
INTERNATIONAL STANDARD



2553

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Welds — Symbolic representation on drawings

Soudures — Représentation symbolique sur les dessins

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FOREWORD

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International Standard ISO 2553 was drawn up by Technical Committee ISO/TC 44, *Welding*, and circulated to the Member Bodies in February 1972.

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Welds – Symbolic representation on drawings

1 SCOPE AND FIELD OF APPLICATION

This International Standard prescribes the rules to be applied for the symbolic representation of welds on drawings.

2 GENERAL

2.1 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 International Standard.

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

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

- a supplementary symbol;
- a means of showing dimensions;

– some complementary indications (particularly for workshop drawings).

2.4 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 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.

3 SYMBOLS

3.1 Elementary symbols

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

The symbol shall not be taken to pre-judge the process to be employed.

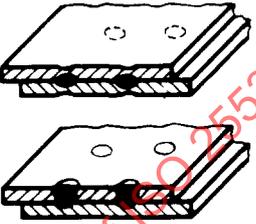
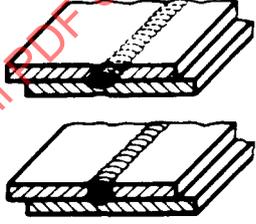
The elementary symbols are shown in table 1.

TABLE 1 — Elementary symbols

No.	Designation	Illustration	Symbol
1	Butt weld between plates with raised edges ¹⁾ ; edge flanged weld /USA/ (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 /USA/		
10	Fillet weld		

1) 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 shown (see table 11).

TABLE 1 (concluded)

No.	Designation	Illustration	Symbol
11	Plug weld; plug or slot weld /USA/		
12	Spot weld		
13	Seam weld		

3.2 Combinations of elementary symbols

When required, combinations of elementary symbols can be used. Typical examples are given in table 7.

3.3 Supplementary symbols

Elementary symbols may be completed by a symbol characterizing the shape of the external surface of the weld.

The recommended supplementary symbols are given in table 2.

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

TABLE 2 – Supplementary symbols

Shape of weld surface	Symbol
a) flat (usually finished flush)	—
b) convex	⌒
c) concave	⌒

Table 3 gives examples of the application of the supplementary symbols.

TABLE 3 – Examples of application of supplementary symbols

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		

4 POSITION OF THE SYMBOLS ON DRAWINGS¹⁾

4.1 General

The symbols covered by these rules form only part of the complete method of representation (figure 1), which comprises in addition to the symbol (3) itself :

- an arrow line (1) per joint (see figures 2 and 3);
- a reference line (2);
- a certain number of dimensions and conventional signs.

The purpose of the following rules is to define the location of welds by specifying :

- the position of the arrow line;
- the position of the reference line;
- the position of the symbol.

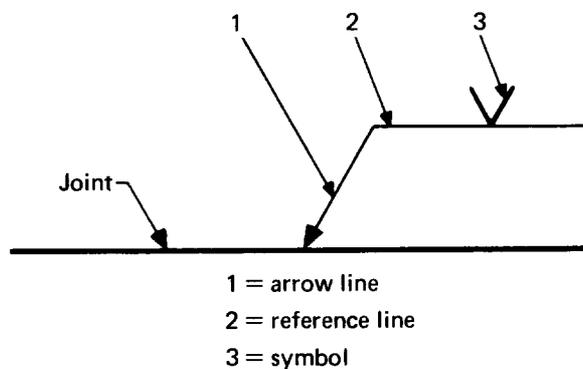


FIGURE 1 – Method of representation

1) The position of the symbols on the drawings has been adopted provisionally until such time as Technical Committee ISO/TC 10 works out a single method for the symbolic representation of welds on drawings.

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4.3 Position of the arrow line

The position of the arrow line with respect to the weld is generally of no special significance (see figure 4). However, in the case of welds of types 4, 6 and 8 (see table 1), the arrow line should point towards the plate which is prepared (see figure 4(c)).

The arrow line

- joins one end of the reference line such that it forms an angle with it;
- is generally completed by an arrow head. In certain cases, the arrow head may be omitted or replaced by a dot.

4.4 Position of the reference line

The reference line shall be a straight line, preferably drawn parallel to the bottom edge of the drawing.

4.5 Position of the symbol with regard to the reference line

The position of the symbol with regard to the reference line is defined by different rules, illustrated by tables 4 and 5, depending upon whether the A or E method of projection given in ISO/R 128, *Engineering drawing – Principles of representation*, is being used.

5 EXAMPLES OF USE OF SYMBOLS

Tables 6 to 10 give some examples of the use of symbols. The representations shown are given simply for explanation and are not obligatory.

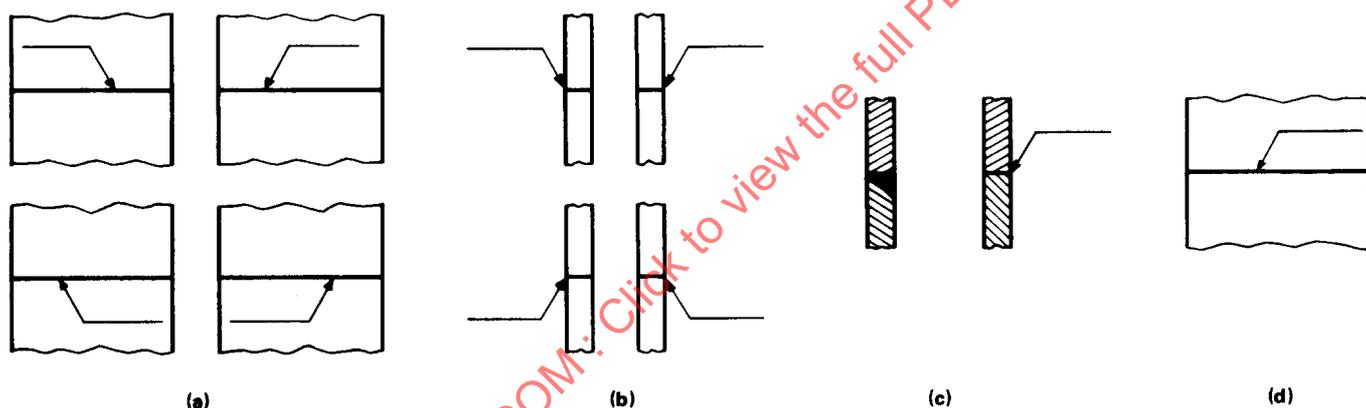


FIGURE 4 – Position of the arrow line

TABLE 4 – Position of the symbol according to method A

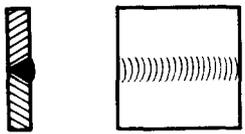
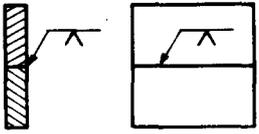
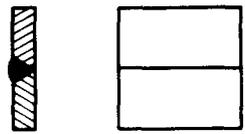
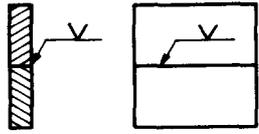
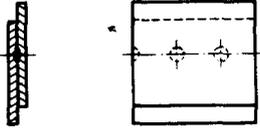
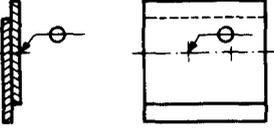
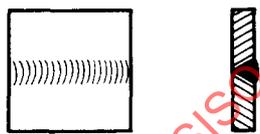
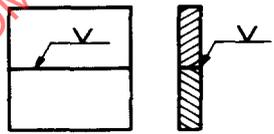
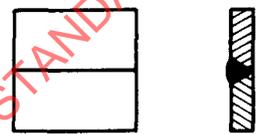
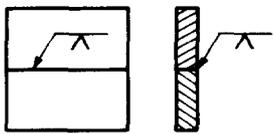
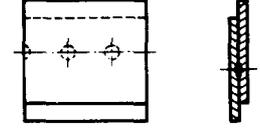
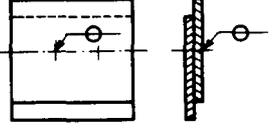
Illustration	Representation	Symbolization	Description of position
			Under the reference line if the external surface of the weld (weld face) is on the arrow side of the joint.
			Above the reference line if the external surface of the weld (weld face) is on the other side of the joint.
			Across the reference line in the case of welds made within the plane of the joint.

TABLE 5 – Position of the symbol according to method E

Illustration	Representation	Symbolization	Description of position
			Above the reference line if the external surface of the weld (weld face) is on the arrow side of the joint.
			Under the reference line if the external surface of the weld (weld face) is on the other side of the joint.
			Across the reference line in the case of welds made within the plane of the joint.

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.

TABLE 6 — Examples of the use of elementary symbols

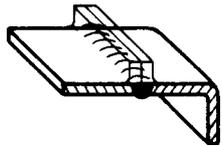
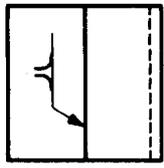
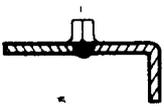
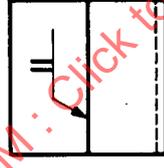
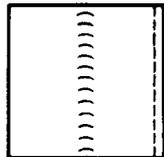
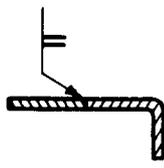
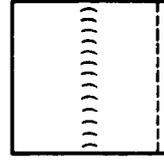
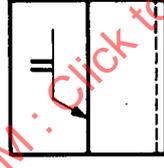
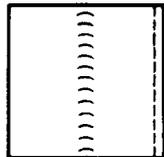
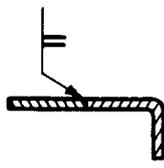
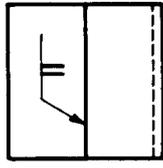
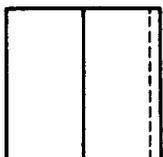
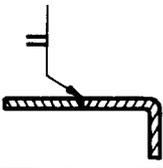
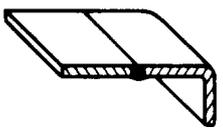
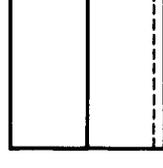
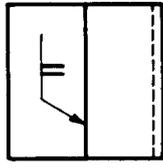
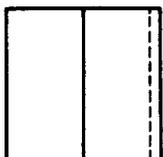
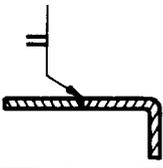
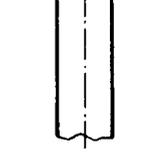
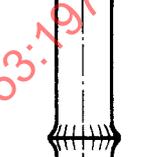
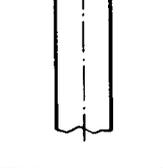
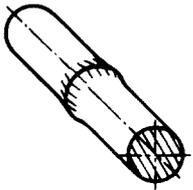
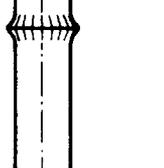
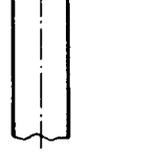
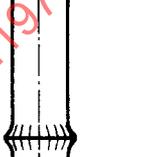
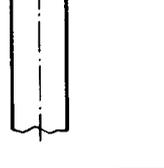
No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
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2			 	 	 	 
3	Square butt weld 2		 	 	 	 
4			 	 	 	

TABLE 6 (continued)

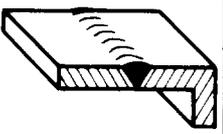
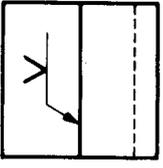
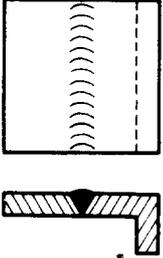
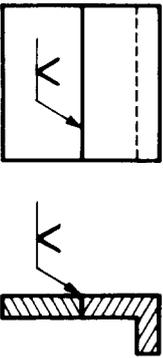
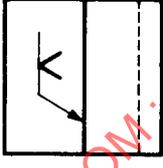
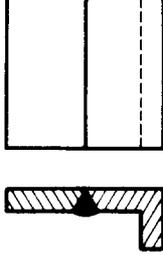
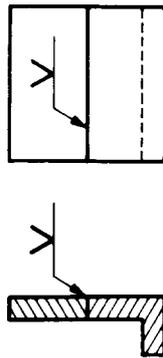
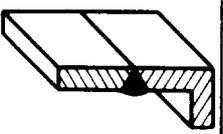
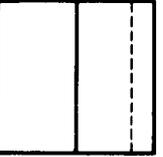
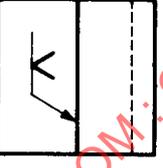
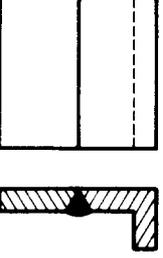
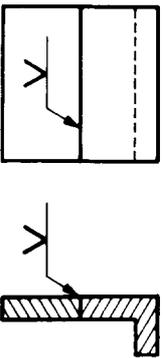
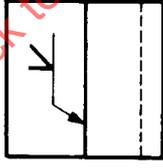
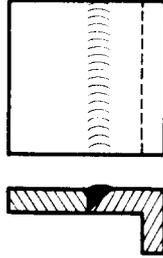
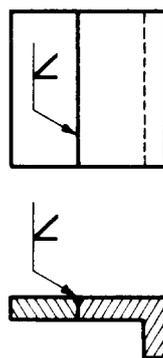
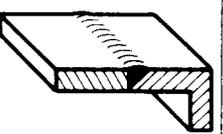
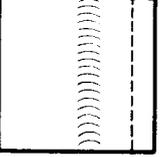
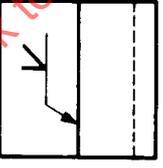
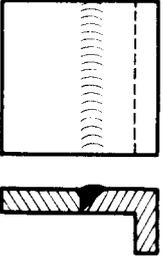
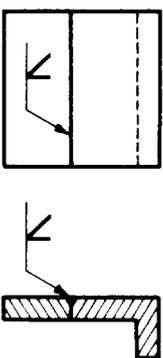
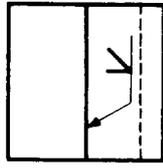
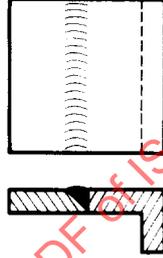
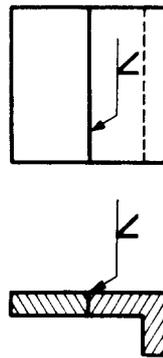
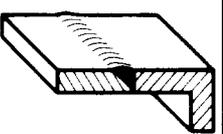
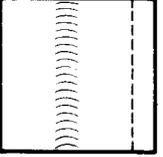
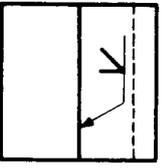
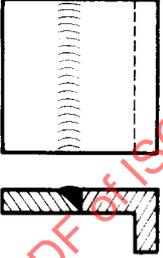
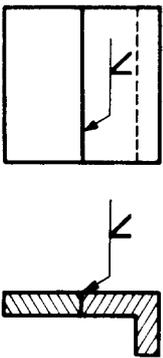
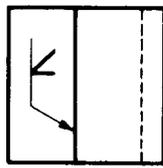
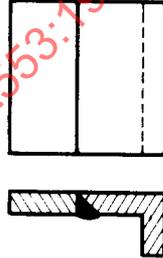
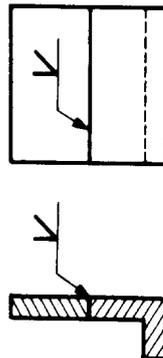
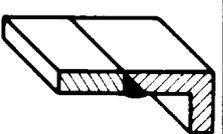
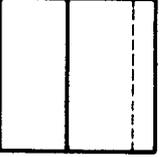
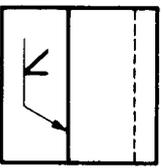
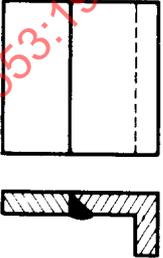
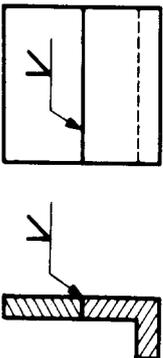
No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
5	Single-V butt weld 					
						
6	Single-V butt weld 					
						
7	Single-V butt weld 					
						
8	Single-bevel butt weld 					
						
9	Single-bevel butt weld 					
						

TABLE 6 (continued)

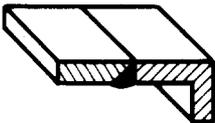
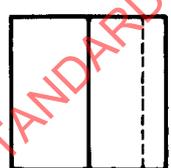
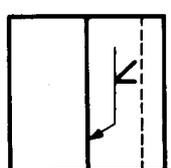
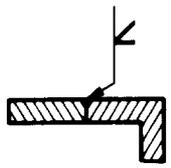
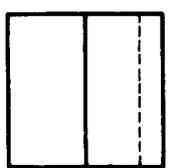
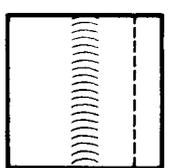
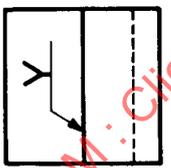
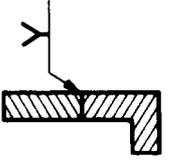
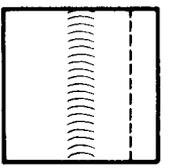
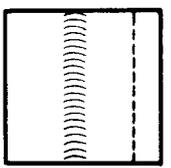
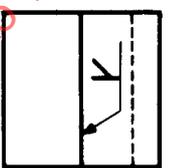
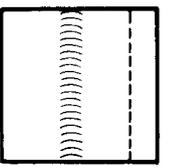
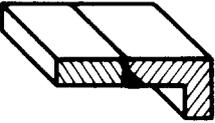
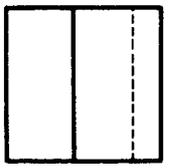
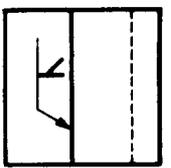
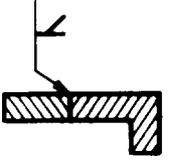
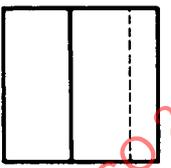
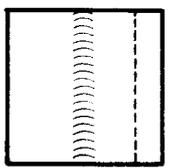
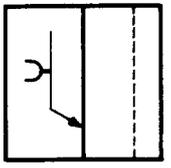
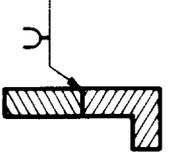
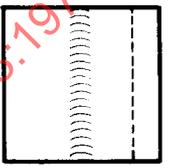
No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
10	Single-bevel butt weld  4					
11	Single-V butt weld with broad root face  5					
12	Single-bevel butt weld with broad root face  6					
13						
14	Single-U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

TABLE 6 (continued)

No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
15	Single-J butt weld P 8					
16	P 8					
17	Fillet weld 10					
18	10					

TABLE 6 (continued)

No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
19						
20	Fillet weld 					
21						

TABLE 6 (continued)

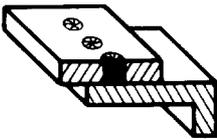
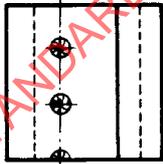
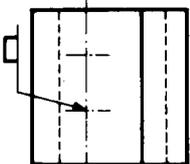
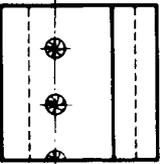
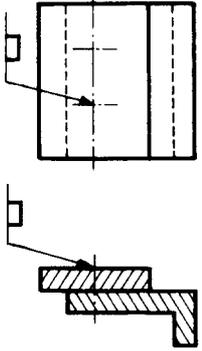
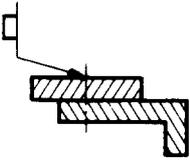
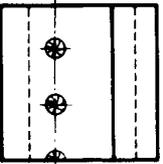
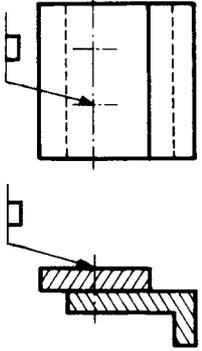
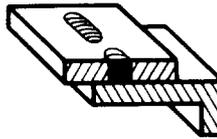
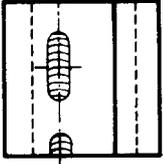
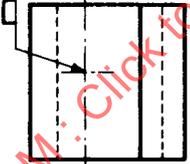
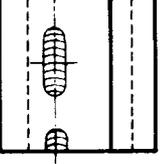
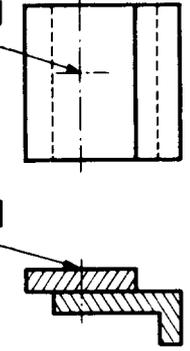
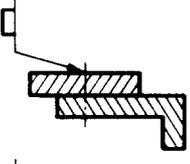
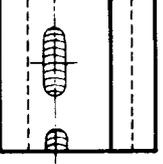
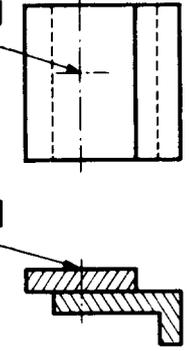
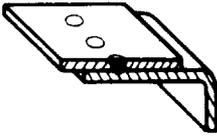
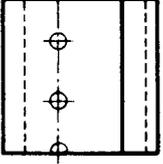
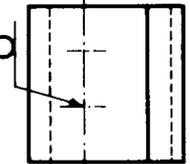
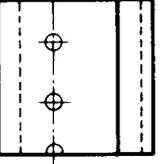
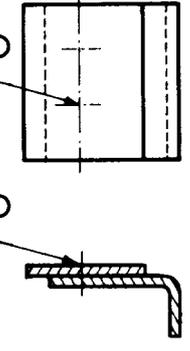
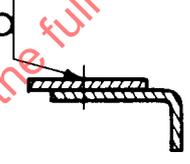
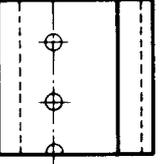
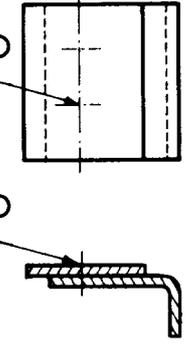
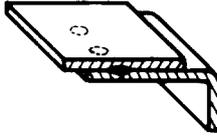
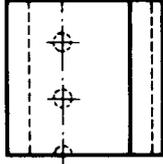
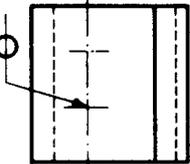
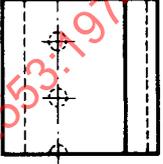
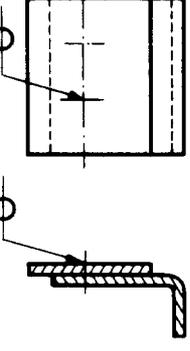
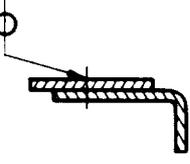
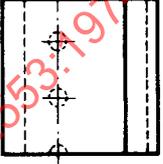
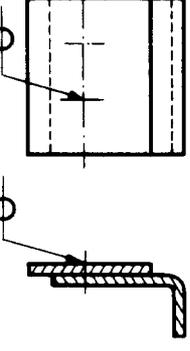
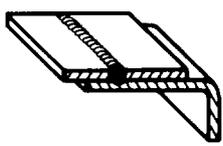
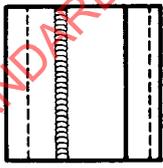
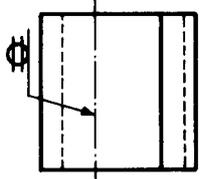
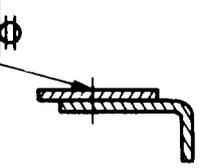
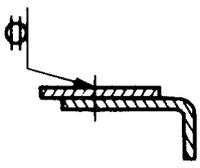
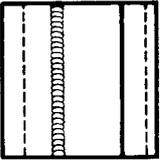
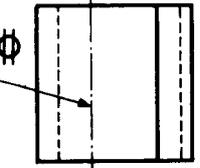
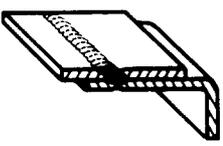
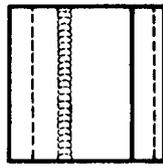
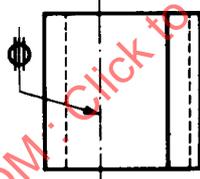
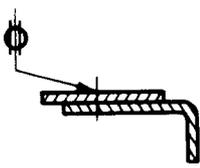
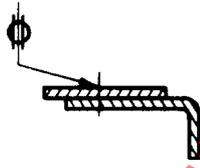
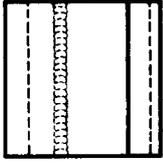
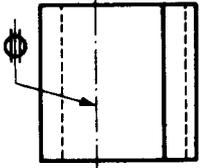
No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
22	Plug weld 					
						
23	11 					
						
24	Spot weld 					
						
25	12 					
						

TABLE 6 (concluded)

No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
26	Seam weld 					
						
27						
						

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TABLE 7 - Examples of combinations of elementary symbols

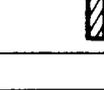
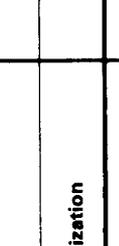
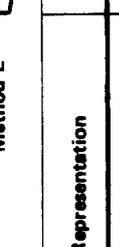
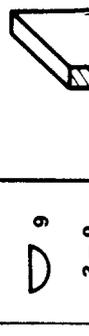
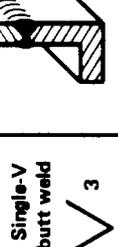
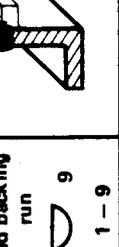
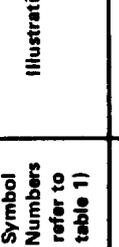
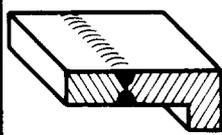
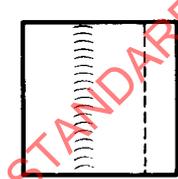
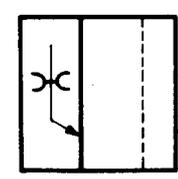
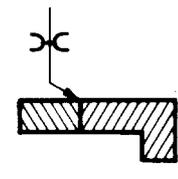
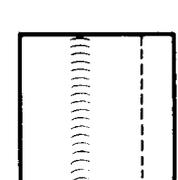
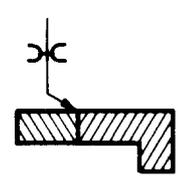
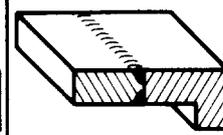
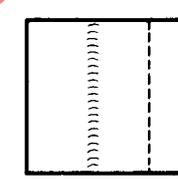
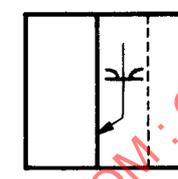
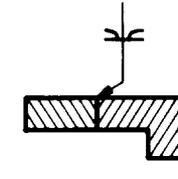
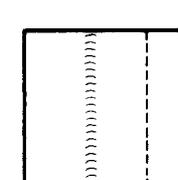
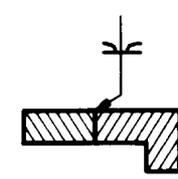
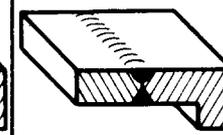
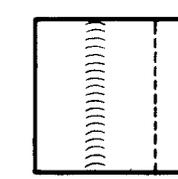
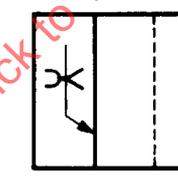
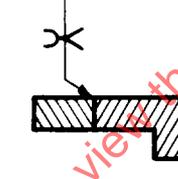
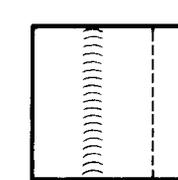
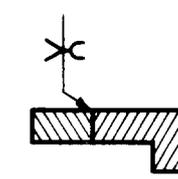
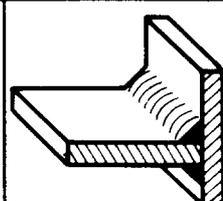
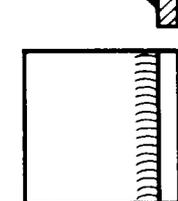
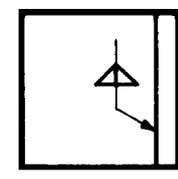
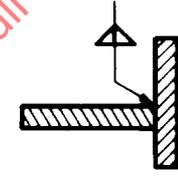
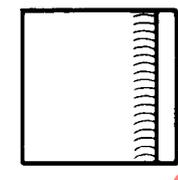
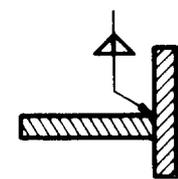
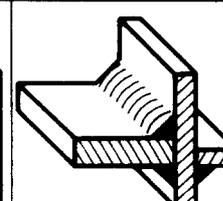
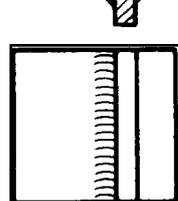
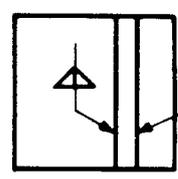
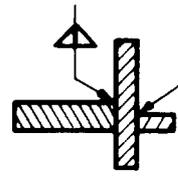
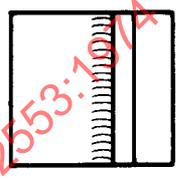
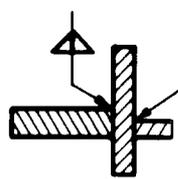
No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
1	Butt weld between plates with raised edges  1  9 1-9					
2	Square butt weld  2 2-2					
3	Single-V butt weld  3 and backing run					
4	 9 3-9					

TABLE 7 (continued)

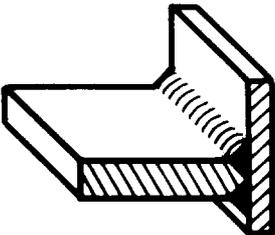
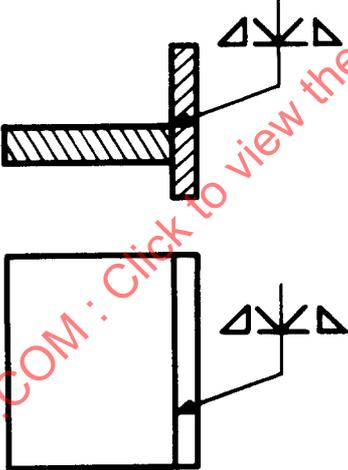
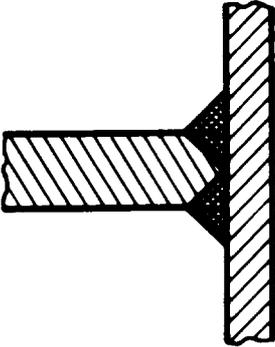
No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
5	Double-V butt weld 3 (X weld) 3-3					
6	Double-bevel butt weld 4 (K weld) 4-4					
7	Double-V butt weld with broad root face 5 5-5					
9	Double-bevel butt weld with broad root face 6 6-6					

TABLE 7 (concluded)

No.	Designation Symbol (Numbers refer to table 1)	Illustration	Method E		Method A		
			Representation	Symbolization	Representation	Symbolization	
10	Double-U butt weld  7 7-7						
11	Double-J butt weld  8 8-8						
12	Single-V butt weld  3 and single-U butt weld  7 3-7						
13	Fillet weld  10 and fillet and fillet weld  10 10-10						
14							

NOTE — Though it is not forbidden to associate several symbols, it is better to represent the weld on a separate sketch, for example, as shown in table 8.

TABLE 8 — Example of the representation of a weld by a separate sketch

Illustration	Symbolization not recommended	Representation recommended
 <p>A 3D perspective drawing of a T-joint weld. The vertical plate is on the left, and the horizontal plate is on the right. The weld is shown as a series of wavy lines connecting the two plates.</p>	 <p>Two 2D sketches of a T-joint weld. The top sketch shows a vertical plate on the left and a horizontal plate on the right, with a weld line between them. Two triangles are placed above the weld line, with lines pointing to the weld. The bottom sketch shows a vertical plate on the left and a horizontal plate on the right, with a weld line between them. Two triangles are placed to the right of the weld line, with lines pointing to the weld.</p>	 <p>A 2D cross-section drawing of a T-joint weld. The vertical plate is on the left, and the horizontal plate is on the right. The weld is shown as a shaded area between the two plates.</p>

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TABLE 9 — Examples of combinations of elementary and supplementary symbols

No.	Symbol	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
1						
2						
3						
4						

TABLE 9 (concluded)

No.	Symbol	Illustration	Method E		Method A	
			Representation	Symbolization	Representation	Symbolization
5						
6						
7						

NOTE — When the arrow cannot point to a joint, symbolisation cannot be used.

TABLE 10 — Examples of exceptional cases

No.	Illustration	Method E		Method A	
		Representation	Symbolization	Representation	Symbolization
1			impossible incorrect		incorrect impossible
2			correct correct		correct correct
3			impossible incorrect		incorrect impossible
4			correct correct		correct correct