

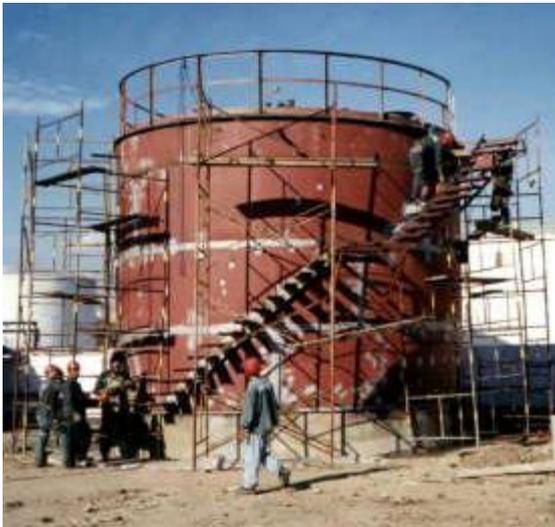
# DESENHO TÉCNICO MECÂNICO I (SEM0564)

## AULA 11 - NOÇÕES DE SOLDAGEM E SIMBOLOGIA

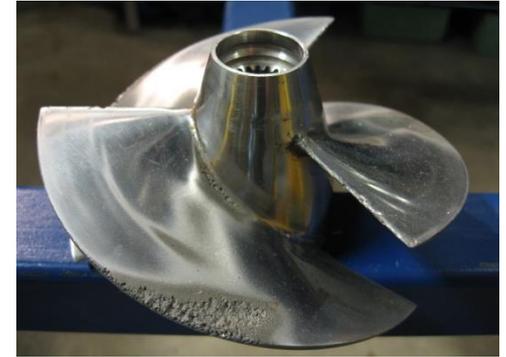


Notas de Aulas v.2018

## Casos Reais de Soldagem



## Casos Reais de Soldagem



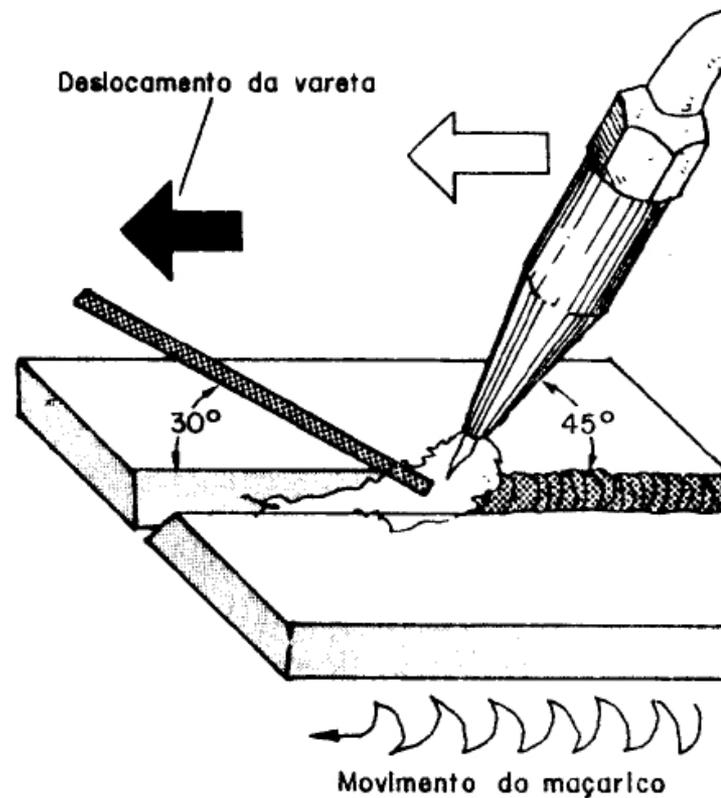
## Soldagem

Processo de união de peças metálicas, cujas superfícies tornam-se liquefeitas pela ação do calor e/ou pressão, com ou sem adição de metal.

### Processos de Soldagem

#### 1. Soldagem por chama:

- Um dos mais antigos
- Baixo custo
- Aquecimento das peças a soldar
- Oxigênio e acetileno
- Com ou sem adição de material

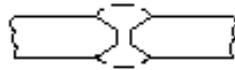


## Posições de soldagem



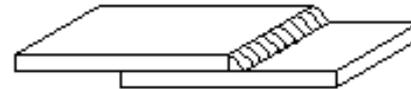
(a)

**Topo com flange**



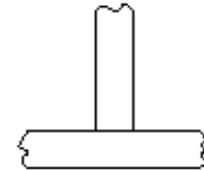
(d)

**Topo em duplo V**



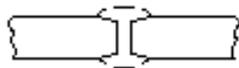
(g)

**Sobreposta**



(j)

**Em T**



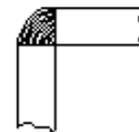
(b)

**Topo reta**



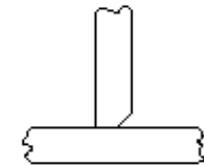
(e)

**Topo em U**



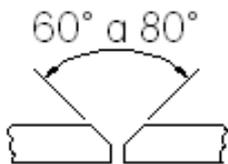
(h)

**De centro**



(k)

**Em T**



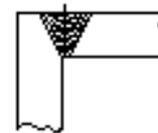
(c)

**Topo em V**



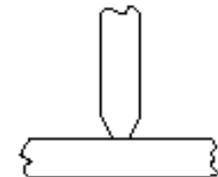
(f)

**Topo em duplo U**



(i)

**De canto**



(l)

**Em T**

# Símbolos Básicos

SÍMBOLOS BÁSICOS					
SEM PREPARAÇÃO		COM PREPARAÇÃO			
FILETE OU CANTO	SEM CHANFRO	V	BISEL	U	J
					

SÍMBOLOS COMPLEMENTARES	
SOLDA EM TODA VOLTA	SOLDA NO CAMPO (ou na montagem)
	

## Representação das Juntas e Símbolos

Designação	Ilustração	Símbolo
1 Junta de bordas rebordadas completamente fundidas		
2 Junta de borda reta		
3 Junta em V simples		
4 Junta em meio V simples		
5 Junta em Y simples		
6 Junta em meio Y simples		
7 Junta em tulipa (ou em U)		
8 Junta em meio U (ou em J)		
9 Cordão de confirmação na raiz da junta		
10 Junta em ângulo		

Designação	Ilustração	Símbolo
11 Soldagem em entalhe (ou perna de solda)		
12 Soldagem por pontos		
13 Soldagem em linha contínua		
14 Junta em V simples de bordas inclinadas		
15 Junta em meio V simples de bordas inclinadas		
16 Soldagem de borda		
17 Enchimento		
18 Junta de superfície		
19 Junta inclinada		
20 Junta dobrada		

## Simbologia de Soldagem

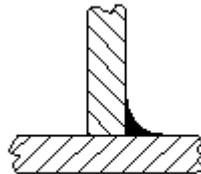
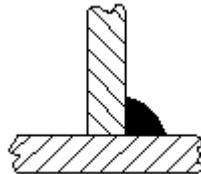
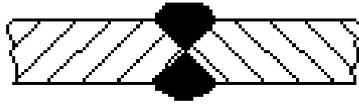
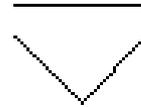
### Símbolos Elementares (Juntas)

Designação	Ilustração	Símbolo
Junta em V dupla		X
Junta em meio V dupla		K
Junta em Y dupla		Y
Junta em meioY dupla		K
Junta em U dupla		U

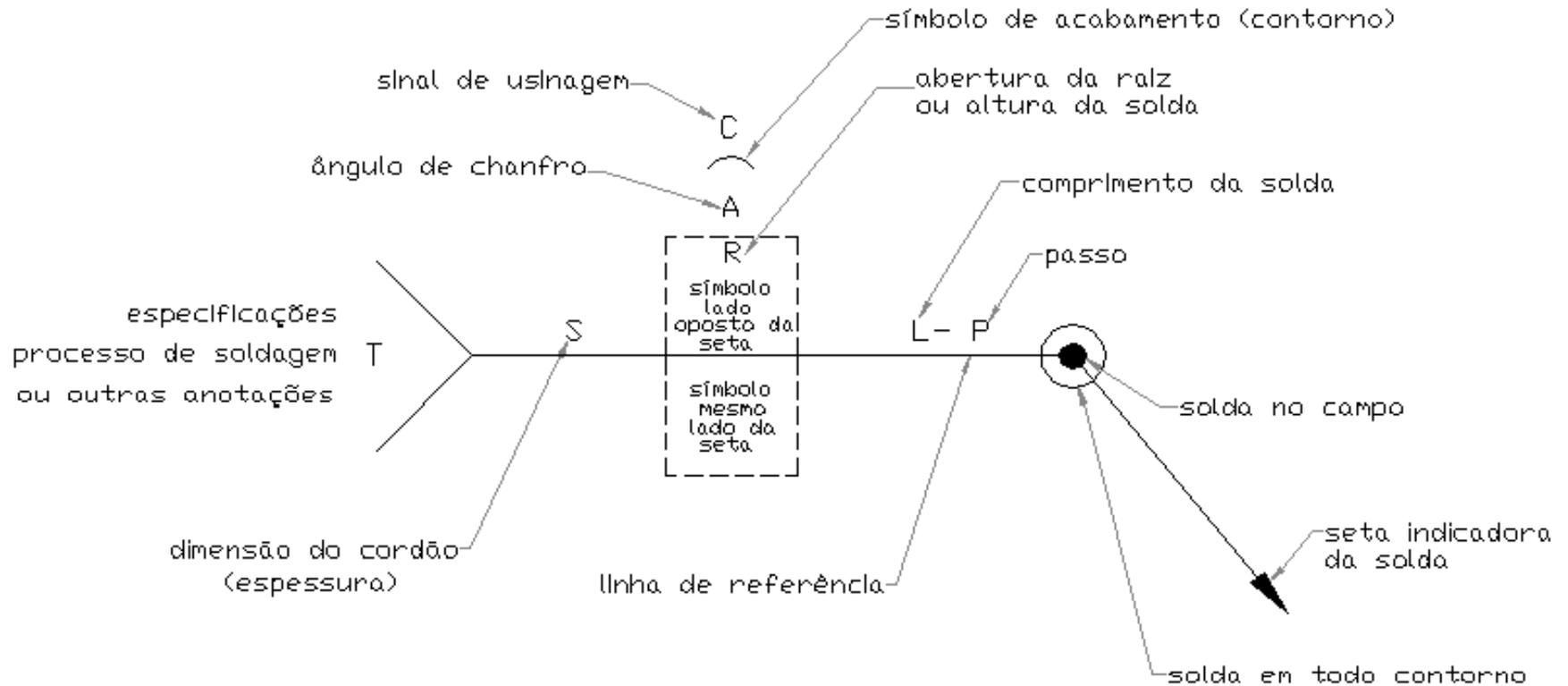
### Símbolos Suplementares (Solda)

Designação	Símbolo
Plana	
Convexa	
Côncava	
De bordos arredondados tangentes	
Cobre-junta permanente	
Cobre-junta removível	

## Simbologia de Soldagem

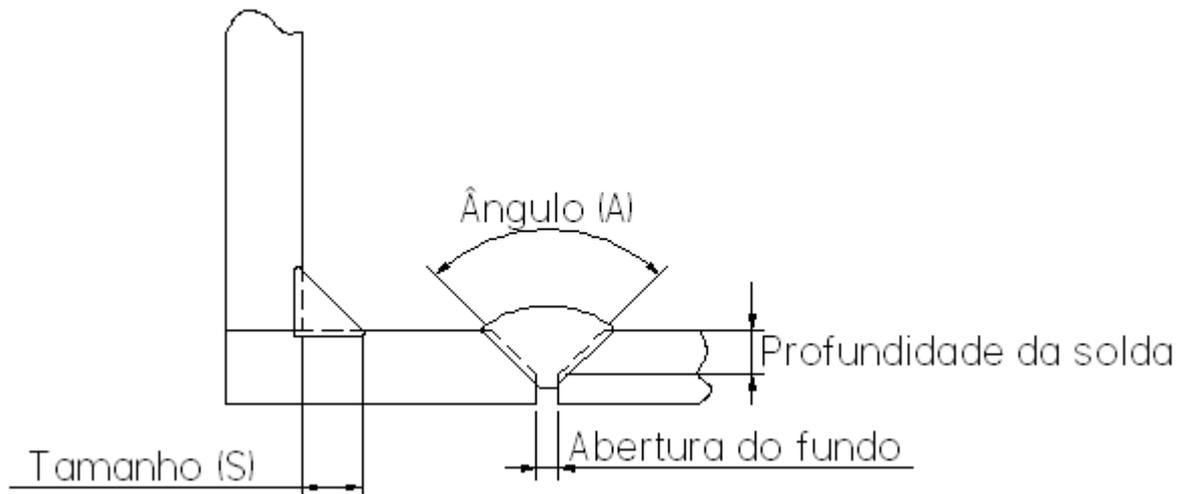


# Simbologia

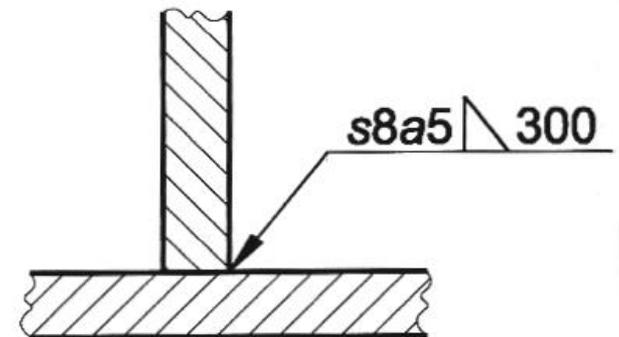
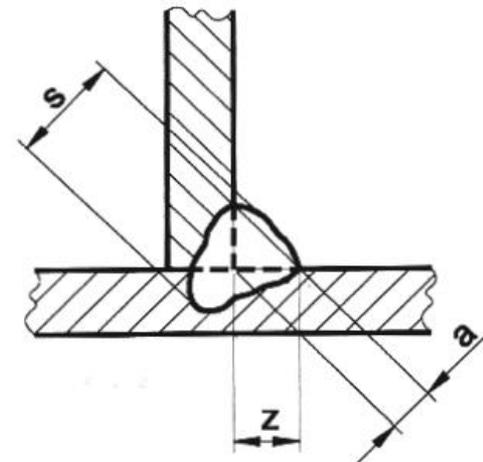
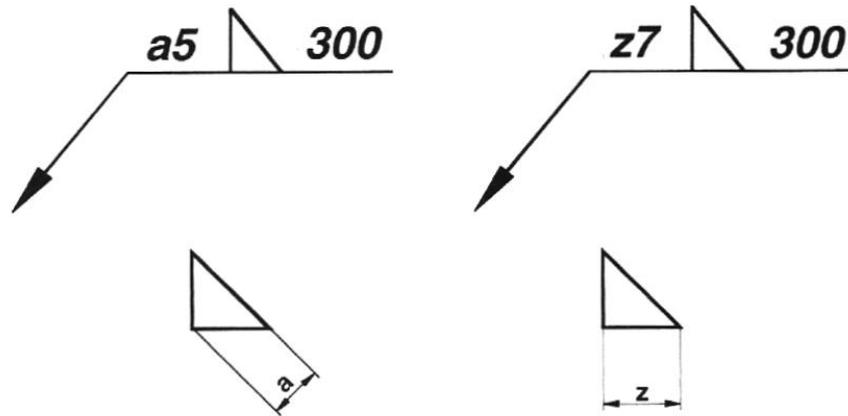


## Dimensão da solda

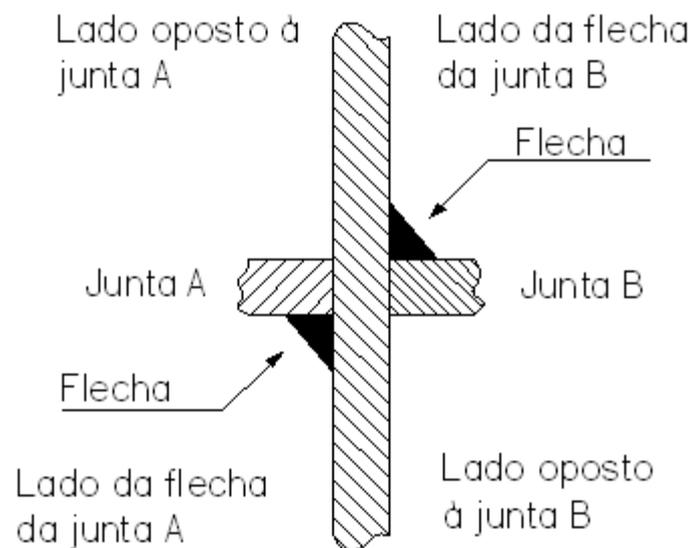
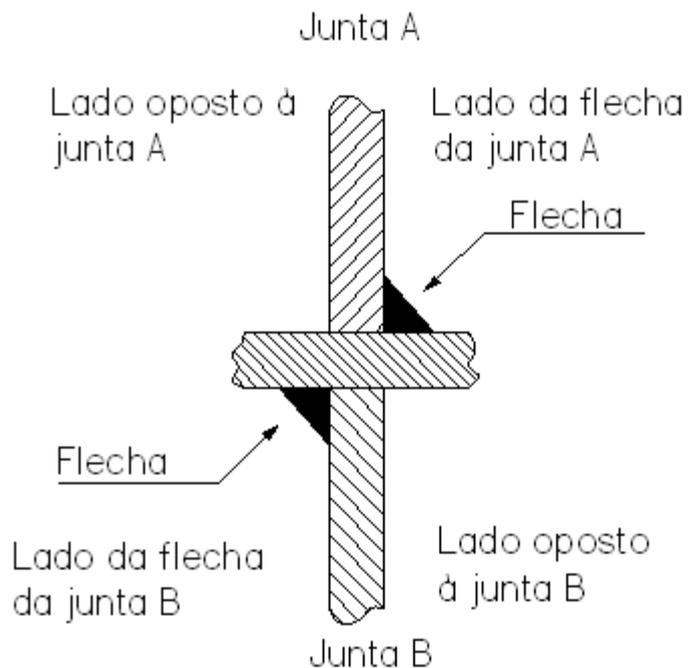
Dimensões fundamentais a serem dadas nos símbolos de soldagem.



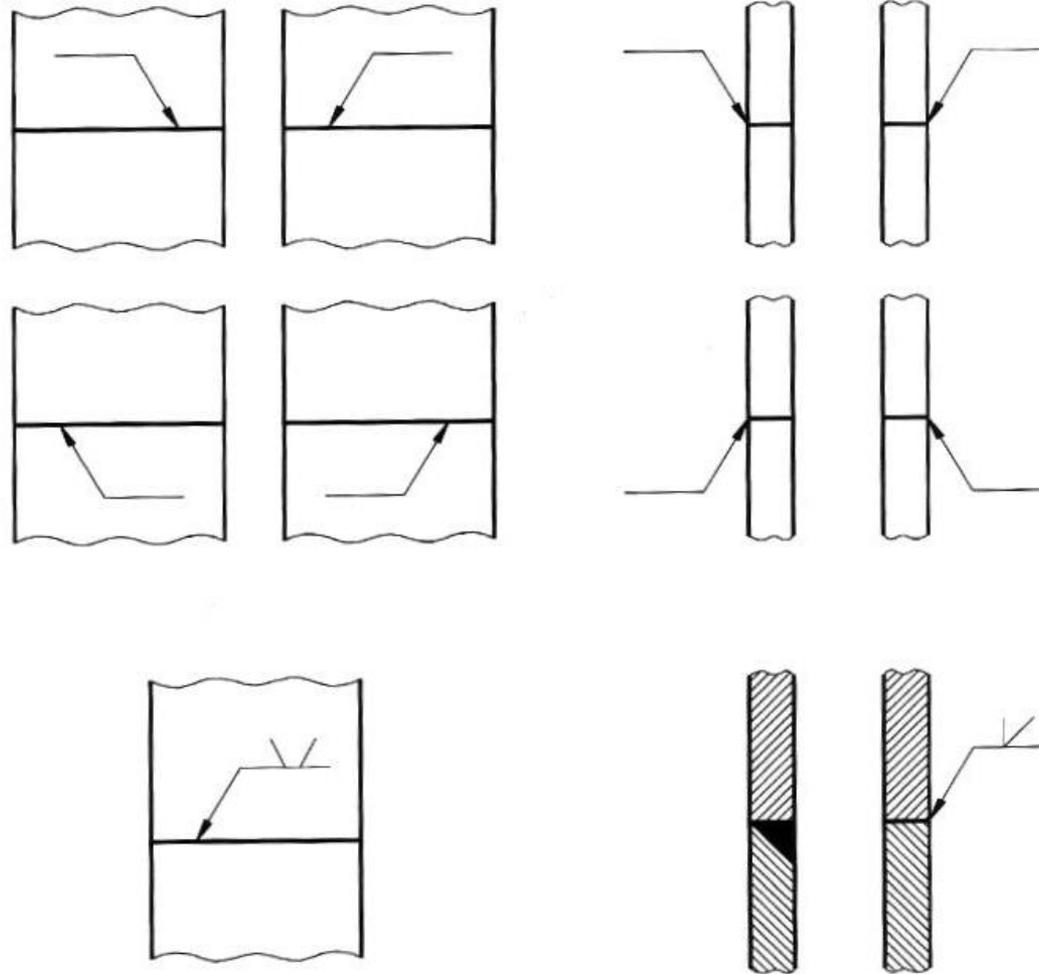
# Cotagem dos Cordões de Solda



## Em cruz com duas soldas em ângulo



## Posições Possíveis da Flecha na Solda

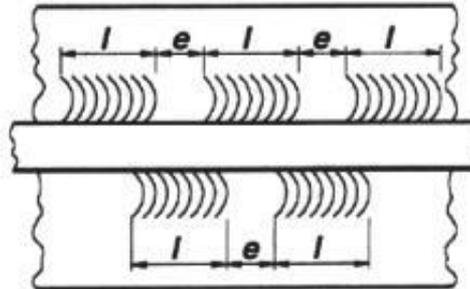


## Outros Exemplos de Cotagem dos Cordões de Solda

Designação	Ilustração	Inscrição
1 Junta de bordas		$\nabla$
		$s \parallel$
		$s \vee$
2 Junta de bordas retas		$s \parallel$
3 Juntas em ângulo contínuas		$a \triangle$ $z \triangle$
4 Junta em ângulo descontínua		$a \triangle n \times l(e)$ $z \triangle n \times l(e)$

## Outros Exemplos de Cotação dos Cordões de Solda

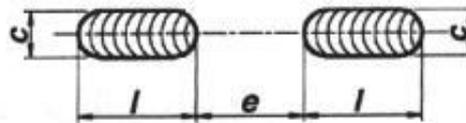
5 Junta em ângulo intermitente desfasada



$$\frac{a}{a} \triangleright \left[ \begin{array}{l} n \ x l \\ n \ x l \end{array} \right] (e)$$

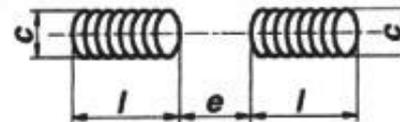
$$\frac{z}{z} \triangleright \left[ \begin{array}{l} n \ x l \\ n \ x l \end{array} \right] (e)$$

6 Soldagem em entalhe descontínua



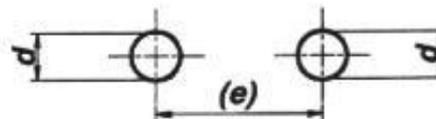
$$c \sqcap \left[ n \ x l \right] (e)$$

7 Soldagem em linha descontínua



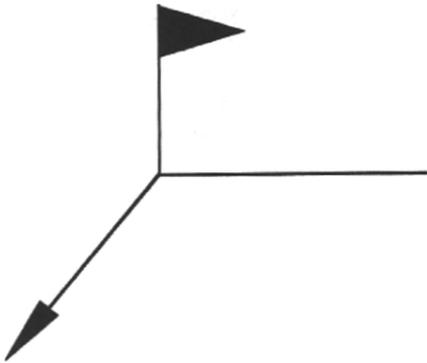
$$c \ominus \left[ n \ x l \right] (e)$$

8 Soldagem por pontos

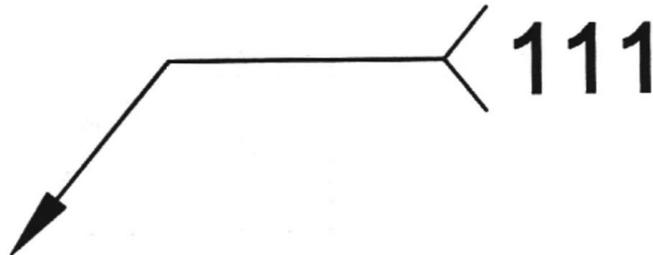


$$d \bigcirc \left[ n \right] (e)$$

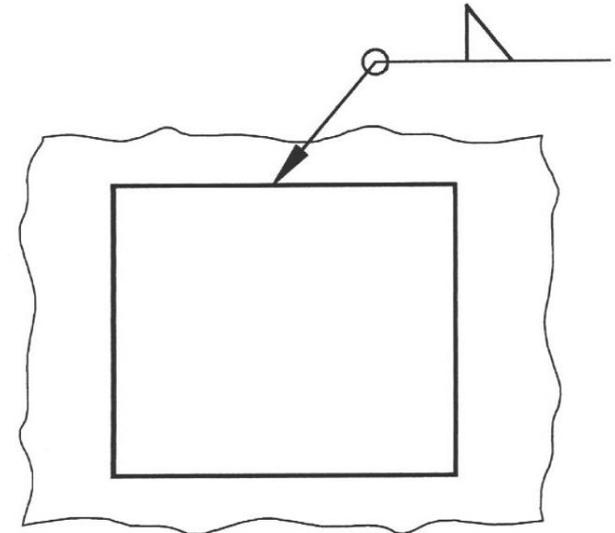
## Outros Exemplos de Cotagem dos Cordões de Solda



Soldagem no campo

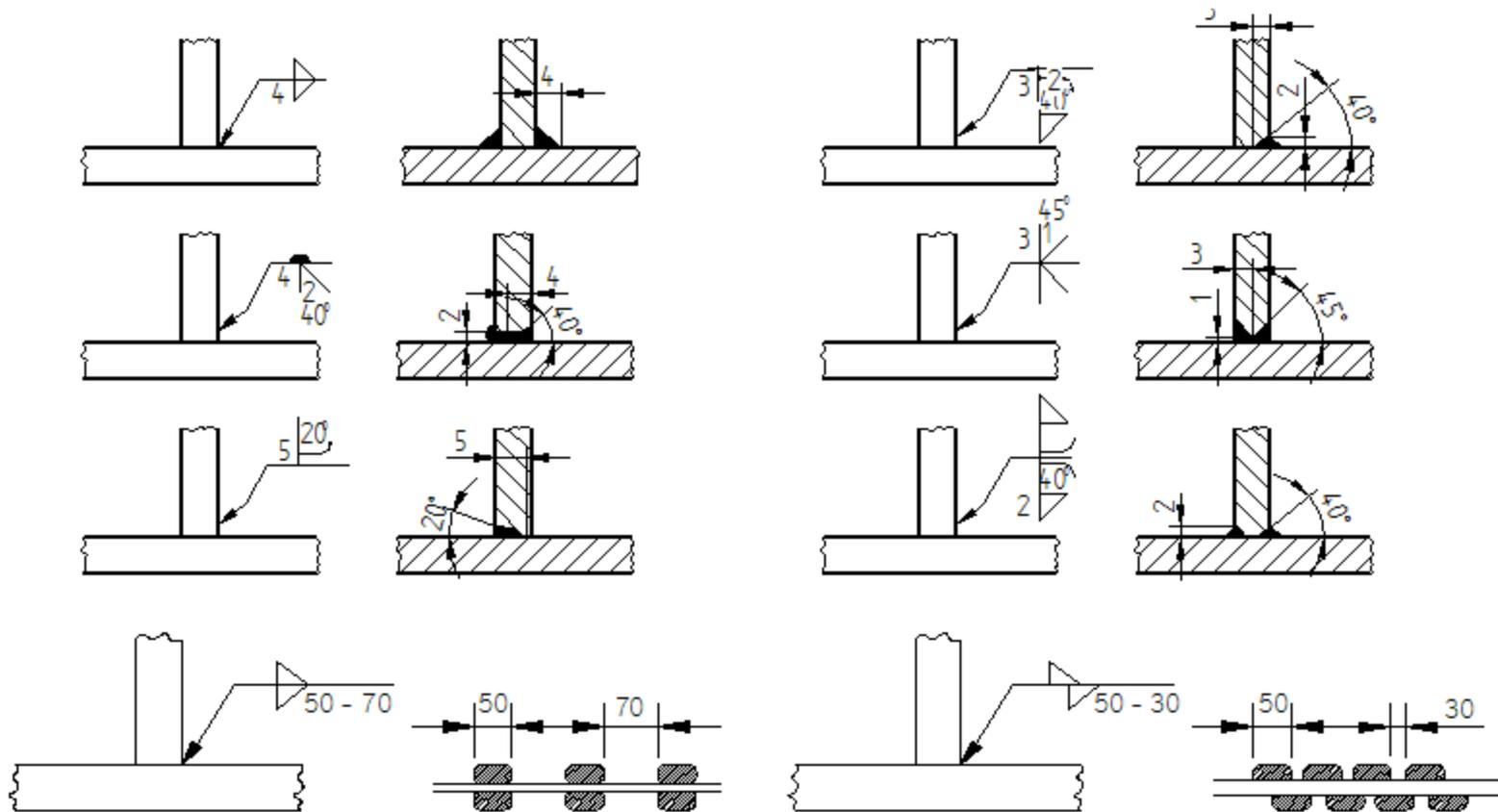


Especificação do processo de soldagem

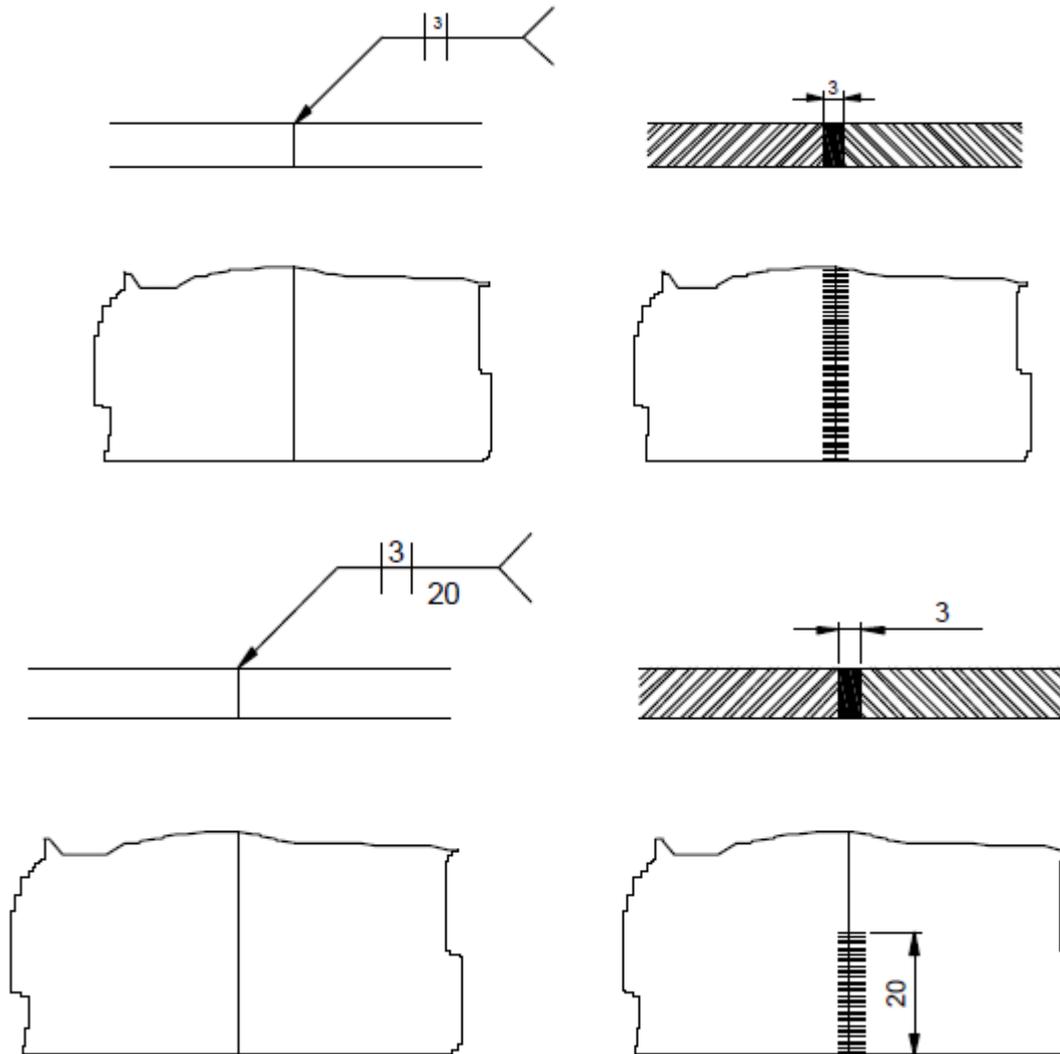


Soldagem ao redor

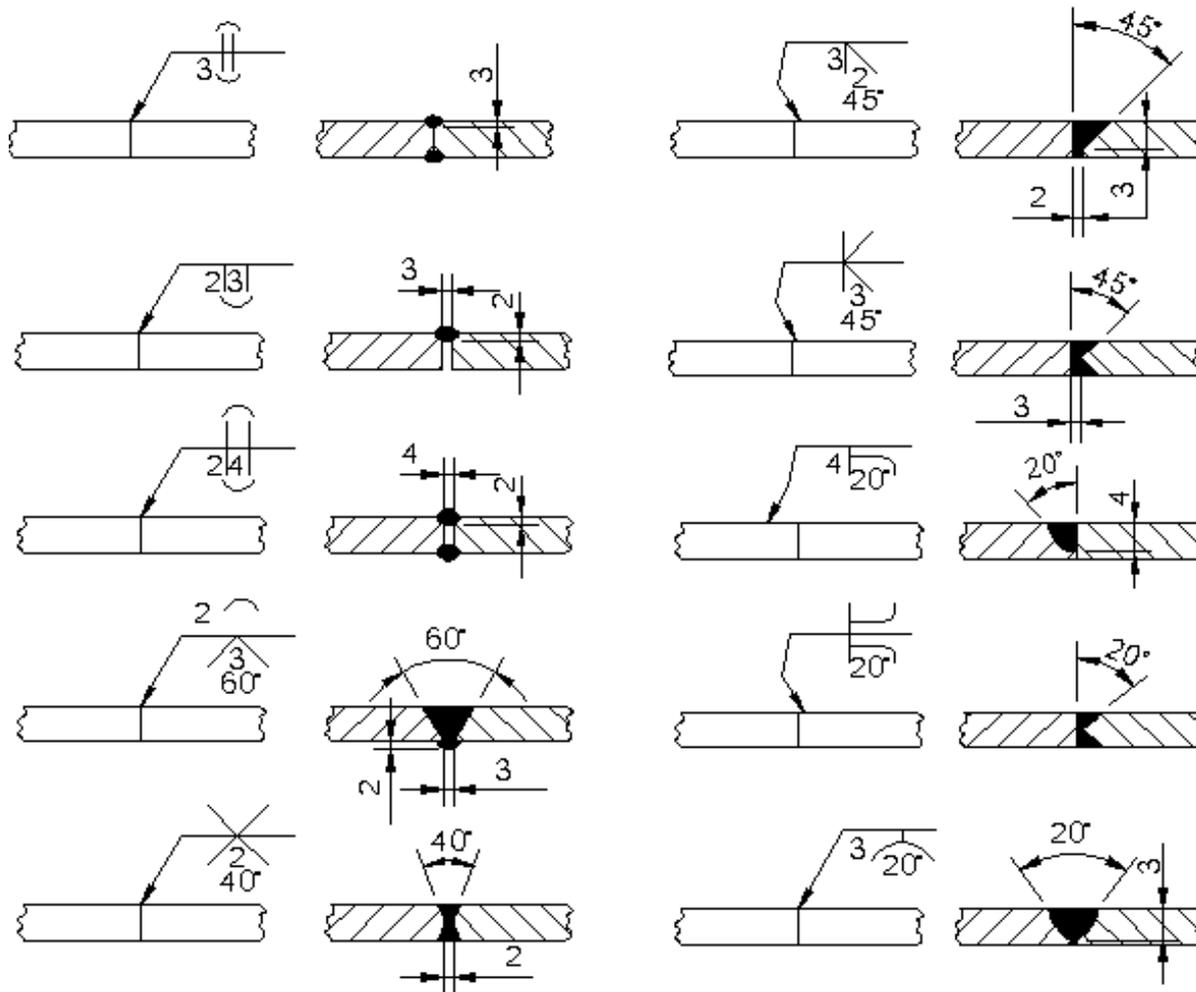
# EXEMPLO – Uniões em T



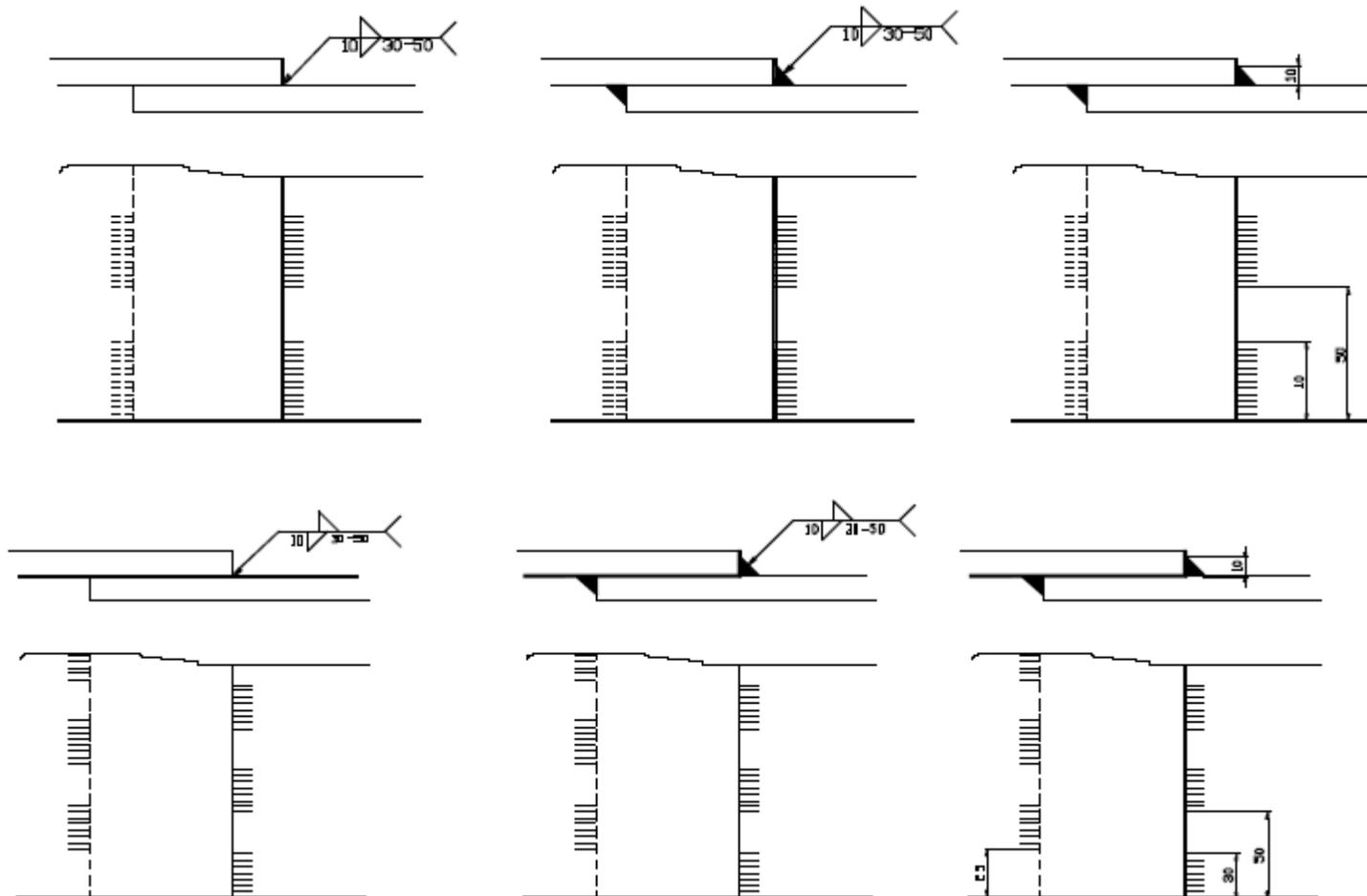
## EXEMPLO – Uniões de Topo



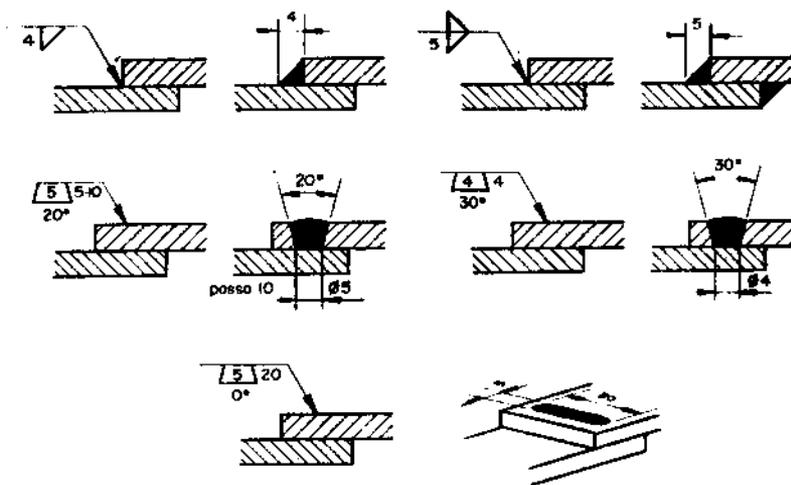
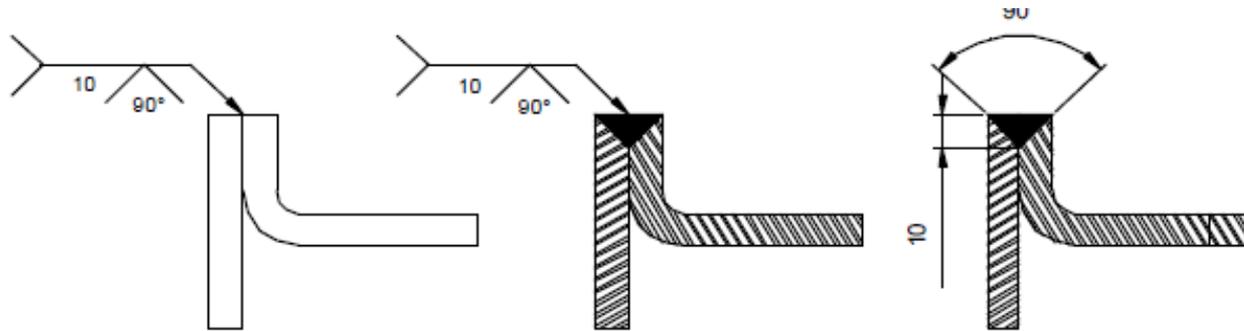
## EXEMPLO – Uniões de Topo



# EXEMPLO – Uniões Sobrepostas

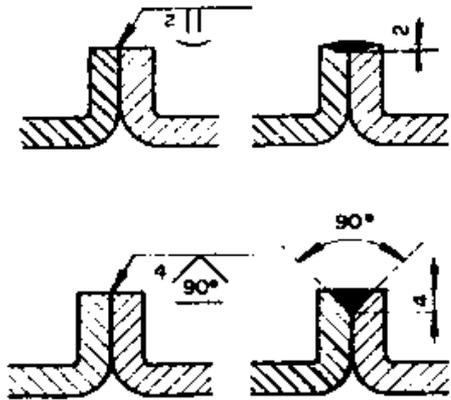


# EXEMPLO – Uniões Sobrepostas

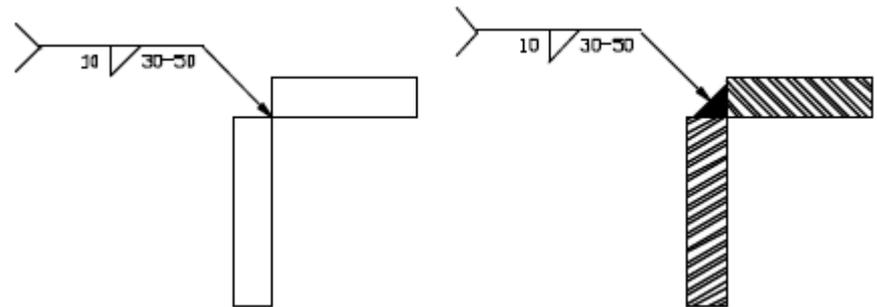
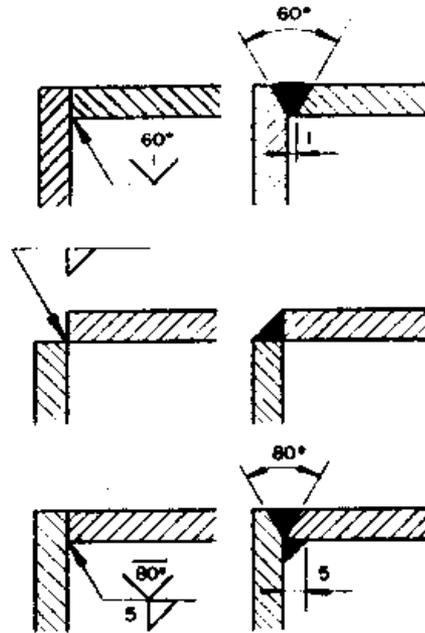


# EXEMPLOS

## • Uniões em aresta

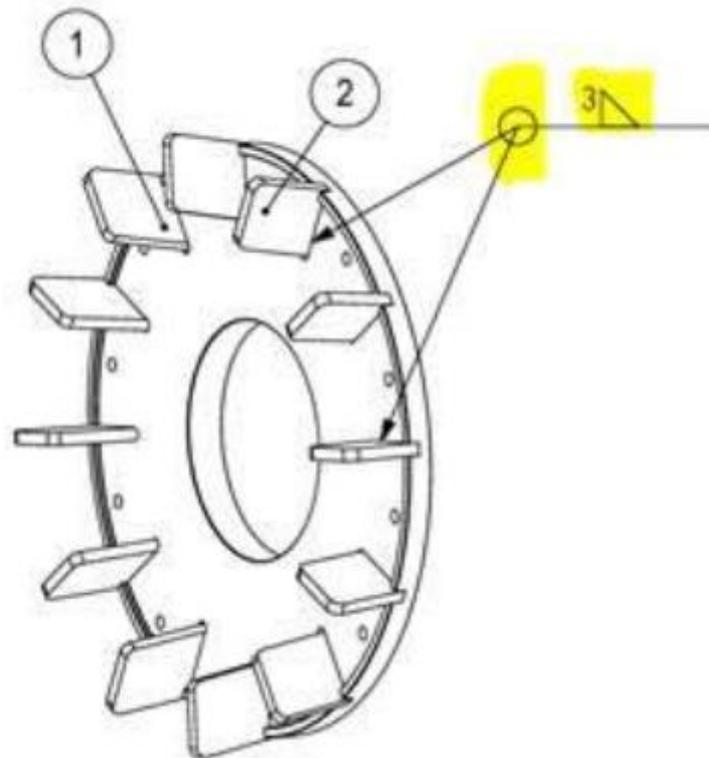


## • Uniões em ângulo



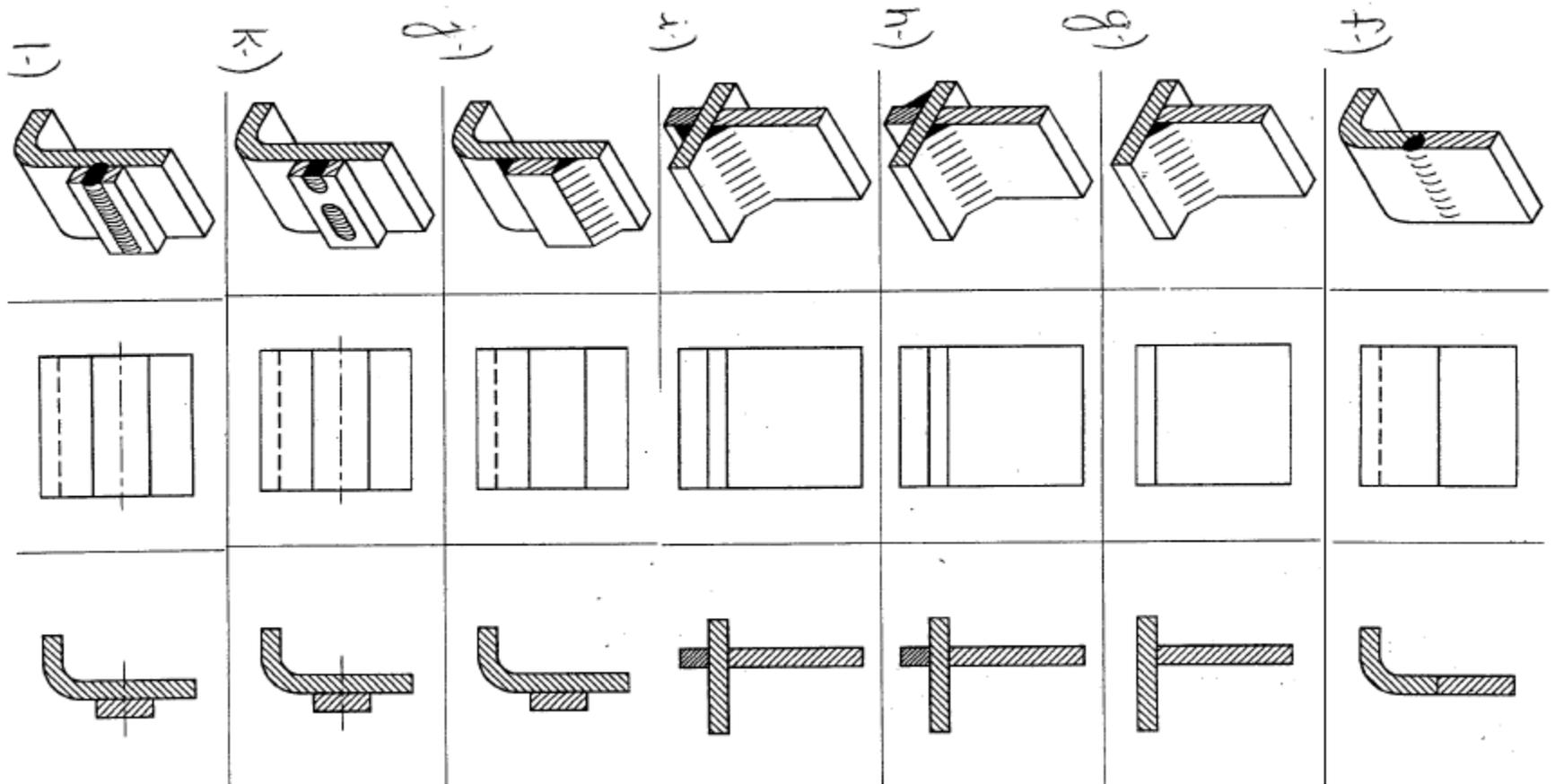
Fonte: Desenhista de Máquinas – Escola pro-tec (1983)

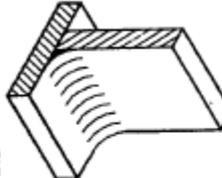
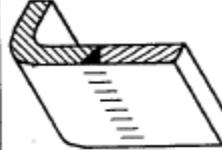
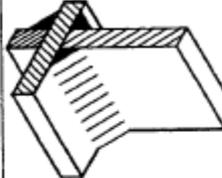
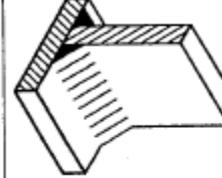
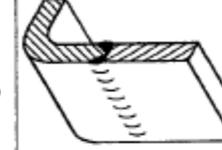
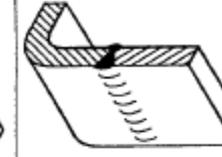
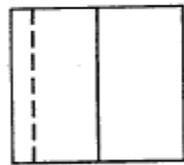
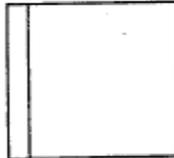
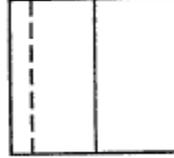
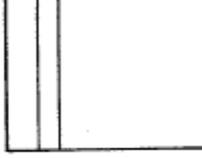
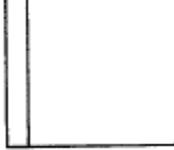
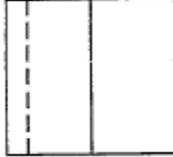
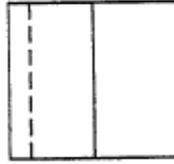
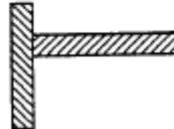
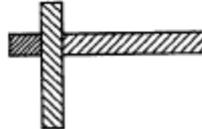
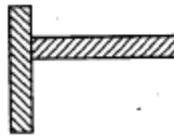
# EXEMPLOS



Exercício 1 - Usando a simbologia correta, referencie as soldas desenhadas à esquerda de duas maneiras diferentes (em vista e em corte), em cada uma das colunas à direita.

<p>a-)</p>		
<p>b-)</p>		
<p>c-)</p>		
<p>d-)</p>		
<p>e-)</p>		



<p>(s)</p> 	<p>(r)</p> 	<p>(b)</p> 	<p>(p)</p> 	<p>(o)</p> 	<p>(u)</p> 	<p>(w)</p> 
						
						

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## REFERÊNCIAS

Silva, A.; Ribeiro, C. T.; Dias, J.; Souza, L. **Desenho Técnico Moderno**, 4. ed., LTC Editora, 2006, 486 p.

Pauli, E. A.; Uliana, F. S. **Noções Básicas de Processos de Soldagem e Corte**, Escola SENAI-ES.