

Indian Standard
SCHEME OF SYMBOLS FOR WELDING
(*First Revision*)

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Indian Standard

SCHEME OF SYMBOLS FOR WELDING

(First Revision)

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Indian Standard

SCHEME OF SYMBOLS FOR WELDING

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 24 January 1986, after the draft finalized by the Welding General Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Welding cannot take its proper place as an engineering tool unless suitable means are provided for conveying the information required for welding from the designers to the operators. The symbols described in this standard provide the means of placing on drawings the information concerning type, size, position, etc, of the welds in welded joints. With a view to avoid confusion and misunderstanding, it is very essential that only standard symbols are used by all designers and fabricators. However, all information required for welding is not conveyed by the symbols alone. It is, therefore, often necessary, even when the standard symbols have been used, to indicate on the drawings, reference to standard specifications for welding procedures and/or

welding procedure sheets giving details of the tools, materials, processes and other requirements for welding.

0.3 This standard was first published in 1956. Amended version of the standard was issued in 1961. It is now being revised to bring it in line with other international standards published on the subject.

0.4 This standard keeps in view the practices being followed in the country in this field. Assistance has also been derived from the following standards issued by the International Organization for Standardization (ISO):

ISO 2553-1984 Welds — Symbolic representation on drawings

ISO 4063-1978 Welding, brazing, braze welding and soldering of metals — List of processes, for symbolic representation on drawings

1. SCOPE

1.1 This standard prescribes the rules to be applied for symbolic representation of welds on drawings giving information concerning type, size, position, welding process, etc, for welds in welded joints.

1.1.1 The scheme does not include the use of thickened lines, hatching and such other means for indicating the welds themselves on the drawings, as it is considered that users will be in the best position to judge whether such additions are desirable to meet their particular needs.

2. TERMINOLOGY

2.1 For the purposes of this standard, the definitions given in IS : 812-1957* shall apply.

3. GENERAL

3.1 Welds may be indicated in accordance with the general recommendations for technical drawings. However, for the purpose of simplification, it is advisable to adopt, for usual welds, the symbolic representation described in this standard.

*Glossary of terms relating to welding and cutting of metals.

3.2 The symbolic representation shall give clearly all necessary indications regarding the specific weld to be obtained, without overburdening the drawing with notes or showing an additional view.

3.3 This symbolic representation includes an elementary symbol which may be completed by:

- a) a supplementary symbol,
- b) a means of showing dimensions, or
- c) some complementary indication (particularly for workshop drawings).

3.4 In order to simplify the drawings as much as possible, it is recommended that references be made to specific instructions or particular specifications giving all details of the preparation of edges to be welded and/or the welding procedures, rather than showing these indications on the drawings of the welded parts.

If there are no such instructions, the dimensions relating to the preparation of the edges to be welded and/or the welding procedures can be close to the symbol.

4. SYMBOLS

4.1 Elementary Symbols

4.1.1 The various categories of welds are characterized by a symbol which, in general, is similar to the shape of the weld to be made.

4.1.2 The symbol shall not be taken to pre-judge the process to be employed. The elementary symbols are shown in Table 1.

4.2 **Combination of Elementary Symbols** — When required, a combination of elementary symbols may be used.

4.3 Supplementary Symbols

4.3.1 Elementary symbols may be completed by another symbol (supplementary) characterizing the shape of the external surface of the weld.

The recommended supplementary symbols are given in Table 2.

NOTE — The absence of a supplementary symbol means that the type of the weld surface does not need to be indicated precisely.

4.3.2 Examples of combination of elementary and supplementary symbols are given in Table 3.

NOTE — Although it is not forbidden to associate other symbols, it is better to represent the weld on a separate sketch when symbolization becomes too difficult.

4.4 Typical examples of the use of elementary symbols, combination of elementary symbols and combination of elementary and supplementary symbols are given in Tables 5, 6 and 7 respectively of Appendix A. Typical examples for symbols for certain exceptional cases are given in Table 8 of Appendix A.

5. POSITION OF SYMBOLS ON DRAWINGS

5.1 General

5.1.1 Symbols covered in this standard form only a part of the complete method of representation (Fig. 1) which comprises in addition, the following:

- a) an arrow line(1) for each joint (see Fig. 2 and 3);
- b) a dual reference line, consisting of two parallel lines, one continuous and one dashed (2) (exception, see Note 1); and
- c) a certain number of dimensions and conventional signs.

NOTE 1 — Dashed line can be drawn either above or beneath the continuous line (see 5.5 and Appendix A).

NOTE 2 — Type of lines and line thicknesses should be in accordance with IS : 10714-1983*.

5.1.2 The location of welds, therefore, is defined on the drawings by specifying:

- a) position of the arrow line,
- b) position of the reference line, and
- c) the position of the symbol.

5.2 **Relation Between Arrow Line and the Joint** — The examples given in Figures 2 and 3 explain the meaning of the terms:

- a) 'arrow side' of the joint, and
- b) 'other side' of the joint.

5.3 **Position of Arrow Line** — The position of the arrow line with respect to the weld is generally of no special significance [see Fig. 4(a) and 4(b)]. However, in the case of welds of types 4, 6 and 8 (see Table 1), the arrow line shall point towards the plate which is prepared [see Fig. 4(c) and 4(d)].

The arrow line joins one end of the continuous reference line such that it forms an angle with it and shall be completed by an arrow head. In certain cases, the arrow head may be omitted or replaced by a dot.

5.4 **Position of Reference Line** — The reference line shall be a straight line preferably drawn parallel to the bottom edge of the drawing.

5.5 **Position of Symbol with Regard to the Reference Line** — The symbol shall be placed either above or beneath the reference line, in accordance with the following:

- a) The symbol is placed on the continuous line side of the reference line if the weld (weld face) is on the arrow side of the joint [(see Fig. 5(a)).
- b) The symbol is placed on the dashed line side if the weld (weld face) is on the other side of the joint [see Fig. 5(b)].

6. DIMENSIONING OF WELDS



















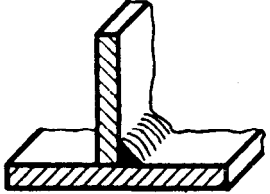

6.1 General

6.1.1 Each weld symbol may be accompanied by a certain number of dimensions, written as follows, in accordance with Fig. 6:

- a) The main dimensions relative to the cross-section are written on the left-hand side (that means before) of the symbol.
- b) Longitudinal dimensions are written on the right-hand side (that means after) of the symbol.

*General principles of presentation on technical drawings.

TABLE 1 ELEMENTARY SYMBOLS
(Clause 4.1.2)

Sl No.	DESIGNATION	ILLUSTRATION	SYMBOL
1	Butt weld between plates with raised edges*, (the raised edges being melted down completely)		
2	Square butt weld		
3	Single-V butt weld		
4	Single-bevel butt weld		
5	Single-V butt weld with broad root face		
6	Single-bevel butt weld with broad root face		
7	Single-U butt weld (parallel or sloping sides)		
8	Single-J butt weld		
9	Backing run; back or backing weld		
10	Fillet weld		

*Butt welds between plates with raised edges (symbol 1) not completely penetrated are symbolized as square butt welds (symbol 2) with the weld thickness, s , as shown in Table 4.

(Continued)

TABLE 1 ELEMENTARY SYMBOLS — Contd

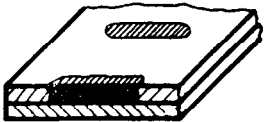

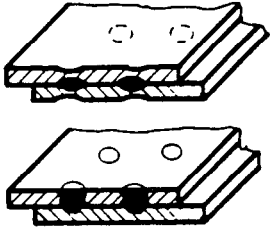

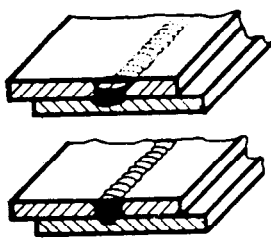




Sl No.	DESIGNATION	ILLUSTRATION	SYMBOL
11	Plug weld; plug or slot weld/USA/		
12	Spot weld		
13	Seam weld		

TABLE 2 SUPPLEMENTARY SYMBOLS

(Clause 4.3.1)

SHAPE OF WELD SURFACE	SYMBOL
a) Flat (usually finished flush)	
b) Convex	
c) Concave	

6.1.2 The method of indicating the main dimensions is defined in Table 4. The rules for setting down these dimensions are also given in this table.

Other dimensions of less importance may be indicated if necessary.

6.2 Dimensions — The dimension that locates the weld in relation to the edge of the sheet shall not appear in the symbolization but on the drawing.

6.2.1 The absence of any indication following the symbol signifies that the weld is to be continuous over the whole length of the workpiece.

6.2.2 In the absence of any indication to the contrary, butt welds shall have complete penetration.

TABLE 3 EXAMPLES OF APPLICATION OF SUPPLEMENTARY SYMBOLS
(Clause 4.3.2)

DESIGNATION	ILLUSTRATION	SYMBOL
Flat (flush) single-V butt weld		
Convex double-V butt weld		
Concave fillet weld		
Flat (flush) single-V butt weld with flat (flush) backing run		

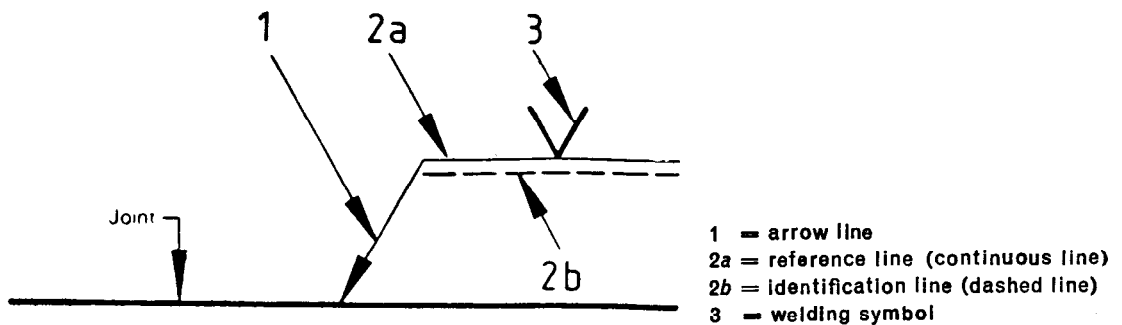


FIG. 1 METHOD OF REPRESENTATION

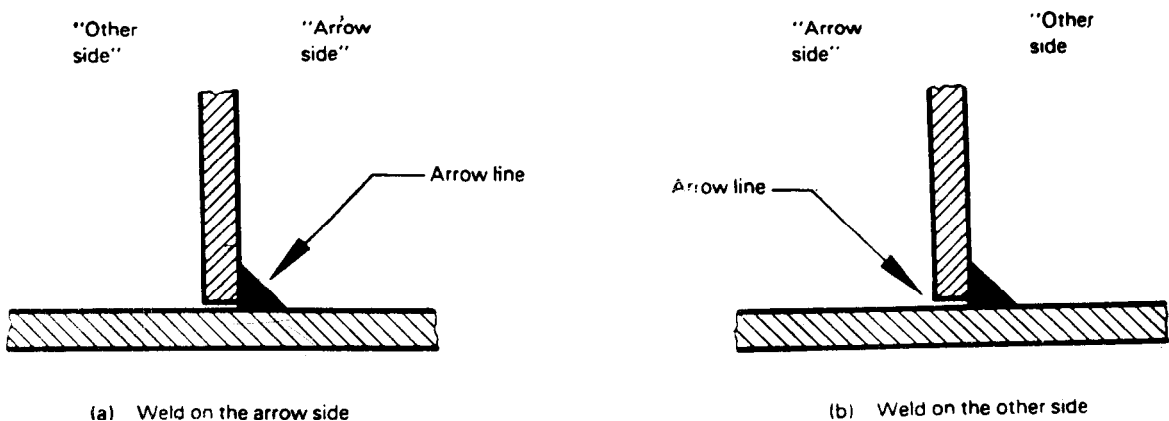
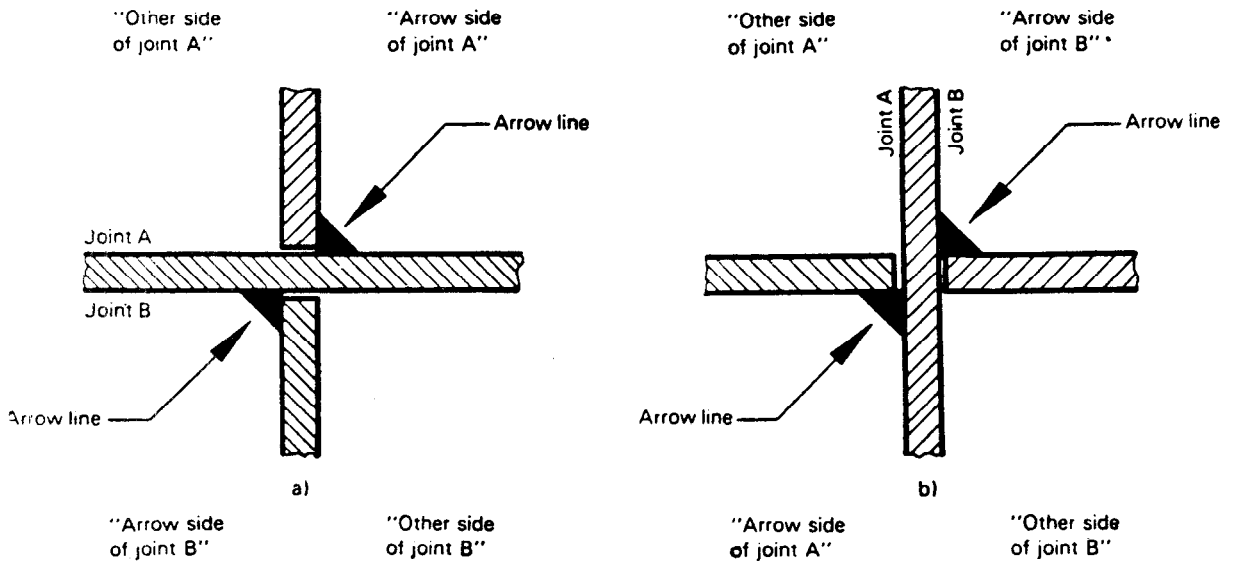
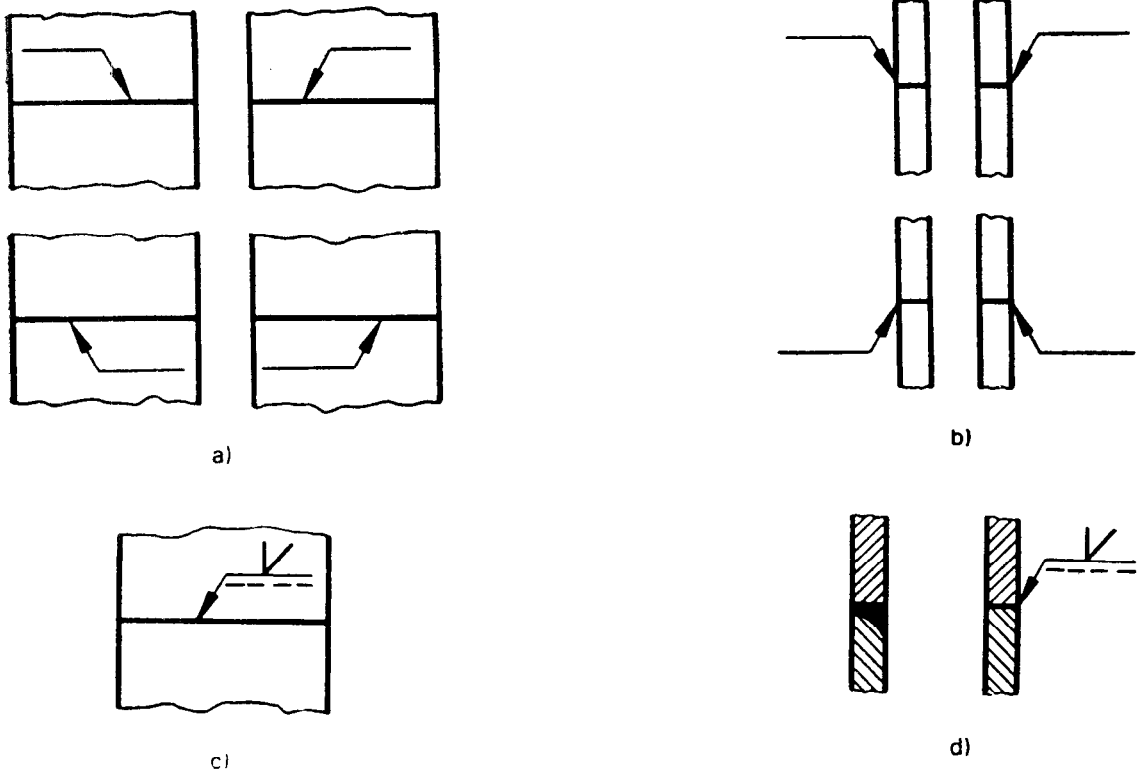


FIG. 2 T-JOINT WITH ONE FILLET WELD



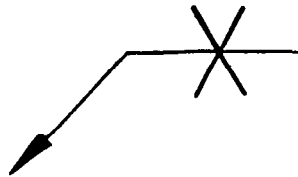
NOTE — The position of the arrow in these sketches is chosen for purposes of clarity. Normally, it would be placed immediately adjacent to the joint.

FIG. 3 CRUCIFORM JOINT WITH TWO FILLET WELDS



NOTE — In the case of spot welds made by projection welding, the projection surface is to be considered as the external surface of the weld.

FIG. 4 POSITION OF THE ARROW LINE



For symmetrical welds only

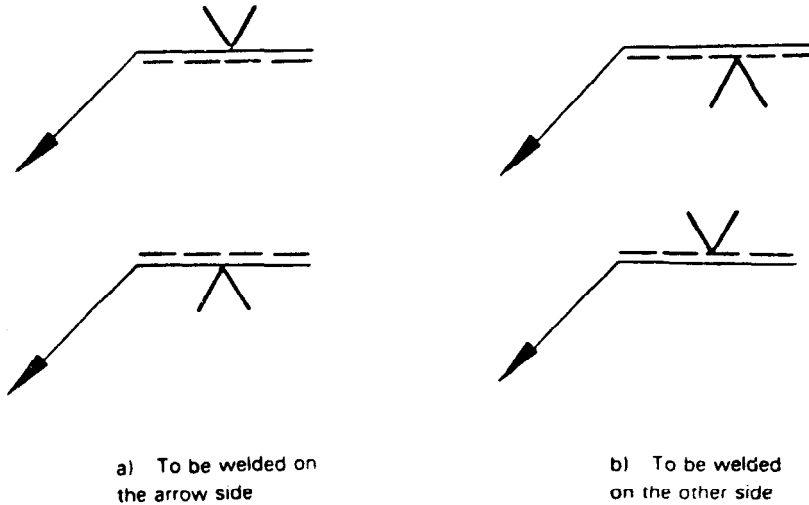


FIG. 5 POSITION OF SYMBOL ACCORDING TO THE REFERENCE LINE

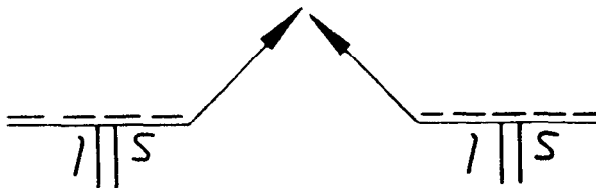
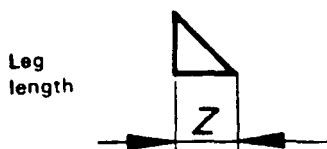


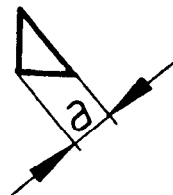
FIG. 6 EXAMPLES OF THE PRINCIPLE

6.2.3 For the fillet welds, there are two methods to indicate dimensions (see Fig. 7). Therefore, the letters *a* or *z* shall always be placed in front of the value of the corresponding dimension.



Leg length

Throat thickness



6.2.4 In the case of plug or slot welds with bevelled edges, it is the dimension at the bottom of the hole which shall be taken into consideration.

7. COMPLEMENTARY INDICATIONS

7.0 Complimentary indications may be necessary in order to specify some other characteristics of welds as given in 7.1, 7.2 and 7.3.



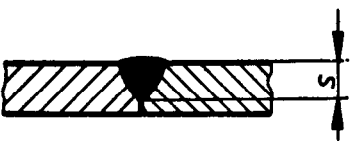

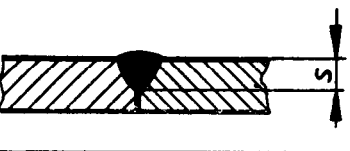

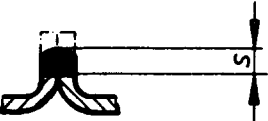

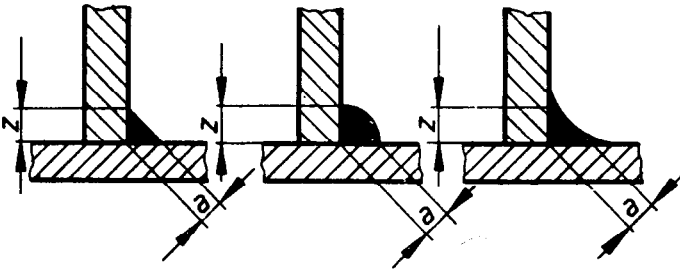


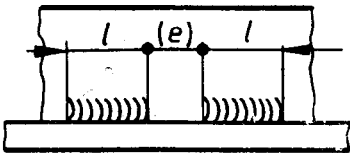
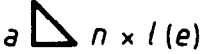
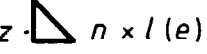
7.1 **Peripheral Welds** — When the weld is to be all around a part, the symbol is a circle, as shown in Fig. 8.

7.2 **Field or Site Welds** — A flag is to be used to indicate the field or site weld, as shown in Fig. 9.

7.3 **Indication of Welding Process** — If required, the welding process may be symbolized by a number written between the two branches of a fork, at the end of the reference line remote from the reference line, as shown in Fig. 10.

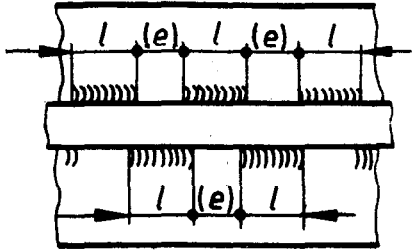
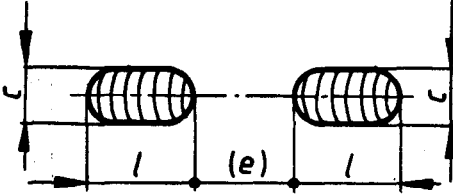
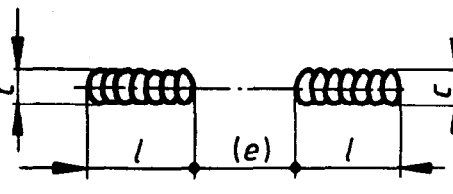
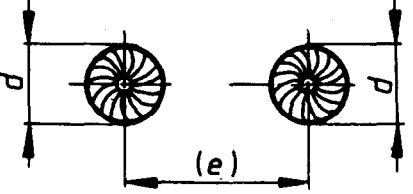
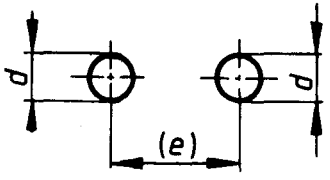
7.3.1 Numerical index numbers identifying each process of welding, brazing, braze welding and soldering to be used for symbolic representation of welds on drawing are given in Appendix B.

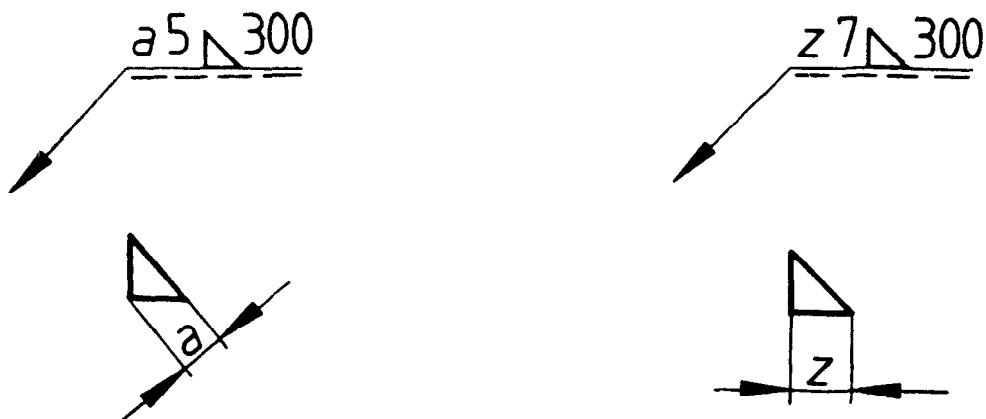
TABLE 4 MAIN DIMENSIONS
(Clause 6.1.2)

Sl No.	Designation of welds	Definition	Inscription		
1	Butt weld		s : minimum distance from the surface of the part to the bottom of the penetration, which cannot be greater than the thickness of the thinner part.	 (See 6.2.1 and 6.2.2)	
					 (See 6.2.1)
					 (See 6.2.1)
2	Butt weld between plates with raised edges		s : minimum distance from the external surface of the weld to the bottom of the penetration.	 (See 6.2.1 and footnote to table 1)	
3	Continuous fillet weld		a : height of the largest isosceles triangle that can be inscribed in the section. z : side of the largest isosceles triangle that can be inscribed in the section.	  (See 6.2.1 and 6.2.3)	
4	Intermittent fillet weld		l : length of weld (without end craters). (e) : distance between adjacent weld elements. n : number of weld elements. a } (see No. 3) z }	 $n \times l (e)$  $n \times l (e)$ (See 6.2.3)	

(Continued)

TABLE 4 MAIN DIMENSIONS — Contd

Sl No.	Designation of welds	Definition	Inscription
5	Staggered intermittent fillet weld		$\begin{array}{l} a \triangleright n \times l \begin{array}{l} (e) \\ (e) \end{array} \\ a \triangleright n \times l \begin{array}{l} (e) \\ (e) \end{array} \\ z \triangleright n \times l \begin{array}{l} (e) \\ (e) \end{array} \\ z \triangleright n \times l \begin{array}{l} (e) \\ (e) \end{array} \end{array}$ <p>(See No. 4) (See No. 3)</p> <p>(See 6.2.3)</p>
6	Plug or slot weld		$\begin{array}{l} l \\ (e) \\ n \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{(See No. 4)}$ <p>c . width of slot</p> $c \sqcap n \times l (e)$ <p>(See 6.2.4)</p>
7	Seam weld		$\begin{array}{l} l \\ (e) \\ n \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{(See No. 4)}$ <p>c . width of weld</p> $c \oplus n \times l (e)$
8	Plug weld		<p>n : (See No. 4) (e) : spacing d . diameter of hole</p> $d \sqcap n \times (e)$
9	Spot weld		<p>n : (See No. 4) (e) : spacing d . diameter of spot</p> $d \bigcirc n \times (e)$



$$z = a\sqrt{2}$$

FIG. 7 METHODS OF INDICATING DIMENSIONS FOR FILLET WELDS

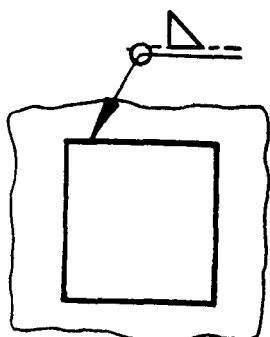


FIG. 8 INDICATION OF PERIPHERAL WELD

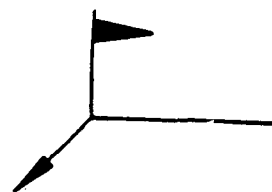


FIG. 9 INDICATION OF FIELD OR SITE WELD

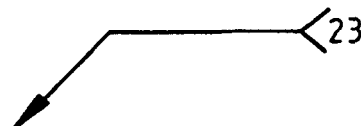


FIG. 10 INDICATION OF WELDING PROCESS

APPENDIX A

(Clauses 4.4 and 5.1.1)

EXAMPLES OF USE OF SYMBOLS



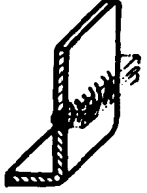
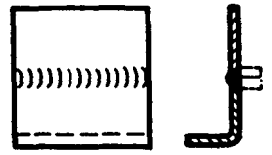
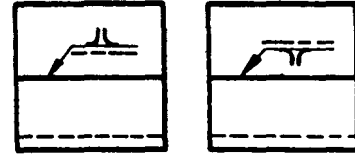
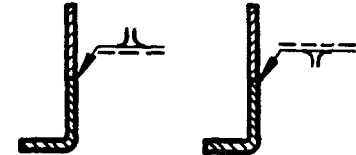
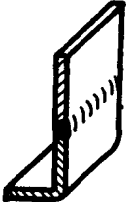
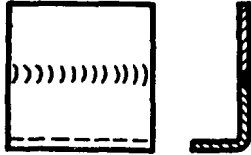
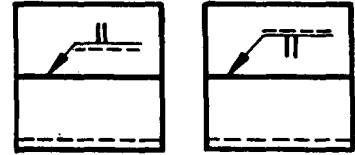
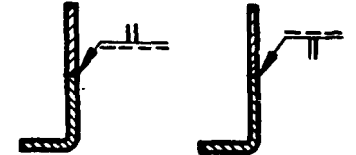

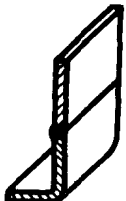

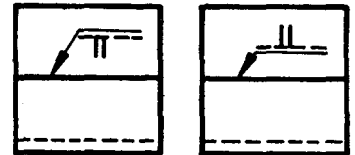
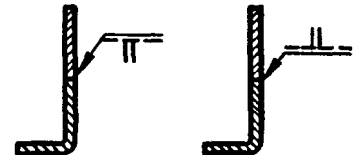
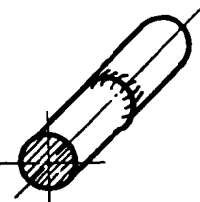

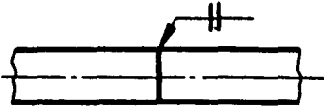
A-1. Typical examples of use of the elementary and supplementary symbols are given in Tables 5 to 8. The representations shown are given simply for explanation and are not obligatory.

NOTE — For the sake of uniformity among the

figures given in this Appendix, the relative position of views are those provided by the first angle projection method. It should be understood, however, that third angle method could equally have been used without prejudice to the principle established but as a basic requirement, use of first angle projection is to be followed.

TABLE 5 EXAMPLES OF USE OF ELEMENTARY SYMBOLS

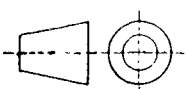

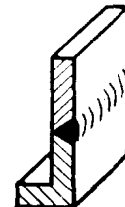
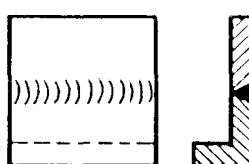
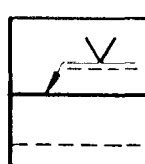
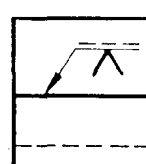
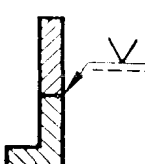
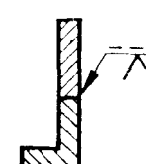

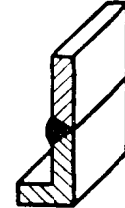

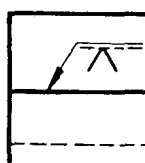
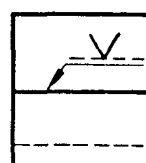
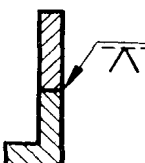
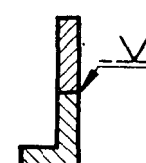
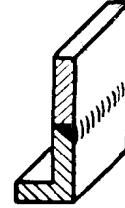

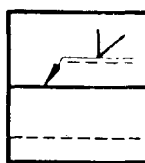
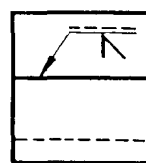
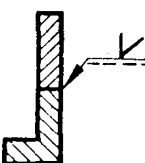
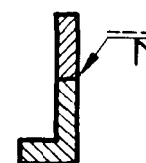

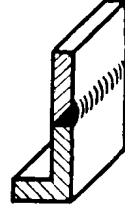
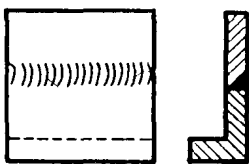
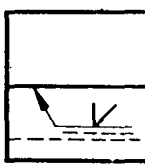
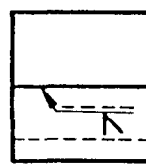
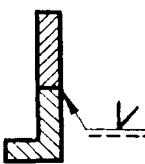
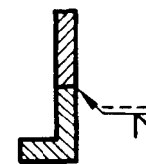
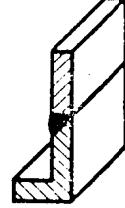
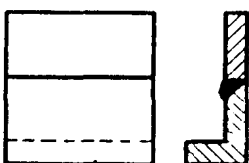
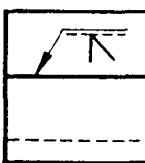
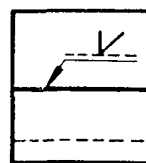
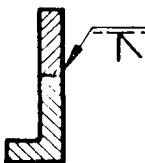
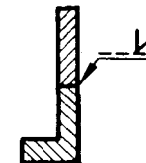
(Clause 4.4, and Appendix A)

SI No.	Designation Symbol (Numbers refer to table 1)	Illustration	Representation 	Symbolization	
				either	or
1	Butt weld between plates with raised edges 				
2					
3	Square butt weld 				
4					

13

(Continued)

TABLE 5 EXAMPLES OF USE OF ELEMENTARY SYMBOLS — *Contd*

SI No.	Designation Symbol (Numbers refer to table 1)	Illustration	Representation 	Symbolization			
				either		or	
5	Single-V butt weld 						
6	3 						
7							
8	Single-bevel butt weld 						
9	4						

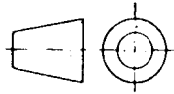

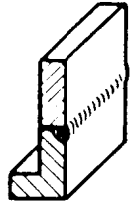
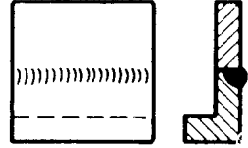
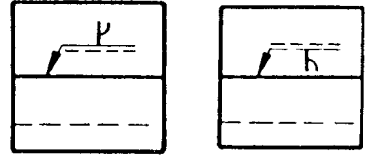
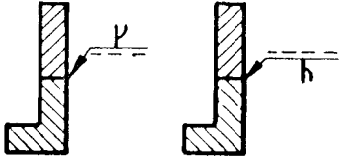

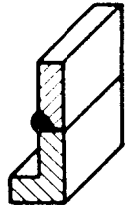
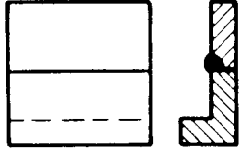
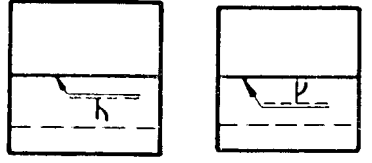


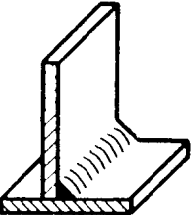
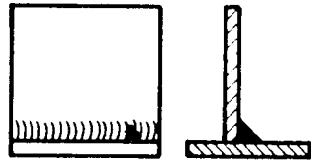
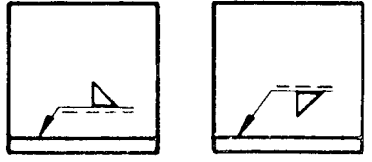
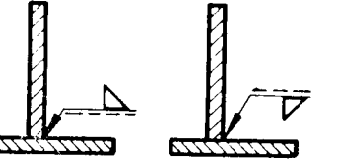

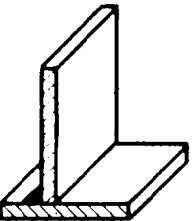
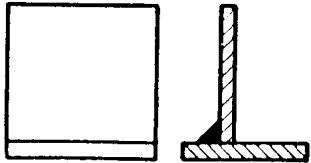
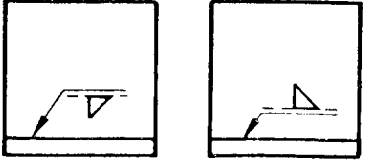
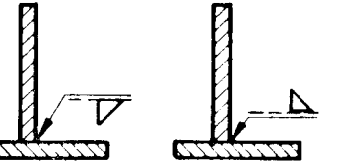
(Continued)

TABLE 5 EXAMPLES OF USE OF ELEMENTARY SYMBOLS — Contd

SI No.	Designation Symbol (Numbers refer to table 1)	Illustration	Representation	Symbolization			
				either		or	
10	Single-bevel butt weld 4						
11	Single-V butt weld with broad root face 5						
12	Single bevel butt weld with broad root face						
13	6						
14	Single-U butt weld 7						

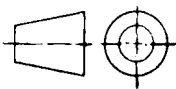
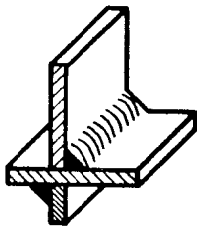
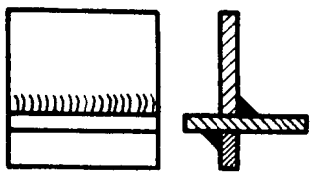
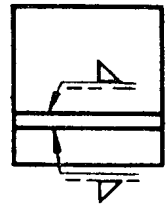
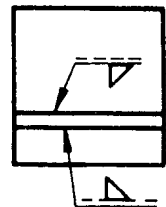

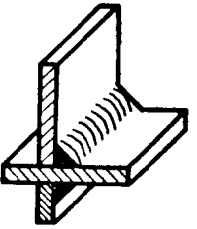
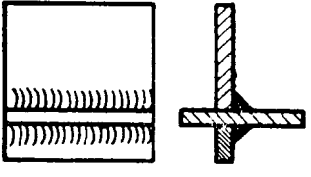
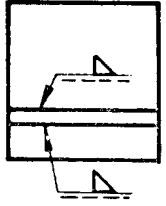
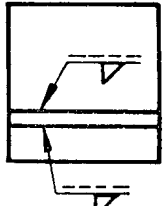
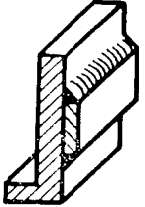
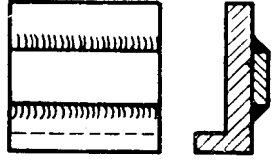
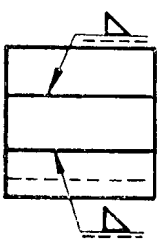
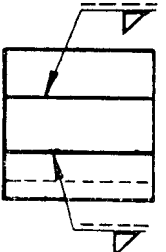
(Continued)

TABLE 5 EXAMPLES OF USE OF ELEMENTARY SYMBOLS — *Contd*

SI No	Designation Symbol (Numbers refer to table 1)	Illustration	Representation 	Symbolization	
				either	or
15	Single J butt weld 				
16	8 				
17	Fillet weld 				
18	10 				

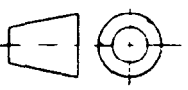

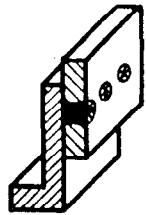
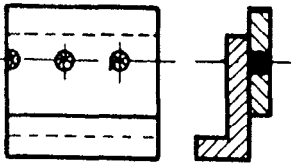
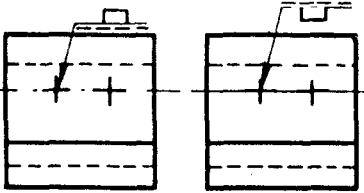
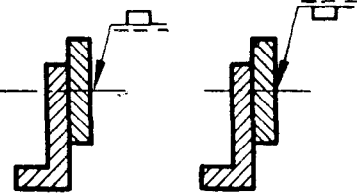
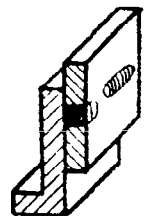
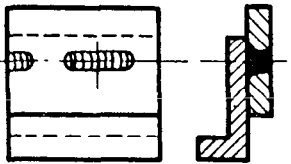
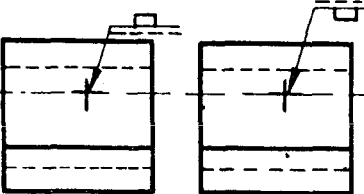
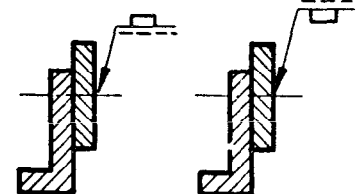

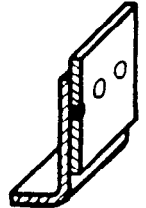
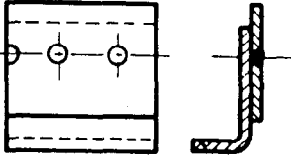
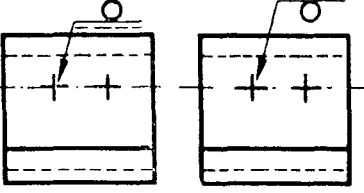
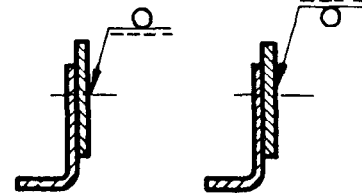
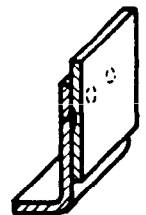
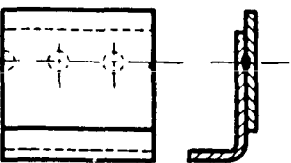
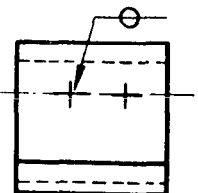
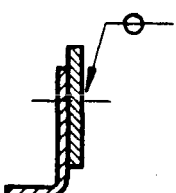
(Continued)

TABLE 5 EXAMPLES OF USE OF ELEMENTARY SYMBOLS — *Contd*

SI No.	Designation Symbol (Numbers refer to table 1)	Illustration	Representation 	Symbolization	
				either	or
19					
20	Fillet weld  10				
21					

(Continued)

TABLE 5 EXAMPLES OF USE OF ELEMENTARY SYMBOLS — *Contd*

SI No	Designation Symbol (Numbers refer to table 1)	Illustration	Representation 	Symbolization	
				either	or
22	Plug weld  11				
23					
24	Spot weld  12				
25					

(Continued)

TABLE 5 EXAMPLES OF USE OF ELEMENTARY SYMBOLS — *Contd*

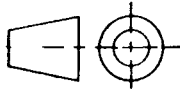

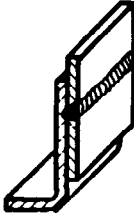
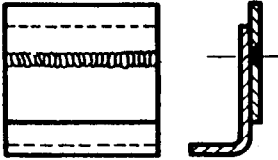
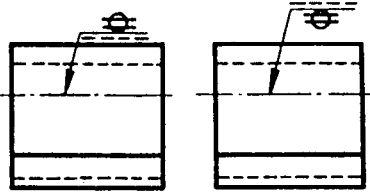
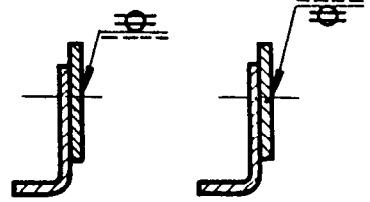

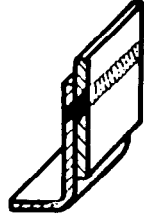

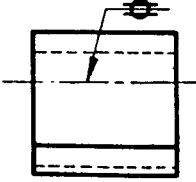
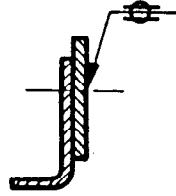
SI No.	Designation Symbol (Numbers refer to table 1)	Illustration	Representation 	Symbolization	
				either	or
26	Seam weld 				
27	13 				

TABLE 6 EXAMPLES OF COMBINATIONS OF ELEMENTARY SYMBOLS

(Clause 4.4, and Appendix A)



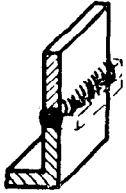
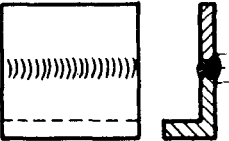
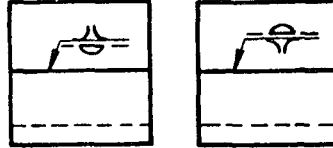
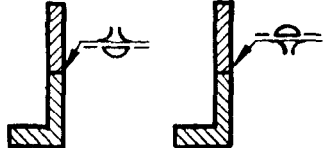

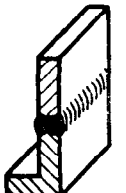

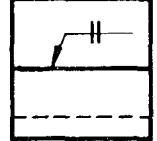
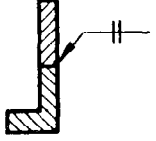

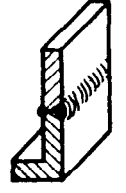
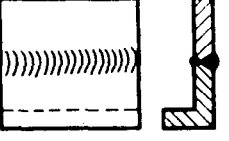
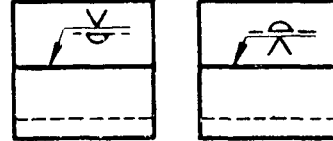
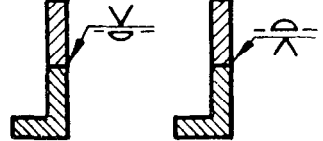

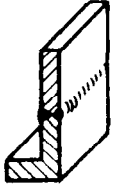

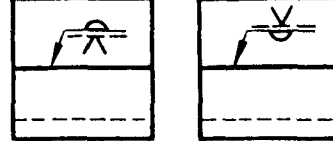
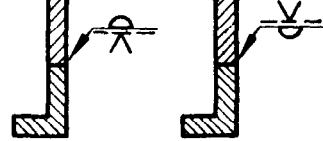
Sl No.	Designation Symbol (Numbers refer to table 1)	Illustration	Representation	Symbolization	
				either	or
1	Butt weld between plates with raised edges  1 and backing run  9 1-9				
2	Square butt weld  2 welded from both sides 2-2				
3	Single-V butt weld  3 and backing run				
4	 9 3-9				

TABLE 6 EXAMPLES OF COMBINATIONS OF ELEMENTARY SYMBOLS — *Contd*


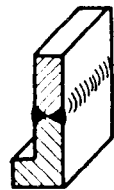
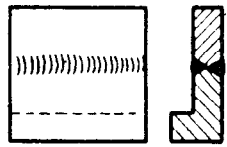
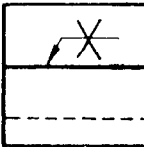
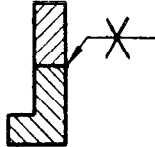

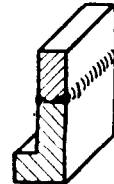
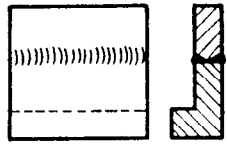
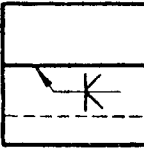
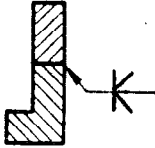
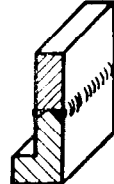
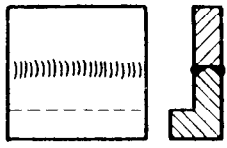
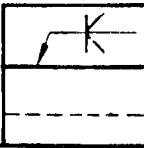
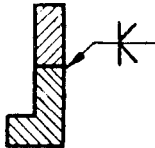

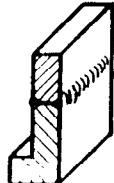
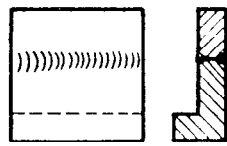
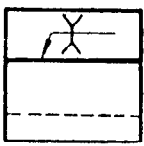
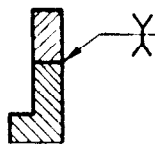

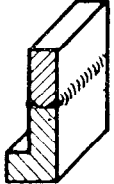
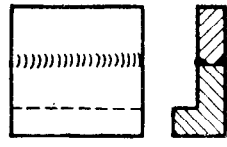
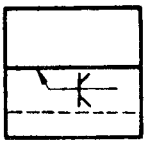
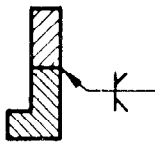
SI No	Designation Symbol (Numbers refer to table 1)	Illustration	Representation	Symbolization	
				either	or
5	Double V butt weld  3 (X weld) 3-3				
6	Double bevel butt weld  4 (K weld)				
7	4-4				
8	Double-V butt weld with broad root face  5 5-5				
9	Double-bevel butt weld with broad root face  6 6-6				

TABLE 6 EXAMPLES OF COMBINATIONS OF ELEMENTARY SYMBOLS — *Contd*



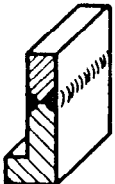
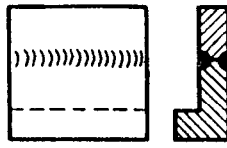
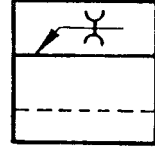
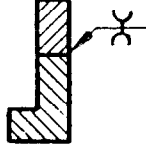

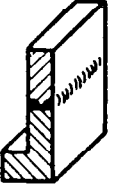
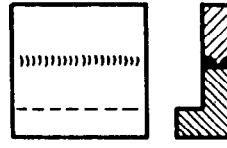
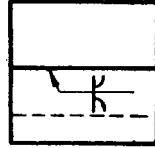
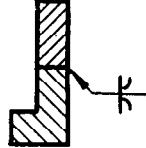


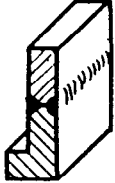
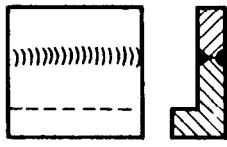
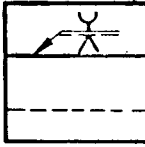
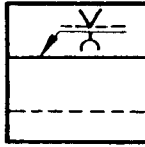
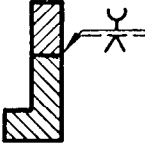
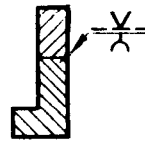

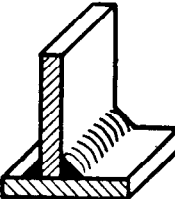
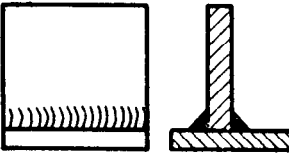
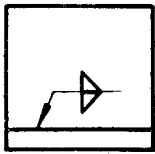
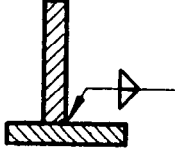

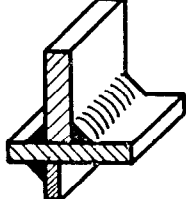
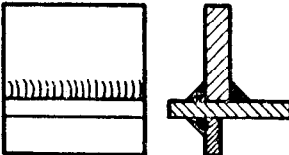
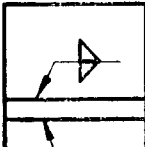
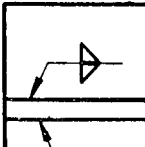
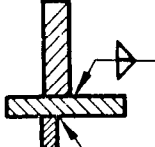
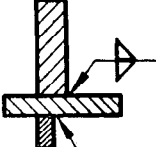
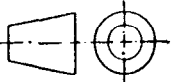

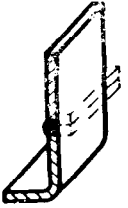
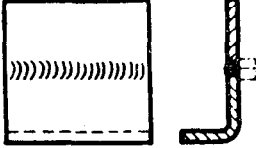

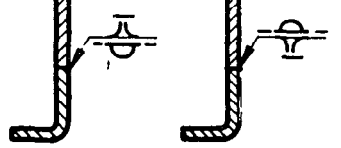

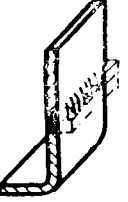
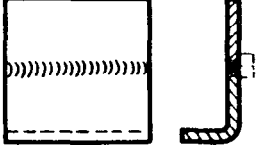
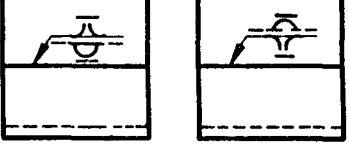
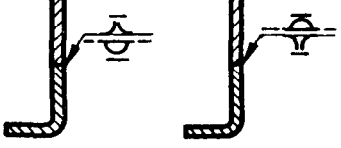

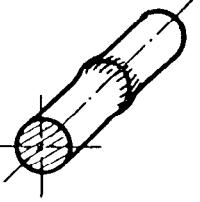

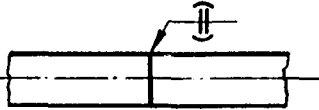
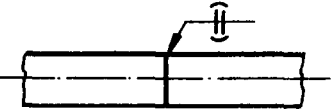

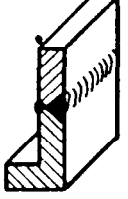
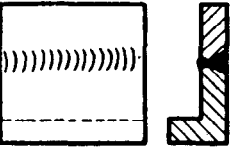
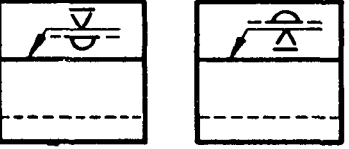
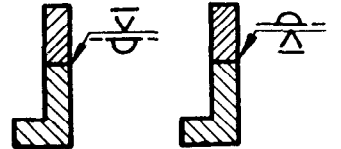
SI No	Designation Symbol (Number refer to table 1)	Illustration	Representation 	Symbolization	
				either	or
10	Double-U butt weld  7 7-7				
11	Double-J butt weld  8 8-8				
12	Single-V butt weld and single-U butt weld  3  7 3-7			 	 
13	Fillet weld and fillet weld  10				
14	 10 10-10			 	 

TABLE 7 EXAMPLES OF COMBINATIONS OF ELEMENTARY AND SUPPLEMENTARY SYMBOLS

(Clause 4.4, and Appendix A)

SI No	Symbol	Illustration	Representation 	Symbolization	
				either	or
1					
2					
3					
4					

(Continued)

TABLE 7 EXAMPLES OF COMBINATIONS OF ELEMENTARY AND SUPPLEMENTARY SYMBOLS — *Contd*

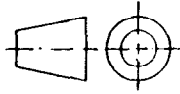

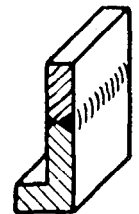
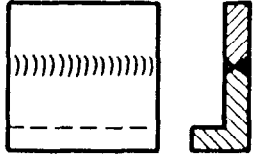
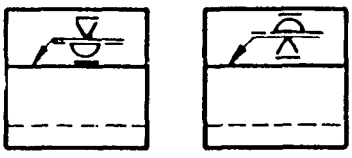
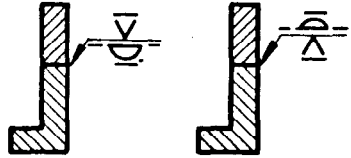

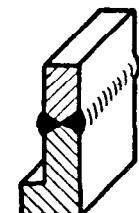
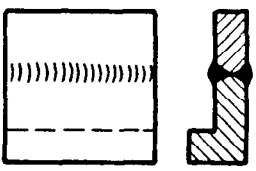
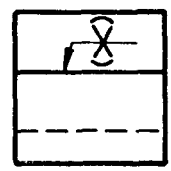
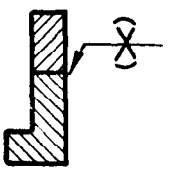

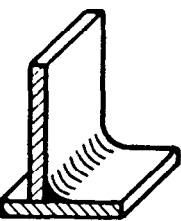
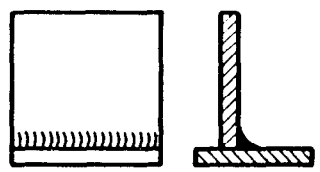
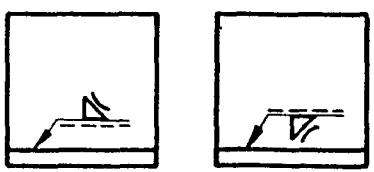
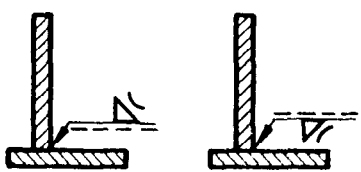

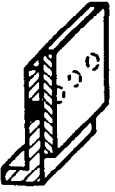
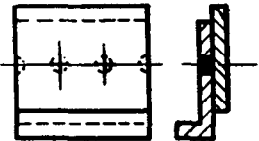

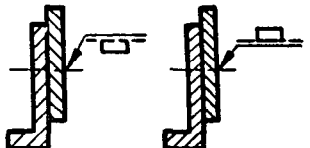
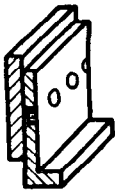
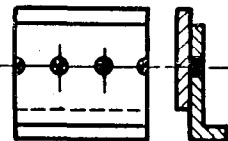
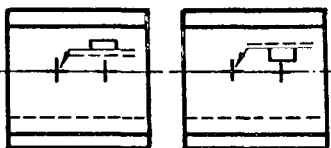
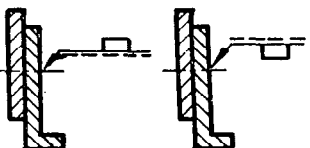
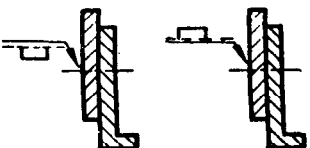
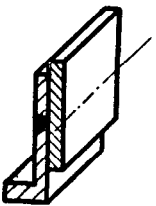
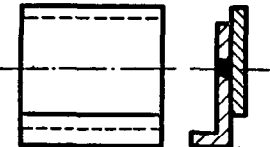

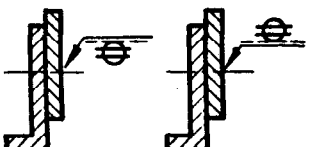
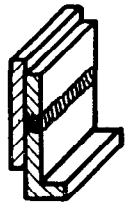
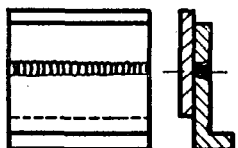
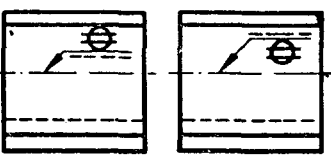
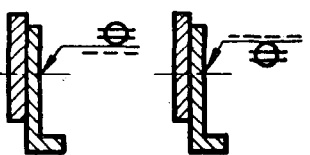
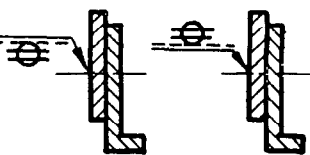
SI No.	Symbol	Illustration	Representation 	Symbolization	
				either	or
5					
6					
7					

TABLE 8 EXAMPLES OF EXCEPTIONAL CASES

(Clause 4.4, and Appendix A)

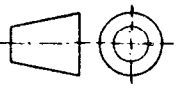
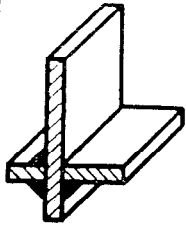
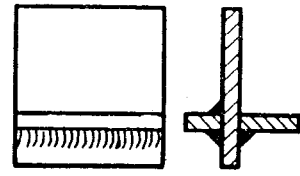
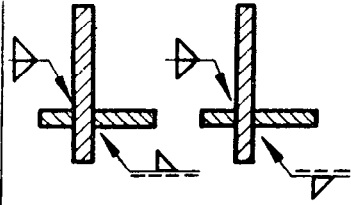
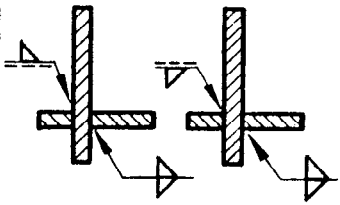
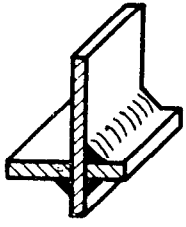
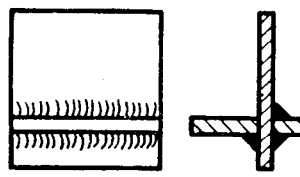
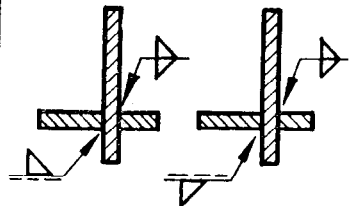
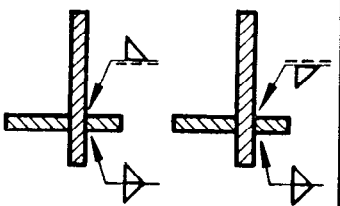
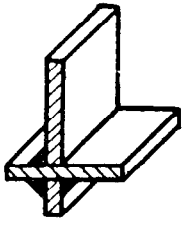
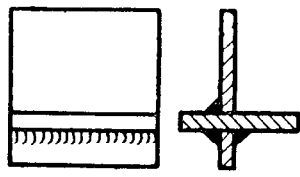
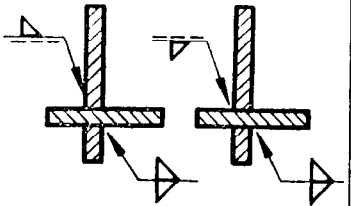
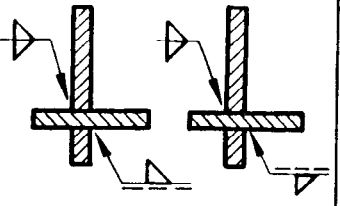
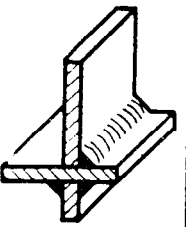
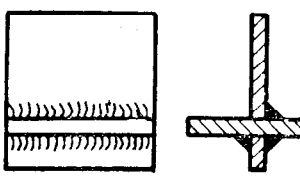
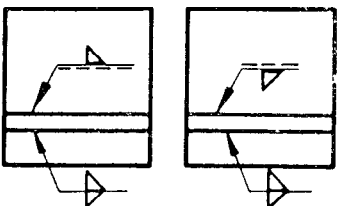
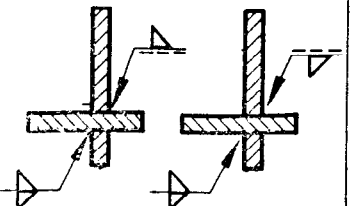
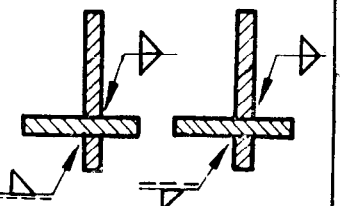
NOTE - When the arrow cannot point to a joint, symbolization cannot be used.

SI No.	Illustration	Representation 	Symbolization		
			either	or	incorrect
1			—		
2					
3			—		
4					

25

(Continued)

TABLE 8 EXAMPLES OF EXCEPTIONAL CASES — *Contd*

SI No.	Illustration	Representation 	Symbolization		
			either	or	Incorrect
5			not recommended		
6			not recommended		
7			not recommended		
8					

APPENDIX B

(Clause 7.3.1)

B-1. The various processes and the corresponding index numbers for welding, brazing, braze welding and soldering of metals, for the purpose of symbolic representation of welds on drawings are as given below:

- | | | | |
|-----|--|-----|--|
| 1 | ARC WELDING | 312 | Oxy-propane welding |
| 11 | Metal-arc welding without gas protection | 313 | Oxy-hydrogen welding |
| 111 | Metal-arc welding with covered electrode | 32 | Air-fuel gas welding |
| 112 | Gravity-arc welding with covered electrode | 321 | Air-acetylene welding |
| 113 | Bare wire metal-arc welding | 322 | Air-propane welding |
| 114 | Flux cored metal-arc welding | 4 | SOLID PHASE WELDING: PRESSURE WELDING |
| 115 | Coated wire metal-arc welding | 41 | Ultrasonic welding |
| 118 | Firecracker welding | 42 | Friction welding |
| 12 | Submerged-arc welding | 43 | Forge welding |
| 121 | Submerged-arc welding with wire electrode | 44 | Welding by high mechanical energy |
| 122 | Submerged-arc welding with strip electrode | 441 | Explosive welding |
| 13 | Gas-shielded metal-arc welding | 45 | Diffusion welding |
| 131 | MIG welding | 47 | Gas pressure welding |
| 135 | MAG welding: metal-arc welding with non-inert gas shield | 48 | Cold welding |
| 136 | Flux cored metal-arc welding with non-inert gas shield | 7 | OTHER WELDING PROCESSES |
| 14 | Gas-shielded welding with non-consumable electrode | 71 | Thermit welding |
| 141 | TIG welding | 72 | Electroslag welding |
| 149 | Atomic-hydrogen welding | 721 | Electroslag welding with non-consumable nozzle |
| 15 | Plasma-arc welding | 722 | Electroslag welding with consumable nozzle |
| 18 | Other arc welding processes | 73 | Electroslag welding |
| 181 | Carbon-arc welding | 74 | Induction welding |
| 185 | Rotating-arc welding | 75 | Light radiation welding |
| 2 | RESISTANCE WELDING | 751 | Laser welding |
| 21 | Spot welding | 752 | Arc image welding |
| 22 | Seam welding | 753 | Infra-red welding |
| 221 | Lap seam welding | 76 | Electron beam welding |
| 225 | Seam welding with strip | 77 | Percussion welding |
| 23 | Projection welding | 78 | Stud welding |
| 24 | Flash welding | 781 | Arc stud welding |
| 25 | Resistance butt welding | 782 | Resistance stud welding |
| 29 | Other resistance welding processes | 9 | BRAZING, SOLDERING AND BRAZE WELDING |
| 291 | HF resistance welding | 91 | Brazing |
| 3 | GAS WELDING | 911 | Infra-red brazing |
| 31 | Oxy-fuel gas welding | 912 | Flame brazing |
| 311 | Oxy-acetylene welding | 913 | Furnace brazing |
| | | 914 | Dip brazing |
| | | 915 | Salt bath brazing |
| | | 916 | Induction brazing |
| | | 917 | Ultrasonic brazing |

- 918 Resistance brazing
- 919 Diffusion brazing
- 923 Friction brazing
- 924 Vacuum brazing
 - 93 Other brazing processes
 - 94 Soldering
- 941 Infra-red soldering
- 942 Flame soldering
- 943 Furnace soldering
- 944 Dip soldering
- 945 Salt bath soldering
- 946 Induction soldering
- 947 Ultrasonic soldering
- 948 Resistance soldering
- 949 Diffusion soldering
- 951 Flow soldering
- 952 Soldering with soldering iron
- 953 Friction soldering
- 954 Vacuum soldering
 - 96 Other soldering processes
 - 97 Braze welding
- 971 Gas braze welding
- 972 Arc braze welding

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