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# International Standard



# 6947

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Fundamental welding positions — Definitions and values of angles of slope and rotation for straight welds for these positions

*Positions fondamentales d'exécution des soudures rectilignes — Définitions et valeurs des angles d'inclinaison et de rotation intervenant pour définir ces positions*

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Descriptors : welding, welded joints, butt welds, angles (geometry), rotation, position (location), dimensions.

Price based on 7 pages

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6947 was developed by Technical Committee ISO/TC 44, *Welding and allied processes*.

It was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces ISO Recommendation R 598-1967 and ISO Recommendation R 627-1967, which had been approved by the member bodies of the following countries :

Austria	India	Romania
Belgium (R 627)	Israel	South Africa, Rep. of
Bulgaria	Italy	Spain
Canada	Japan	Sweden
Denmark	Netherlands	Switzerland
Finland	Norway	USSR
France	Poland	

The member bodies of the following countries had expressed disapproval of the documents on technical grounds :

Belgium (R 598)  
Germany, F. R.  
United Kingdom

# Fundamental welding positions — Definitions and values of angles of slope and rotation for straight welds for these positions

(supersedes the Recommendations ISO/R 598 and ISO/R 627)

## Foreword

The present International Standard cancels and replaces the recommendations :

ISO/R 598-1967, *Limitation of angles of slope and rotation for welding positions for straight manual arc welds made with covered electrodes of mild steel and low alloy high tensile steels*

and

ISO/R 627-1967, *Fundamental welding positions and definitions of rotation and slope for straight welds*

It was decided to merge both into a single standard.

## 1 Scope and field of application

The present International Standard defines fundamental welding positions and makes possible the location in space of straight welds by means of angles of slope and rotation.

## 2 Definitions

### 2.1 Fundamental welding positions for straight welds

Four fundamental welding positions should be distinguished. The terms for these are given below with the French equivalents.

**2.1.1 Butt welds** (see table 1)

**2.1.2 Fillet welds** (see table 2)

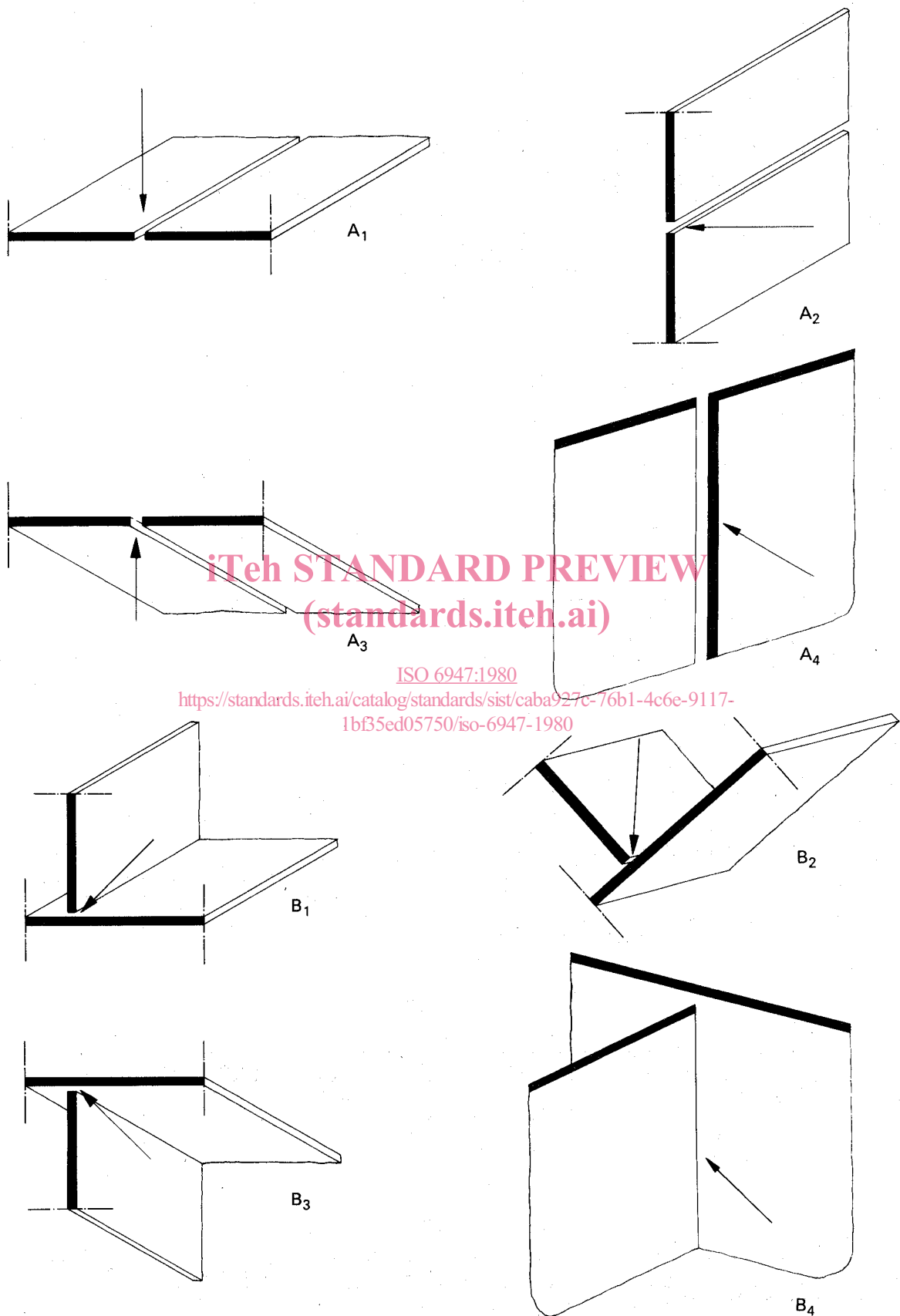
**2.2 Inclined welding positions** are not considered to be fundamental and no special term has been allocated for their designation. However, the adjective inclined may be used for this purpose.

Table 1

Term	Figure	Equivalent in French
Flat butt weld	A <sub>1</sub>	Soudure en bout à plat
Horizontal vertical butt weld	A <sub>2</sub>	Soudure en bout en corniche
Overhead butt weld	A <sub>3</sub>	Soudure en bout au plafond
Vertical butt weld	A <sub>4</sub>	Soudure en bout verticale

Table 2

Term	Figure	Equivalent in French
Horizontal vertical fillet weld	B <sub>1</sub>	Soudure d'angle à plat
Flat fillet weld	B <sub>2</sub>	Soudure d'angle en gouttière
Overhead fillet weld	B <sub>3</sub>	Soudure d'angle au plafond
Vertical fillet weld	B <sub>4</sub>	Soudure d'angle verticale



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Figure 1 — Fundamental welding positions

### 2.3 Location in space of straight welds by means of angles of slope and rotation

A weld should be located in space by means of rotation and slope defined as follow :

**2.3.1 slope :** The angle, within  $0^\circ$  to  $90^\circ$ , formed by the line of the weld root and the horizontal reference plane.

**2.3.2 rotation :** The smaller of the angles formed by the upper portion of the vertical reference plane passing through the line of the weld root and a half-plane drawn from the line of

the weld root which intersects the weld surface at a line equidistant from either edge of the weld.

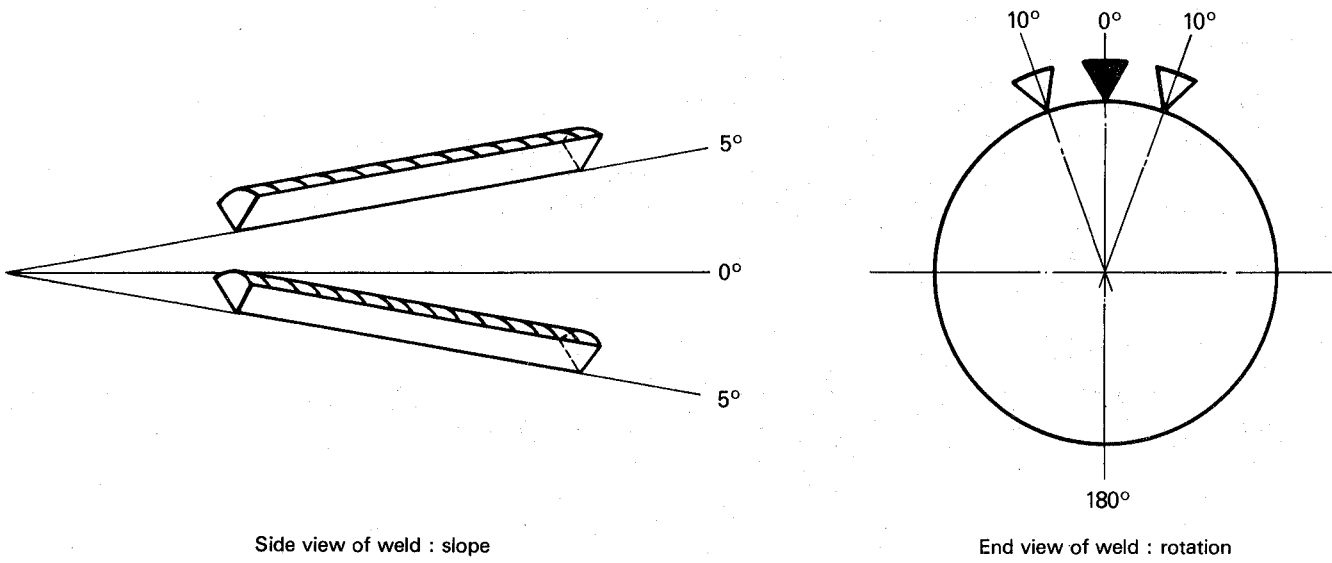
Rotation is measured either clockwise, or counterclockwise, up to a maximum of  $180^\circ$ .

### 3 Angles of slope and rotation for these fundamental welding positions for straight welds — Limits

Angles of slope and rotation and limits are given in degrees.

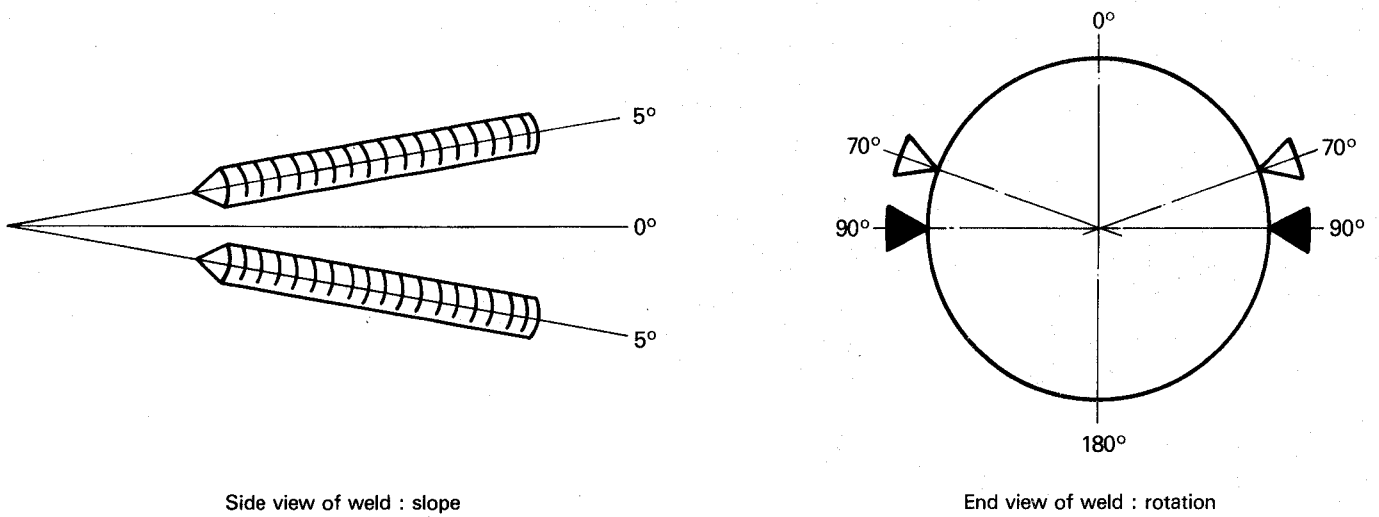
Table 3

Butt welds		Slope and limits	Rotation and limits
Flat	(Figure 2)	$0 \begin{smallmatrix} + 5 \\ 0 \end{smallmatrix}$	$0 \begin{smallmatrix} + 10 \\ 0 \end{smallmatrix}$
Horizontal-vertical	(Figure 3)	$0 \begin{smallmatrix} + 5 \\ 0 \end{smallmatrix}$	$90 \begin{smallmatrix} 0 \\ - 20 \end{smallmatrix}$
Overhead	(Figure 4)	$0 \begin{smallmatrix} + 15 \\ 0 \end{smallmatrix}$	$180 \begin{smallmatrix} 0 \\ - 15 \end{smallmatrix}$
Vertical (upwards or downwards)	(Figure 5)	$90 \begin{smallmatrix} 0 \\ - 10 \end{smallmatrix}$	
Fillet welds		Slope and limits	Rotation and limits
Flat	(Figure 6)	$0 \begin{smallmatrix} + 5 \\ 0 \end{smallmatrix}$	$0 \begin{smallmatrix} + 10 \\ 0 \end{smallmatrix}$
Horizontal-vertical	(Figure 7)	$0 \begin{smallmatrix} + 5 \\ 0 \end{smallmatrix}$	$45 \begin{smallmatrix} + 10 \\ - 15 \end{smallmatrix}$
Overhead	(Figure 8)	$0 \begin{smallmatrix} + 15 \\ 0 \end{smallmatrix}$	$135 \begin{smallmatrix} + 45 \\ - 20 \end{smallmatrix}$
Vertical (upwards or downwards)	(Figure 9)	$90 \begin{smallmatrix} 0 \\ - 10 \end{smallmatrix}$	



**Figure 2 — Flat butt weld**  
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**Figure 3 — Horizontal-vertical butt weld**

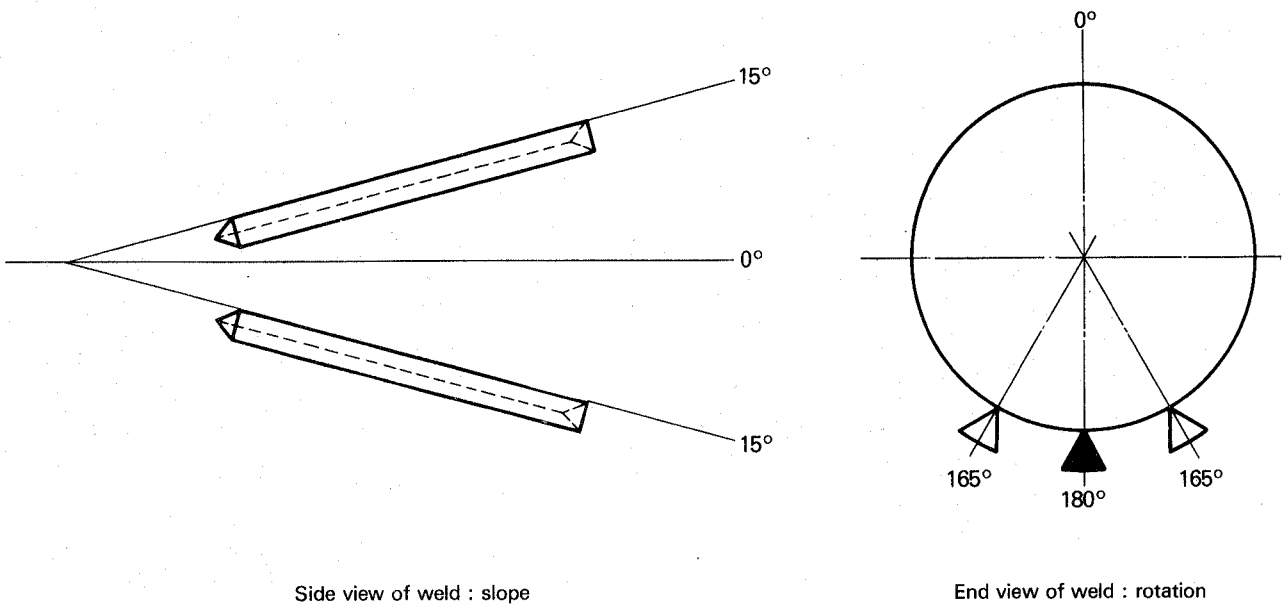


Figure 4 — Overhead butt weld

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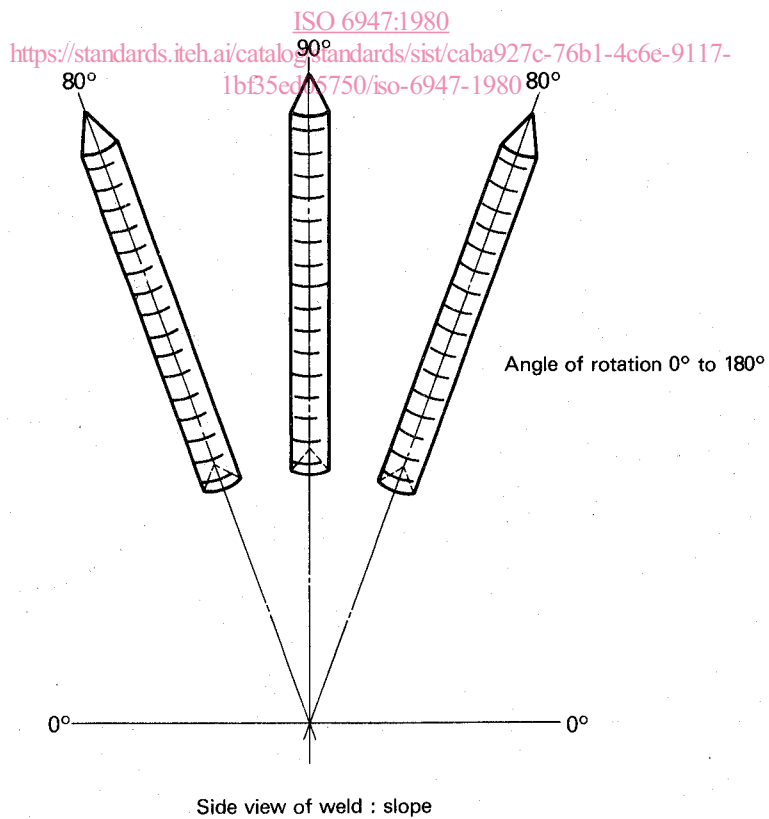
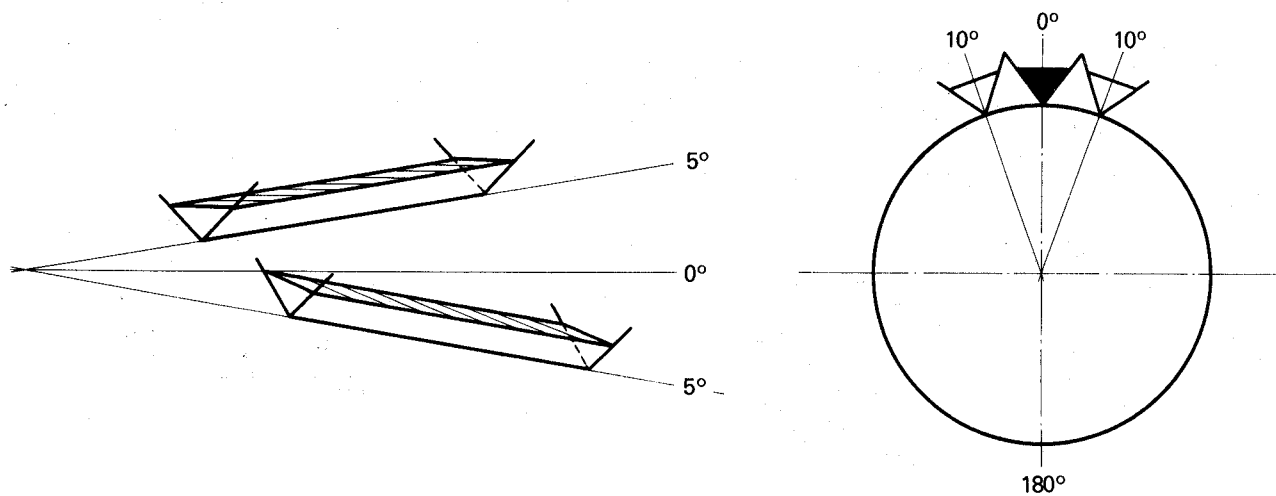


Figure 5 — Vertical butt weld (upwards or downwards)



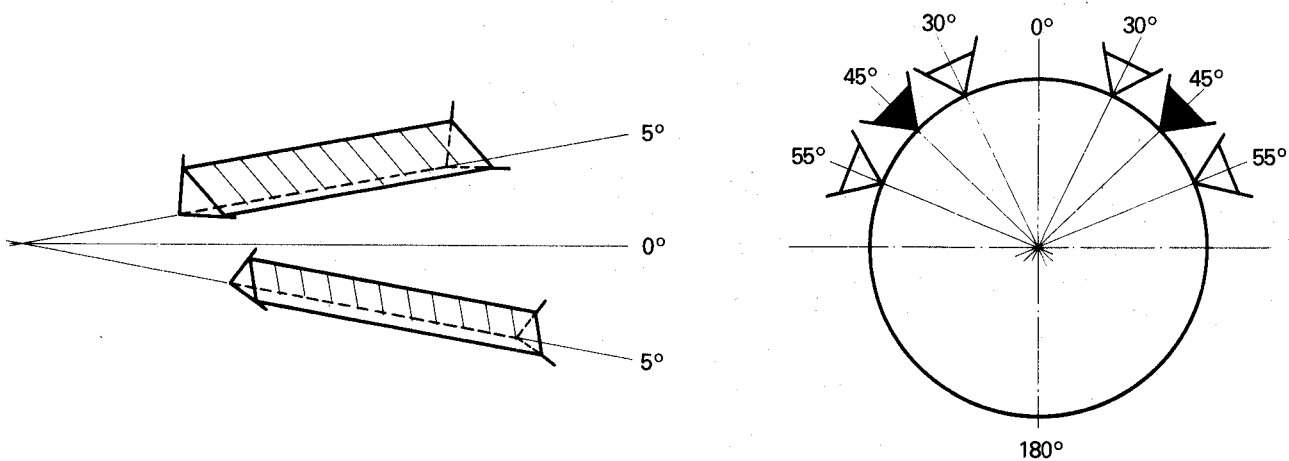
Side view of weld : slope

End view of weld : rotation

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Figure 6 – Flat fillet weld  
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Side view of weld : slope

End view of weld : rotation

Figure 7 – Horizontal-vertical fillet weld