UNIONES SOLDADAS

ESFUERZOS PERMISIBLES EN CORDONES DE SOLDADURA DE FILETE REFERIDOS A LOS LADOS DEL FILETE

ELECTRODO	ESFUERZO PERMISIBLE S_w (PSI)	
	AWS D2.0-69	AWS Obsoleto
E-60XX	12700	9600
E-70XX	14800	11100
E-80XX	17000	12800
E-90XX	19100	14400
E-100XX	21200	16000
E-110XX	23300	17600

TABLA Nº1

REQUERIMIENTOS MINIMOS DEL MATERIAL DE APORTE SEGÚN AWS

ELECTRODO AWS	ESFUERZO DE ROTURA MINIMO EN KPSI	ESFUERZO DE FLUENCIA MINIMO,KPSI	ELONGACION %
E-60XX	62-67	50-55	17, 22, 25
E-70XX	72	60	17, 22
E-80XX	80	65-70	22, 24
E-90XX	90	78-90	24
E-100XX	100	90-102	20
E-110XX	110	95-107	20

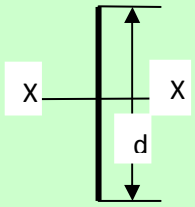
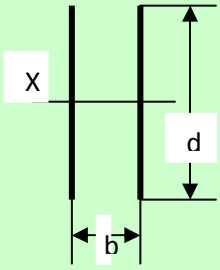
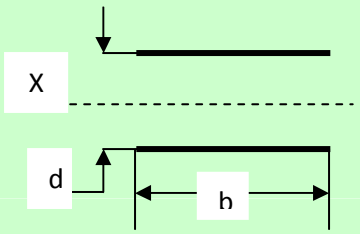
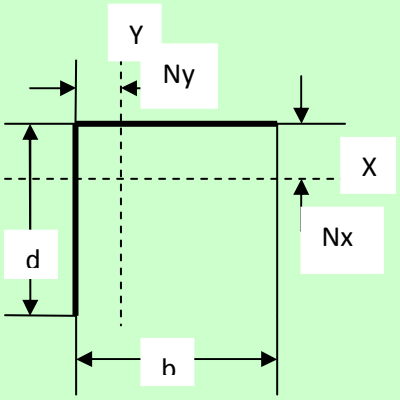
TABLA Nº2

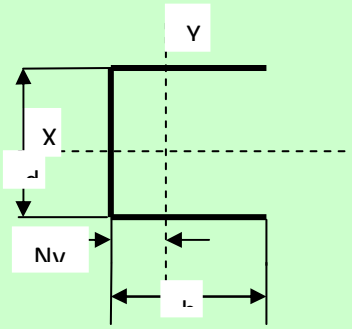
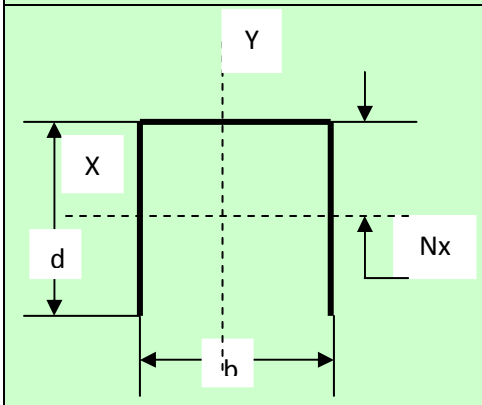
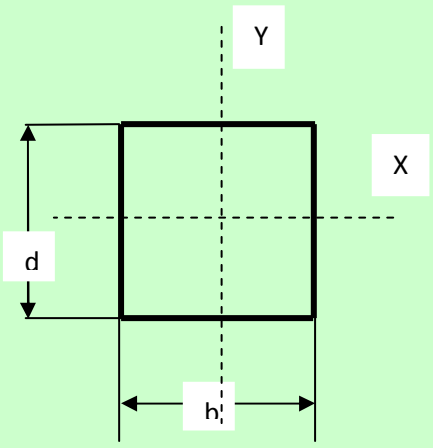
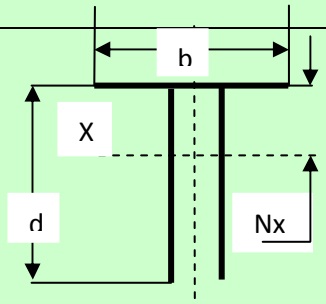
TAMAÑO MINIMO DEL CORDON DE FILETE

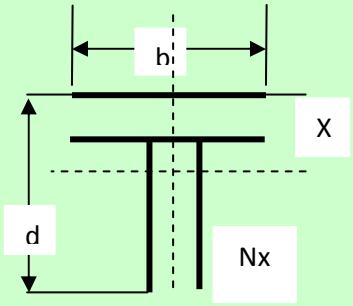
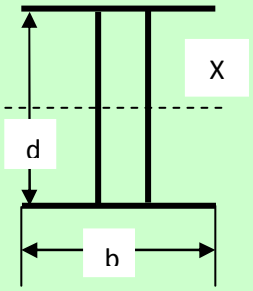
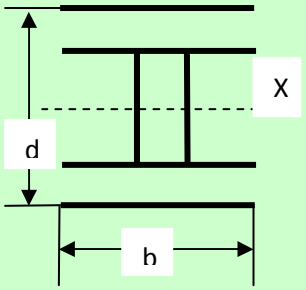
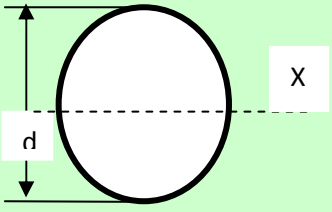
ESPESOR DE LA PLANCHA MAS GRUESA EN PULGADAS	TAMAÑO MINIMMO DEL CORDON DE FILETE EN PULGADAS
t≤1/4	1/8
1/4<t≤1/2	3/16
1/2<t≤3/4	¼
3/4<t≤1 1/2	5/16
1 1/2<t≤2 1/4	3/8
2 1/4<t≤6	½
t>6	5/8

TABLA Nº3

PROPIEDADES DEL CORDON DE SOLDADURA TRATADO COMO LINEA

SECCION	Nx, Ny	FLEXION Zw RESPECTO X-X	TORSION Jw
	$Nx = \frac{d}{2}$	$\frac{d^2}{6}$	$\frac{d^3}{12}$
	$Nx = \frac{d}{2}$	$\frac{d^2}{3}$	$\frac{d(3b^2 + d^2)}{6}$
	$Nx = \frac{d}{2}$	bd	$\frac{b(3d^2 + b^2)}{6}$
	$Nx = \frac{b^2}{2(b+d)}$ $Nx = \frac{d^2}{2(b+d)}$	$\frac{4bd + d^2}{6}$ (sup) $\frac{d^2(4b+d)}{6(2b+d)}$ (inf)	$\frac{(b+d)^4 - 6b^2d^2)}{12(b+d)}$

SECCION	Nx,Ny	FLEXION Zw RESPECTO X-X	TORSION Jw
	$Nx = \frac{b^2}{2b+d}$	$bd + \frac{d^2}{6}$	$\frac{(2b+d)^2}{12} - \frac{b^2(b+d)^2}{2b+d}$
	$Nx = \frac{d^2}{2d+b}$	$\frac{2bd+d^2}{3}$ (sup) $\frac{d^2(2b+d)}{3(b+d)}$ (inf)	$\frac{(b+2d)^3}{12} - \frac{d^2(b+d)^2}{b+2d}$
	$Nx = \frac{d}{2}$	$bd + \frac{d^2}{3}$	$\frac{(b+d)^3}{6}$
	$Nx = \frac{d^2}{2d+b}$	$\frac{2bd+d^2}{3}$ (sup) $\frac{d^2(2b+d)}{3(b+d)}$ (inf)	$\frac{(b+2d)^3}{12} - \frac{d^2(b+d)^2}{b+2d}$

SECCION	NX,Ny	FLEXION Zw RESPECTO X-X	TORSION Jw
	$Nx = \frac{d^2}{2(d+b)}$	$\frac{4bd + d^2}{3}$ (sup) $\frac{4bd^2 + d^3}{6b + 3d}$ (inf)	$\frac{d^3(4b+d)}{6(b+d)} + \frac{b^3}{6}$
	$Nx = \frac{d}{2}$	$bd + \frac{d^2}{3}$	$\frac{b^3 + 3bd^2 + d^3}{6}$
	$Nx = \frac{d}{2}$	$2bd + \frac{d^2}{3}$	$\frac{2b^3 + 6bd^2 + d^3}{6}$
	$Nx = \frac{d}{2}$	$\frac{\pi d^2}{4}$	$\frac{\pi d^3}{4}$

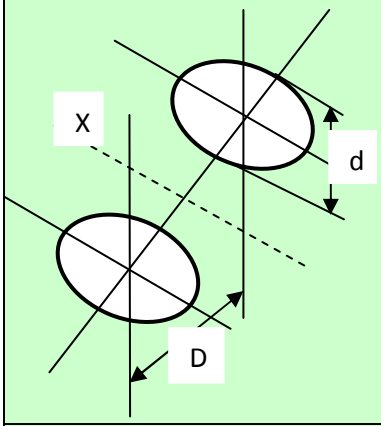
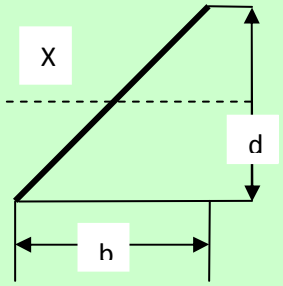
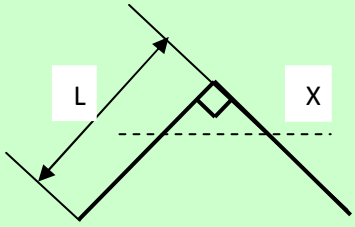
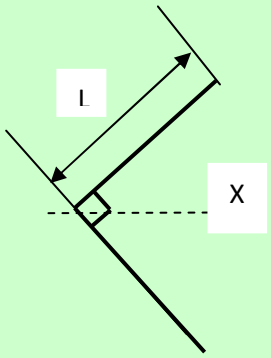
SECCION	Nx,Ny	FLEXION Zw RESPECTO X-X	TORSION Jw
	$Nx = \frac{d}{2}$	$\frac{\pi d^{2}}{2} + \pi D^{2}$	$J_{wz} = \frac{\pi d^{3}}{2}$
	$Nx = \frac{d}{2}$	$\frac{Ld}{6}$	$\frac{L^{3}}{12}$
	$Nx = \frac{L}{2\sqrt{2}}$	$\frac{L^{2}}{3\sqrt{2}}$	$\frac{5\,L^{3}}{12}$
	$Nx = \frac{L}{\sqrt{2}}$	$\frac{2L^{2}}{3\sqrt{2}}$	$\frac{5\,L^{3}}{12}$

TABLA Nº4

SELECCIÓN DE LA LONGITUD Y EL PASO DEL CORDON DE SOLDARURA INTERMITENTE DE FILETE

R %	LONGITUD Y PASO ENTRE CORDONES (PULGS.)		
75	---	3-4	---
66	---	---	4-6
60	---	3-5	---
57	---	---	4-7
50	2-4	3-6	4-8
44	---	---	4-9
43	---	3-7	---
40	2-5	---	4-10
37	---	3-8	---
33	2-6	3-9	4-12
30	---	3-10	---
25	2-8	3-12	---
20	2 -10	---	---
16	2-12	---	---

TABLA Nº5

ESFUERZOZ PERMISIBLES DE FATIGA AWS D2.0-69(KPSI)

LOCALIZACION	TIPO DE CARGA	≤100000 CICLOS	>100000 A 500000 CICLOS	>500000 A 2000000 CICLOS
En metal base de conexiones a la alma con cordón de soldadura de filete	Tracción	$\frac{20.5}{1-0.49K}$	$\frac{20.0}{1-0.55K}$	$\frac{20.0}{1-0.55K}$
En metal de aporte y en metal base adyacentes a cordones longitudinales soldadas a tope	Compresión	$\frac{19.8}{1-0.49K}$	$\frac{19.8}{1-0.49K}$	$\frac{19.8}{1-0.49K}$
En material de aporte y en metal base adyacentes acordones de soldadura soldados a tope	Tracción	$\frac{20.5}{1-0.55K}$	$\frac{17.2}{1-0.62K}$	$\frac{15.0}{1-0.67K}$
	Compresión	$\frac{19.8}{1-0.49K}$	$\frac{19.8}{1-0.87K}$	$\frac{19.8}{1-1.20K}$
En metal base unidos con soldadura de filete	Tracción Compresión	$\frac{15.0}{1-0.70K}$	$\frac{10.5}{1-0.80K}$	$\frac{8}{1-0.83K}$
Metal de aporte	corte	$\frac{12.0}{1-0.50K}$	$\frac{10.8}{1-0.55K}$	$\frac{9}{1-0.62K}$

Fuente: Diseño de elementos de máquinas del Ing. Fortunato Alva Dávila