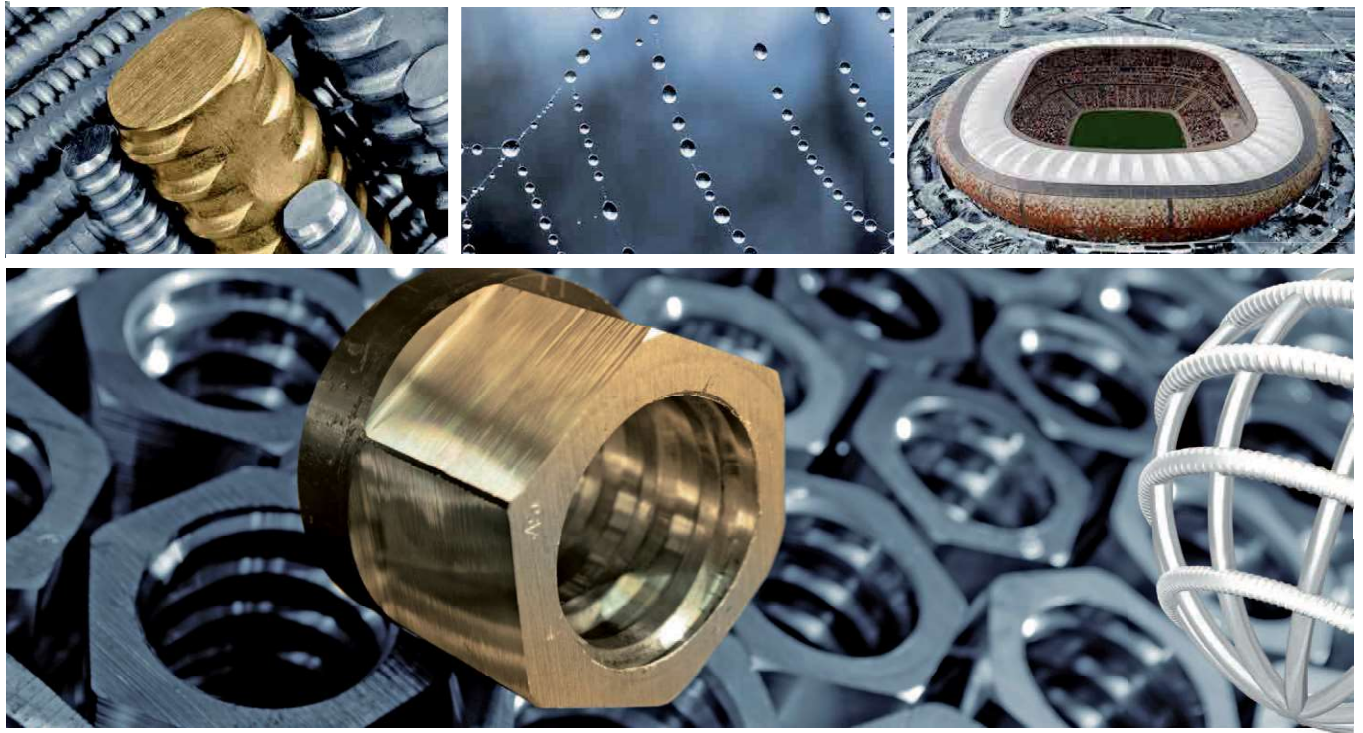


Catálogo / catalogue

SAS 950 / 1050 Ø 18 - 47 mm

SAS 835 / 1035 Ø 57 - 75 mm

SAS 950 / 1050 Ø 32, 36 mm lisa / smooth



SAS SYSTEMS

artículo WR item WR	denominación specification	Ø [mm]								
		18	26,5	32	36	40	47	57	65	75
SAS 950/1050 SAS 835/1035	SAS barra tensora, laminada en caliente, de paso derecho <i>SAS stress bar, hot rolled, right hand thread</i>	EU •	EU •	EU •	EU •	EU •	EU ○	○	○	○
WR 1928	placa de anclaje 30° <i>anchor plate cone 30°</i>	○	○	○	○	○	○	○	○	○
WR 2001	tuerca con asiento esférico 55° <i>domed nut 55°</i>	EU	EU	EU	EU	EU	EU	-	-	-
WR 2002	tuerca de anclaje recta <i>anchor nut flat</i>	○	○	○	○	○	○	○	○	○
WR 2002 EP	tuerca de anclaje EP recta <i>anchor nut flat EP</i>	○	○	○	○	○	○	○	○	○
WR 2011	placa de anclaje cuadrada 55° <i>anchor plate square 55°</i>	EU	EU	EU	EU	EU	EU	-	-	-
WR 2012	placa de anclaje rectangular 55° <i>anchor plate rectangular 55°</i>	EU	EU	EU	EU	EU	EU	-	-	-
WR 2074	placa QR <i>QR plate</i>	-	EU	EU	EU	EU	-	-	-	-
WR 2099	tuerca de collar esférico 55° con ranuras para inyección <i>domed nut 55° with grout slots</i>	EU	EU	EU	EU	EU	EU	-	-	-
WR 2139	placa de anclaje recta <i>anchor plate flat</i>	○	○	○	○	○	○	○	○	○
WR 2927	tuerca anular <i>ring nut</i>	○	○	○	○	○	○	-	-	-
WR 2963	tuerca de anclaje abombada 30° <i>bull nose nut 30°</i>	○	○	○	○	○	○	○	○	○
WR 2963 EP	tuerca de anclaje EP, abombada 30° <i>bull nose nut EP 30°</i>	○	○	○	○	○	○	○	○	○
WR 3003	manguito estándar <i>coupler standard</i>	EU	EU	EU	EU	EU	EU	○	○	○
WR 3003 EP	manguito estándar EP <i>coupler standard EP</i>	○	○	○	○	○	○	○	○	○
WR 3009	manguito hexagonal <i>hexagonal coupler</i>	○	○	○	○	○	-	-	-	-
WR 3009 EP	manguito hexagonal EP <i>hexagonal coupler EP</i>	○	○	○	○	○	-	-	-	-
WR 3303	manguito largo <i>coupler long</i>	EU	EU	EU	EU	EU	EU	-	-	-
WR 5005	tuerca de retención <i>fix nut</i>	○	○	○	○	○	○	○	○	○
WR 5005 EP	tuerca de retención EP <i>fix nut EP</i>	○	○	○	○	○	○	○	○	○
WR 8002	anclaje tensor <i>stressing anchorage</i>	○	○	○	○	○	○	○	○	○
WR 8003	manguito tensor <i>stressing coupler</i>	○	○	○	○	○	○	○	○	○

EU disponible - conforme a ETA 05/122 / available - acc. to ETA 05/122

• disponible - acero de pretensado homologado por DIBt (Instituto Alemán para la Técnica de Construcción) / available - prestressing steel approved by DIBt, for PT system please refer to German application document

○ disponible / available

artículo WR item WR	denominación specification	Ø [mm]							
		18	26,5	32	36	40	47	57	65
SAS 950/1050 SAS 835/1035	SAS barra tensora, laminada en caliente, de paso derecho SAS stress bar, hot rolled, right hand thread	-	-	•	•	-	-	-	-
WS 1928	placa de anclaje 30° anchor plate cone 30°	-	-	o	o	-	-	-	-
WS 2001	tuerca con asiento esférico 55° domed nut 55°	-	-	EU	EU	-	-	-	-
WS 2002	tuerca de anclaje recta anchor nut flat	-	-	o	o	-	-	-	-
WS 2011	placa de anclaje cuadrada 55° anchor plate square 55°	-	-	EU	EU	-	-	-	-
WS 2012	placa de anclaje rectangular 55° anchor plate rectangular 55°	-	-	EU	EU	-	-	-	-
WS 2099	tuerca con asiento esférico 55° con muescas por inyección domed nut 55° with grout slots	-	-	EU	EU	-	-	-	-
WS 2927	tuerca anular ring nut	-	-	o	o	-	-	-	-
WS 2963	tuerca de anclaje abombada 30° bull nose nut 30°	-	-	o	o	-	-	-	-
WS 3003	manguito estándar coupler standard	-	-	EU	EU	-	-	-	-
WS 3004	manguito de junta transition coupler	-	-	EU	EU	-	-	-	-
WS 5005	tuerca de retención fix nut	-	-	o	o	-	-	-	-
WS 8004	manguito tensor stressing coupler	-	-	o	o	-	-	-	-

EU disponible - conforme a ETA 05/122 / available - acc. to ETA 05/122

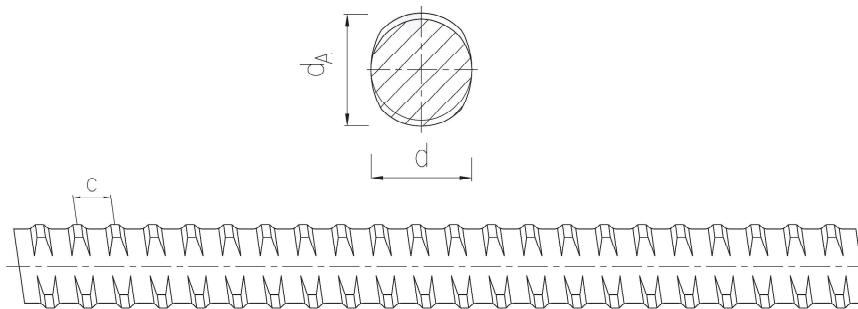
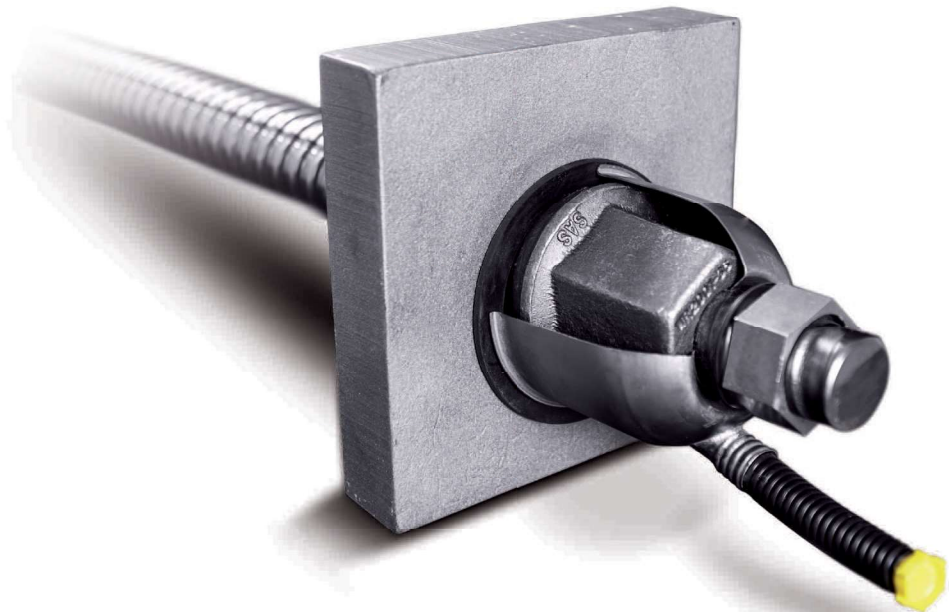
- disponible - acero de pretensado homologado por DIBt (Instituto Alemán para la Técnica de Construcción) / available - prestressing steel approved by DIBt, for PT system please refer to German application document
- o disponible / available

Los pesos indicados son valores promedio. Los pesos reales pueden variar por tolerancias de fabricación. / Weight specifications are average values. The actual values may deviate due to fabrication tolerances.

SAS barra tensora / SAS stress bars

SAS 950 / 1050 Ø 18 - 47 mm

SAS 835 / 1035 Ø 57 - 75 mm



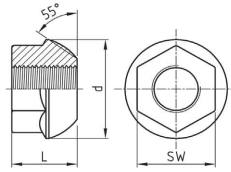
SAS barra tensora
laminada en caliente, corrugada - de paso derecho

SAS stress bar
hot rolled, ribbed - right hand thread

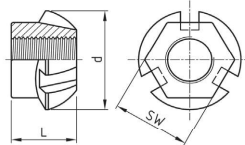
d	[mm]	18	26,5	32	36	40	47	57	65	75
max d _A	[mm]	21	31	37	42	46	53	64	72	82
c	[mm]	8	13	16	18	20	21	21	21	24
$f_{p0,1} k/f_{pk}/A_{10}^{-1}$		950 N/mm ² / 1050 N/mm ² / ≥ 7 %						835 N/mm ² / 1035 N/mm ² / ≥ 7 %		
F _{yk} (F _{0,1k})	[kN]	230	525	760	960	1190	1650	2155	2780	3690
F _{pk}	[kN]	255	580	845	1070	1320	1820	2671	3447	4572
A	[mm ²]	241	551	804	1020	1257	1735	2581	3331	4418
G	[kg/m]	1,96	4,48	6,53	8,27	10,21	14,10	20,95	27,10	35,90

1) Alargamiento de rotura con respecto al diámetro décuplo de la barra / ultimate elongation in a gauge length to 10 bar diameters

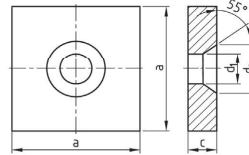
tuerca con asiento
esférico 55°
dome nut 55°



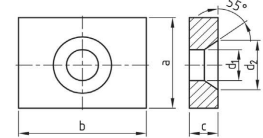
tuerca de collar esférico
55° mit con ranuras para
inyección
domed nut 55° with
grout slots



placa de anclaje
cuadrada 55°
anchor plate square 55°

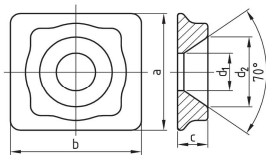


placa de anclaje
rectangular 55°
anchor plate rectangular 55°

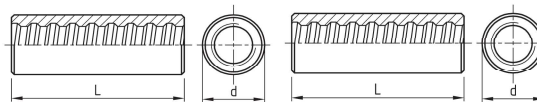


Ø [mm]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]	a x c x d, x d ₂ [mm]	[kg]	a x b x c x d, x d ₂ [mm]	[kg]
	WR 2001		WR 2099		WR 2011		WR 2012	
18	36 x 55 x 50	0,43	36 x 55 x 50	0,42	110 x 30 x 28 x 45	2,66	100 x 130 x 30 x 28 x 45	2,39
26,5	50 x 75 x 72	1,09	50 x 75 x 72	1,02	150 x 35 x 39 x 72	5,61	130 x 150 x 35 x 39 x 72	4,50
32	60 x 90 x 80	1,70	60 x 90 x 80	1,65	180 x 40 x 45 x 82	9,33	140 x 180 x 40 x 45 x 82	7,07
36	65 x 100 x 90	2,24	65 x 100 x 90	2,13	200 x 45 x 49 x 92	12,95	150 x 220 x 50 x 49 x 92	11,70
40	70 x 115 x 100	2,91	70 x 115 x 100	2,71	220 x 45 x 54 x 100	15,64	160 x 250 x 60 x 54 x 100	17,10
47	80 x 135 x 110	4,09	80 x 135 x 110	3,79	260 x 50 x 64 x 110	24,49	200 x 280 x 60 x 64 x 110	24,12
57	-	-	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-

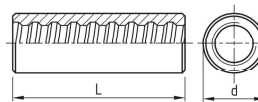
placa QR
QR plate



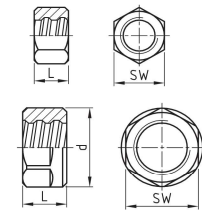
manguito estándar
coupler standard



manguito largo
coupler long

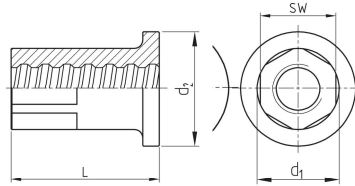


tuerca de retención
fix nut

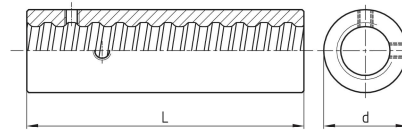


Ø [mm]	a x b x c x d, x d ₂ [mm]	[kg]	d x L [mm]	[kg]	d x L [mm]	[kg]	SW x L x d [mm]	[kg]
	WR 2074		WR 3003		WR 3303		WR 5005	
18	-	-	36 x 100	0,56	36 x 115	0,64	30 x 22	0,08
26,5	130 x 120 x 30 x 39 x 72	2,00	50 x 170	1,73	50 x 195	2,00	36 x 22	0,08
32	165 x 140 x 35 x 45 x 82	3,30	60 x 200	2,91	60 x 230	3,40	41 x 22	0,09
36	180 x 160 x 40 x 49 x 93	4,90	68 x 210	3,98	68 x 245	4,68	46 x 25	0,12
40	195 x 180 x 45 x 54 x 100	7,20	70 x 245	4,59	70 x 285	5,38	50 x 25	0,13
47	-	-	83 x 270	9,44	-	-	60 x 30	0,22
57	-	-	95 x 240	7,75	-	-	85 x 40 x 90	0,99
65	-	-	105 x 260	10,18	-	-	90 x 40 x 102	1,25
75	-	-	114 x 290	12,17	-	-	105 x 50 x 114	2,10

anclaje tensor
stressing anchorage

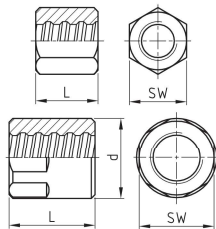


manguito tensor
stressing-coupler

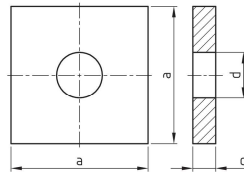


Ø [mm]	SW x L x d ₁ x d ₂ [mm]	[kg]	d ₁ x L [mm]	[kg]
	WR 8002		WR 8003	
18	41 x 70 x 45 x 65	0,82	45 x 100	1,00
26,5	46 x 90 x 50 x 70	1,15	45 x 150	1,17
32	50 x 110 x 56 x 70	1,31	53 x 180	1,88
36	55 x 120 x 60 x 80	1,80	58 x 200	2,43
40	55 x 130 x 65 x 80	1,91	65 x 220	3,44
47	65 x 140 x 75 x 90	2,83	75 x 240	4,87
57	90 x 160 x 100 x 110	6,75	95 x 270	9,40
65	100 x 180 x 120	9,53	108 x 290	12,39
75	105 x 200 x 133	12,28	120 x 320	15,47

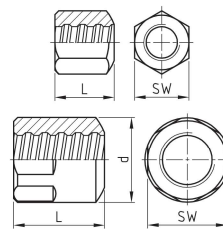
tuercas de anclaje recta
anchor nut flat



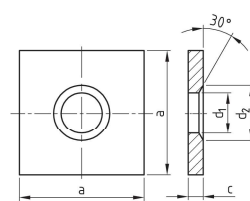
placa de anclaje recta
anchor plate flat



tuercas de anclaje 30°
bull nose nut 30°

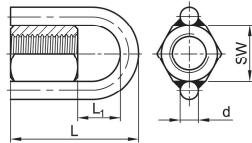


placa de anclaje cono 30°
anchor plate cone 30°

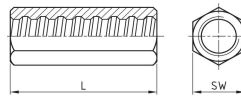


Ø [mm]	SW x L x d [mm]	[kg]	a x c x d [mm]	[kg]	SW x L x d [mm]	[kg]	a x c x d1 x d2 [mm]	[kg]
	WR 2002		WR 2139		WR 2963		WR 1928	
18	41 x 60	0,54	120 x 20 x 25	2,20	41 x 60	0,52	120 x 20 x 25 x 35	2,18
26,5	46 x 80	0,73	150 x 35 x 32	5,90	46 x 80	0,71	150 x 35 x 32 x 45	5,95
32	55 x 90	1,17	180 x 40 x 38	9,82	55 x 90	1,14	180 x 40 x 38 x 50	9,81
36	60 x 110	1,63	200 x 45 x 45	13,57	60 x 110	1,59	200 x 45 x 45 x 60	13,55
40	70 x 120	2,56	220 x 45 x 50	16,40	70 x 120	2,49	220 x 45 x 50 x 70	16,36
47	80 x 140	3,65	240 x 55 x 58	23,73	80 x 140	3,54	240 x 55 x 58 x 80	23,67
57	90 x 120 x 95	3,72	285 x 65 x 70	39,48	90 x 120 x 95	3,65	285 x 65 x 70 x 90	39,30
65	100 x 130 x 105	4,75	325 x 70 x 78	55,42	100 x 130 x 105	4,59	325 x 70 x 78 x 110	55,50
75	105 x 145 x 114	5,57	370 x 80 x 88	82,15	105 x 145 x 114	5,41	370 x 80 x 88 x 120	82,00

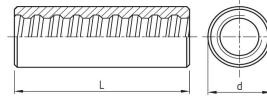
tuerca anular (Carga máxima de uso del anillo 60 kN)
ring nut (working load of ring max. 60 kN)



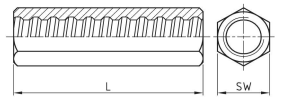
manguito hexagonal hexagonal coupler



manguito EP estándar coupler EP standard

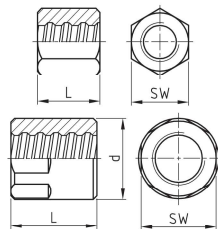


manguito hexagonal EP hexagonal coupler EP

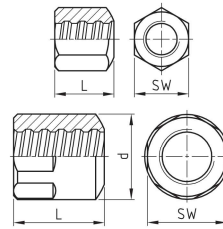


Ø [mm]	SW x L x L ₁ [mm]	[kg]	SW x L [mm]	[kg]	d x L [mm]	[kg]	SW x L [mm]	[kg]
	WR 2927		WR 3009		WR 3003 EP		WR 3009 EP	
18	41 x 135 x 59	0,99	36 x 100	0,65	36 x 120	0,68	36 x 120	0,78
26,5	46 x 165 x 69	1,28	50 x 170	2,01	50 x 185	1,94	50 x 185	2,24
32	55 x 190 x 84	1,81	60 x 200	3,41	60 x 220	3,33	60 x 220	3,83
36	60 x 219 x 89	2,78	70 x 210	5,03	68 x 240	4,72	70 x 240	5,87
40	70 x 244 x 104	3,87	70 x 245	5,37	70 x 270	5,26	70 x 270	5,99
47	80 x 274 x 114	5,10	80 x 280	7,78	83 x 310	8,65	80 x 310	8,97
57	-	-	-	-	95 x 270	9,32	-	-
65	-	-	-	-	105 x 290	11,75	-	-
75	-	-	-	-	320 x 114	14,15	-	-

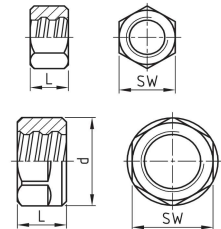
tuerca de anclaje EP recta anchor nut EP flat



tuerca de anclaje EP abombada 30° bull nose nut EP 30°



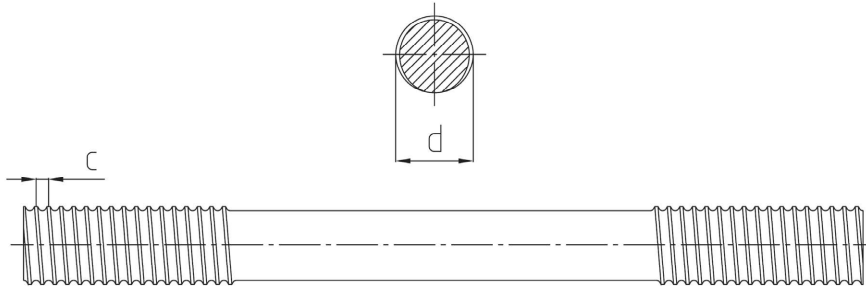
tuerca de retención EP fix nut EP



Ø [mm]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]
	WR 2002 EP		WR 2963 EP		WR 5005 EP	
18	41 x 70	0,62	41 x 70	0,60	30 x 22	0,08
26,5	46 x 90	0,81	46 x 90	0,79	36 x 22	0,08
32	55 x 100	1,30	55 x 100	1,27	41 x 22	0,09
36	60 x 120	1,75	60 x 120	1,71	46 x 25	0,12
40	70 x 130	2,77	70 x 130	2,70	50 x 25	0,13
47	80 x 150	3,92	80 x 150	3,81	60 x 30	0,22
57	90 x 145 x 95	4,59	90 x 145 x 95	4,46	85 x 40 x 90	1,01
65	100 x 155 x 105	5,82	100 x 155 x 105	5,66	90 x 40 x 102	1,13
75	105 x 180 x 114	7,60	105 x 180 x 114	6,96	105 x 50 x 114	1,92

SAS barra lisa / SAS smooth bar

SAS 950 / 1050 Ø 32, 36 mm lisa / smooth

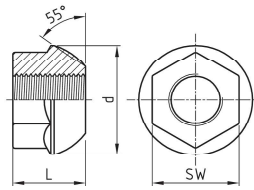


SAS barra tensor
redonda, lisa con rosca maquinada

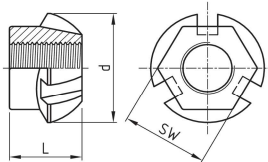
SAS stress bar
round, smooth with rolled on thread

d	[mm]	32	36
c	[mm]	3	3
$f_{p0,1k}/f_{pk}/A_{10}$		950 N/mm ² / 1050 N/mm ² / ≥ 7 %	
F_{yk} ($F_{0,1k}$)	[kN]	760	960
F_{pk}	[kN]	845	1070
A	[mm ²]	804	1018
G	[kg/m]	6,31	7,99

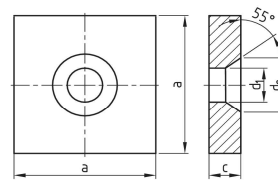
tuerca con asiento esférico 55°
dome nut 55°



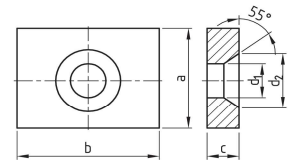
tuerca con asiento esférico 55° con muescas por inyección
domed nut 55° with grout slots



placa de anclaje cuadrada 55°
anchor plate square 55°

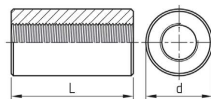


placa de anclaje rectangular 55°
anchor plate rectangular 55°

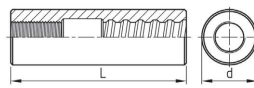


Ø [mm]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]	a x c x d ₁ x d ₂ [mm]	[kg]	a x b x c x d ₁ x d ₂ [mm]	[kg]
	WS 2001		WS 2099		WS 2011		WS 2012	
32	55 x 46 x 72	0,78	55 x 46 x 72	0,74	80 x 40 x 45 x 72	9,50	140 x 180 x 40 x 45 x 72	7,24
36	65 x 60 x 90	1,55	65 x 60 x 90	1,41	200 x 45 x 49 x 92	12,95	150 x 220 x 50 x 49 x 92	11,70

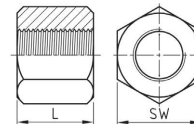
manguito estándar
coupler standard



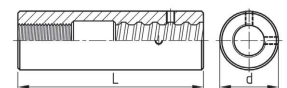
manguito de juntura
transition coupler



tuerca de anclaje recta
anchor nut flat

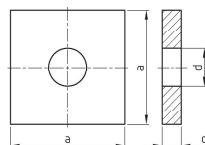


manguito tensor para WS
stressing coupler for WS

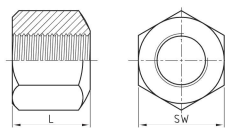


Ø [mm]	d x L [mm]	[kg]	d x L [mm]	[kg]	SW x L [mm]	[kg]	d x L [mm]	[kg]
	WS 3003		WS 3004		WS 2002		WS 8004	
32	60 x 110	1,74	60 x 200	2,94	55 x 50	0,71	60 x 190	2,79
36	68 x 160	3,25	68 x 235	4,47	60 x 65	1,06	65 x 230	3,80

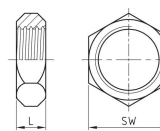
placa de anclaje recta
anchor plate flat



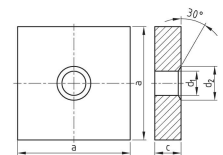
tuerca de anclaje abombada 30°
bull nose 30°



tuerca de retención
fix nut

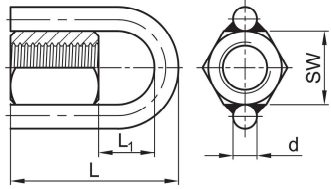


placa de anclaje cono 30°
anchor plate rectangular 30°



Ø [mm]	a x c x d [mm]	[kg]	d x L [mm]	[kg]	SW x L [mm]	[kg]	a x c x d ₁ x d ₂ [mm]	[kg]
	WS 2139		WS 2963		WS 5005		WS 1928	
32	180 x 40 x 38	10,36	55 x 50	0,68	41 x 15	0,08	180 x 40 x 38 x 50	9,81
36	200 x 45 x 45	13,57	60 x 65	0,93	46 x 15	0,09	200 x 45 x 45 x 60	13,55

tuerca anular
(Carga máxima de uso del anillo 60 kN)
ring nut
(working load of ring max. 60 kN)



Ø [mm]	SW x L x L1 [mm]	[kg]
WS 2927		
32	55 x 125 x 59	1,22
36	60 x 149 x 64	1,86



Proyecto: Estadio Nacional, Varsovia, Polonia
 Project: National stadium, Warsaw, Poland

