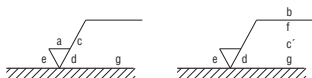


Position of Auxiliary Symbols for Surface Symbols

An auxiliary symbol indicating a surface roughness value, cut-off value or reference length, machining method, grain direction, surface undulation, etc. is placed around the surface symbol as shown in Fig. 1.

Fig. 1 Positions of Auxiliary Symbols



- a: Ra value
- b: Machining method
- c: Cutoff value • Evaluation length
- c': Reference length • Evaluation length
- d: Grain direction
- f: Parameter other than Ra (when tp, this is parameter / cutoff level)
- g: Surface undulation (according to JIS B 0610)

Remark : Symbols other than a and f shall be entered when needed.

Reference : In ISO 1302, a finish allowance is entered at the location of e in Figure 1.

Symbol	Meaning	Diagram
=	Direction of grains left by the cutting instrument are parallel to the projection plane of the drawing where the symbol is entered. Example: Shaped surface	
⊥	Direction of grains left by the cutting instrument are perpendicular to the projection plane of the drawing where the symbol is entered. Examples: Shaped surface (side view), circular cut, cylindrical cut	
X	Direction of grains left by the cutting instrument intersect in 2 directions at angles to the projection plane of the drawing where the symbol is entered. Example: Honed surface	
M	Direction of grains left by the cutting instrument intersect in multiple directions or have no direction. Examples: Lapped surface, superfinished surface, and surface finished by front milling or end milling with cross feed	
C	Grains left by the cutting instrument are virtually concentric around the center of the projection plane of the drawing where the symbol is entered. Example: Facing surface	
R	Grains left by the cutting instrument are virtually radial with respect to the center of the projection plane of the drawing where the symbol is entered.	

Examples of surface symbols

Surface symbol

Symbol indicating a surface that requires a removal process

Symbol indicating a surface where removal processes are prohibited

Examples of indicating the Ra upper limit

(a) (b) (c)

Example of indicating grain direction

Examples of indicating Ra upper limit and lower limit

(a) (b)

Examples of indicating the machining method

(a) (b)