	The contracted part equipped at the part except the shank according to the requirement for manufacturing or using the tool (see Attached Fig. 1-3).	—	neck, recess
1008	溝	MIZO	Depressed part between adjacent cutting edge and heel (see Attached Figs. 1-2 to 1-4).	—	flute
1009	ヒール	HÎRU	Tool having flute, which is the part connecting flank and flute (see Attached Figs. 1-2 and 1-5).	—	heel
1010	バックテーパー	BAKKU TÊPA	Taper equipped to give relief to the tool for the feed motion in longitudinal direction of the shank.	—	back taper
1011	すくい面	SUKUIMEN	Face performing mainly the cutting work of tool. The chips pass away on his face. Where the face consists of plural faces, term them the first face, the second face, the third face and the like in the order of the nearer one to the cutting edge. The first face narrow in width is termed "land", too. Unless otherwise specified especially, these faces mean the face related to the major cutting edge. Where the division into major cutting edge and minor cutting edge is required, the face being connected with the major cutting edge is termed "major face" and the face being connected with the minor cutting edge is termed "minor face" (see Attached Figs. 1-1 to 1-4). Examples: Major second face, Minor first face	—	face, rake face

No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
1012	逃げ面	NIGEMEN	Relief face to avoid unnecessary contact with the machined surface. Where the flank consists of plural faces, they are termed the first flank, the second flank and the like in the order of nearer one to the cutting edge. The first flank narrow in width is termed "land", too. Unless otherwise specified especially, these flanks mean those related to the major cutting edge.	—	flank
1013	主逃げ面	SYU-NIGEMEN	Flank being connected with the major cutting edge. When the major flank consists of plural faces, they are termed the first major flank, the second major flank and the like in the order of nearer one to the major cutting edge (see Attached Figs. 1-1 to 1-4).	—	major flank
1014	副逃げ面	HUKU-NIGEMEN	Flank being connected with the minor cutting edge. When the minor flank consists of plural faces they are termed the first minor flank, the second minor flank and the like in the order of nearer one to the minor cutting edge (see Attached Figs. 1-1 to 1-4).	—	minor flank
1015	ランド	RANDO	(1) Part having a banklike width from cutting edge to heel of tool having flute (see Attached Fig. 1-5). (2) Narrow beltlike face equipped along the cutting edge on the face (see Attached Fig. 1-6). (3) Narrow beltlike face equipped along the cutting edge on the flank. The clearance angle is not appended to the land in many cases.	—	land

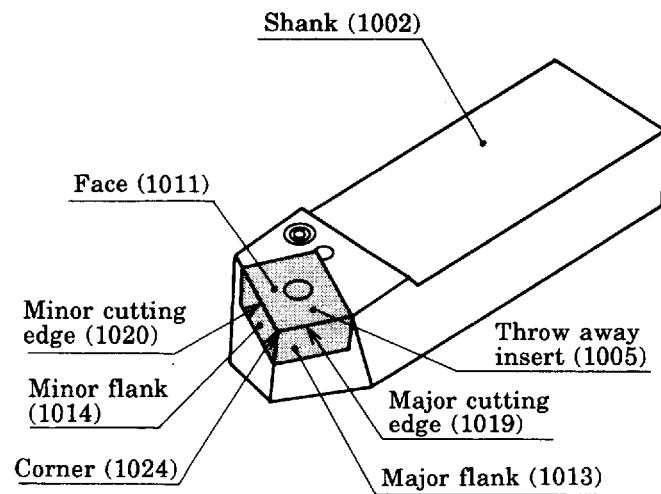
No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
1016	マージン	MÁZIN	Part without clearance angle on the flank (see Attached Figs. 1-2 and 1-5).	—	margin
1017	切れ刃	KIREHA	One of the composing elements of cutting part and at the same time the intersecting line of face and flank.	—	cutting edge
1018	切れ刃の状態	KIREHA NO ZYÔTAI	The condition of cutting edge treated considering the tool material type, tool shape, use, etc. There are following shapes in general. (1) Sharp cutting edge: The cutting edge which keeps sharp condition without particular treatment. (2) Rounded cutting edge: The cutting edge of which face side and flank side have been connected with a circular arc. (3) Chamfered cutting edge: The cutting edge of which face side and flank side have been connected by a straight line in a certain angle. (4) Chamfered and rounded cutting edge: The cutting edge of which face side and flank side have been connected by a straight line in a certain angle, and one side or both sides of the face side and flank side are rounded respectively.	—	condition of cutting edge (1) sharp cutting edge (2) rounded cutting edge (3) chamfered cutting edge (4) chamfered and rounded cutting edge

No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
1018 (continued)					
1019	主切れ刃	SYU-KIREHA	Cutting edge performing a main part to create chips in cutting work. For the plural major cutting edges, they are termed the first major cutting edge, the second major cutting edge and the like in the order of nearer one to the corner (see Attached Figs. 1-1 to 1-4).	—	major cutting edge
1020	副切れ刃	HUKU-KIREHA	Part except the major cutting edge out of the cutting edges. For plural minor cutting edges, they are termed the first minor cutting edge, the second minor cutting edge and the like in the order of nearer one to the corner (see Attached Figs. 1-1 to 1-4).	—	minor cutting edge
1021	横切れ刃	YOKO-KIREHA	The cutting edge of keeping away from machined surface in general.	—	side cutting edge
1022	前切れ刃	MAE-KIREHA	The cutting edge of generating machined surface or the cutting edge nearer side to that in general.	—	end cutting edge

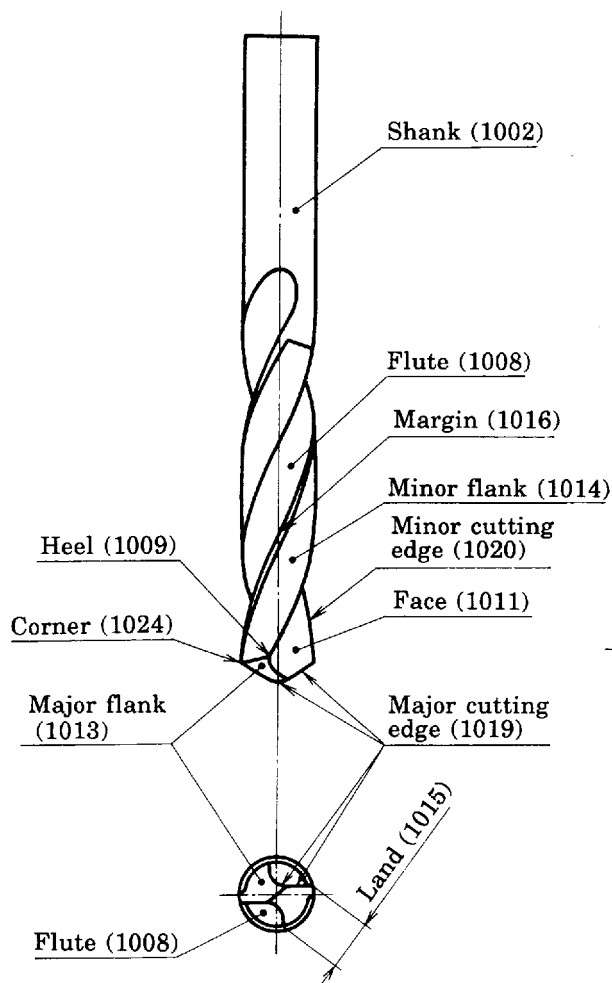
No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
1023	切れ刃の丸み	KIREHA NO MARUMI	The roundness generating at the corner part connecting the flank from the face. There are two types: one is a micro-roundness generated in production, and the other one is a roundness generated by cutting.	—	cutting edge roundness
1024	コーナー	KÔNA	Part of cutting edge in a relatively small range at the corner connecting one cutting edge and another cutting edge. This is termed "nose", too (see Attached Figs. 1-1 to 1-4).	—	corner, nose
1025	丸コーナー	MARUKÔNA	Rounded corner (see Attached Fig. 1-6).	—	rounded corner
1026	コーナー半径	KÔNA-HANKEI	Nominal radius of the roundness of rounded corner. This is indicated by the value which has been measured in the reference plane.	r_e	corner radius

No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
1027	面取りコーナー	MENTORI-KÔNA	Corner which has been chamfered in a straight line form (see Attached Fig. 1-6).	—	chamfered corner
1028	チップポケット	TIPPU-POKETTO	Cavity equipped at the tool to facilitate the creation, accommodation and exhaustion of chips during cutting (see Attached Fig. 1-5).	—	chip pocket, chip space
1029	チップフローマ	TIPPU-FÔMA	Obstacles of flute mould or barrier or the like equipped at the face for the purpose of letting the chips which separate from a workpiece and flow out by the cutting, change into appropriate shapes.	—	chip former
1030	チップブレイカ	TIPPU-BURÊKA	Obstructs of flute mould, barrier or the like equipped at the face or the flank for the purpose of letting the chips which separate from a workpiece and run out by the cutting, break into appropriate small pieces into longitudinal direction or width direction.	—	chip breaker
1031	食付き部	KUITUKIBU	Tool part to bite a workpiece or part to guide the tool itself while cutting. The part of chamfered form is termed "chamfer", too (see Attached Fig. 1-3).	—	leading part, bevel lead, chamfer

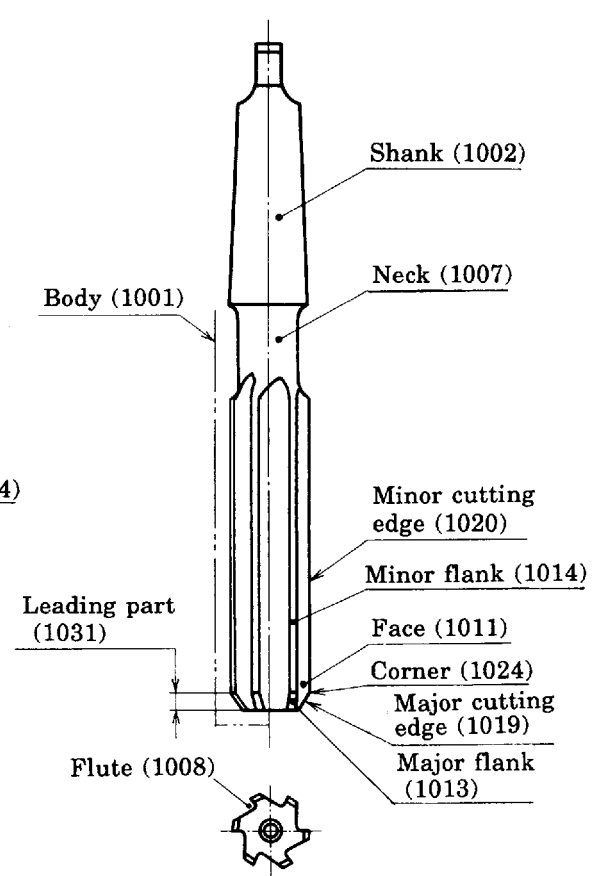
Attached Fig. 1-1. Names of respective parts of cutting tool (bite)



Attached Fig. 1-2. Names of respective parts of cutting tool (drill)

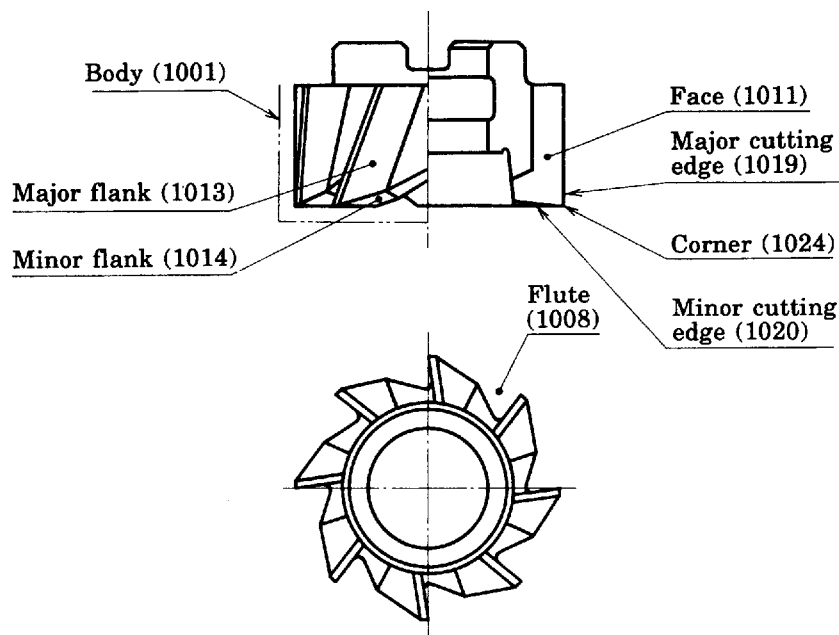


Attached Fig. 1-3. Names of respective parts of cutting tool (reamer)

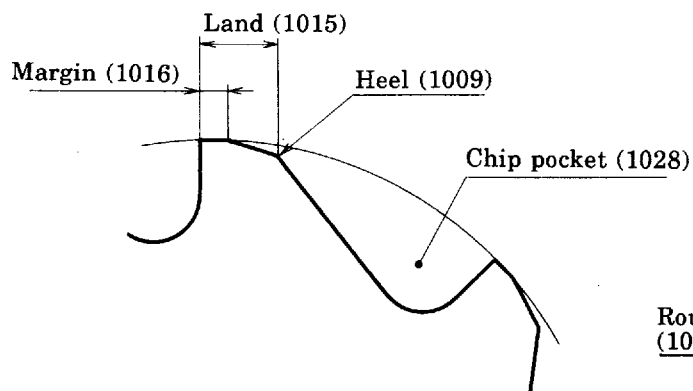


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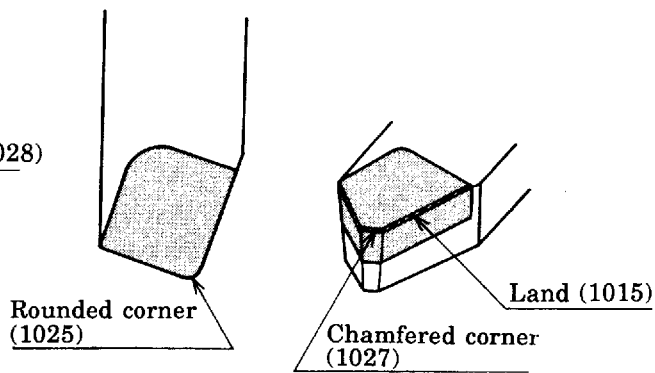
Attached Fig. 1-4. Names of respective parts of cutting tool
(face milling cutter)



Attached Fig. 1-5. Names of respective parts of cutting tool
(reamer)



Attached Fig. 1-6. Rounded corner, chamfered corner and land



(2) Reference systems

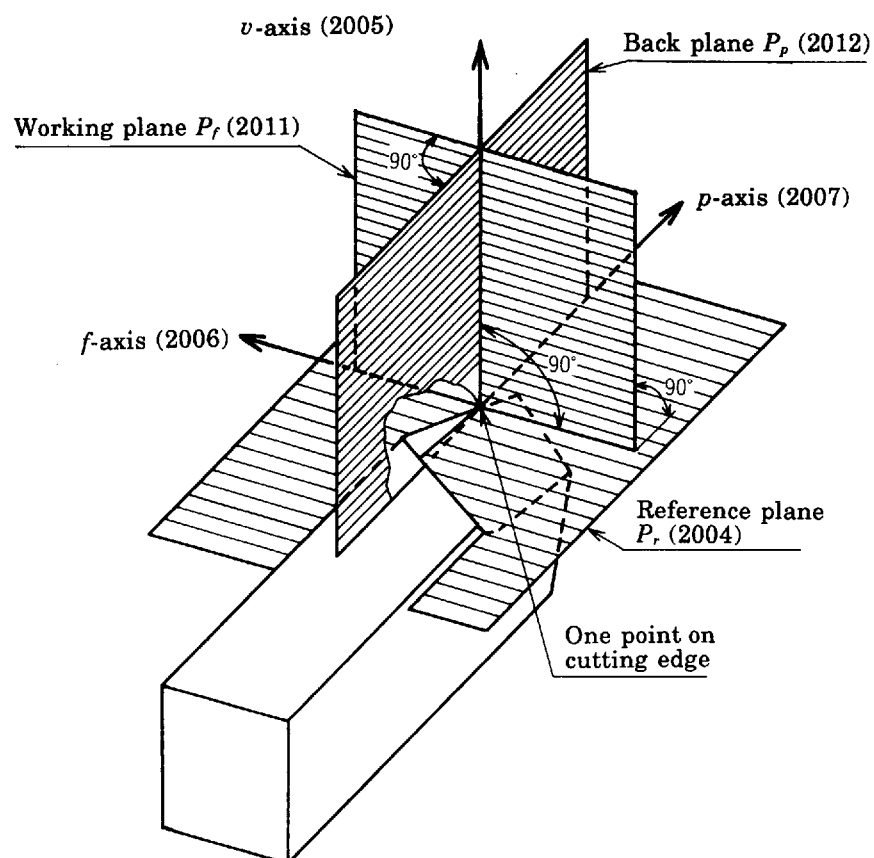
No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
2001	基準方式	KIZYUN-HÔSIKI	Systems to be taken as the reference when defining the various angles of cutting part in relation to the cutting works. The reference systems consist of three systems of the tool-in-hand system placing the reference on the tool itself, the tool-in-use system placing the reference on the cutting work, and the mechanical reference system placing the reference on the machine tool to which tool is to be mounted. Remarks: As to the mechanical reference system, its details are not specified.	—	reference systems
2002	工具系基準方式	KÔGUKEL-KIZYUN-HÔSIKI	System to set the plane and axis, which serve as the reference passing one point on the cutting edge in order to define various angles of the cutting part based on the directions of primary motion, feed motion and depth setting motion which have been supposed on the basis of the revolving axis of shank or tool and the like for conveniences of the manufacture of tool, measurement and fitting. When it is required especially to distinguish that the point on the cutting edge is on the minor cutting edge, the symbols indicating the plane, axis and angle shall be appended with dash (see Attached Figs. 2-1 to 2-4).	—	tool-in-hand system

No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
2003	作用系基準方式	SAYÔKEI-KIZYUN- HÔSIKI	System to define various angles of the cutting part by setting the reference plane and axis passing one point on the cutting edge based on the direction of resultant cutting motion which has been composed of the primary motion and feed motion during cutting. Distinguish the tool-in-use system from the tool-in-hand system by appending "tool-in-use" before the terms indicating plane, axis and angle, and "e" to the symbols (see Attached Figs. 2-5 to 2-8).	—	tool-in-use system
2004	基準面	KIZYUNMEN	Plane being taken as reference to define various angles of the cutting part. This is set as a plane passing one point on the cutting edge. Plane vertical to the direction of the primary motion in tool-in-hand system, and plane vertical to the direction of the resultant cutting motion composed of primary motion and feed motion in tool-in-use system. The former is termed "tool reference plane" and the latter is termed "working reference plane" (see Attached Figs. 2-1 to 2-8).	P_r	reference plane
2005	v 軸	v -ZIKU	Axis passing one point on the cutting edge and being in the direction of major motion. It serves as an aid for setting the plane required to define various angles of the cutting part (see Attached Figs. 2-1 to 2-8).	—	v -axis
2006	f 軸	f -ZIKU	Axis passing one point on the cutting edge and being in the direction of feed motion (see Attached Figs. 2-1 to 2-8). It serves as an aid for setting the plane required to define various angles of the cutting part.	—	f -axis

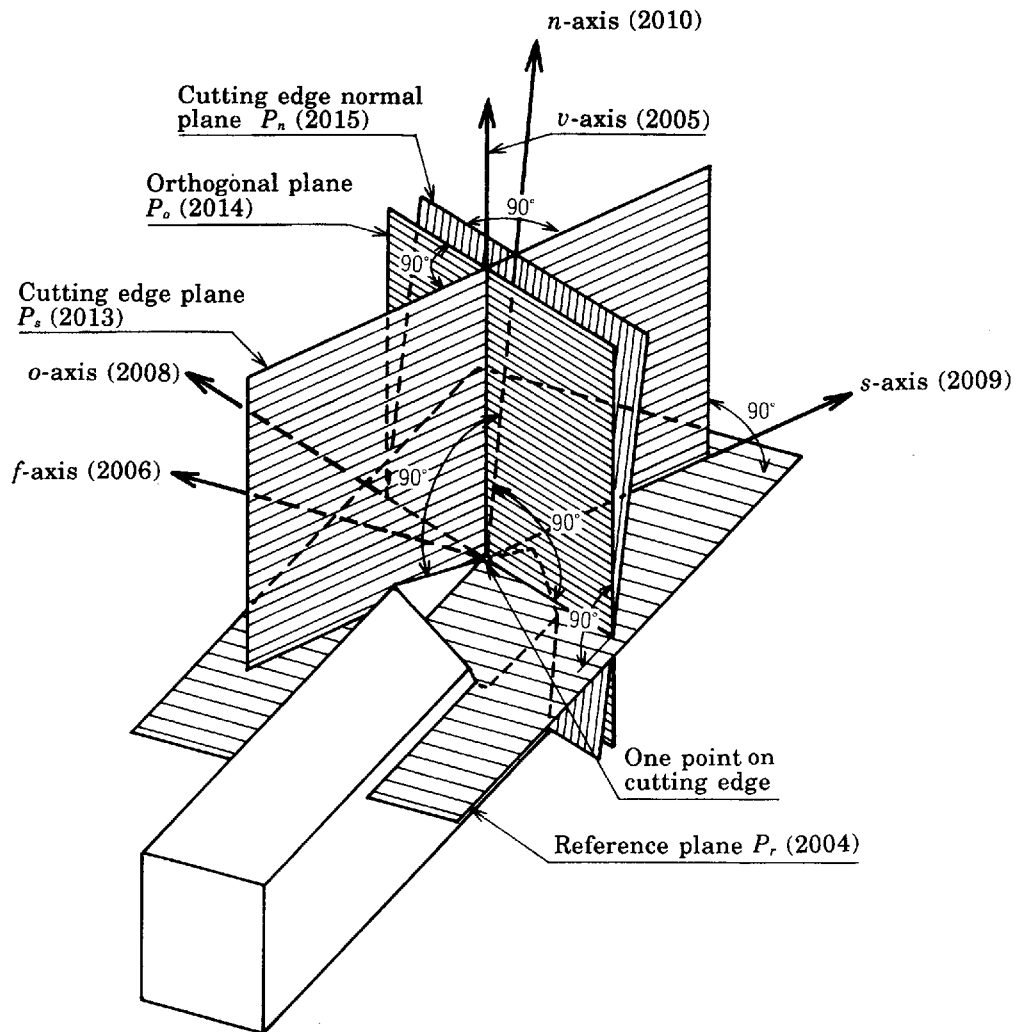
No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
2007	<i>p</i> 軸	<i>p</i> -ZIKU	Axis passing one point on the cutting edge and being in the direction of depth setting motion (see Attached Fig. 2-1). It serves as an aid for setting the plane required to define various angles of the cutting part.	—	<i>p</i> -axis
2008	<i>o</i> 軸	<i>o</i> -ZIKU	Axis passing one point on the cutting edge, intersecting at right angles with <i>v</i> -axis and vertical to the projection of cutting edge to the reference plane (<i>P_r</i>) (see Attached Fig. 2-2).	—	<i>o</i> -axis
2009	<i>s</i> 軸	<i>s</i> -ZIKU	Axis passing one point on the cutting edge and contacting with the projection of cutting edge to the reference plane (<i>P_r</i>) (see Attached Fig. 2-2).	—	<i>s</i> -axis
2010	<i>n</i> 軸	<i>n</i> -ZIKU	Axis passing one point on the cutting edge, intersecting at right angles with <i>o</i> -axis and vertical to the cutting edge (see Attached Fig. 2-2).	—	<i>n</i> -axis
2011	<i>f-v</i> 面	<i>f-v</i> -MEN	Plane including <i>f</i> -axis and <i>v</i> -axis. Namely, plane passing one point on the cutting edge and to be decided by the direction of primary motion and that of feed motion (see Attached Figs. 2-1, 2-3 to 2-5, 2-7 and 2-8).	<i>P_f</i>	working plane
2012	<i>p-v</i> 面	<i>p-v</i> -MEN	Plane including <i>p</i> -axis and <i>v</i> -axis. Namely, plane passing one point on the cutting edge, and vertical to the reference plane (<i>P_r</i>) and working plane (see Attached Figs. 2-1, 2-3 to 2-5, 2-7 and 2-8).	<i>P_p</i>	back plane
2013	<i>s-v</i> 面	<i>s-v</i> -MEN	Plane including <i>s</i> -axis and <i>v</i> -axis. Namely, plane contacting the cutting edge at one point on that cutting edge and vertical to the reference plane (<i>P_r</i>) (see Attached Figs. 2-2 to 2-4 and 2-6 to 2-8).	<i>P_s</i>	cutting edge plane

No.	Term (Japanese characters)	Reading	Definition	Informative reference	
				Quantity symbol	English equivalent
2014	<i>o-v</i> 面	<i>o-v</i> -MEN	Plane including <i>o</i> -axis and <i>v</i> -axis. Namely, plane passing one point on the cutting edge and vertical to the reference plane (P_r) and furthermore, vertical to the projection of cutting edge to the reference plane (P_r) (see Attached Figs. 2-2 to 2-4, 2-6 to 2-8).	P_o	orthogonal plane
2015	<i>n-o</i> 面	<i>n-o</i> -MEN	Plane including <i>n</i> -axis and <i>o</i> -axis. Namely, plane intersecting at right angles with the cutting edge at one point on the cutting edge (see Attached Figs. 2-2 to 2-4, 2-6 to 2-8). This plane is not changed by the difference of reference system.	P_n	cutting edge normal plane

Attached Fig. 2-1. Tool-in-hand system (bite)



Attached Fig. 2-2. Tool-in-hand system (bite)



Attached Fig. 2-3. Tool-in-hand system (convex milling cutter)

