

焊接符号

2006.3.18

焊接符号的定义

Standard symbols are used universally to indicate desired welding and brazing information on engineering drawings. They convey the design requirements to the shop in a concise manner.

标注在设计图纸上，以一种简洁的方式传达焊接信息和对焊接的要求的一种标准化的符号。

焊接符号的定义

从焊接符号中可得到以下信息：

1. 焊缝类型（如 角焊缝 或者 坡口焊缝）
2. 坡口型式（如 单面坡口 或者 双V型坡口）
3. 焊缝尺寸（如角焊缝的焊角高为12mm）
4. 焊接方法（如 SMAW 或者 GTAW）
5. 钝边和间隙（如钝边 1-2mm，间隙 2-4mm）
6. 焊接次序（如制管先焊内侧，后外侧）
7. 焊缝长度（如设备底座角焊缝：50-150）
8. 以及其它的一些信息（如现场焊缝）

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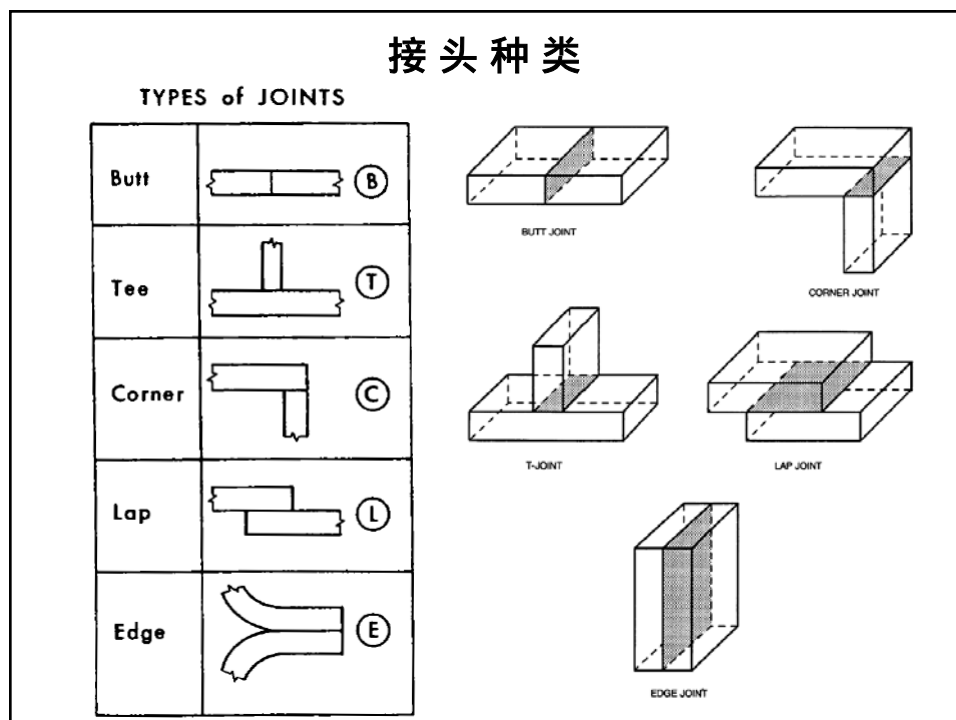
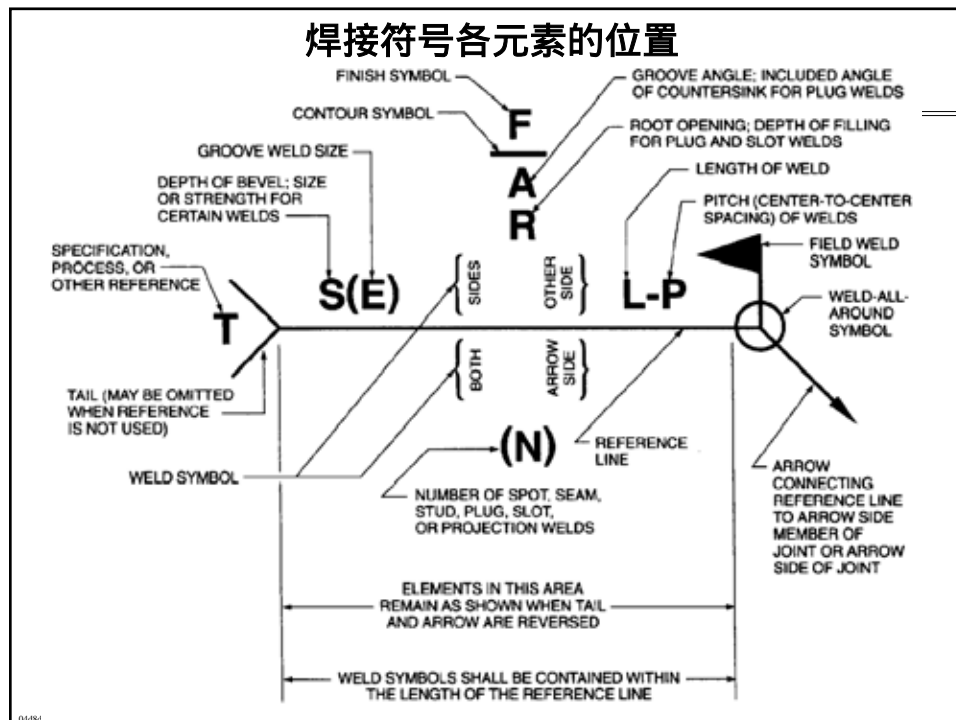
焊接符号的组成

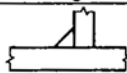





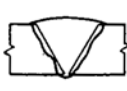

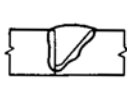

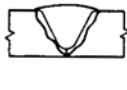

- ☐ 基准线 Reference line
- ☐ 箭头 Arrow
- ☐ 焊缝符号 Basic weld symbol
- ☐ 焊缝尺寸及其它参数 Dimension and other data
- ☐ 补充符号 Supplementary symbol
- ☐ 轮廓符号 Finish symbol
- ☐ 尾巴 Tail
- ☐ 其它信息 Specification, process, or other references

焊接符号由8部分组成

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焊缝种类		
TYPES of WELDS		
	Single	Double
Fillet		
Square		
Bevel Groove		
Vee Groove		
J Groove		
U Groove		

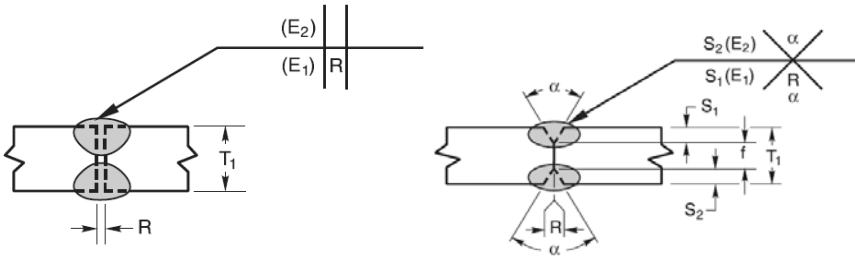
焊缝种类

焊缝按照熔透的程度分为：

- (1) PJP Partial Joint Penetration 部分熔透焊缝
- (2) CJP Complete Joint Penetration 全熔透焊缝

PP CP

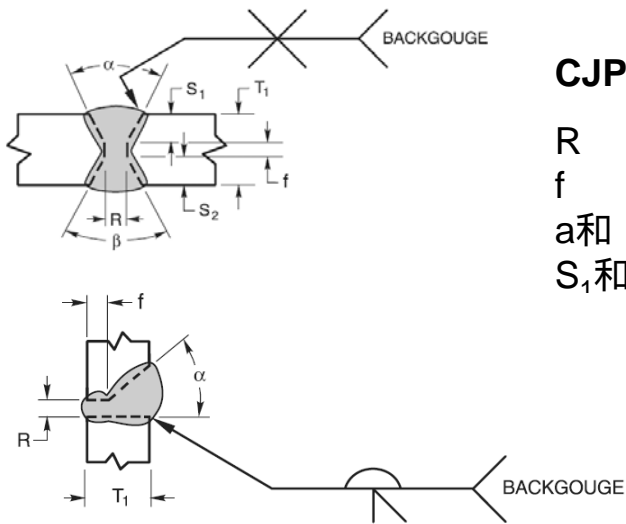
焊缝种类



PJP 部分熔透焊缝

- R 间隙
- a 坡口角度
- S₁和S₂ 坡口深度

焊缝种类



CJP 全部熔透焊缝

- R 间隙
- f 钝边
- a和 坡口角度
- S₁和S₂ 坡口深度

常用术语

- Root Face
- Root Opening / Root Gap
- Bevel
- Groove / Groove Angle
- CJP Complete Joint Penetration
- PJP Partial Joint Penetration

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焊缝符号

GROOVE							
SQUARE	SCARF	V	BEVEL	U	J	FLARE-V	FLARE-BEVEL

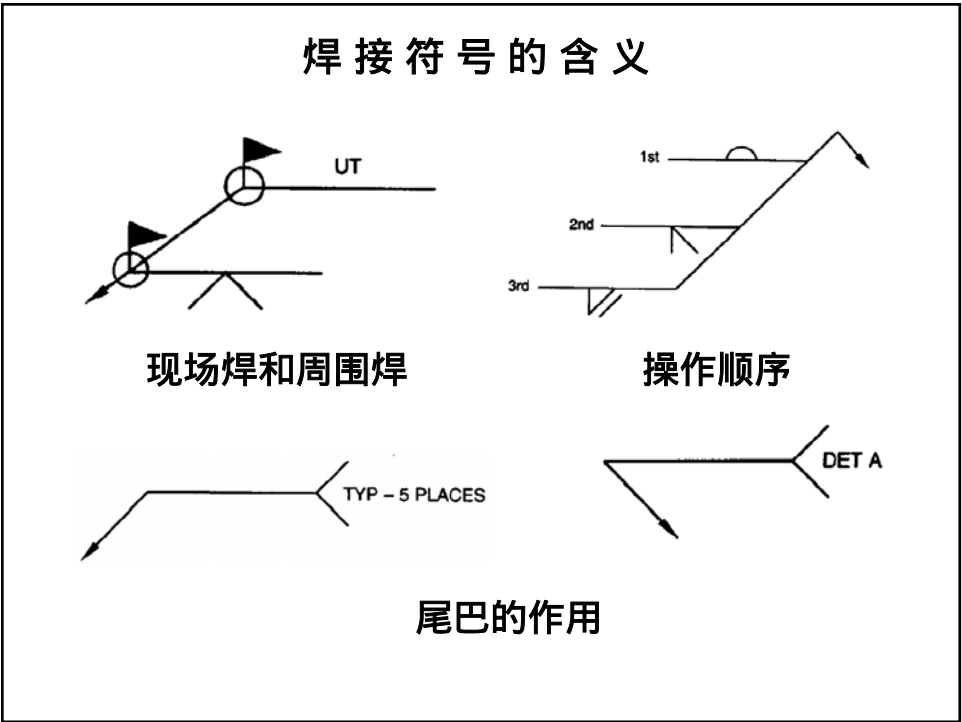
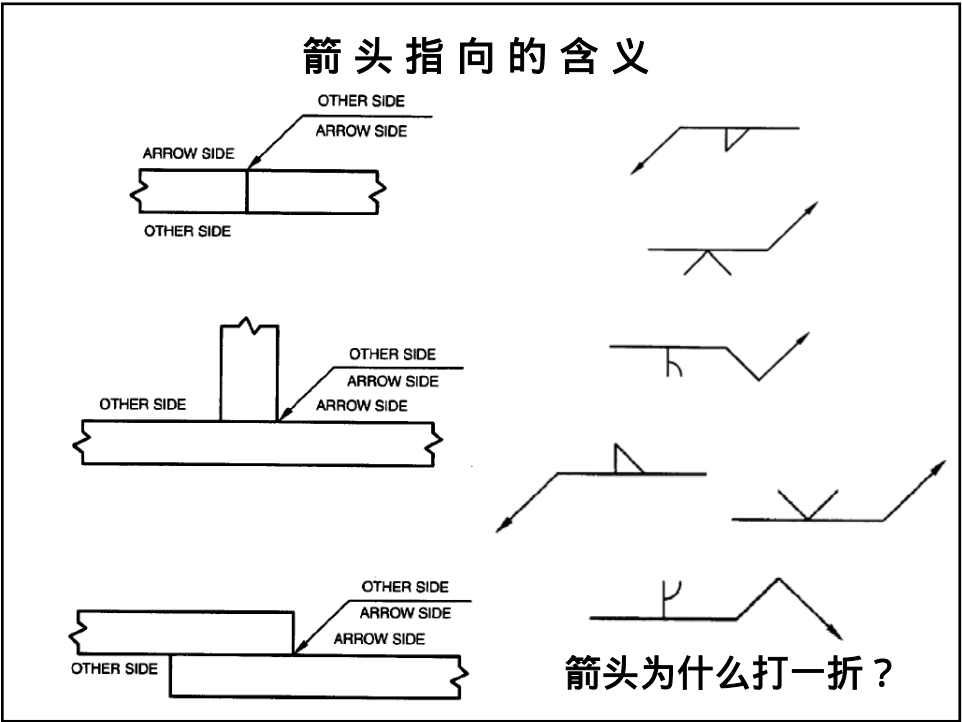
FILLET	PLUG OR SLOT	STUD	SPOT OR PROJECTION	SEAM	BACK OR BACKING	SURFACING	EDGE

补充和轮廓符号




WELD ALL AROUND	FIELD WELD	MELT THROUGH	CONSUMABLE INSERT (SQUARE)	BACKING OR SPACER (RECTANGLE)	CONTOUR		
					FLUSH OR FLAT	CONVEX	CONCAVE

补充符号

- ☐ **Field Weld:** Welds not made in a shop or at the place of initial construction.
- ☐ **Weld-All-Around Symbol**
注意：环形焊缝不需要使用 四周焊缝。
- ☐ **Backing Weld / Back Weld 的区别**
- ☐ **Omission of Tail**



焊接符号的含义

	—
	⌒
	⌒




轮廓符号

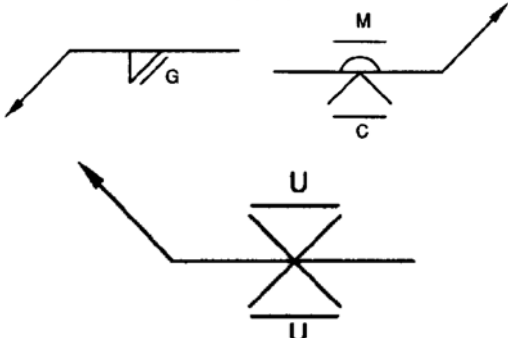
焊接符号的含义

字母的含义

C - CHIPPING
G - GRINDING
H - HAMMERING
M - MACHINING
R - ROLLING

轮廓符号的含义

CONTOUR		
FLUSH OR FLAT	CONVEX	CONCAVE
		



Finishing Method Unspecified

焊接符号的含义

一个符号指向多道焊缝

箭头打折含义

尺寸公差

FILLET LEG + 1/8
TOLERANCE - 0

1/4

2-6

SEGMENT LENGTH + 1/4
TOLERANCE - 1/4

尺寸公差标注位置

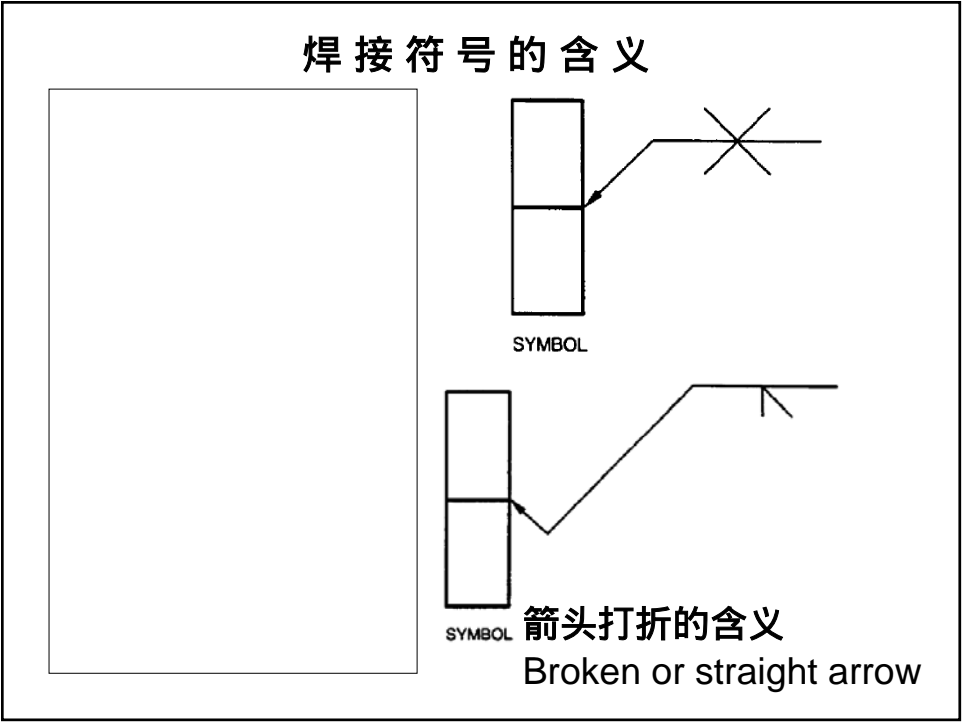
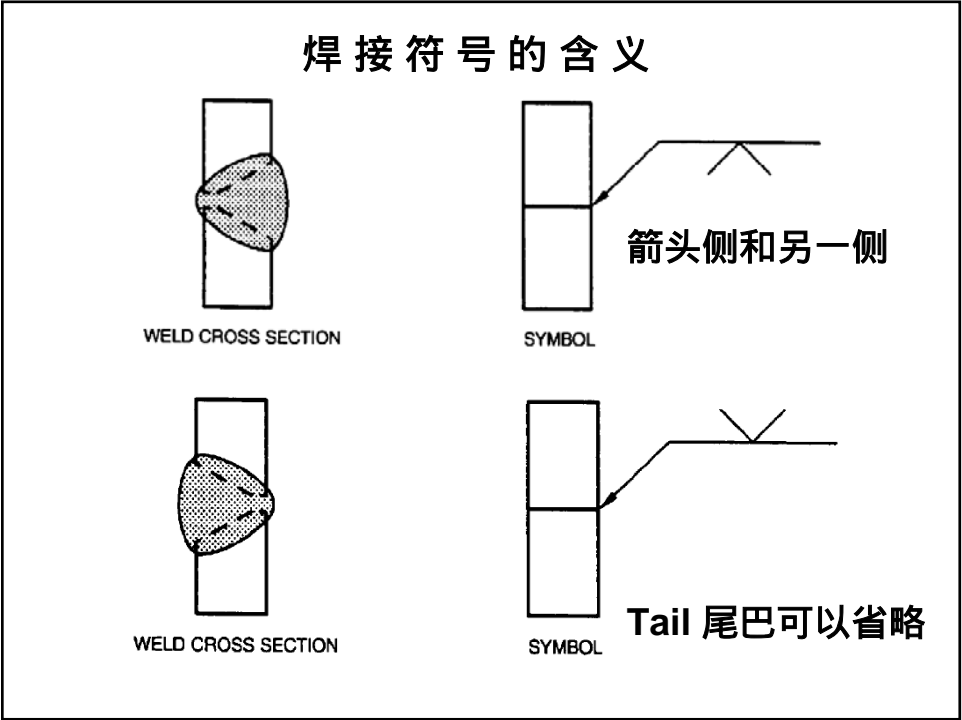
焊接符号的含义

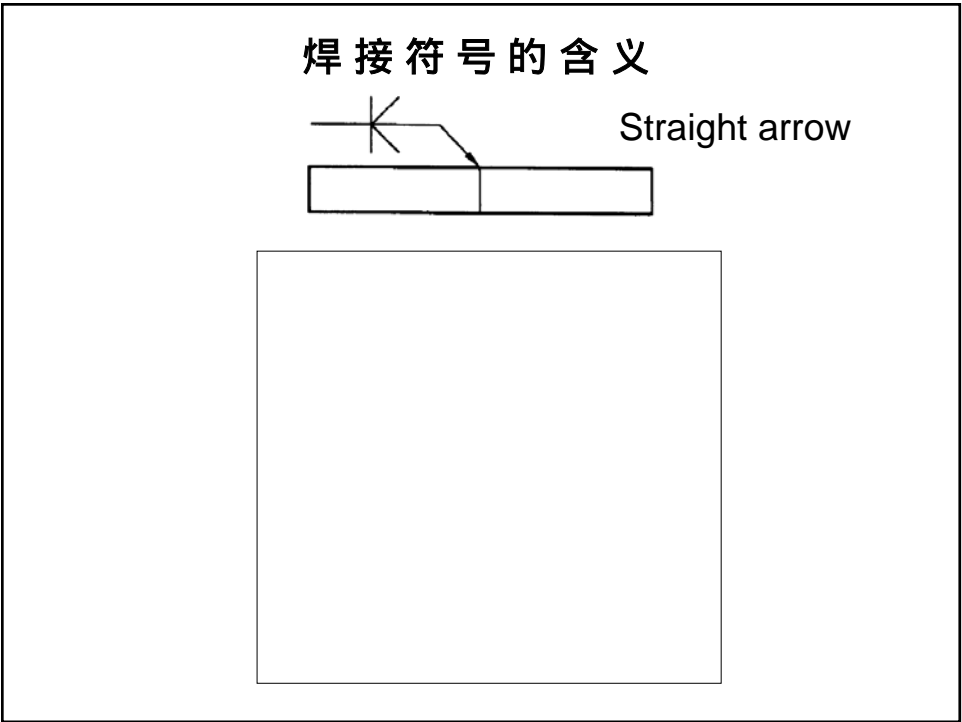
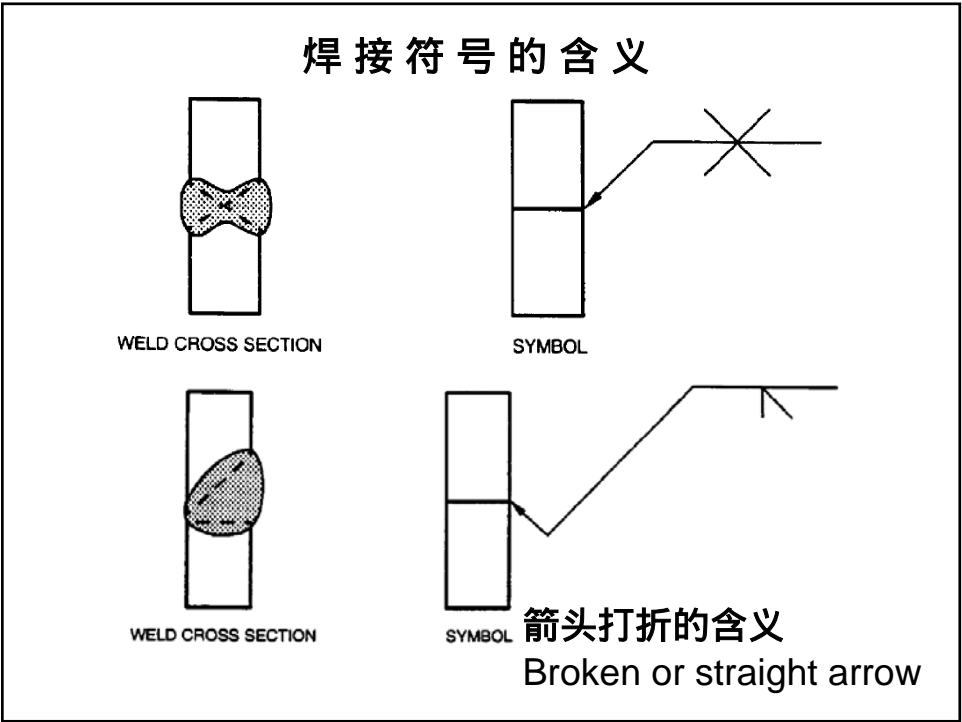
SYMBOL

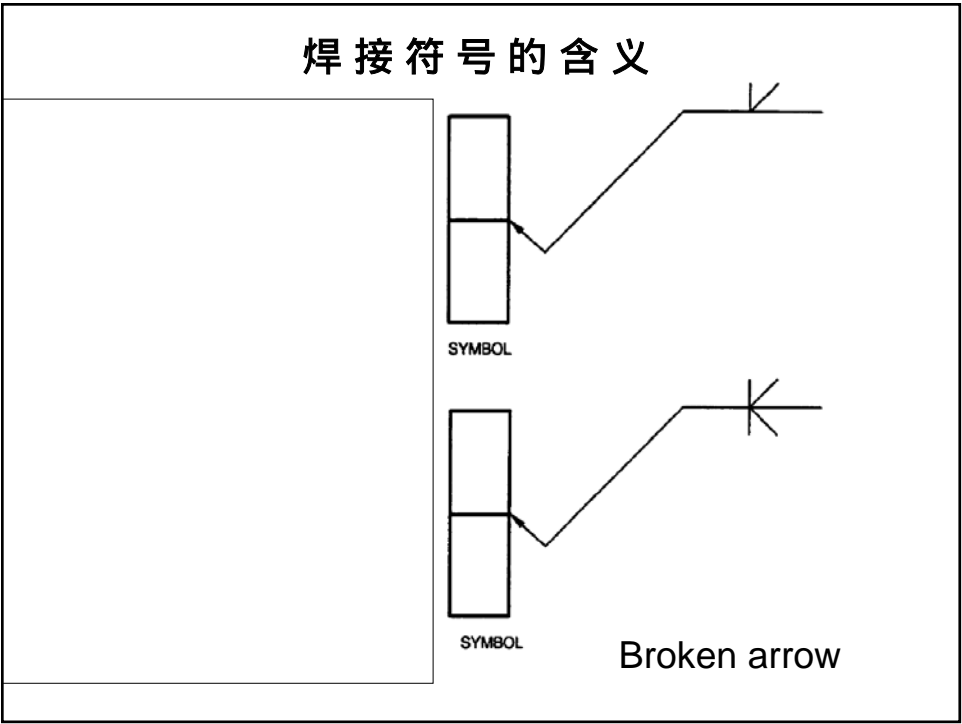
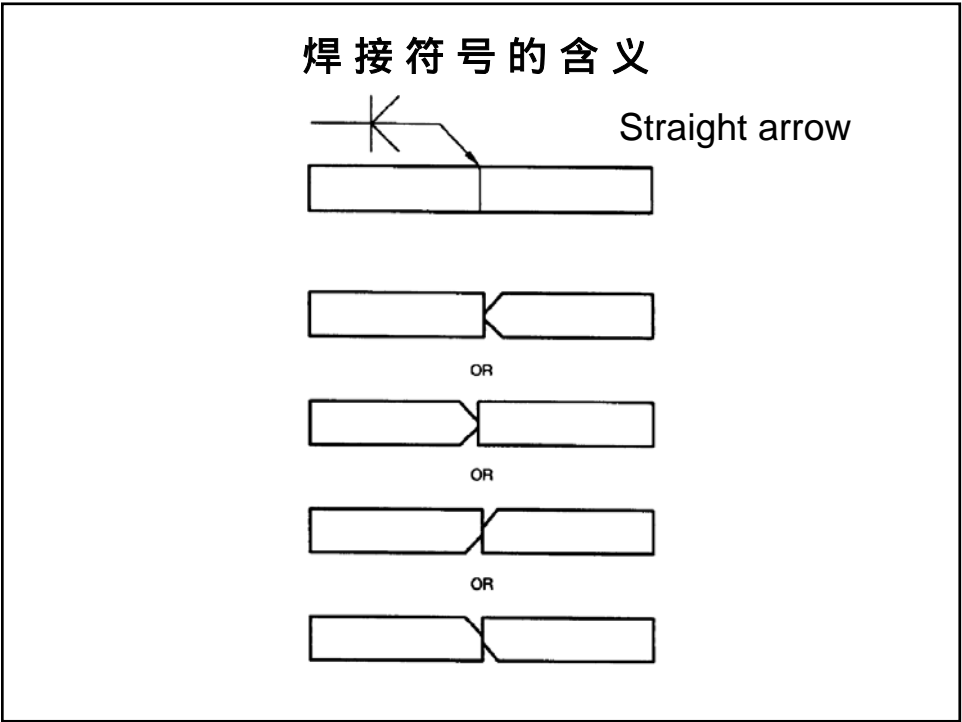
箭头侧和另一侧

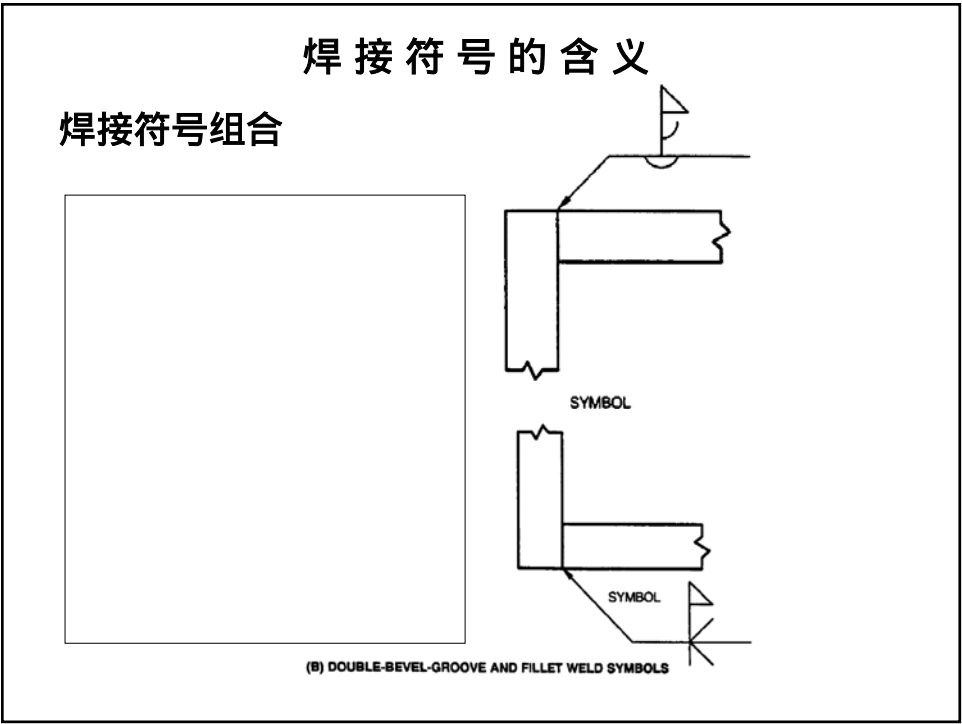
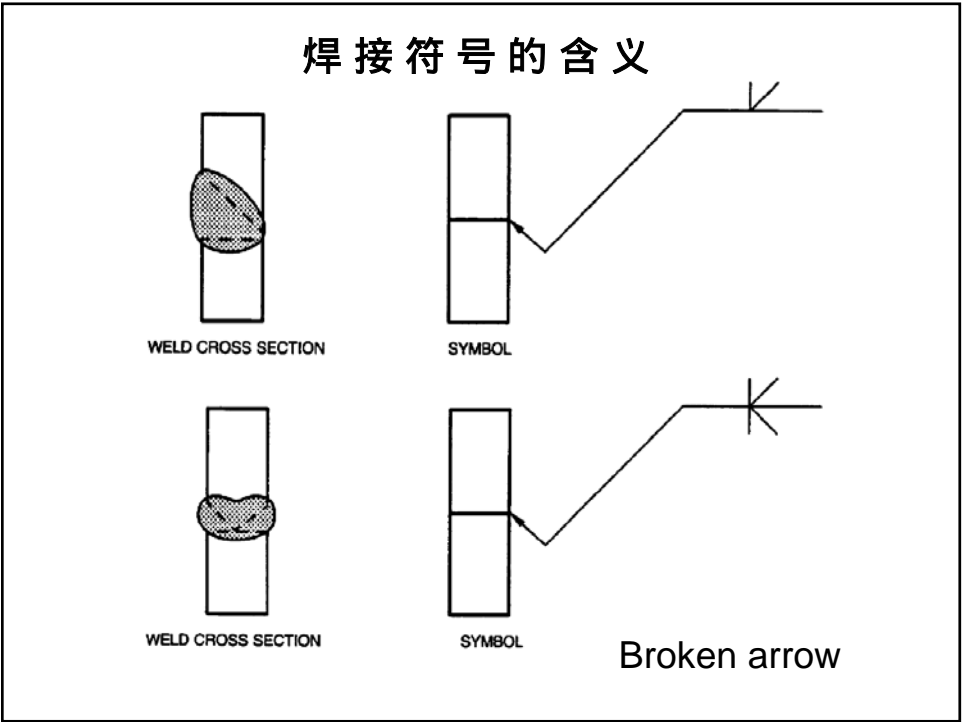
SYMBOL

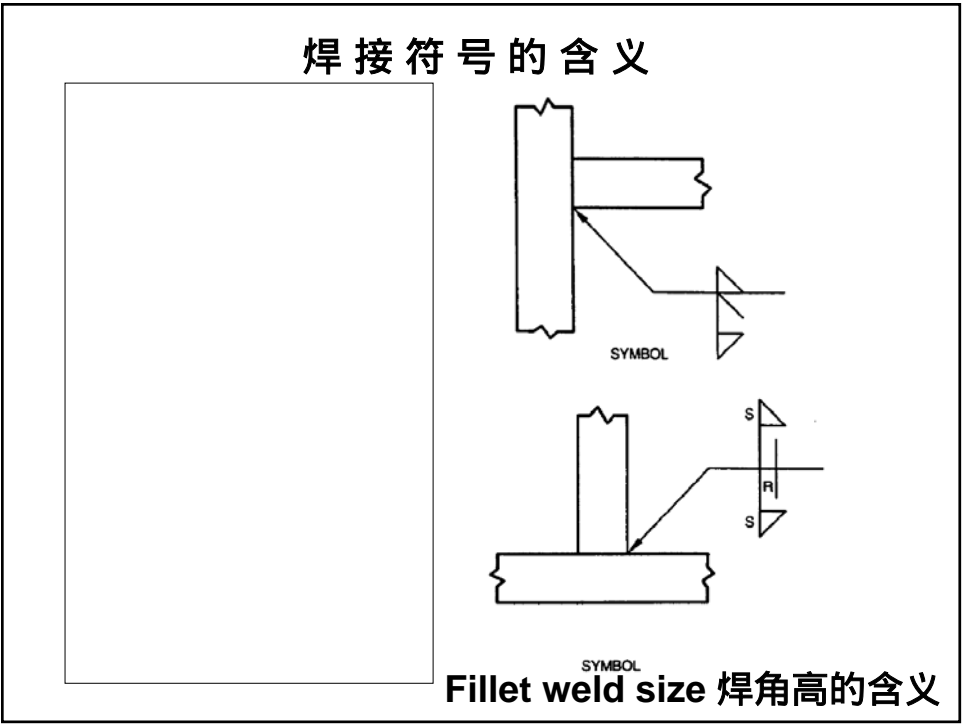
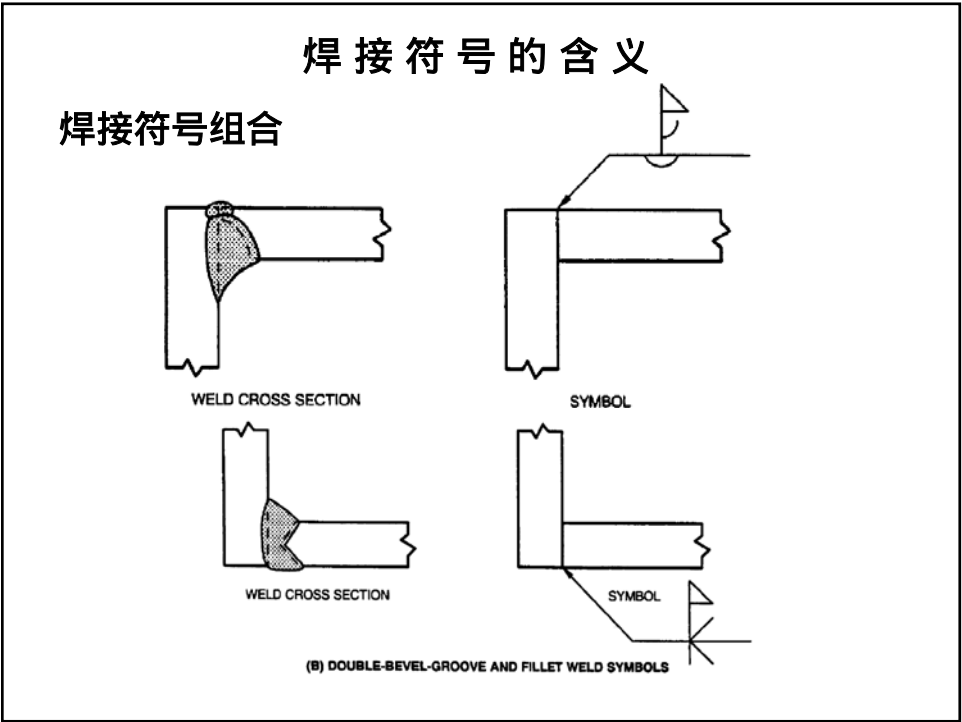
Tail 尾巴可以省略

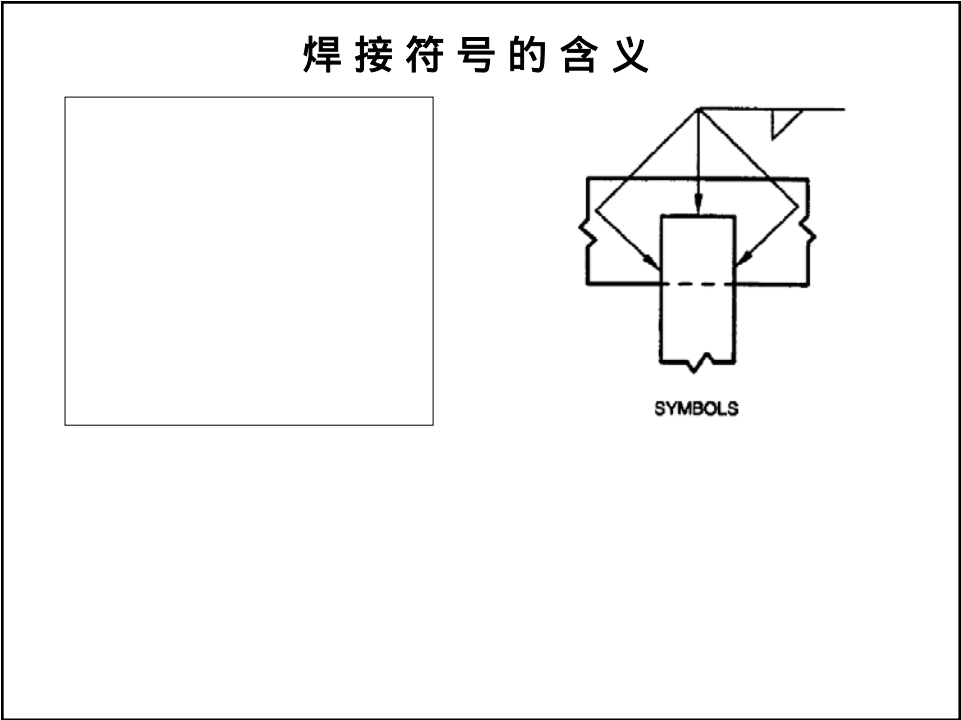
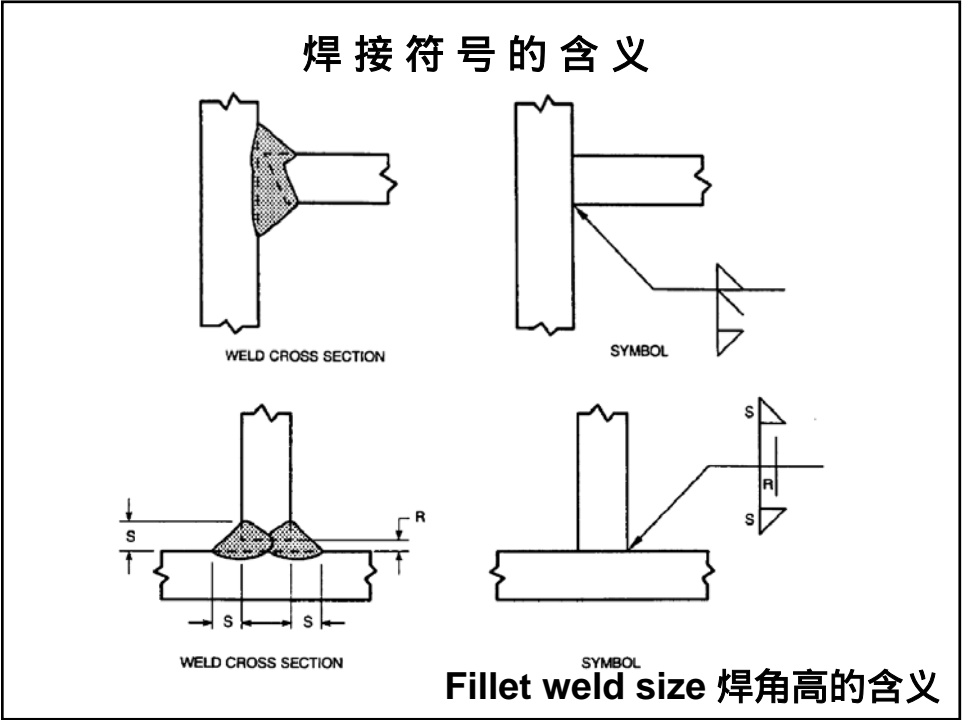


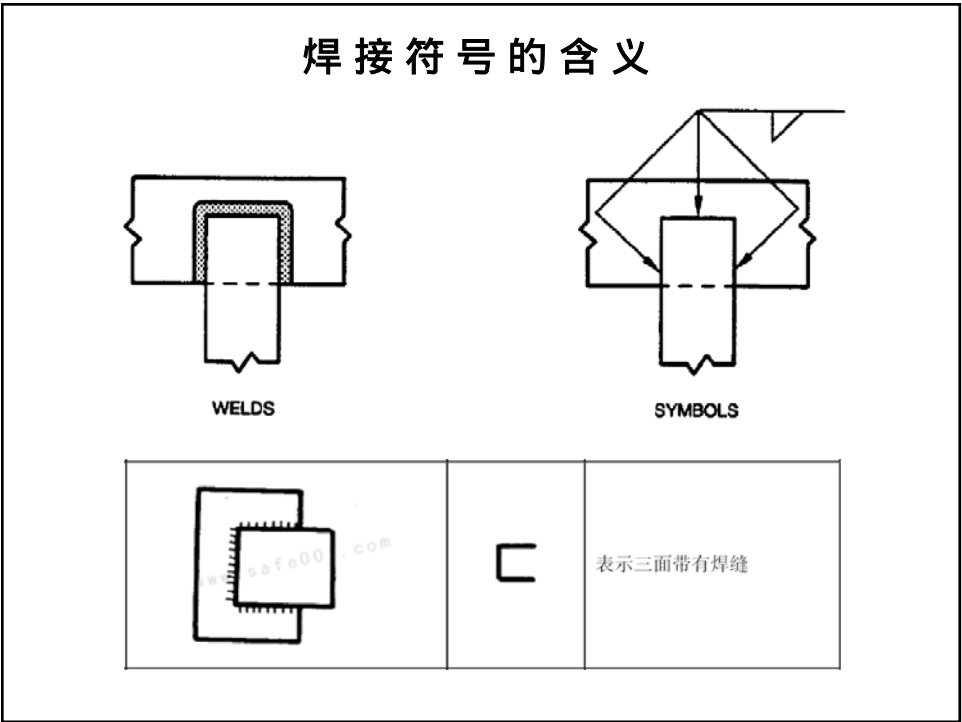
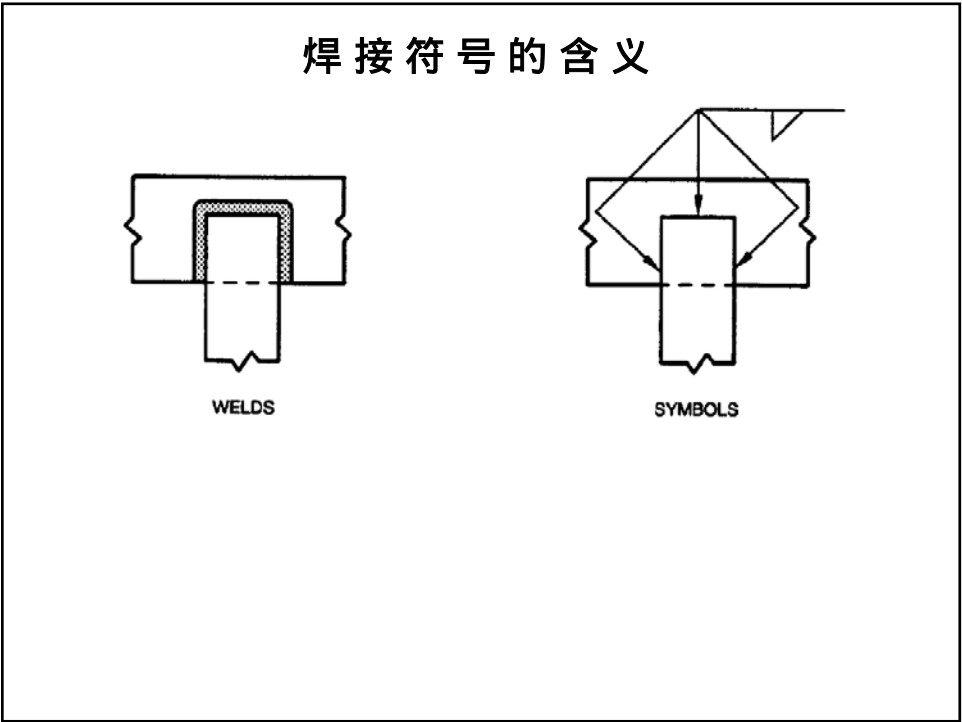


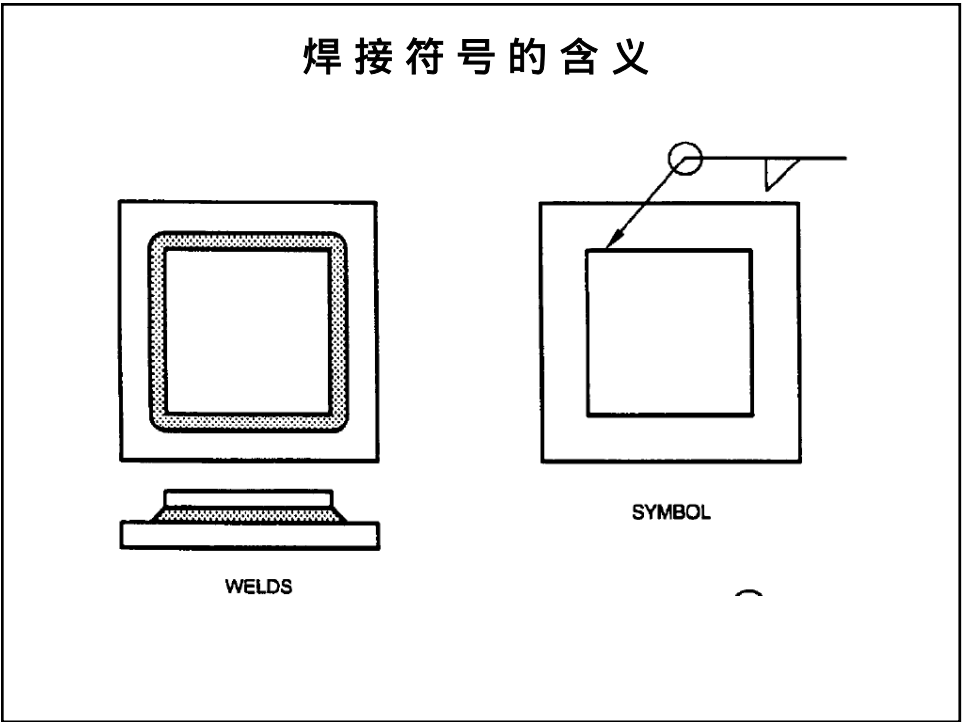
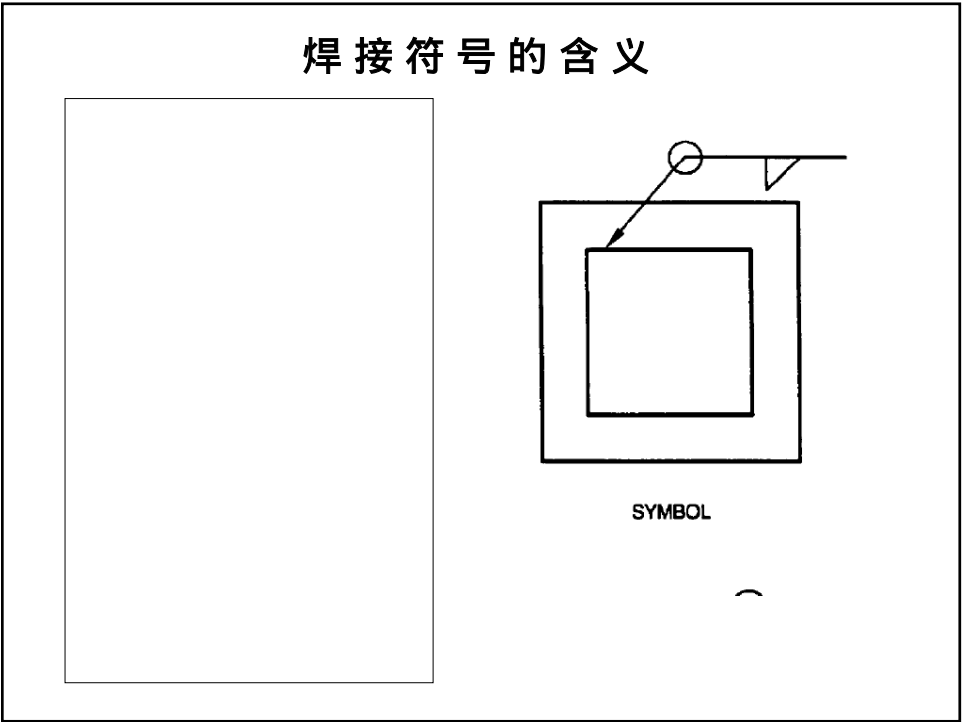


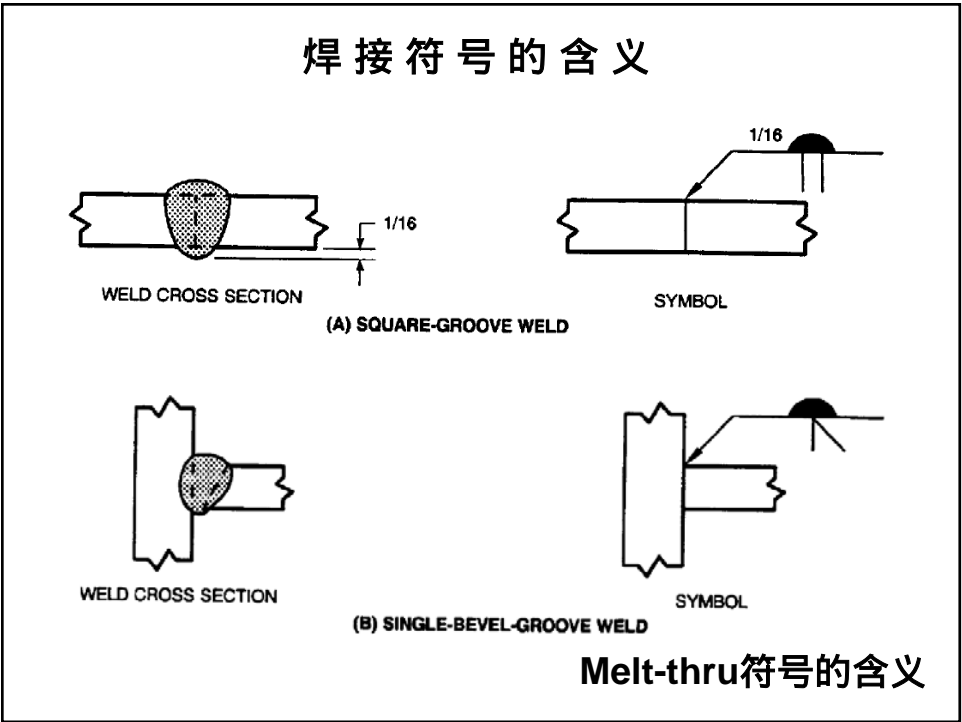
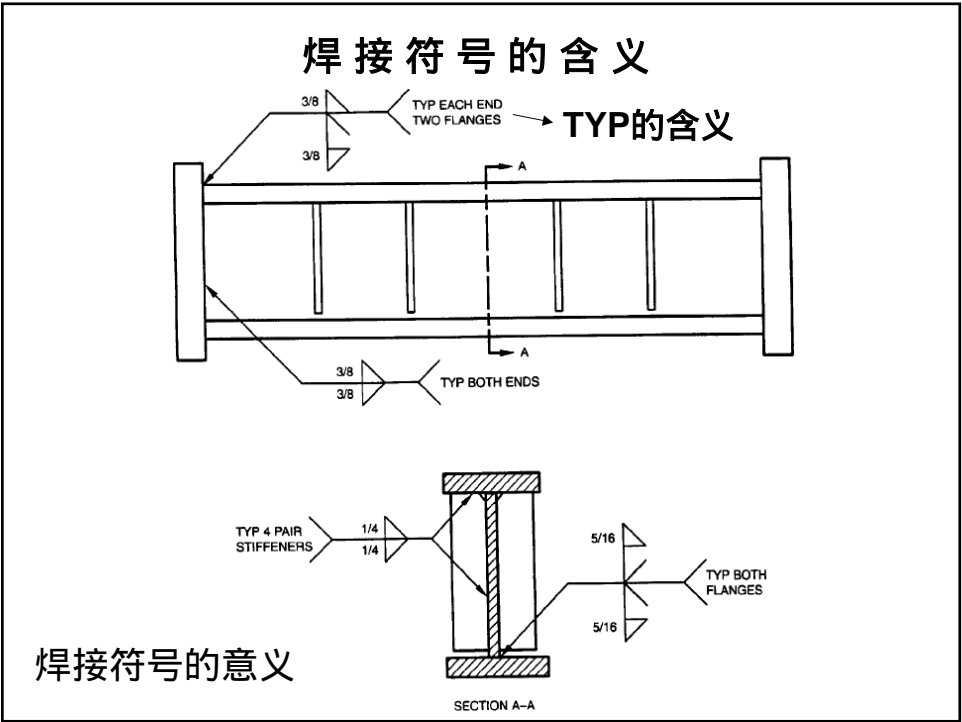




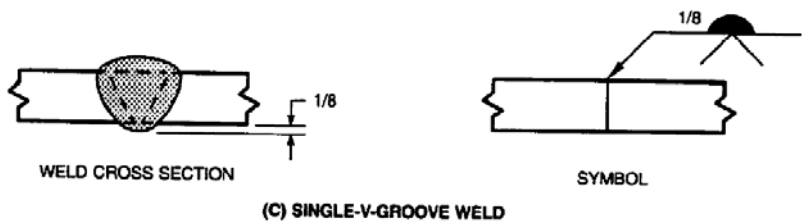






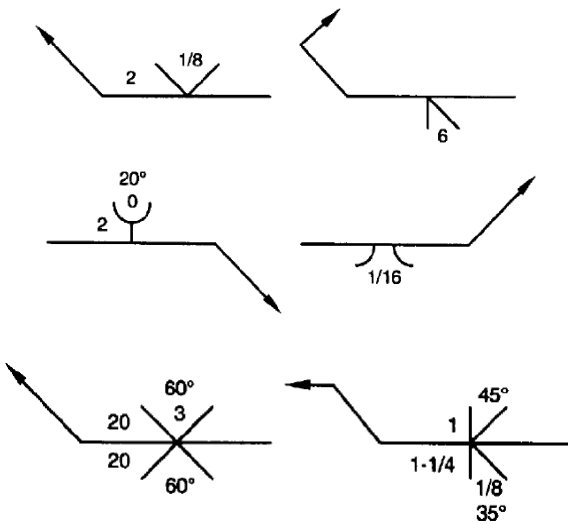


焊接符号的含义

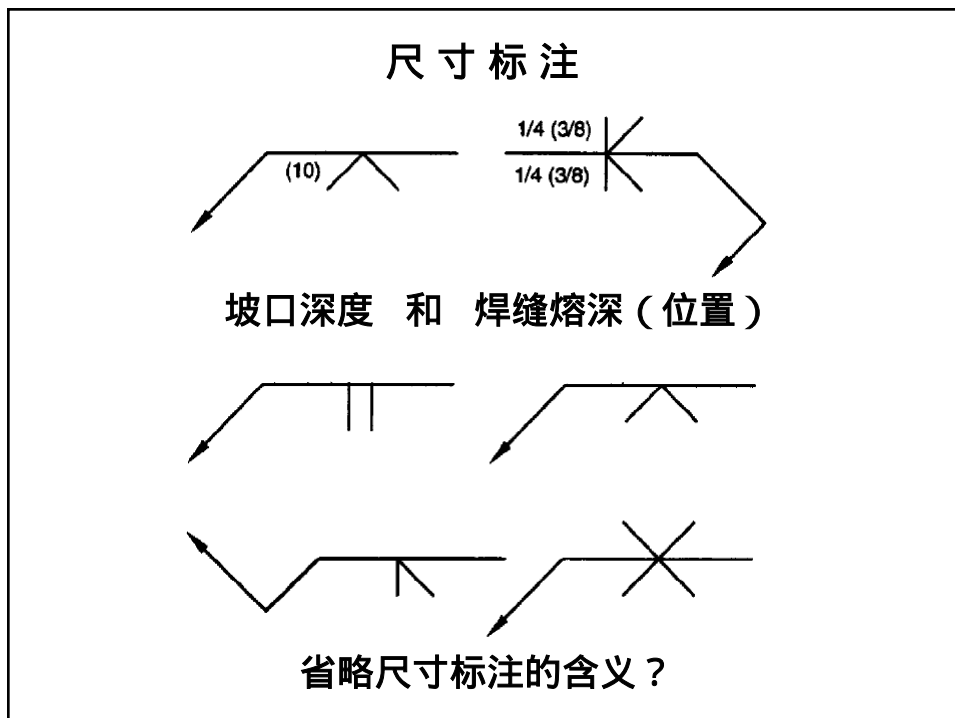
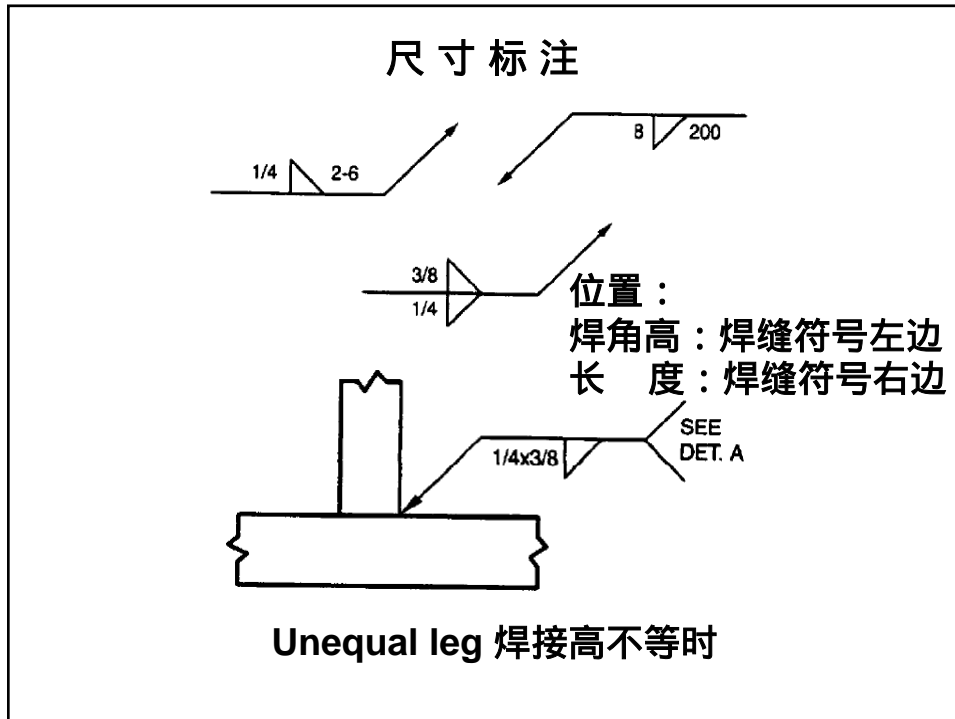


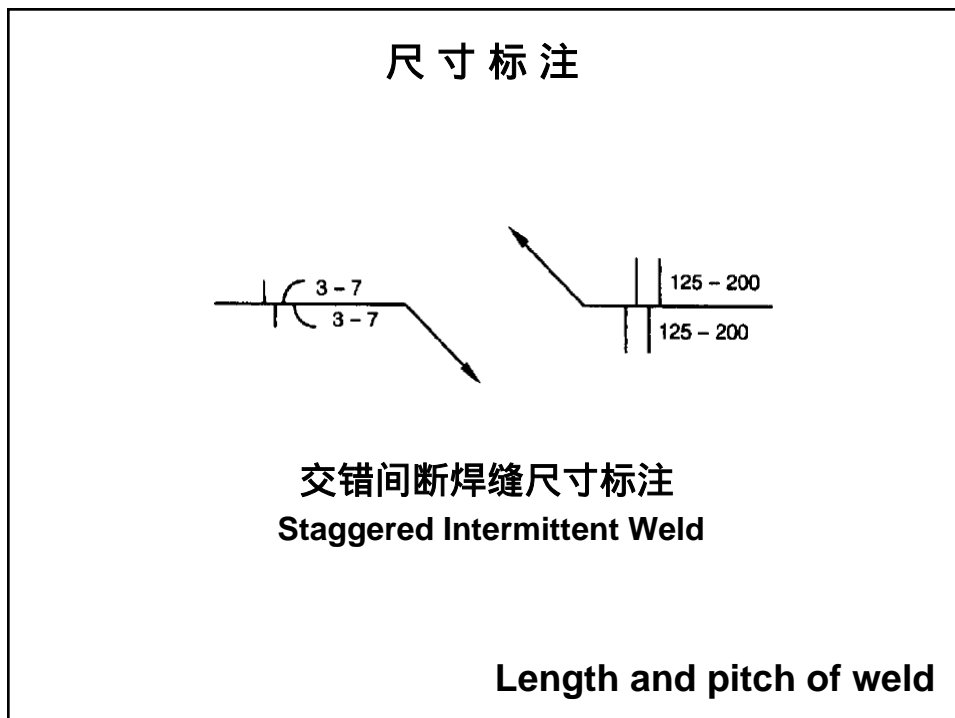
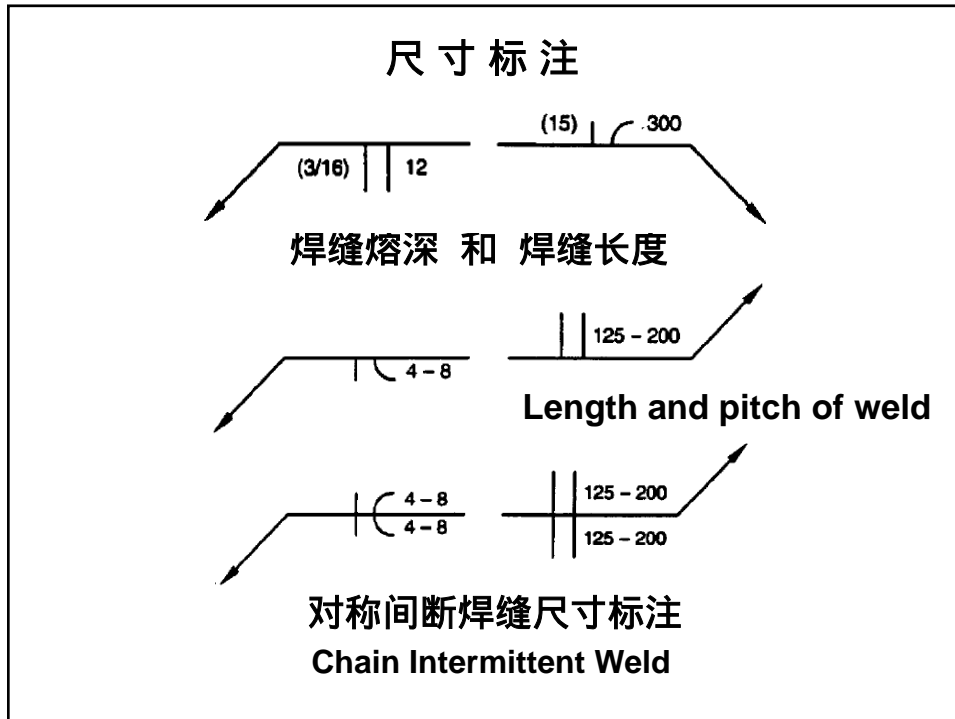
Melt-thru符号标注位置

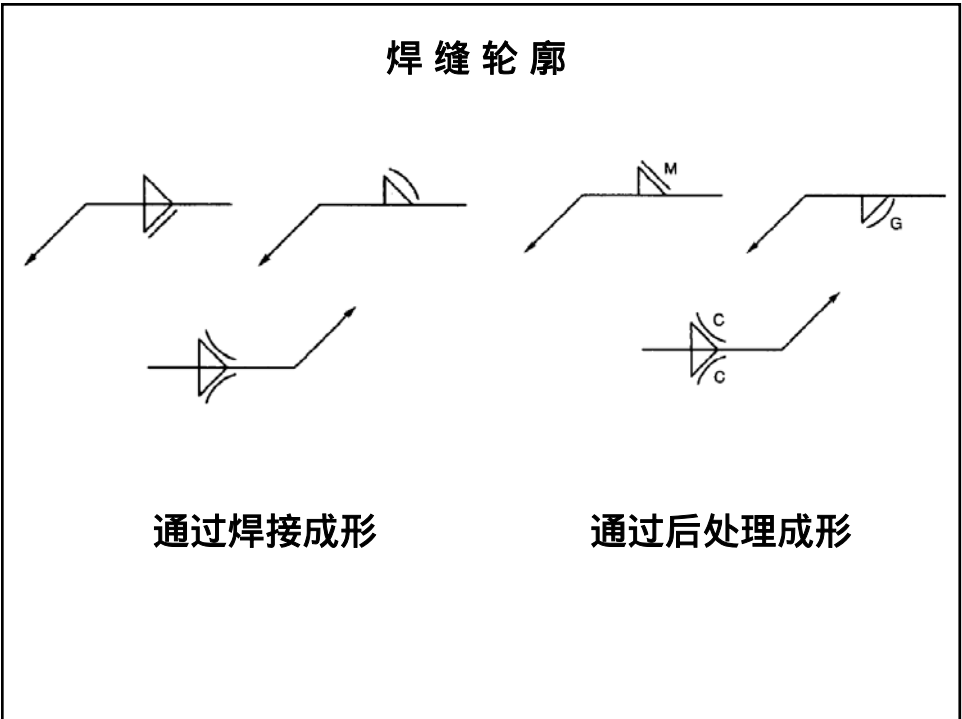
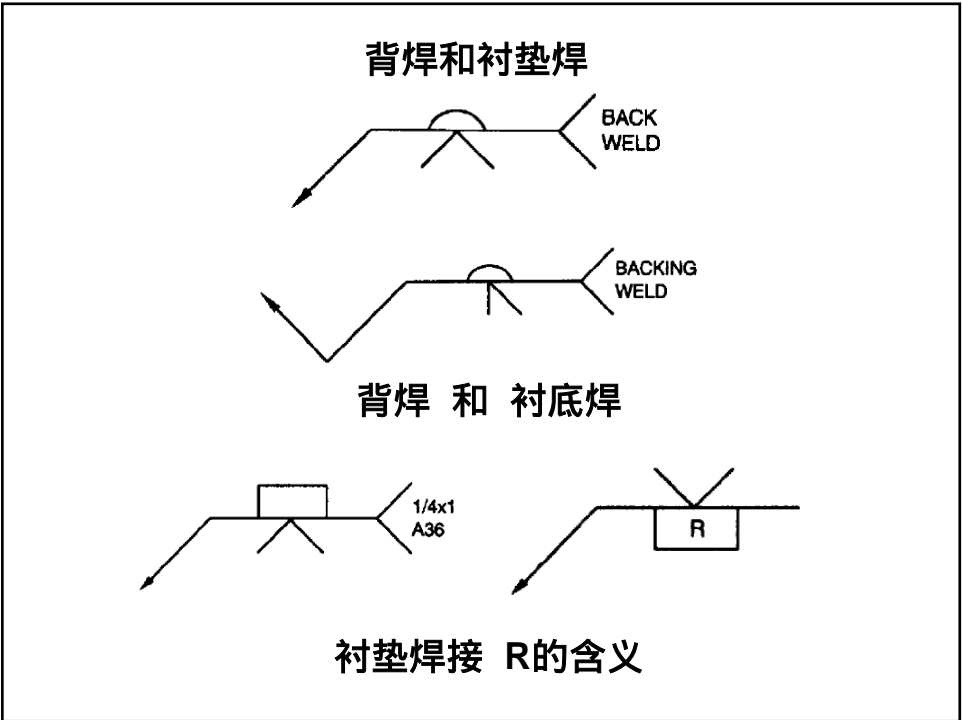
尺寸标注

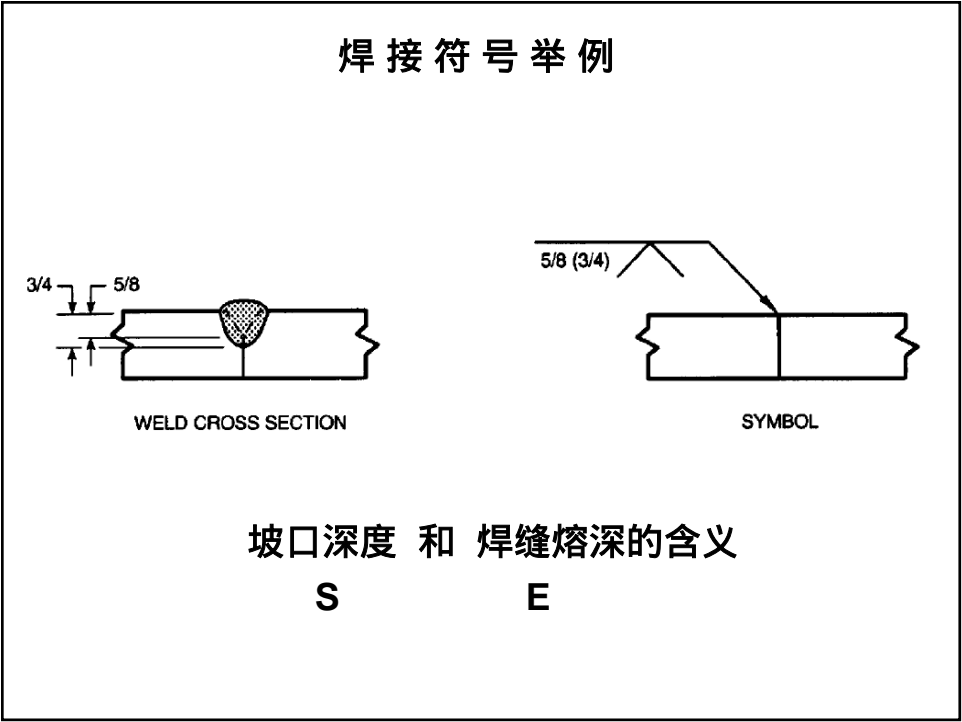
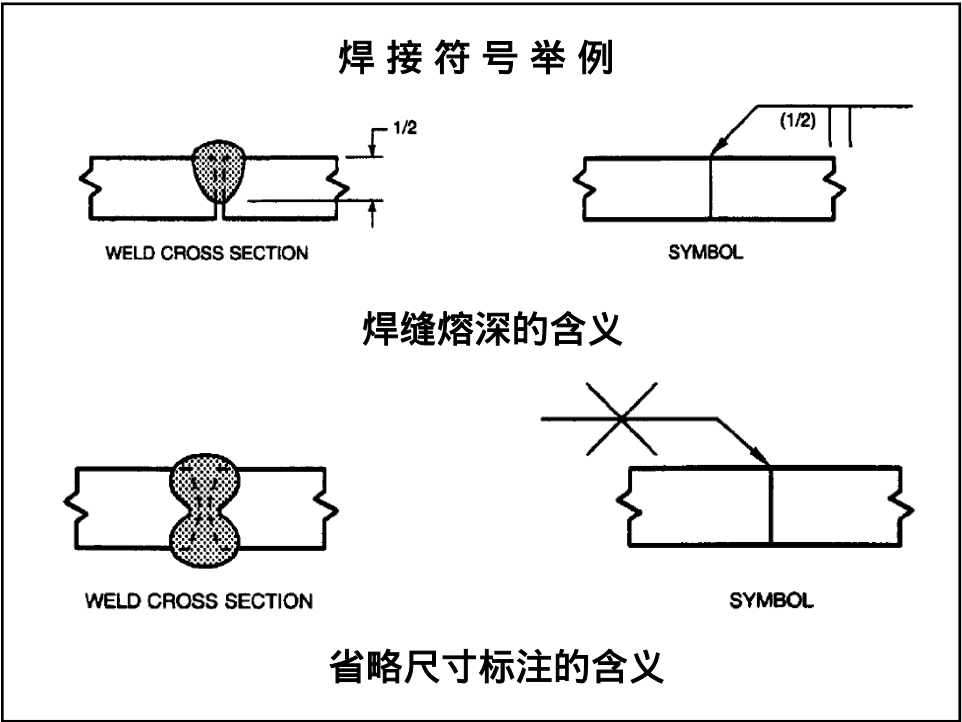


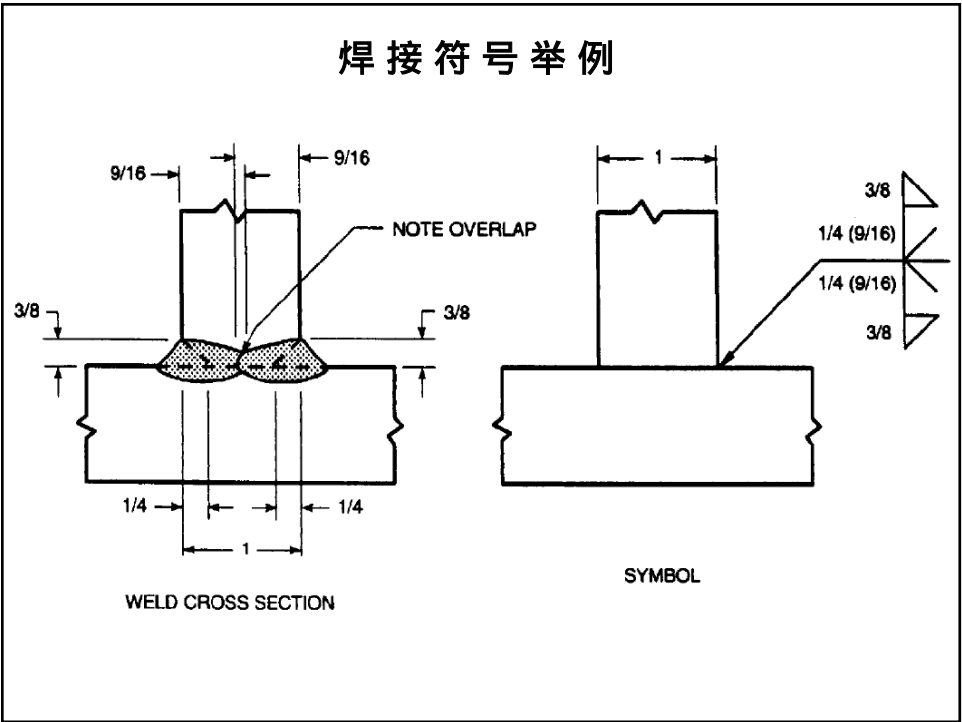
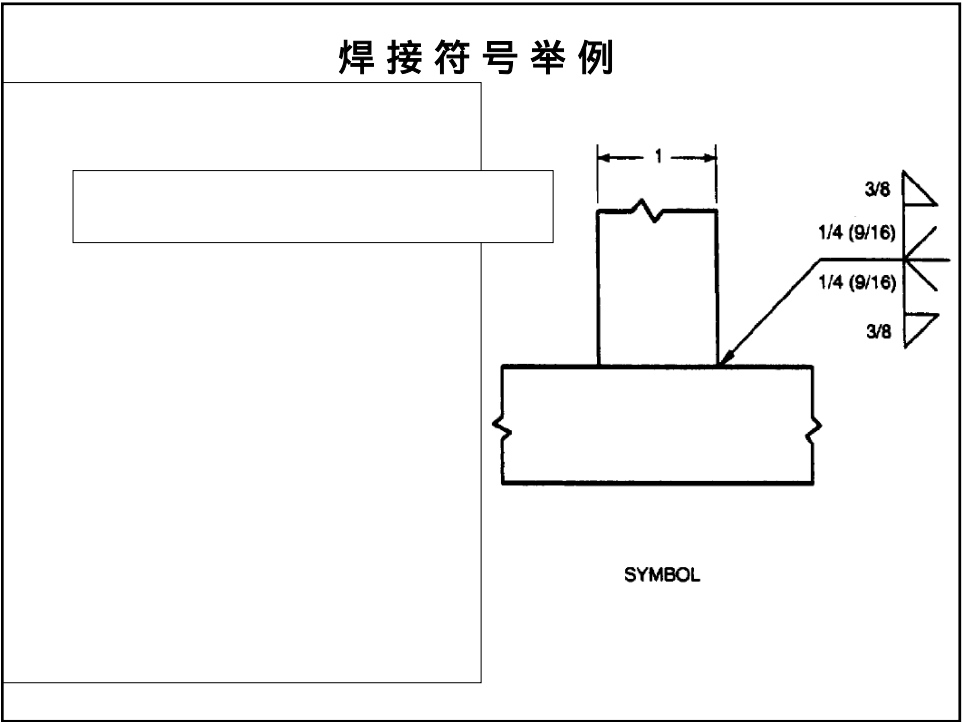
各项尺寸标注的位置

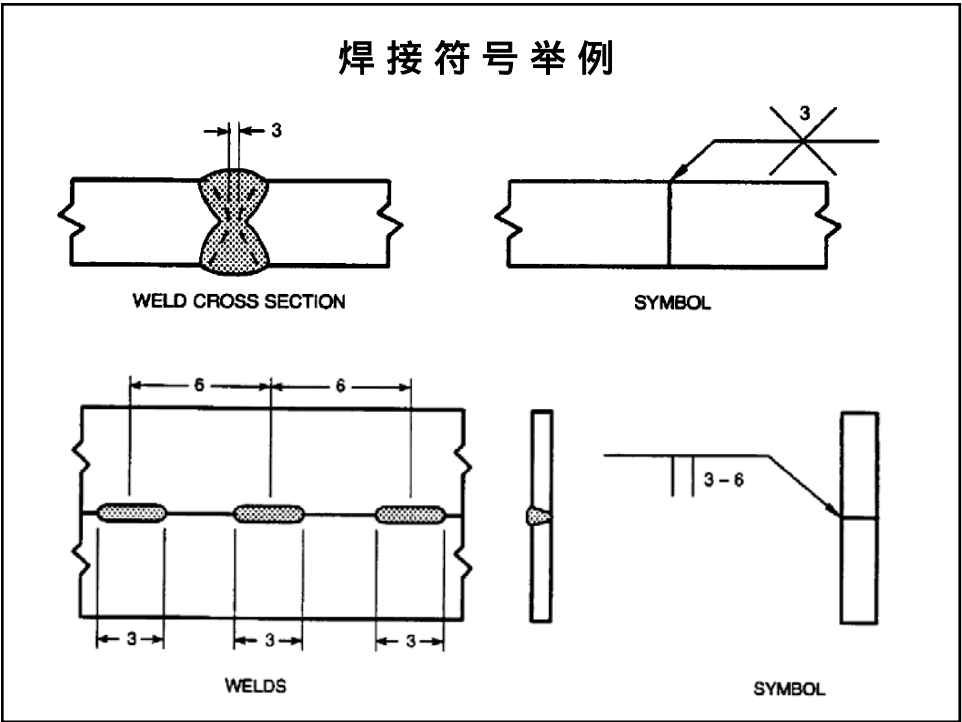
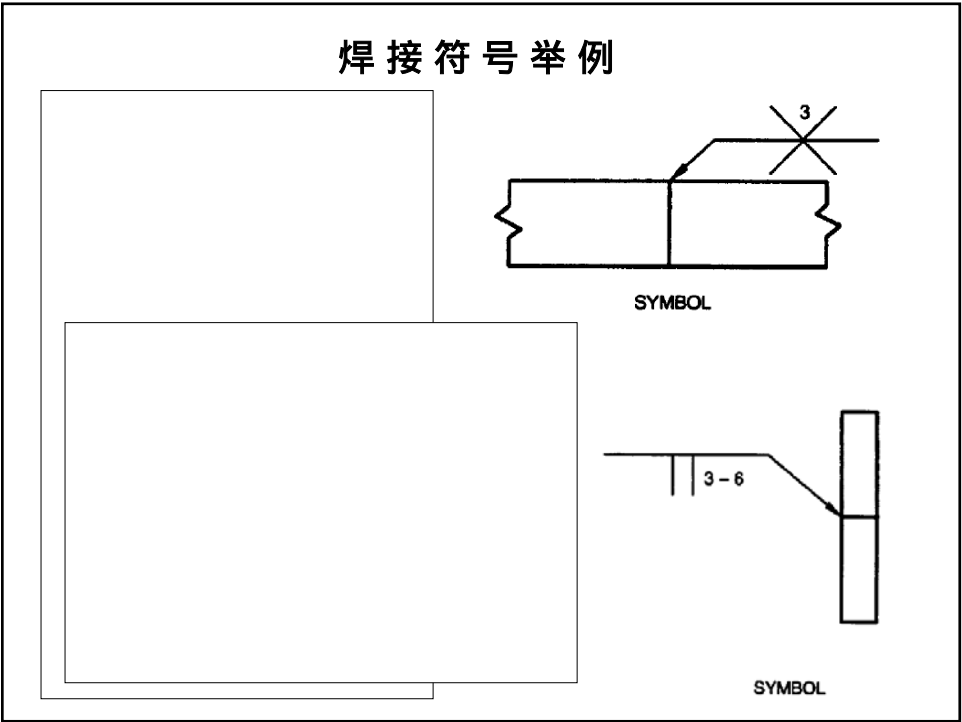


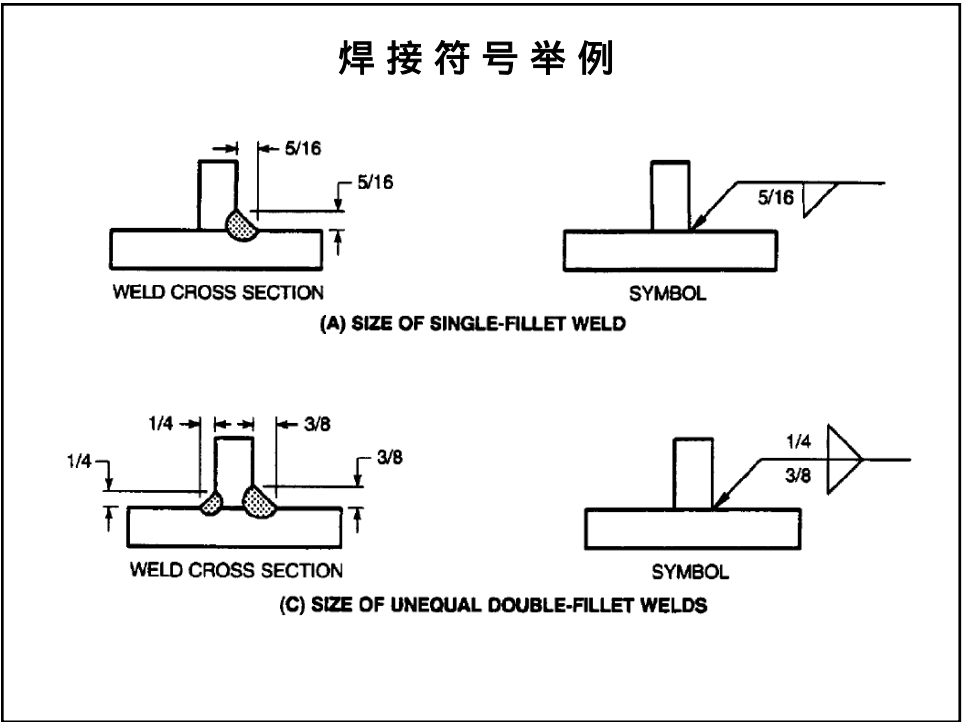
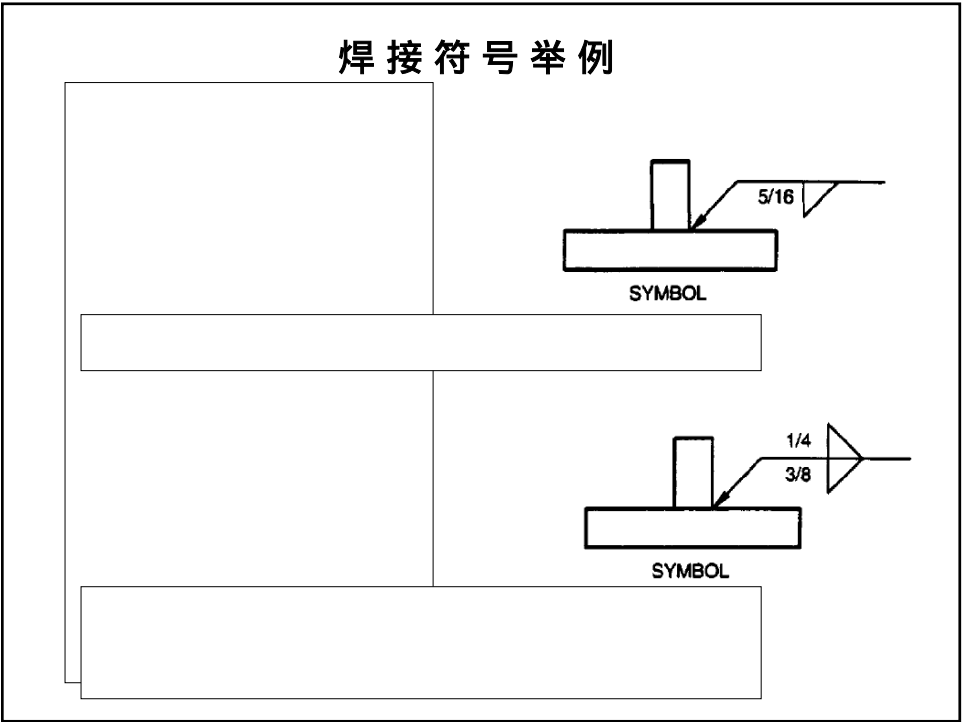


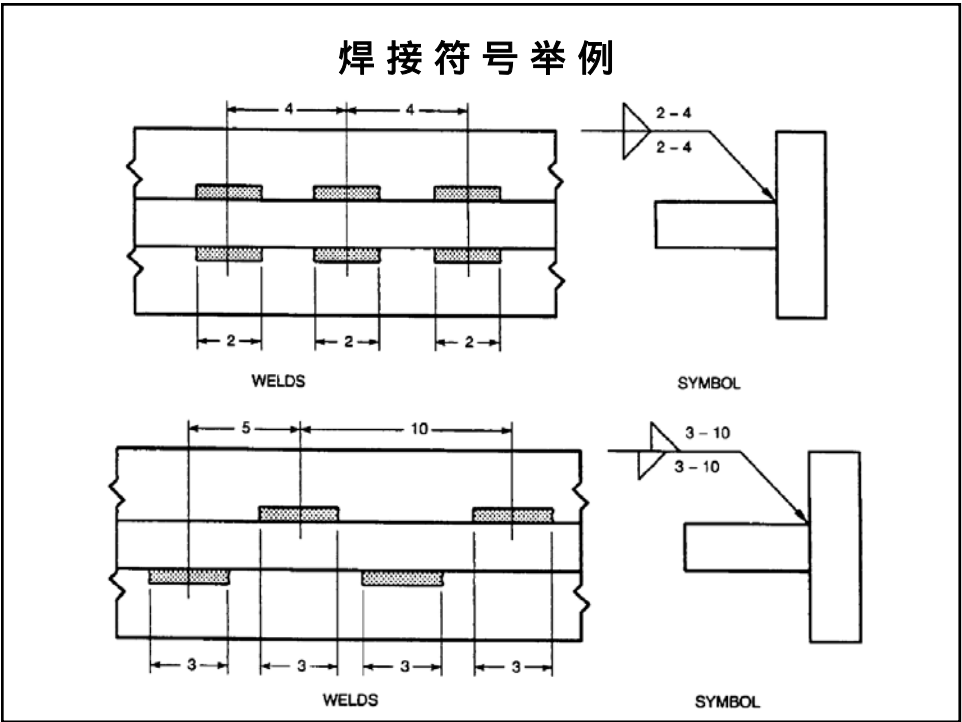
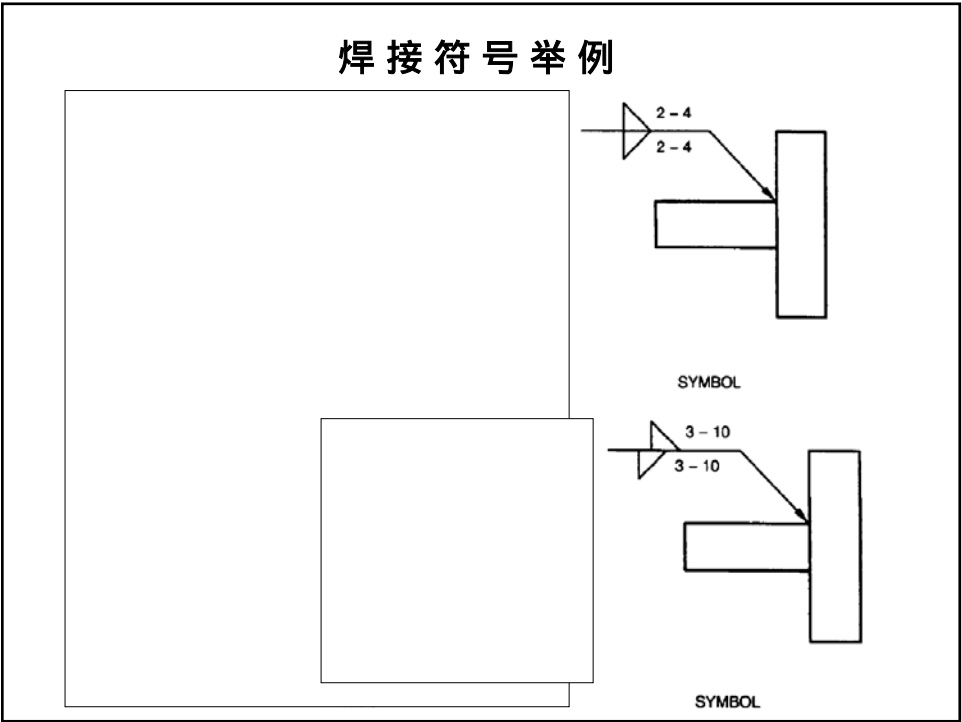




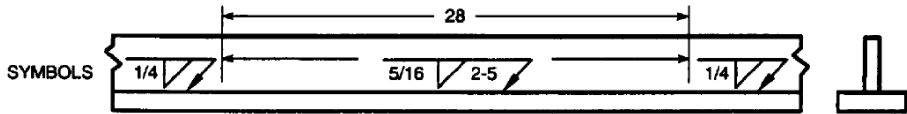
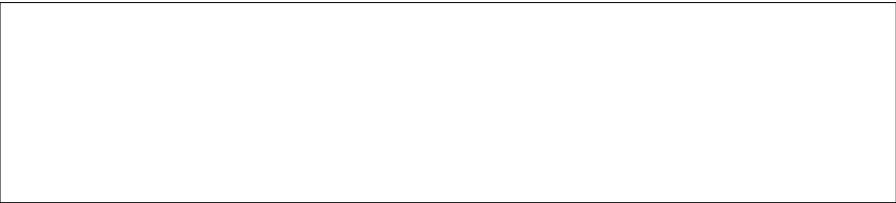




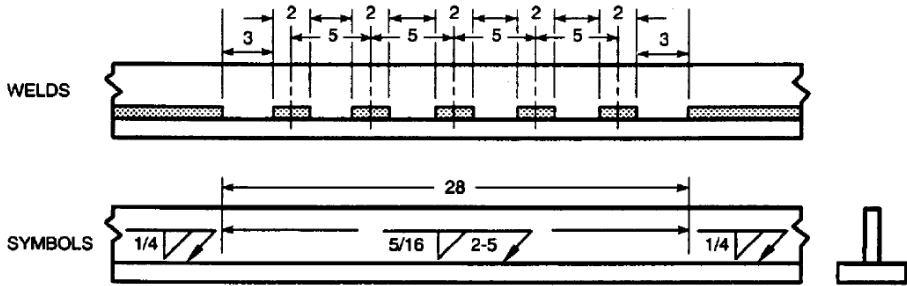


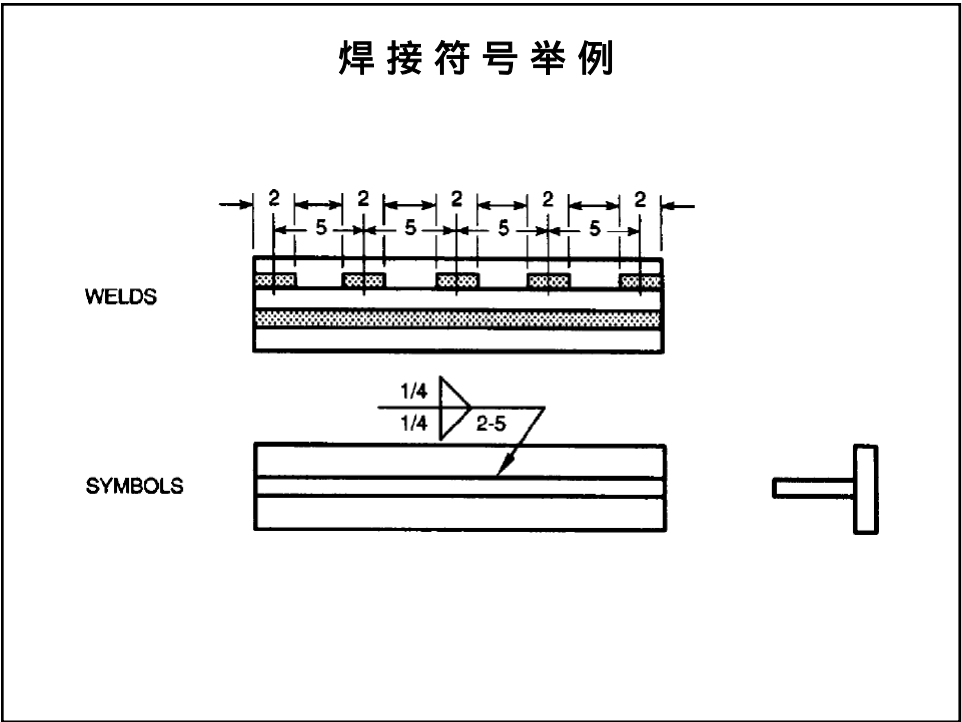
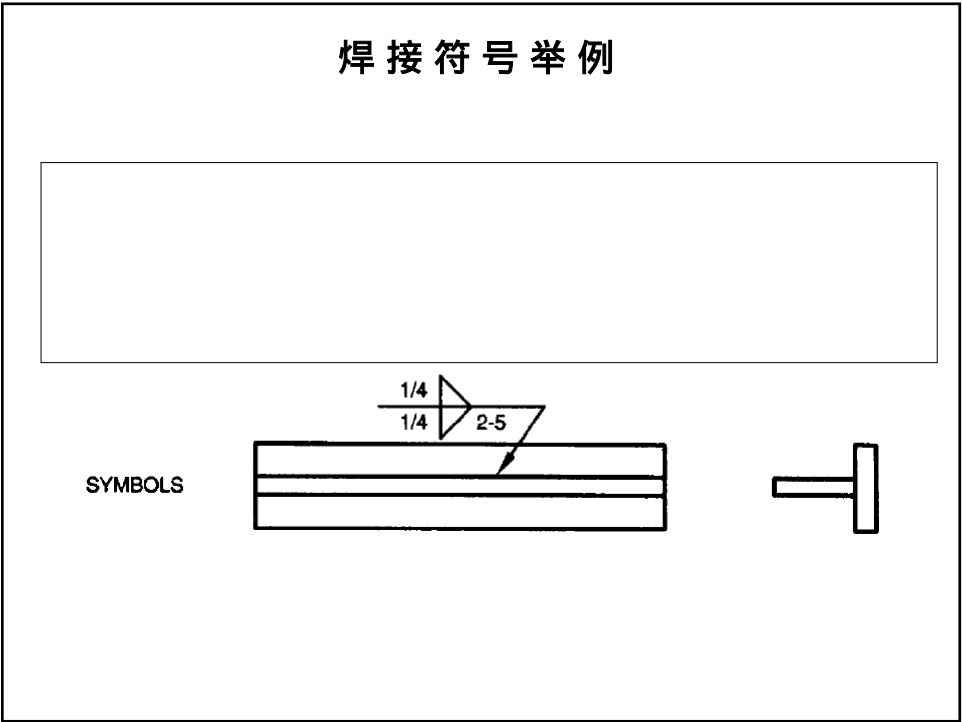


焊接符号举例

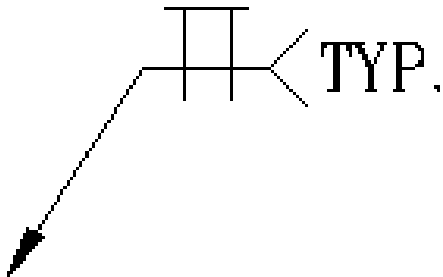


焊接符号举例



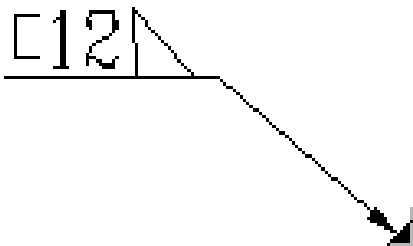


焊接符号举例



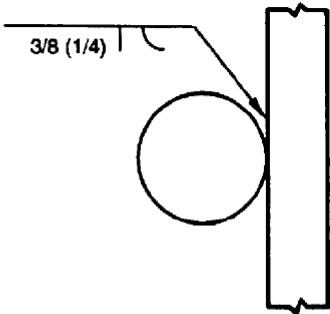
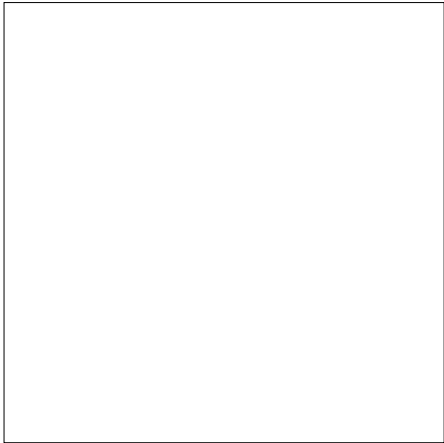
此符合的含义？
TYP. 的含义

焊接符号举例



含义？

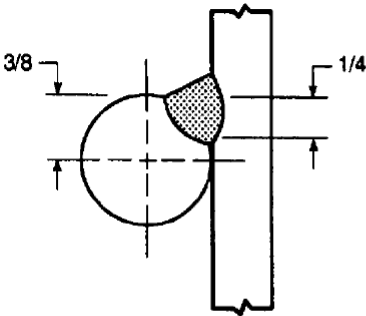
焊接符号举例



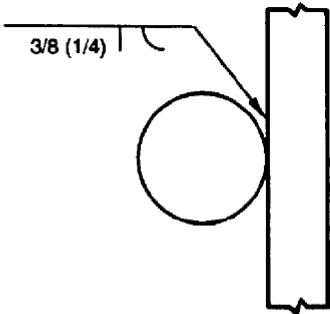
SYMBOL

(D) SINGLE-FLARE-BEVEL-GROOVE WELD

焊接符号举例



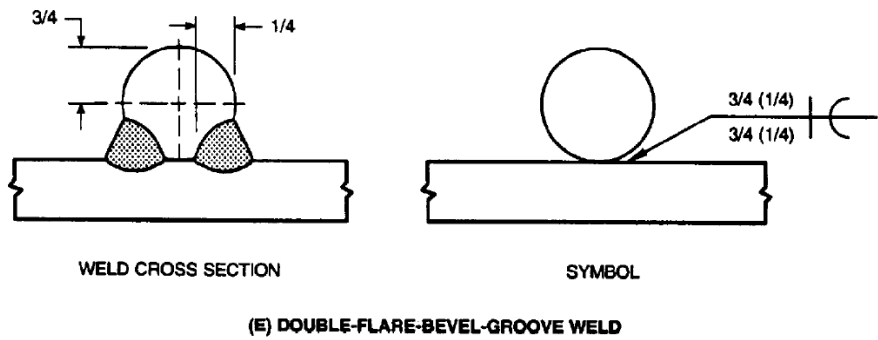
WELD CROSS SECTION



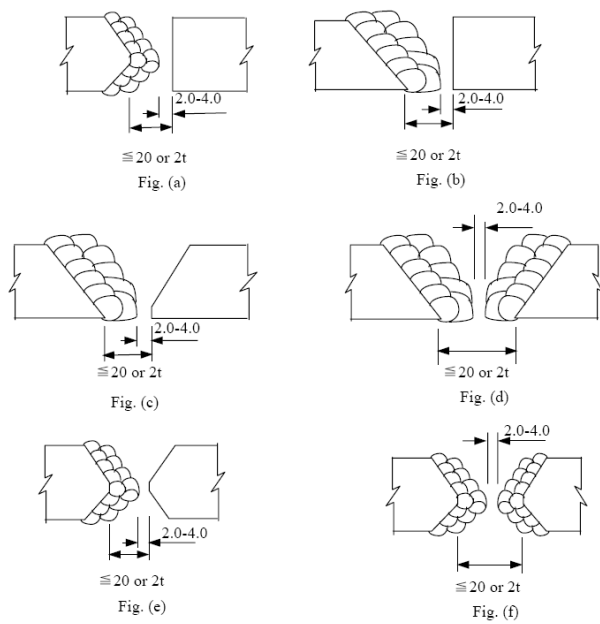
SYMBOL

(D) SINGLE-FLARE-BEVEL-GROOVE WELD

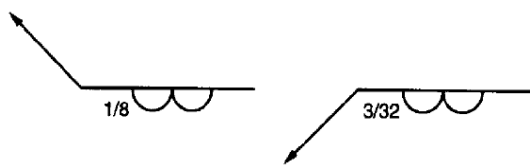
焊接符号举例



表面堆焊

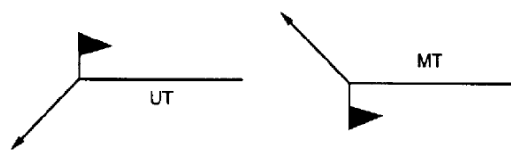


焊接符号举例



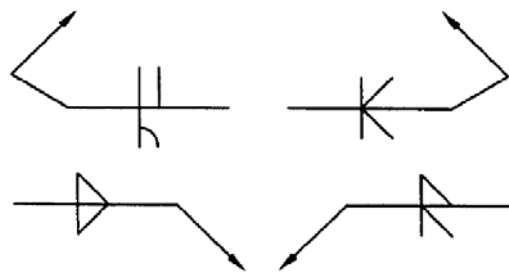
表面堆焊
Surfacing welding

检验符号举例



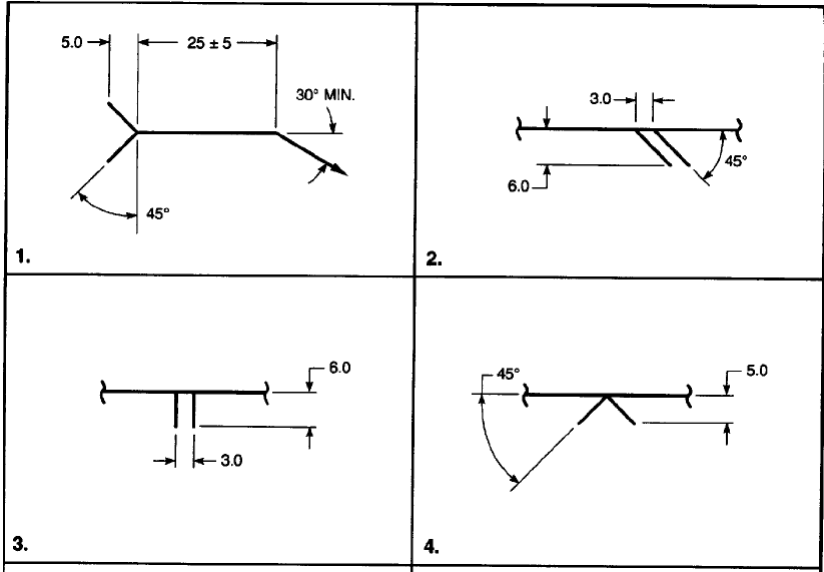
与焊接符号类似

画法注意事项

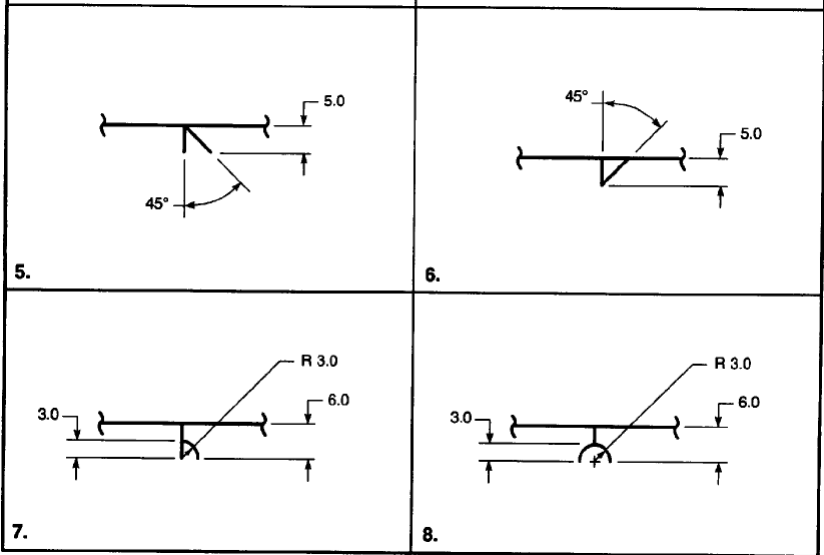


焊缝符号中垂直于基准线的直线始终在左边

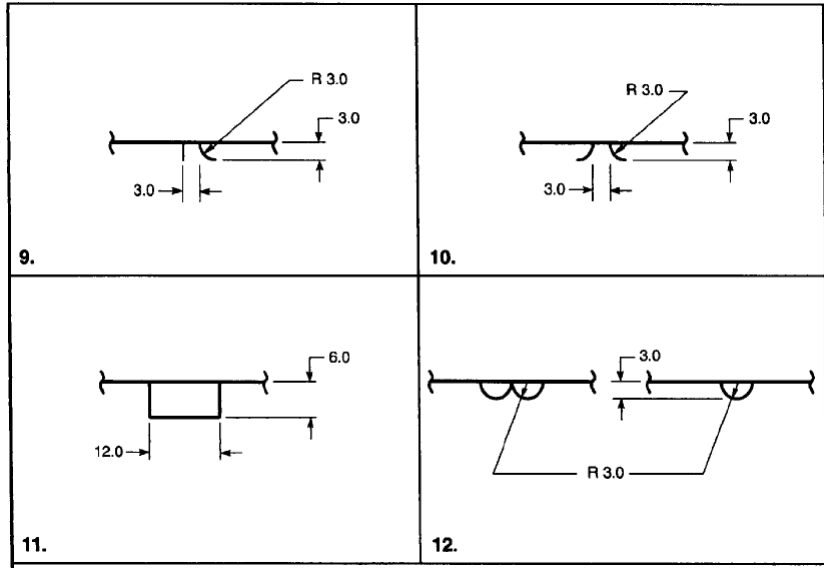
标准焊接符号尺寸



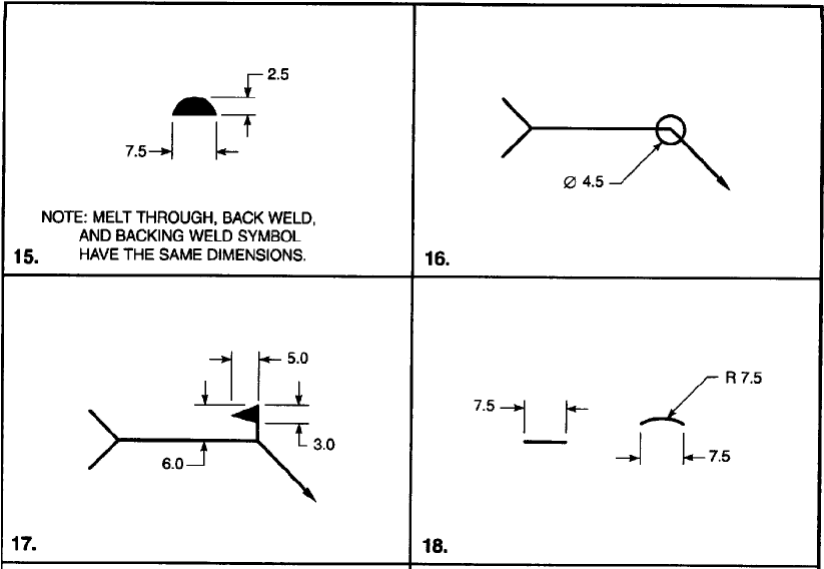
标准焊接符号尺寸



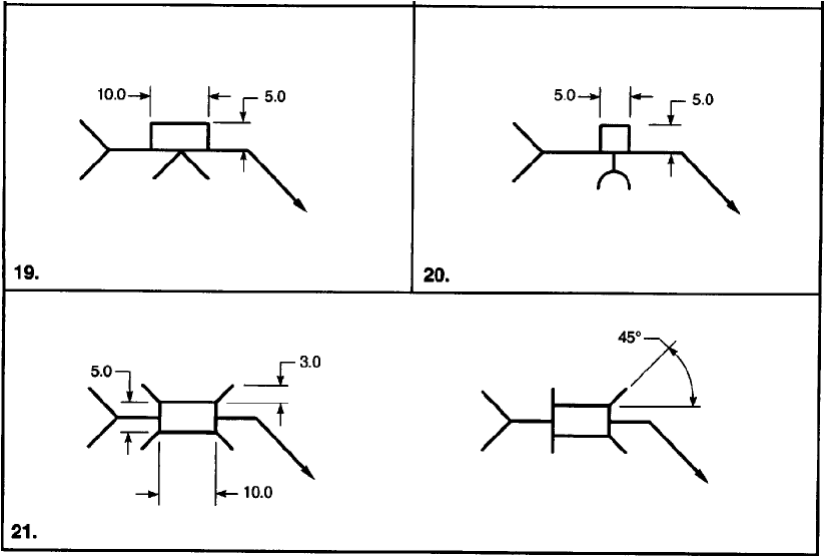
标准焊接符号尺寸



标准焊接符号尺寸



标准焊接符号尺寸



常用的焊接方法

- ☐ SAW 埋弧焊
- ☐ SMAW 手工电弧焊
- ☐ FCAW 药芯焊
- ☐ GTAW 氩弧焊
- ☐ GMAW 熔化极气体保护焊

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常用的无损检测方法

- ☐ VT 外观检验
- ☐ RT 射线检验（体积型缺陷）
- ☐ UT 超声波检验（体积和面积型缺陷）
- ☐ AUT 全自动超声波检验（非常敏感）
- ☐ MT 磁粉检验（表面缺陷）
- ☐ PT 渗透检验（表面缺陷，非铁素体材料）

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可参考的资料

1. AWS A2.4 Standard Symbols for Welding, Brazing, and Nondestructive Examination
2. Welding Handbook - AWS
3. GB 324-88 焊缝符号表示法

美标和国标之间的差异

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谢谢！

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