

JIS

JAPANESE INDUSTRIAL STANDARD

Steel die sets for press dies

JIS B 5060—1995

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Steel die sets for press dies

B 5060-1995

1. Scope This Japanese Industrial Standard specifies the steel die sets for press dies (hereafter, referred to as "die sets").

Remarks: The standards cited in this Standard are given in the following:

JIS B 0601 Surface roughness - Definitions and designation

JIS B 0651 Instruments for the measurement of surface roughness by the stylus method

JIS B 1501 Steel balls for ball bearings

JIS B 5031 Accuracy test for press dies sets

JIS B 7503 Dial gauges

JIS B 7513 Precision surface plates

JIS B 7725 Vickers hardness testing machines

JIS B 7726 Rockwell and Rockwell superficial hardness testing machines

JIS G 3101 Rolled steel for general structure

JIS G 4805 High carbon chromium bearing steels

JIS H 4040 Aluminium and aluminium alloy rods, bars and wires

JIS Z 2244 Method of Vickers hardness test

JIS Z 2245 Method of Rockwell and Rockwell superficial hardness test

2. Types and symbols The types and symbols of the die sets shall be classified as given in Table 1 according to the shapes of guides.

Table 1. Types and symbols

Type		Symbol
Plane guide	Type SBB	SBB
	Type SCB	SCB
	Type SDB	SDB
	Type SFB	SFB
Ball guide	Type SBR	SBR
	Type SCR	SCR
	Type SDR	SDR
	Type SFR	SFR

3. Quality

3.1 Appearance The die sets in appearance shall be free from the defects such as cracks and harmful flaws, rust, etc. in use.

Further, the corner parts shall be processed with appropriate chamfers in a range not impedimental in use.

3.2 Surface roughness The surface roughness shall be in accordance with the following:

- (1) The surface roughness of the upper face and lower face of the die sets and punch holder, when subjected to the test of 7.1, shall be $1.6 \mu m R_a$ or under in accordance with the surface roughness of JIS B 0601.
- (2) The surface roughness of the fitting part of the guide post and guide bush, when subjected to the test of 7.1, shall be $0.2 \mu m R_a$ or under in accordance with the surface roughness of JIS B 0601.

3.3 Hardness The hardness of the guide post and guide bush of the die set, when subjected to the test of 7.2, shall be the values of Table 2.

Table 2. Hardness

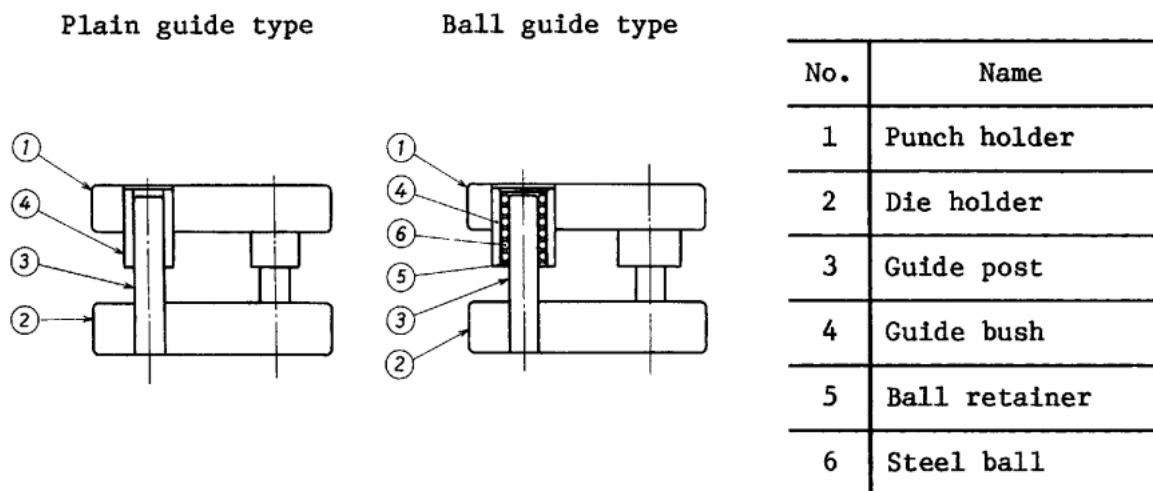
Quenched and tempered	Surface hardened layer
58 HRC or over	650 HV or over

3.4 Accuracy The accuracy of the die sets shall be in accordance with JIS B 5031. However, the perpendicularity and dislocation, when subjected to the test of 7.4, shall be the values as follows:

- (1) Perpendicularity The perpendicularity of the reference plane Y in respect to the reference plane X shall be 0.02 mm or under per 100 mm.
- (2) Dislocation The dislocation of the reference planes of the punch holder and die holder shall be 0.02 mm or under per 100 mm.
4. Structure The structure of the die sets shall be in accordance with Fig. 1.

For the structure of the guide post and guide bush, one of the types of the press fitting, cementing, detachable, etc. may also be used.

Fig. 1. Structure



5. Shapes and dimensions The shapes and dimensions of the die sets shall be in accordance with Attached Tables 1 to 8.
6. Materials The materials of die sets shall be those given in Table 3 or those of having performance equal or superior thereto in use.

Table 3. Materials

No.	Name	Material
1	Punch holder	SS400 of JIS G 3101
2	Die holder	SS400 of JIS G 3101
3	Guide post	SUJ2 of JIS G 4805
4	Guide bush	SUJ2 of JIS G 4805
5	Ball retainer	A2011 T8 of JIS H 4040, or other metal or synthetic resin may also be used as required.
6	Steel ball	JIS B 1501

7. Test methods

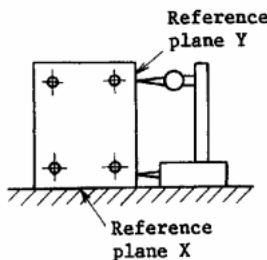
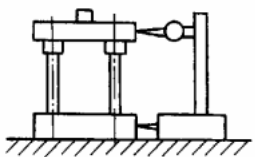
7.1 Surface roughness The surface roughness of the die set shall be measured by using the measuring instrument of JIS B 0651 or that having performance equal or superior thereto.

7.2 Hardness The hardness of the guide post and guide bush shall be measured in accordance with the test method of JIS Z 2244 or JIS Z 2245, using the testing machine of JIS B 7725 or JIS B 7726.

7.3 Accuracy The accuracy of the die set shall be measured in accordance with the measuring method of JIS B 5031.

7.4 Perpendicularity and dislocation The measurements of the perpendicularity and dislocation of the die set shall be in accordance with Table 4.

Table 4. Test methods

Measuring item	Measuring method	Diagram of measuring method	Applicable standards to measuring instrument
Perpendicularity of reference plane Y in respect to reference plane X	Place the reference plane X on the precision surface plate facing to the upper face of surface plate, measure the perpendicularity in respect to the reference plane Y by a right angle measuring instrument, and consider the maximum value of the readings thereof to be the measured value.		JIS B 7503 and Grade 1 specified in JIS B 7513
Dislocation of the reference planes of punch holder and die holder	Place an assembled die set on the precision surface plate, apply a right angle measuring device to the right angle reference planes of the punch holder and die holder, and consider the maximum difference of the readings when measured its overall length to be the measured value.		JIS B 7503 and Grade 1 specified in JIS B 7513

8. Inspection The inspection of the die set shall be carried out on the quality, shapes and dimensions, and the results shall conform to the requirements of 3. and 4. respectively.

9. Designation The die set shall be designated by this Standard number or the title of this Standard, type or its symbol, nominal dimension and the length (L) of guide post.

Examples 1. For plane guide type:

JIS B 5060 SBB $160 \times 100 - 150$

Steel die set for press dies Type SBB $160 \times 100 - 150$

2. For ball guide type:

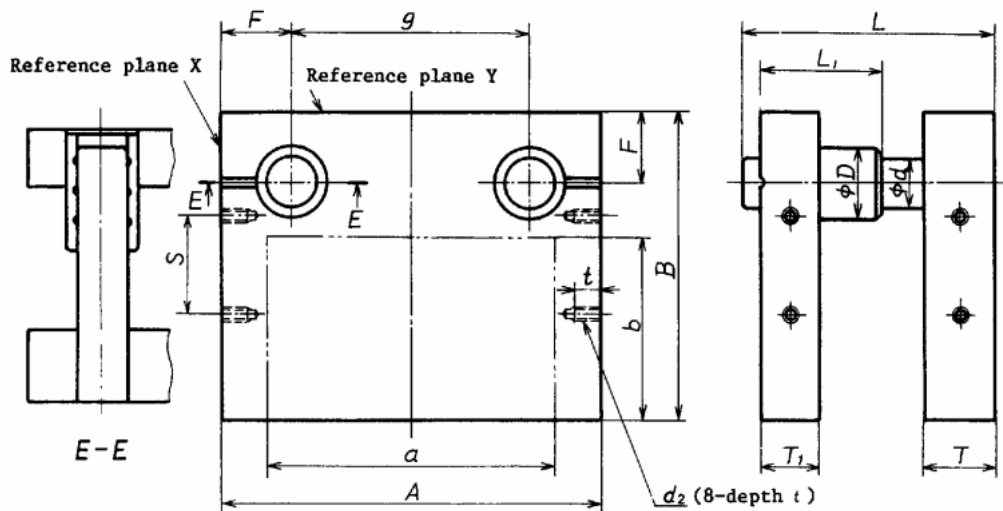
JIS B 5060 SBR $160 \times 100 - 150$

Steel die set for press dies Type SBR $160 \times 100 - 150$

10. Marking The package of the die set shall be marked with the following information:

- (1) Title of this Standard
- (2) Type or its symbol
- (3) Nominal dimension
- (4) Length (L) of guide post
- (5) Manufacturer's name or abbreviation

Attached Table 1. Shape and dimensions of type SBB



Unit: mm

Nominal dimension ⁽¹⁾ (<i>a</i> × <i>b</i>)		<i>A</i> ⁽²⁾	<i>B</i> ⁽²⁾	<i>F</i>	<i>g</i>	<i>T</i> ⁽²⁾	<i>T</i> ₁ ⁽²⁾	<i>d</i> ⁽²⁾	<i>D</i>	Screw thread hole		Informative reference value						
<i>a</i>	<i>b</i>									<i>d</i> ₂	<i>t</i>	<i>S</i>	<i>L</i> ₁	<i>L</i>				
100	80	140	140	30	80	※35	30	※22	34	—		—	60	130, 140, 150				
125		150	140	30	100													
160		200	140	30	140													
200		250	150	35	180	40	※35	28	40	M10	20	125	67	140, 150, 160				
250		300	150	35	230													
100	100	140	160	30	80	※35	30	※22	34	—		—	60	130, 140, 150				
125		160	160	30	100													
160		200	160	35	130	40	※35	28	40	M10	20	135	67	140, 150, 160				
200		250	160	35	180													
250		300	160	35	230													
125	125	160	200	35	90	50	40	※36	51	M12	25	90	75	150, 160, 170				
160		200	200	35	130													
200		250	200	35	180													
250		300	200	35	230													
160	160	200	※220	35	130										200	280	40	170
200		250	※220	35	180													
250		300	※230	40	220													
300		※350	※230	40	270													
350		※420	※230	40	340													
200	200	250	280	40	170	60	45	45	63			120		170, 180, 190				
250		300	280	40	220													
300		※350	280	40	270													
350		※420	280	40	340													
400		※480	280	40	400													
450		※550	300	50	450													