



**SAH**  
Stahlwerk Annahütte

## Catálogo | *catalogue*

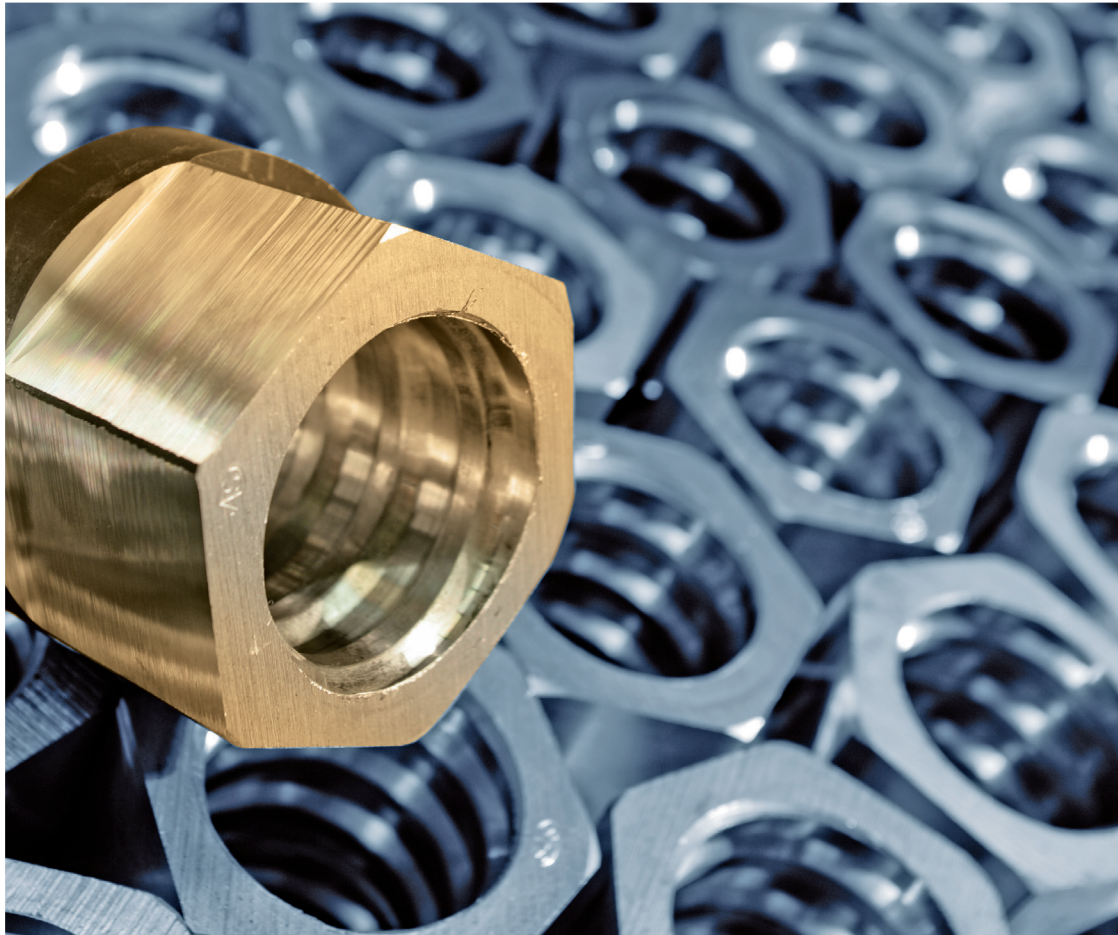
SAS 500 / 550 | SAS 550 / 620 | grado 75

SAS 555 / 700 | grado 80

SAS 670 / 800 | grado 97

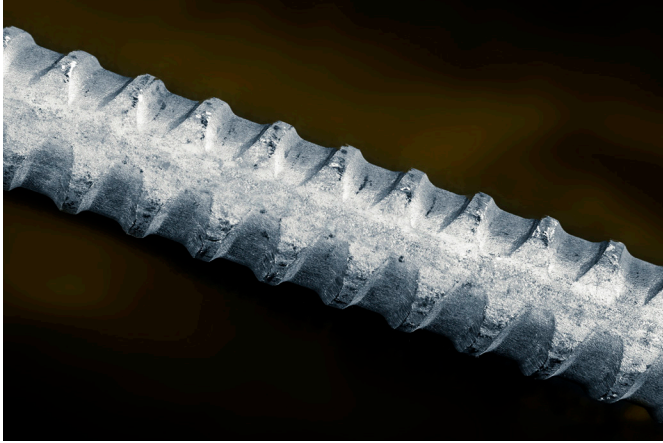
SAS 950 / 1050 | SAS 835 / 1035 | grado 150 – Según ASTM A722

**SAS** SYSTEMS



**MAX AICHER**

## SAS barras roscadas | SAS thread bars



SAS barra roscada laminada en caliente - rosca a izquierdas | SAS thread bar hot rolled, ribbed - left hand thread

**SAS 500 / 550 Ø 12 - 50 mm + 75 mm | grade 75**

**SAS 555 / 700 Ø 57,5 mm + 63,5 mm | grade 80**

Ø <sub>NENN</sub> / Ø <sub>NOM</sub>	[mm]	12	14	16	20	25	28	32	36	40	43	50	57,5	63,5	75
max d <sub>A</sub>	[mm]	14	16	19	23	29	32	36	41	45	48	56	63	70	82
c	[mm]	7	7,5	8	10	12,5	14	16	18	20	21,5	26	20	21	24
f <sub>yk</sub> (f <sub>0,2k</sub> ) / f <sub>tk</sub> / A <sub>gt</sub> <sup>1)</sup>		500 N/mm <sup>2</sup> / 550 N/mm <sup>2</sup> / ≥ 6 %											555 N/mm <sup>2</sup> 700 N/mm <sup>2</sup> ≥ 5 %	500 N/mm <sup>2</sup> 550 N/mm <sup>2</sup> ≥ 5 %	
F <sub>yk</sub> (F <sub>0,2k</sub> )	[kN]	57	77	100	160	245	310	405	510	630	726	980	1441	1760	2209
F <sub>tk</sub>	[kN]	62	85	110	175	270	340	440	560	690	799	1080	1818	2215	2430
A	[mm <sup>2</sup> ]	113	154	201	314	491	616	804	1020	1260	1452	1960	2597	3167	4418
G	[kg/m]	0,89	1,21	1,58	2,47	3,85	4,83	6,31	7,99	9,87	11,40	15,40	20,38	24,86	34,68

**SAS 550 / 620 Ø 12 - 50 mm | grade 75**

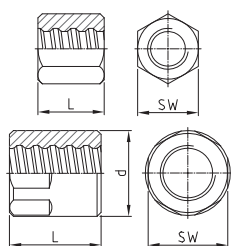
Ø <sub>NENN</sub> / Ø <sub>NOM</sub>	[mm]	12	14	16	20	25	26	28	30	32	36	40	43	50
max d <sub>A</sub>	[mm]	14	16	19	23	29	30	32	34	36	41	45	48	56
c	[mm]	7	7,5	8	10	12,5	13	14	15	16	18	20	21,5	26
f <sub>yk</sub> (f <sub>0,2k</sub> ) / A <sub>gt</sub> <sup>1)</sup>		550 N/mm <sup>2</sup> / 620 N/mm <sup>2</sup> ≥ 6 %												
F <sub>yk</sub> (F <sub>0,2k</sub> )	[kN]	62	85	110	175	270	290	340	390	440	560	690	799	1080
F <sub>tk</sub> = 1,08 x F <sub>yk</sub>	[kN]	67	92	119	189	292	313	367	421	475	605	745	862	1166
A	[mm <sup>2</sup> ]	113	154	201	314	491	531	616	707	804	1020	1260	1452	1960
G	[kg/m]	0,89	1,21	1,58	2,47	3,85	4,17	4,83	5,55	6,31	7,99	9,87	11,40	15,40

<sup>1)</sup> Deformación total porcentual para carga máxima | Percentage total elongation at maximum force

Los pesos reales pueden variar dentro de las tolerancias de fabricación. | Weight specifications of bar and accessories are average values. The actual values may deviate due to fabrication tolerances.

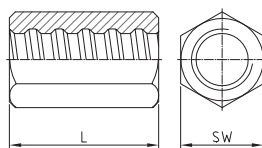
SAS SYSTEMS

tuerca hexagonal  
anchor nut



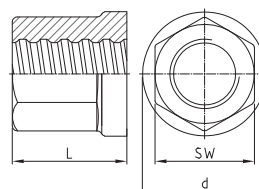
Ø [mm]      SW x L x d [mm]      [kg]

tuerca hexagonal larga  
anchor nut long



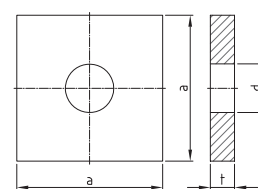
SW x L [mm]      [kg]

tuerca hexagonal apoyo circular  
anchor nut with flange



SW x L x d [mm]      [kg]

placa de anclaje lisa  
anchor plate flat

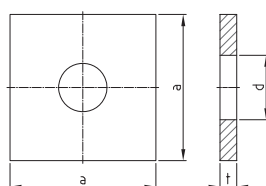


a x t x d [mm]      [kg]

T 2002 - Ø			T 2024 - Ø		T 2163 - Ø		T 2139 - Ø **	
12	22 x 25	0,10	22 x 35	0,08	-	-	50 x 8 x 16	0,14
14	27 x 35	0,12	27 x 45	0,16	-	-	50 x 8 x 18	0,14
16	32 x 40	0,20	32 x 50	0,25	-	-	50 x 8 x 20	0,15
20	36 x 45	0,27	32 x 65	0,25	-	-	70 x 12 x 25	0,42
25	41 x 50	0,34	41 x 75	0,52	-	-	90 x 15 x 30	0,87
26	46 x 50	0,45	41 x 80	0,56	-	-	100 x 15 x 33	1,08
28	46 x 55	0,48	41 x 85	0,48	-	-	100 x 15 x 33	1,08
30	50 x 60	0,65	46 x 90	0,77	-	-	120 x 20 x 36	2,10
32	55 x 60	0,78	50 x 90	0,90	-	-	120 x 20 x 40	2,06
36	60 x 65	1,00	55 x 95	1,17	-	-	150 x 30 x 44	4,94
40	65 x 70	1,19	60 x 100	1,30	65 x 70 x 85	1,20	150 x 30 x 47	4,89
43	70 x 75	1,51	70 x 110	2,22	70 x 80 x 90	1,81	160 x 40 x 50	7,42
50	79 x 90	2,17	79 x 120	3,00	80 x 85 x 100	2,35	190 x 45 x 58	11,82
57,5	90 x 110 x 102	4,13	-	-	90 x 100 x 110	3,50	220 x 50 x 67	17,61
63,5	100 x 115 x 108	4,72	-	-	100 x 115 x 125	4,90	245 x 50 x 73	22,05
75	100 x 100 x 108	2,99	-	-	100 x 120 x 115	4,15	275 x 65 x 88	35,48

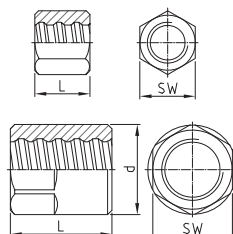
SAS SYSTEMS

placa de anclaje lisa pequeña  
anchor plate flat small



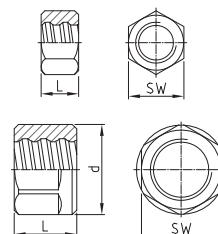
Ø [mm]      a x t x d [mm]      [kg]

contratuerca larga  
lock nut long



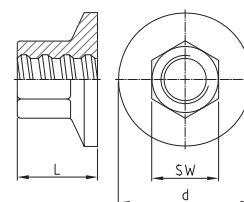
SW x L x d [mm]      [kg]

contratuerca corta  
lock nut short



SW x L x d [mm]      [kg]

pieza de anclaje  
anchor piece



SW x L x d [mm]      [kg]

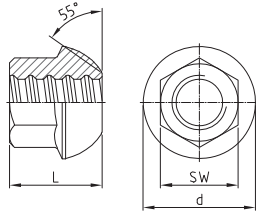
T 2008 - Ø **			T 2003 - Ø		T 2040 - Ø		T 2073 - Ø	
12	40 x 6 x 16	0,06	19 x 20	0,04	19 x 13	0,03	-	-
14	-	-	27 x 25	0,09	27 x 15	0,06	-	-
16	50 x 8 x 20	0,10	32 x 30	0,15	32 x 20	0,10	30 x 33 x 50	0,25
20	60 x 10 x 25	0,16	32 x 40	0,16	32 x 20	0,09	36 x 40 x 70	0,43
25	70 x 12 x 30	0,40	41 x 40	0,25	41 x 20	0,14	41 x 45 x 70	0,50
26	-	-	41 x 45	0,35	41 x 25	0,20	41 x 50 x 90	0,70
28	85 x 14 x 33	0,70	41 x 45	0,26	41 x 25	0,15	46 x 50 x 90	0,77
30	-	-	50 x 50	0,55	50 x 30	0,35	50 x 55 x 95	1,00
32	100 x 15 x 38	1,00	50 x 50	0,47	50 x 30	0,30	50 x 60 x 100	1,40
36	-	-	55 x 55	0,85	55 x 30	0,40	60 x 65 x 110	1,64
40	120 x 17 x 47	1,69	60 x 65	0,85	60 x 35	0,45	65 x 70 x 120	2,10
43	-	-	70 x 65	1,31	70 x 40	0,80	70 x 80 x 130	2,43
50	150 x 20 x 58	3,12	79 x 80	2,10	79 x 50	1,30	80 x 85 x 150	3,88
57,5	-	-	90 x 80 x 102	2,87	90 x 60 x 102	2,08	90 x 100 x 175	6,09
63,5	-	-	90 x 115 x 102	3,74	90 x 75 x 102	2,28	100 x 115 x 190	7,38
75	-	-	100 x 80 x 108	2,37	100 x 80 x 108	2,37	-	-

\*\* La formación de óxido no se puede descartar debido al almacenamiento y a las condiciones de transporte | Rust formation cannot be ruled out due to storage and transport conditions

# Accesorios | accessories

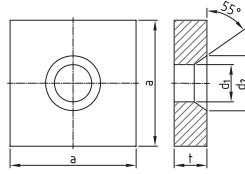
SAS SYSTEMS

**tuerca asiento esférico 55°**  
*domed nut 55°*



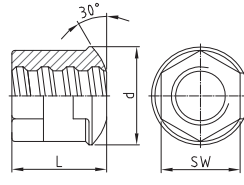
∅ [mm]      SW x L x d [mm]      [kg]

**placa de anclaje asiento esférico 55°**  
*anchor plate cone 55°*



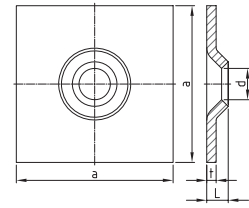
a x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

**tuerca asiento esférico 30°**  
*dome nut 30°*



SW x L x d [mm]      [kg]

**placa de anclaje abombada 30°/55°**  
*domed washer 30°/55°*



a x L x t x d [mm]      [kg]

T 2044 - ∅

T 2011 - ∅ \*\*

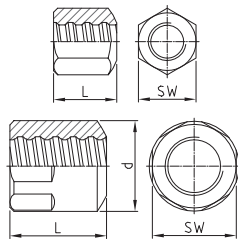
T 2944 - ∅

T 2132 - ∅ \*\*

12	-	-	-	-	-	-	-	
14	-	-	-	-	-	-	-	
16	27 x 33 x 35	0,11	60 x 10 x 25 x 33	0,24	-	-	150 x 25 x 10 x 22	1,77
20	36 x 42 x 49	0,30	70 x 12 x 30 x 44	0,37	36 x 40 x 51	0,30	150 x 25 x 10 x 26	1,76
25	41 x 45 x 55	0,35	90 x 15 x 35 x 49	0,81	41 x 45 x 54	0,32	150 x 25 x 10 x 34	1,74
26	-	-	-	-	-	-	-	-
28	41 x 54 x 62	0,45	100 x 15 x 40 x 54	0,99	41 x 50 x 58	0,38	200 x 25 x 10 x 34	3,11
30	-	-	-	-	-	-	-	-
32	46 x 57 x 70	0,60	120 x 20 x 52 x 60	1,91	50 x 60 x 62	0,70	200 x 27 x 12 x 40	3,70
36	-	-	-	-	-	-	-	-
40	60 x 70 x 88	1,50	150 x 30 x 65 x 76	4,48	65 x 70 x 85	1,79	200 x 42 x 20 x 53	5,90
43	70 x 80 x 100	2,12	160 x 40 x 75 x 93	6,54	-	-	-	-
50	80 x 85 x 107	2,57	190 x 45 x 83 x 96	10,78	80 x 85 x 100	2,96	-	-
57,5	90 x 100 x 120	3,79	220 x 50 x 92 x 110	16,25	-	-	-	-
63,5	100 x 115 x 144	5,51	245 x 50 x 104 x 121	20,09	-	-	-	-
75	100 x 120 x 160	6,62	275 x 65 x 118 x 145	32,60	-	-	-	-

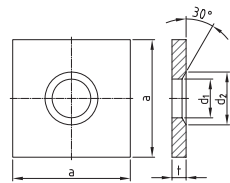
SAS SYSTEMS

**tuerca hexagonal asiento esférico 30°**  
*bull nose nut 30°*



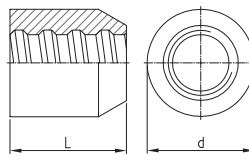
∅ [mm]      SW x L x d [mm]      [kg]

**placa de anclaje asiento esférico 30°**  
*anchor plate cone 30°*



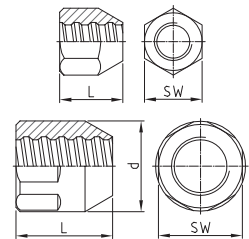
a x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

**perno de soldadura**  
*welding bolt*



d x L [mm]      [kg]

**perno de soldadura hexagonal**  
*welding bolt hexagonal*



SW x L x d [mm]      [kg]

T 2963 - ∅

T 1928 - ∅ \*\*

T 3022 - ∅

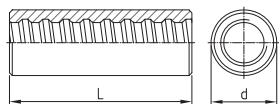
T 3026 - ∅

12	22 x 25	0,05	50 x 8 x 16 x 26	0,14	30 x 30	0,12	32 x 40	0,21
14	27 x 35	0,12	50 x 8 x 18 x 28	0,14	36 x 40	0,24	36 x 50	0,34
16	32 x 40	0,18	60 x 8 x 20 x 30	0,20	40 x 45	0,33	41 x 55	0,48
20	36 x 45	0,25	70 x 12 x 25 x 35	0,41	45 x 50	0,44	46 x 65	0,70
25	41 x 50	0,33	90 x 15 x 30 x 40	0,87	50 x 55	0,55	50 x 75	0,89
26	46 x 50	0,42	100 x 15 x 33 x 45	1,07	50 x 55	0,53	50 x 75	0,89
28	46 x 55	0,47	100 x 15 x 33 x 45	1,07	55 x 60	0,73	55 x 85	1,21
30	50 x 60	0,61	120 x 20 x 36 x 46	2,09	60 x 65	1,02	60 x 90	1,20
32	55 x 60	0,75	120 x 20 x 40 x 50	2,06	60 x 65	0,91	60 x 90	1,20
36	60 x 65	0,94	150 x 30 x 44 x 59	4,92	70 x 70	1,45	70 x 95	1,20
40	65 x 70	1,15	150 x 30 x 47 x 60	4,88	80 x 80	2,11	79 x 100	2,66
43	70 x 75	1,47	160 x 40 x 58 x 78	7,16	90 x 90	3,07	80 x 100 x 90	3,11
50	79 x 90	2,15	190 x 45 x 58 x 75	11,79	90 x 90	2,77	90 x 120 x 100	4,51
57,5	90 x 110 x 102	3,92	220 x 50 x 67 x 87	17,56	110 x 110	5,29	100 x 120 x 110	5,44
63,5	100 x 115 x 108	4,65	245 x 50 x 73 x 100	21,92	114 x 120	5,88	100 x 120 x 114	5,25
75	100 x 100 x 108	2,90	275 x 65 x 88 x 110	35,40	-	-	-	-

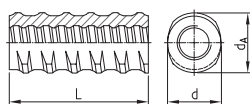
\*\* La formación de óxido no se puede descartar debido al almacenamiento y a las condiciones de transporte | Rust formation cannot be ruled out due to storage and transport conditions

SAS SYSTEMS

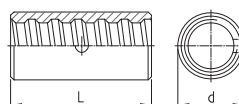
manguito estándar  
coupler standard



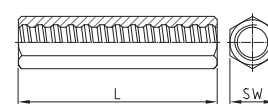
manguito de barra roscada  
thread coupler



manguito de contacto  
contact coupler



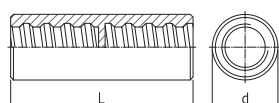
manguito hexagonal largo  
hexagonal coupler long



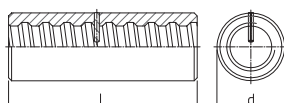
Ø [mm]	d x L [mm]	[kg]	d x d <sub>a</sub> x L [mm]	[kg]	d x L [mm]	[kg]	SW x L [mm]	[kg]
T 3003 - Ø			T 3087 - Ø		T 3006 - Ø		T 3010 - Ø	
12	22 x 60	0,11	-	-	-	-	22 x 80	0,20
14	27 x 75	0,22	-	-	-	-	27 x 100	0,34
16	32 x 90	0,37	26,5 x 31 x 90	0,27	27 x 65	0,17	32 x 120	0,60
20	36 x 105	0,52	32 x 37 x 105	0,40	32 x 70	0,25	32 x 140	0,55
25	40 x 115	0,62	40 x 46 x 115	0,68	36 x 80	0,30	41 x 160	1,10
26	45 x 120	0,80	47 x 53 x 120	1,13	36 x 80	0,30	41 x 170	1,10
28	45 x 125	0,85	47 x 53 x 125	1,09	40 x 85	0,40	41 x 180	1,05
30	50 x 135	1,37	47 x 53 x 135	1,10	45 x 90	0,60	50 x 180	1,75
32	52 x 140	1,32	57 x 64 x 140	1,93	45 x 90	0,50	50 x 180	1,76
36	60 x 150	2,10	57 x 64 x 150	1,78	50 x 120	1,25	60 x 190	2,75
40	65 x 160	2,34	65 x 72 x 160	2,52	54 x 120	0,82	65 x 210	3,67
43	80 x 170	4,49	75 x 82 x 170	3,79	60 x 130	1,19	70 x 220	4,46
50	80 x 200	4,49	-	-	63 x 160	1,09	79 x 240	5,97
57,5	102 x 230	9,54	-	-	83 x 170	3,36	-	-
63,5	102 x 260	9,45	-	-	90 x 200	4,28	-	-
75	108 x 240	8,01	-	-	102 x 210	5,33	-	-

SAS SYSTEMS

manguito estándar con tope central  
coupler standard with center stop



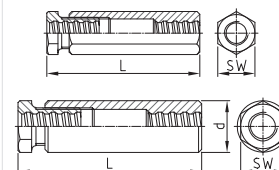
manguito de barra roscada con tope central  
thread coupler with center stop



manguito reductor  
reducing coupler



tensor  
turnbuckle

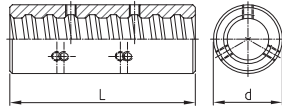


Ø [mm]	d x L [mm]	[kg]	d x L [mm]	[kg]	Ø x d x L [mm]	[kg]	SW x L x d [mm]	[kg]
T 3002 - Ø			T 3043 - Ø		T 3102 - Ø		T 3105 - Ø	
12	22 x 60	0,12	-	-	-	-	32 x 126	0,65
14	27 x 75	0,23	-	-	-	-	32 x 138	0,66
16	32 x 90	0,38	32 x 90	0,40	16/14 x 32 x 120	0,55	36 x 150	0,92
20	36 x 105	0,54	36 x 105	0,53	20/16 x 36 x 130	0,65	41 x 175	1,28
25	40 x 115	0,65	40 x 115	0,62	25/20 x 40 x 150	0,84	46 x 190	1,64
26	45 x 120	0,83	45 x 120	0,91	26/20 x 40 x 155	0,88	50 x 205	2,17
28	45 x 125	0,89	45 x 125	0,86	28/26 x 45 x 170	1,20	50 x 205	2,04
30	50 x 135	1,41	50 x 135	1,21	30/28 x 50 x 180	1,62	60 x 225	3,58
32	52 x 140	1,37	52 x 140	1,32	32/30 x 52 x 185	1,72	60 x 225	3,41
36	-	-	60 x 150	1,96	36/32 x 60 x 205	2,61	70 x 250	5,39
40	-	-	65 x 160	2,38	40/36 x 65 x 215	3,26	79 x 270	7,31
43	-	-	80 x 170	4,49	43/40 x 80 x 225	5,93	90 x 290 x 105	13,46
50	-	-	80 x 200	4,55	50/40 x 80 x 240	6,00	100 x 310 x 115	16,89
57,5	-	-	102 x 230	9,54	57,5/50 x 90 x 280	7,99	100 x 340 x 125	20,37
63,5	-	-	102 x 260	9,45	63,5/57,5 x 102 x 310	11,56	100 x 395 x 130	24,11
75	-	-	108 x 240	8,08	75/63,5 x 110 x 290	11,63	110 x 370 x 130	19,67

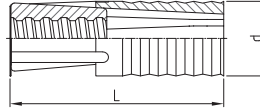
# Accesorios | accessories

SAS SYSTEMS

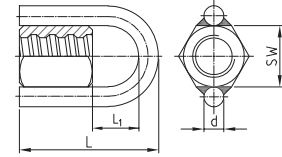
manguito con tornillos de apriete  
coupler with set screws



perno expansivo  
expansion shell



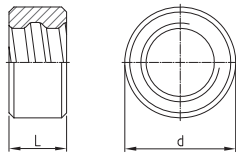
tuerca hexagonal con argolla  
ring nut



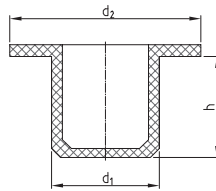
Ø [mm]	d x L [mm]	[kg]	d x L [mm]	[kg]	SW x L x L <sub>1</sub> x d [mm]	[kg]
T 3020 - Ø			T 2136 - Ø *		T 2927 - Ø *	
12	-	-	-	-	-	-
14	-	-	-	-	32 x 110 x 54 x 16	0,58
16	-	-	32 x 92	0,22	32 x 110 x 54 x 16	0,57
20	-	-	39 x 109	0,44	36 x 120 x 59 x 16	0,67
25	-	-	49 x 121	0,60	41 x 135 x 69 x 16	0,78
26	-	-	-	-	-	-
28	45 x 125	0,82	49 x 121	0,60	46 x 145 x 74 x 16	0,97
30	-	-	-	-	-	-
32	52 x 140	1,35	59 x 149	1,00	55 x 165 x 89 x 16	1,34
36	60 x 150	1,94	-	-	-	-
40	65 x 160	2,35	-	-	65 x 193 x 103 x 20	2,10
43	80 x 170	4,41	-	-	70 x 200 x 105 x 20	2,56
50	80 x 200	4,50	-	-	79 x 220 x 110 x 20	3,33
57,5	102 x 230	9,45	-	-	90 x 270 x 140 x 20	5,57
63,5	102 x 260	9,41	-	-	100 x 279 x 144 x 20	6,07
75	108 x 240	8,02	-	-	100 x 279 x 159 x 20	4,43

SAS SYSTEMS

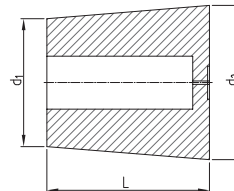
tuerca de fijación  
fix ring



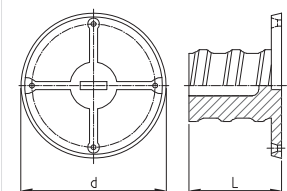
tapón interior  
inner cap



cono hueco  
recess cone



tape con tornillos  
nail plate

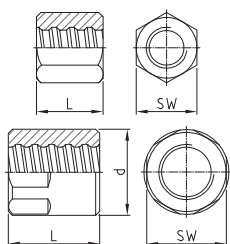


Ø [mm]	d x L [mm]	[kg]	d <sub>1</sub> x d <sub>2</sub> x h [mm]	[kg]	d <sub>1</sub> x d <sub>2</sub> x L [mm]	[kg]	d x L [mm]	[kg]
T 5003 - Ø			T 5025 - Ø		T 5050 - Ø		T 5979 - Ø	
12	-	-	12 x 19 x 7	0,01	36 x 42 x 40	0,02	36 x 20	0,01
14	-	-	14 x 19 x 7	0,01	41 x 49 x 49	0,03	42 x 20	0,01
16	-	-	16 x 25 x 9	0,01	48 x 58 x 64	0,05	48 x 25	0,01
20	-	-	20 x 25 x 9	0,01	50 x 62 x 74	0,07	48 x 30	0,01
25	-	-	25 x 30 x 9	0,01	63 x 76 x 78	0,10	58 x 35	0,02
26	-	-	26 x 31 x 9	0,01	-	-	58 x 35	0,02
28	-	-	28 x 35 x 9	0,01	74 x 89 x 89	0,14	58 x 40	0,02
30	-	-	30 x 35 x 9	0,01	-	-	68 x 45	0,03
32	-	-	32 x 37 x 9	0,01	77 x 93 x 98	0,14	68 x 45	0,03
36	50 x 25	0,15	36 x 42 x 9	0,01	-	-	-	-
40	55 x 25	0,18	40 x 48 x 10	0,01	-	-	-	-
43	65 x 25	0,33	46 x 53 x 9	0,01	-	-	-	-
50	65 x 30	0,25	50 x 58 x 10	0,01	-	-	-	-
57,5	81 x 35	0,60	-	-	-	-	-	-
63,5	89 x 40	0,85	64 x 74 x 10	0,01	-	-	-	-
75	102 x 40	1,01	-	-	-	-	-	-

\* Para más información respecto de la capacidad de carga e instalación, consulte por favor la ficha técnica incluida en nuestra página web  
with regard to load capacity and installation, please note data sheet available on the homepage

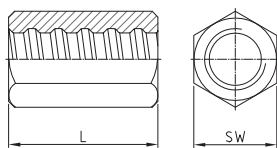
SAS SYSTEMS

tuerca hexagonal EP  
anchor nut EP flat



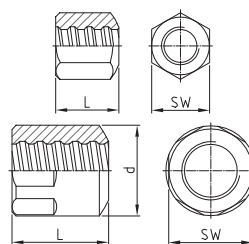
Ø [mm] SW x L x d [mm] [kg]

tuerca hexagonal larga EP  
anchor nut EP long



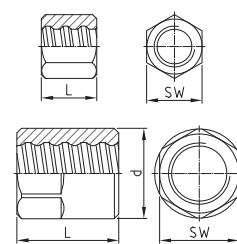
SW x L [mm] [kg]

tuerca hexagonal  
asiento esférico 30° EP  
bull nose nut EP 30°



SW x L x d [mm] [kg]

contratuerca larga EP  
lock nut EP long

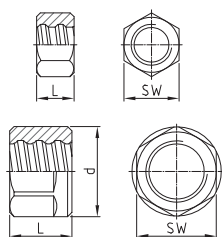


SW x L x d [mm] [kg]

T 2002 - Ø EP			T 2024 - Ø EP		T 2963 - Ø EP		T 2003 - Ø EP	
12	22 x 30	0,06	22 x 35	0,08	22 x 30	0,06	19 x 25	0,05
14	27 x 40	0,14	27 x 45	0,16	27 x 40	0,14	27 x 30	0,12
16	32 x 50	0,25	32 x 50	0,25	32 x 50	0,24	32 x 35	0,18
20	36 x 55	0,31	32 x 65	0,26	36 x 55	0,31	32 x 45	0,19
25	41 x 60	0,40	41 x 75	0,51	41 x 60	0,40	41 x 50	0,35
26	46 x 60	0,57	41 x 80	0,52	-	-	41 x 55	0,36
28	46 x 65	0,55	41 x 85	0,49	46 x 65	0,55	41 x 55	0,31
30	50 x 75	0,79	46 x 90	0,71	-	-	50 x 60	0,63
32	55 x 75	0,97	50 x 90	0,87	55 x 75	0,96	50 x 60	0,57
36	60 x 80	1,22	55 x 95	1,08	60 x 80	1,18	55 x 65	1,01
40	65 x 85	1,43	60 x 100	1,31	65 x 85	1,43	60 x 75	1,00
43	70 x 90	1,81	-	-	70 x 90	1,77	70 x 75	1,51
50	79 x 105	2,71	79 x 120	2,97	79 x 105	2,62	79 x 95	2,50
57,5	90 x 125 x 102	4,72	-	-	90 x 125 x 102	4,53	90 x 100 x 102	3,68
63,5	100 x 130 x 108	5,53	-	-	100 x 130 x 108	5,30	90 x 130 x 102	4,26
75	100 x 115 x 108	3,48	-	-	100 x 115 x 108	3,38	100 x 100 x 108	2,97

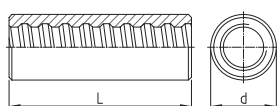
SAS SYSTEMS

contratuerca corta EP  
lock nut EP short



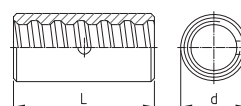
Ø [mm] SW x L x d [mm] [kg]

manguito EP estándar  
coupler EP standard



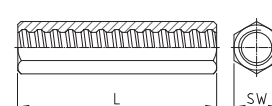
d x L [mm] [kg]

manguito de contacto EP  
contact coupler EP



d x L [mm] [kg]

manguito hexagonal largo EP  
hexagonal coupler EP long



SW x L [mm] [kg]

T 2040 - Ø EP			T 3003 - Ø EP		T 3006 - Ø EP		T 3010 - Ø EP	
12	19 x 20	0,03	22 x 75	0,15	-	-	22 x 80	0,17
14	27 x 25	0,09	27 x 90	0,32	-	-	27 x 100	0,34
16	32 x 30	0,15	32 x 105	0,46	-	-	32 x 120	0,60
20	32 x 40	0,17	36 x 120	0,59	32 x 70	0,25	32 x 140	0,56
25	41 x 40	0,28	40 x 135	0,71	36 x 80	0,30	41 x 160	1,10
26	41 x 45	0,29	45 x 140	1,06	36 x 80	0,24	41 x 170	1,11
28	41 x 45	0,41	45 x 145	0,97	40 x 85	0,40	41 x 200	1,22
30	50 x 50	0,52	50 x 155	1,38	45 x 90	0,53	50 x 180	1,89
32	50 x 50	0,50	52 x 160	1,49	45 x 90	0,50	50 x 180	1,75
36	55 x 55	0,73	60 x 170	2,30	50 x 120	0,74	60 x 190	2,90
40	60 x 65	0,85	65 x 190	3,07	54 x 120	0,90	65 x 210	3,66
43	70 x 65	1,30	80 x 200	5,28	60 x 130	1,18	70 x 220	4,44
50	79 x 80	2,10	80 x 235	5,60	64 x 160	1,35	79 x 240	5,95
57,5	90 x 80 x 102	2,85	102 x 260	10,75	80 x 170	2,90	-	-
63,5	90 x 85 x 102	2,62	102 x 300	10,87	90 x 200	4,25	-	-
75	100 x 80 x 108	2,36	108 x 270	9,00	102 x 210	5,30	-	-



SAS barra roscada laminada en caliente, rosca a derechas | SAS thread bar hot rolled, ribbed - right hand thread

SAS 670 / 800 Ø 18 - 75mm | grado 97

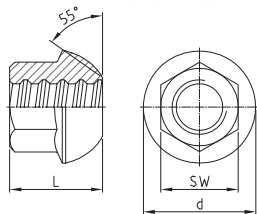
$\varnothing_{NENN} / \varnothing_{NOM}$	[mm]	18	22	25	28	30	35	43	50	57,5	63,5	75
max $d_A$	[mm]	21	25	28	32	34	40	48	55	63	70	82
c	[mm]	8	8	10	11	11	14	17	18	20	21	24
$f_{yk} (f_{0,2k}) / f_{tk} / A_{gt}^{1)}$		670N/mm <sup>2</sup> / 800N/mm <sup>2</sup> / $\geq 5\%$										
$F_{yk} (F_{0,2k})$	[kN]	170	255	329	413	474	645	973	1315	1740	2122	2960
$F_{tk}$	[kN]	204	304	393	493	565	770	1162	1570	2077	2534	3535
A	[mm <sup>2</sup> ]	254	380	491	616	707	962	1452	1963	2597	3167	4418
G	[kg/m]	2,00	2,98	3,85	4,83	5,55	7,55	11,40	15,40	20,38	24,86	34,68

<sup>1)</sup> Deformación total porcentual para carga máxima | Percentage total elongation at maximum force

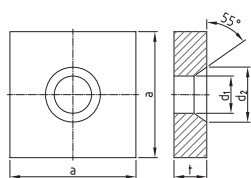
Los pesos reales pueden variar dentro de las tolerancias de fabricación. | Weight specifications of bar and accessories are average values. The actual values may deviate due to fabrication tolerances.

SAS SYSTEMS

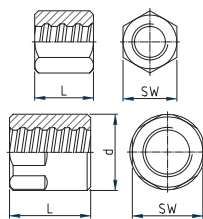
tuerca asiento esférico 55°  
dome nut 55°



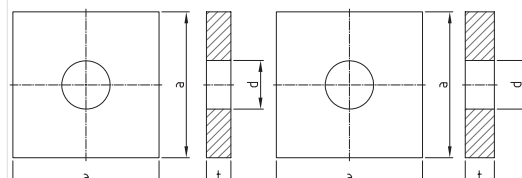
placa de anclaje asiento esférico 55°  
anchor plate cone 55°



tuerca hexagonal anchor nut



placa de anclaje lisa  
anchor plate flat

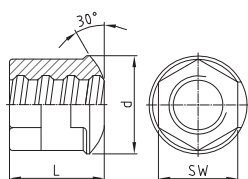


Ø [mm]    SW x L x d [mm]    [kg]    a x t x d<sub>1</sub> x d<sub>2</sub> [mm]    [kg]    SW x L x d [mm]    [kg]    a x t x d [mm]    [kg]    a x t x d [mm]    [kg]

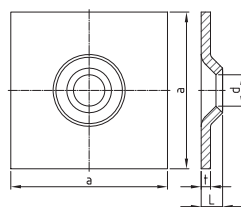
TR 2001 - Ø			TR 2011 - Ø **			TR 2002 - Ø		TR 2138 - Ø **		TR 2139 - Ø **	
18	32 x 35 x 43	0,18	100 x 25 x 27 x 39	1,83	36 x 45	0,29	100 x 20 x 23	1,51	100 x 25 x 23	1,88	
22	36 x 45 x 53	0,27	110 x 30 x 32 x 47	2,62	41 x 50	0,39	110 x 25 x 27	2,26	110 x 30 x 27	2,72	
25	41 x 50 x 60	0,47	125 x 30 x 35 x 53	3,40	46 x 55	0,53	110 x 25 x 30	2,20	115 x 30 x 30	2,95	
28	46 x 55 x 67	0,62	135 x 35 x 40 x 59	4,59	50 x 60	0,67	115 x 30 x 34	2,90	120 x 30 x 34	3,18	
30	50 x 60 x 71	0,66	145 x 35 x 40 x 63	5,32	55 x 65	0,90	130 x 30 x 36	3,74	130 x 35 x 36	4,36	
35	60 x 70 x 83	1,40	170 x 40 x 47 x 73	8,36	65 x 70	1,41	150 x 35 x 42	5,80	150 x 40 x 42	6,63	
43	70 x 85 x 102	2,22	210 x 50 x 58 x 90	15,96	79 x 90	2,62	185 x 45 x 50	11,40	185 x 55 x 50	13,93	
50	80 x 100 x 116	3,44	240 x 55 x 70 x 110	22,59	79 x 100	2,53	215 x 50 x 60	17,03	215 x 60 x 60	20,44	
57,5	90 x 115 x 137	5,69	275 x 60 x 75 x 119	32,77	90 x 120 x 102	4,53	250 x 55 x 67	25,46	245 x 65 x 67	28,83	
63,5	100 x 125 x 151	7,52	300 x 65 x 82 x 131	42,19	100 x 145 x 114	6,97	265 x 60 x 74	31,05	270 x 70 x 74	37,70	
75	120 x 150 x 178	12,94	325 x 70 x 100 x 159	51,89	100 x 130 x 108	3,86	320 x 70 x 86	53,10	325 x 70 x 86	54,85	

SAS SYSTEMS

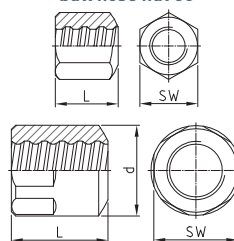
tuerca asiento esférico 30°  
dome nut 30°



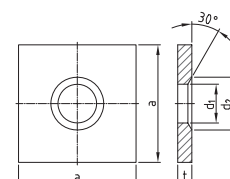
placa de anclaje abombada 30°  
domed washer 30°



tuerca hexagonal sientto esférico 30°  
bull nose nut 30°



placa de anclaje asiento esférico 30°  
anchor plate cone 30°



Ø [mm]    SW x L x d [mm]    [kg]    a x L x t x d [mm]    [kg]    SW x L x d [mm]    [kg]    a x t x d<sub>1</sub> x d<sub>2</sub> [mm]    [kg]

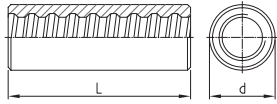
TR 2944 - Ø			TR 2132 - Ø **			TR 2963 - Ø		TR 1928 - Ø **	
18	30 x 35 x 46	0,20	150 x 25 x 10 x 26	1,76	36 x 45	0,28	70 x 10 x 25 x 35	0,34	
22	36 x 40 x 51	0,29	150 x 25 x 10 x 34	1,74	41 x 50	0,39	90 x 12 x 30 x 40	0,69	
25	41 x 50 x 58	0,45	200 x 25 x 10 x 34	3,11	46 x 55	0,53	100 x 12 x 33 x 45	0,85	
28	46 x 60 x 62	0,67	200 x 27 x 12 x 40	3,70	50 x 60	0,66	120 x 20 x 40 x 50	2,06	
30	46 x 60 x 62	0,65	200 x 27 x 12 x 40	3,70	55 x 65	0,82	120 x 20 x 40 x 50	2,06	
35	-	-	-	-	65 x 70	1,35	150 x 30 x 47 x 60	4,88	
43	-	-	-	-	79 x 90	2,50	190 x 45 x 58 x 75	11,79	
50	-	-	-	-	79 x 100	2,46	215 x 50 x 60 x 80	16,99	
57,5	-	-	-	-	90 x 120 x 102	4,32	245 x 50 x 70 x 90	22,00	
63,5	-	-	-	-	100 x 145 x 114	6,67	280 x 60 x 78 x 100	34,60	
75	-	-	-	-	100 x 130 x 108	3,93	325 x 70 x 88 x 120	54,52	

\*\* La formación de óxido no se puede descartar debido al almacenamiento y a las condiciones de transporte | Rust formation cannot be ruled out due to storage and transport conditions

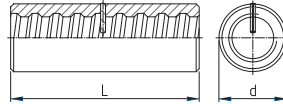
# Accesorios | accessories

SAS SYSTEMS

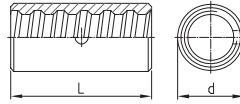
manguito estándar  
coupler standard



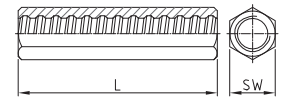
manguito de barra roscada  
thread bar coupler



manguito de contacto  
contact coupler



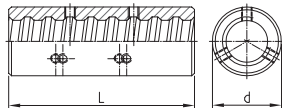
manguito hexagonal largo  
hexagonal coupler long



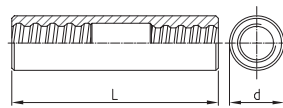
Ø [mm]	d x L [mm]	[kg]	d x L [mm]	[kg]	d x L [mm]	[kg]	SW x L [mm]	[kg]
TR 3003 - Ø			TR 3043 - Ø		TR 3006 - Ø		TR 3010 - Ø	
18	36 x 100	0,57	36 x 100	0,57	27 x 70	0,16	36 x 120	0,78
22	40 x 110	0,55	40 x 110	0,71	32 x 75	0,22	41 x 135	1,08
25	45 x 130	1,05	45 x 130	1,05	40 x 80	0,43	46 x 150	1,49
28	50 x 140	1,36	50 x 140	1,39	45 x 90	0,67	50 x 170	1,96
30	55 x 150	1,84	55 x 150	1,85	45 x 90	0,60	55 x 185	2,63
35	65 x 180	3,16	65 x 180	3,17	50 x 120	0,82	60 x 210	3,36
43	80 x 200	5,42	80 x 200	5,35	65 x 160	2,08	79 x 245	7,27
50	90 x 210	6,92	90 x 210	6,92	70 x 170	2,23	-	-
57,5	102 x 250	10,37	102 x 250	10,38	83 x 180	3,55	-	-
63,5	114 x 300	15,85	114 x 300	15,86	90 x 200	4,24	-	-
75	108 x 260	8,98	108 x 260	8,76	102 x 230	5,83	-	-

SAS SYSTEMS

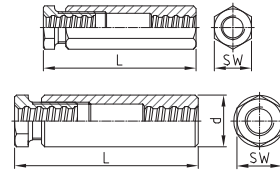
manguito con tornillos de apriete  
coupler with set screws



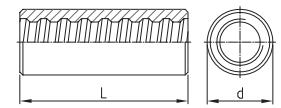
manguito reductor  
reducing coupler



manguito tensor  
turnbuckle

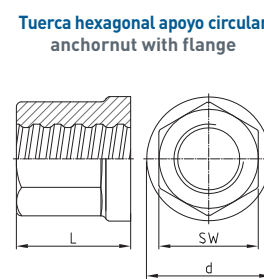
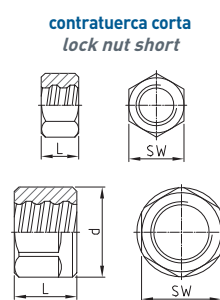
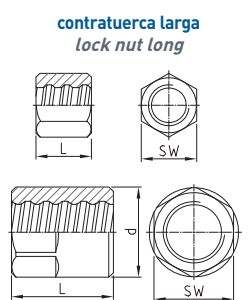
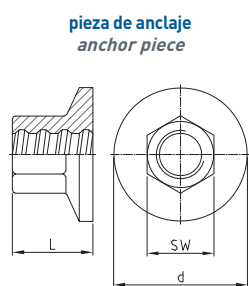


manguito acero templado  
coupler tempered



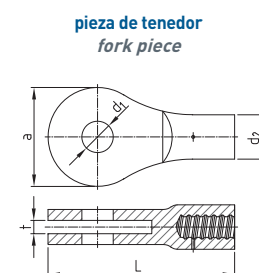
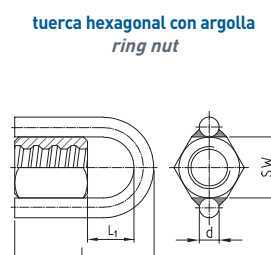
Ø [mm]	d x L [mm]	[kg]	Ø x d x L [mm]	[kg]	SW x L x d [mm]	[kg]	d x L [mm]	[kg]
TR 3020 - Ø			TR 3102 - Ø		TR 3105 - Ø		TR 3927 - Ø	
18	36 x 100	0,56	-	-	41 x 175	1,34	-	-
22	40 x 110	0,70	22/18 x 40 x 145	1,00	46 x 190	1,78	36 x 90	0,41
25	45 x 130	1,03	25/22 x 45 x 160	1,40	55 x 205	2,94	38 x 100	0,45
28	50 x 140	1,37	28/25 x 50 x 180	2,00	60 x 225	3,74	42 x 120	0,64
30	55 x 150	1,85	30/28 x 55 x 195	2,50	65 x 260	5,11	50 x 130	1,18
35	65 x 180	3,13	35/30 x 60 x 215	3,00	79 x 275	8,27	55 x 150	1,52
43	80 x 200	5,40	43/35 x 80 x 250	5,50	90 x 330 x 105	15,14	65 x 170	2,26
50	90 x 210	6,82	50/43 x 85 x 270	7,68	100 x 350 x 115	19,04	75 x 180	3,17
57,5	102 x 250	10,00	57,5/50 x 100 x 295	11,94	100 x 405 x 125	24,46	85 x 220	4,92
63,5	114 x 300	14,70	63,5/57,5 x 110 x 305	14,89	100 x 425 x 120	21,56	95 x 240	6,81
75	108 x 260	8,90	75/63,5 x 110 x 335	13,24	110 x 460 x 130	25,20	-	-

SAS SYSTEMS



Ø [mm]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]
TR 2073 - Ø			TR 2003 - Ø		TR 2040 - Ø		TR 2163 - Ø	
18	32 x 35 x 55	0,28	30 x 40	0,16	30 x 22	0,10	36 x 45 x 42	0,31
22	36 x 45 x 65	0,43	36 x 45	0,25	36 x 22	0,12	41 x 50 x 47	0,43
25	41 x 50 x 75	0,62	41 x 50	0,37	41 x 22	0,16	46 x 55 x 53	0,59
28	46 x 55 x 85	0,85	46 x 55	0,50	46 x 30	0,26	50 x 65 x 58	0,80
30	50 x 60 x 90	1,03	50 x 60	0,67	50 x 30	0,31	55 x 65 x 64	0,98
35	60 x 70 x 105	1,66	55 x 65	0,78	55 x 40	0,47	65 x 70 x 75	1,51
43	70 x 85 x 130	2,74	70 x 80	1,60	70 x 50	1,00	80 x 90 x 92	2,99
50	80 x 100 x 150	3,63	79 x 90	2,27	79 x 50	1,26	80 x 100 x 92	2,84
57,5	90 x 115 x 175	6,96	90 x 100 x 102	3,71	90 x 60 x 102	2,04	90 x 120 x 102	4,15
63,5	100 x 125 x 190	8,78	100 x 115 x 114	5,45	100 x 70 x 114	3,07	100 x 145 x 114	6,23
75	120 x 150 x 230	15,03	100 x 120 x 108	4,20	100 x 80 x 108	2,70	-	-

SAS SYSTEMS



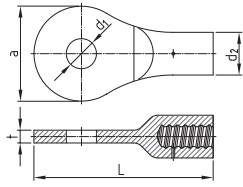
Ø [mm]	d x L [mm]	[kg]	d x L [mm]	[kg]	SW x L x d x L1 [mm]	[kg]	a x L x t x d1 x d2 [mm]	[kg]
TR 5003 - Ø			TR 2136 - Ø *		TR 2927 - Ø *		TR 2090 - Ø EP	
18	-	-	39 x 109	0,44	36 x 120 x 16 x 59	0,68	-	-
22	31 x 20	0,06	49 x 121	0,60	41 x 135 x 16 x 69	0,83	-	-
25	-	-	49 x 121	0,60	46 x 145 x 16 x 74	1,02	-	-
28	45 x 20	0,14	59 x 149	1,00	50 x 155 x 16 x 79	1,19	-	-
30	45 x 20	0,06	59 x 149	1,00	55 x 165 x 16 x 84	1,46	-	-
35	50 x 20	0,13	-	-	65 x 193 x 20 x 103	2,42	167 x 315 x 27 x 53 x 75	7,40
43	65 x 25	0,33	-	-	79 x 220 x 20 x 110	3,78	197 x 384 x 29 x 63 x 92	12,80
50	70 x 30	0,39	-	-	79 x 220 x 20 x 100	3,69	221 x 406 x 35 x 75 x 94	14,75
57,5	81 x 35	0,60	-	-	90 x 270 x 20 x 130	5,97	248 x 454 x 42 x 88 x 96	20,40
63,5	89 x 40	0,85	-	-	100 x 305 x 20 x 140	8,60	298 x 553 x 42 x 98 x 114	34,50
75	102 x 40	1,01	-	-	100 x 279 x 20 x 129	5,30	328 x 627 x 54 x 108 x 116	44,40

\* Para más información respecto de la capacidad de carga e instalación, consulte por favor la ficha técnica incluida en nuestra página web with regard to load capacity and installation, please note data sheet available on the homepage

# Accesorios | accessories

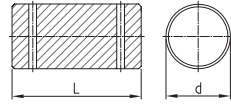
SAS SYSTEMS

pieza tipo argolla  
eye piece



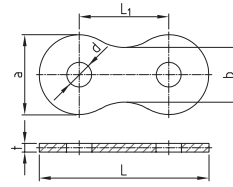
Ø [mm]      a x L x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

pasador para pieza perforada  
bolt eye piece



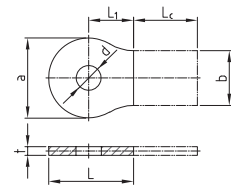
d x L [mm]      [kg]

pieza de conexión tipo argolla  
strap connection eye piece



a x L x t x d x L<sub>1</sub> x b [mm]      [kg]

pieza tipo argolla para soldar  
welding plate eye piece



a x L x L<sub>1</sub> x t x d x b [mm]      [kg+Lc]

TR 2080 - Ø EP \*\*

TR 2081 - Ø

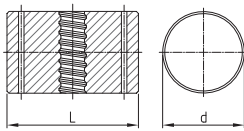
TR 3080 - Ø \*\*

TR 3081 - Ø \*\*

18	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-
35	167 x 315 x 23 x 53 x 75	7,18	50 x 100	1,52	167 x 354 x 18 x 53 x 187 x 114	7,00	167 x 177 x 94 x 18 x 53 x 114 x Lc	3,10 + Lc
43	197 x 384 x 25 x 63 x 92	12,54	60 x 110	2,40	197 x 414 x 20 x 63 x 217 x 134	9,60	197 x 207 x 109 x 20 x 63 x 134 x Lc	4,72 + Lc
50	221 x 406 x 31 x 75 x 92	17,99	72 x 105	3,31	221 x 467 x 25 x 75 x 246 x 160	14,91	221 x 224 x 114 x 25 x 75 x 160	7,15 + Lc
57,5	248 x 469 x 38 x 88 x 96	21,57	85 x 145	6,45	248 x 526 x 30 x 88 x 278 x 160	22,00	248 x 263 x 139 x 30 x 88 x 160 x Lc	10,95 + Lc
63,5	298 x 558 x 38 x 98 x 114	33,45	95 x 145	8,02	298 x 626 x 30 x 98 x 328 x 200	31,80	298 x 313 x 164 x 30 x 98 x 200 x Lc	17,95 + Lc
75	328 x 627 x 50 x 108 x 116	46,13	105 x 165	11,21	328 x 691 x 35 x 108 x 363 x 220	45,80	328 x 346 x 182 x 35 x 108 x 220 x Lc	22,75 + Lc

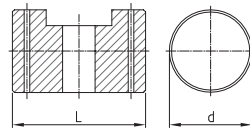
SAS SYSTEMS

tuerca articulada  
joint nut



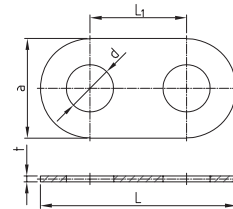
Ø [mm]      d x L [mm]      [kg]

perno articulado  
joint bolt



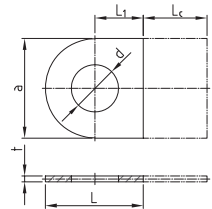
d x L [mm]      [kg]

pieza de conexión para tuerca y perno articulados  
strap connection joint bolt & nut



a x L x t x d x L<sub>1</sub> [mm]      [kg]

placa soldada para tuerca y perno articulados  
welding plate joint bolt & nut



a x L x t x d x L<sub>1</sub> x Lc [mm]      [kg+Lc]

TR 2020 - Ø

TR 2021 - Ø

TR 2022 - Ø \*\*

TR 2023 - Ø \*\*

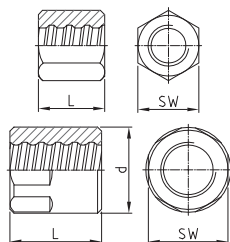
18	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-
35	120 x 193	16,00	120 x 193	14,60	260 x 512 x 15 x 123 x 252	11,00	260 x 256 x 15 x 123 x 126 x Lc	5,60 + Lc
43	140 x 212	23,80	140 x 212	21,20	320 x 626 x 15 x 145 x 306	16,60	320 x 313 x 15 x 145 x 153 x Lc	8,55 + Lc
50	150 x 222	24,39	150 x 212	21,20	355 x 680 x 20 x 155 x 325	27,73	355 x 340 x 20 x 155 x 163 x Lc	13,87 + Lc
57,5	150 x 222	27,00	150 x 222	24,53	420 x 780 x 20 x 155 x 360	40,20	420 x 390 x 20 x 155 x 180 x Lc	19,80 + Lc
63,5	190 x 265	53,40	190 x 265	51,06	460 x 894 x 25 x 195 x 434	59,60	460 x 447 x 25 x 195 x 217 x Lc	30,05 + Lc
75	190 x 279	55,00	190 x 279	52,00	470 x 912 x 35 x 195 x 442	88,40	470 x 456 x 35 x 195 x 221 x Lc	44,20 + Lc

Lc a petición del cliente / Lc on customer request

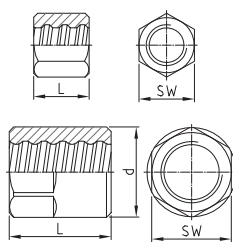
\*\* La formación de óxido no se puede descartar debido al almacenamiento y a las condiciones de transporte | Rust formation cannot be ruled out due to storage and transport conditions

SAS SYSTEMS

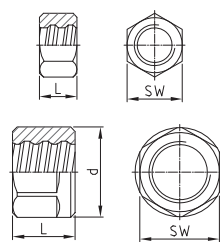
**tuercas hexagonales EP**  
*anchor nut EP flat*



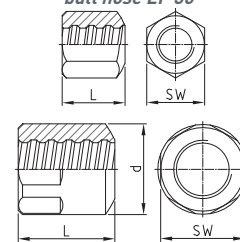
**contratuercas largas EP**  
*lock nut EP long*



**contratuercas cortas EP**  
*lock nut EP short*



**tuercas hexagonales con asiento esférico 30° EP**  
*bull nose EP 30°*

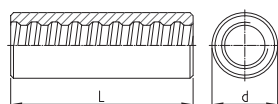


Ø [mm]      SW x L x d [mm]      [kg]      SW x L x d [mm]      [kg]      SW x L x d [mm]      [kg]      SW x L x d [mm]      [kg]

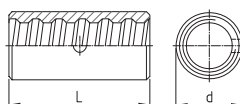
TR 2002 - Ø EP			TR 2003 - Ø EP		TR 2040 - Ø EP		TR 2963 - Ø EP	
18	36 x 55	0,40	30 x 50	0,20	30 x 40	0,15	36 x 55	0,38
22	41 x 60	0,45	36 x 60	0,33	36 x 45	0,24	41 x 60	0,43
25	46 x 70	0,65	41 x 65	0,44	41 x 50	0,36	46 x 70	0,64
28	50 x 75	0,90	46 x 70	0,59	46 x 55	0,50	50 x 75	0,67
30	55 x 80	1,00	50 x 75	0,77	50 x 60	0,66	55 x 80	0,98
35	65 x 85	1,75	55 x 80	0,94	55 x 65	0,76	65 x 85	1,70
43	79 x 105	3,30	70 x 100	2,00	70 x 80	1,65	79 x 105	3,20
50	79 x 115	2,91	79 x 110	2,78	79 x 90	2,26	79 x 115	2,83
57,5	90 x 140 x 102	5,34	90 x 120 x 102	4,51	90 x 100 x 102	3,54	90 x 140 x 102	5,14
63,5	100 x 170 x 114	8,27	100 x 140 x 114	6,73	100 x 115 x 114	5,44	100 x 170 x 114	7,79
75	100 x 150 x 108	4,67	100 x 140 x 108	4,32	100 x 120 x 108	3,65	100 x 150 x 108	4,60

SAS SYSTEMS

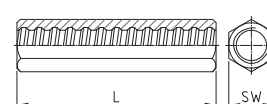
**manguito estándar EP**  
*coupler EP standard*



**manguito de contacto EP**  
*contact coupler EP*



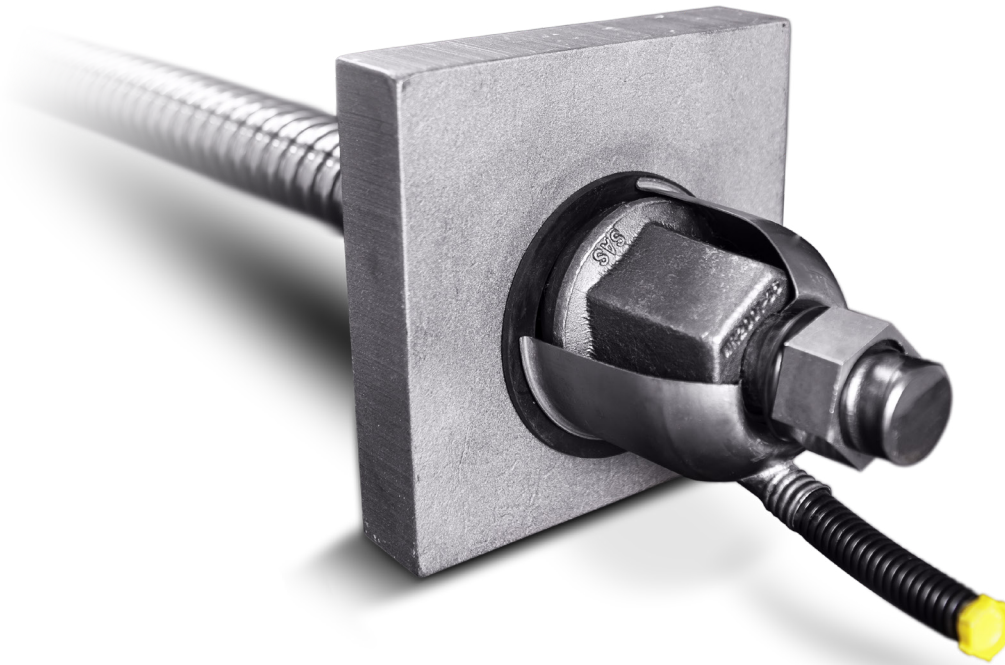
**manguito hexagonal largo EP**  
*hexagonal coupler EP long*



Ø [mm]      d x L [mm]      [kg]      d x L [mm]      [kg]      SW x L [mm]      [kg]

TR 3003 - Ø EP			TR 3006 - Ø EP		TR 3010 - Ø EP	
18	36 x 120	0,69	27 x 70	0,16	36 x 120	0,77
22	40 x 125	0,81	32 x 75	0,25	41 x 135	1,08
25	45 x 150	1,24	40 x 80	0,47	46 x 150	1,49
28	50 x 160	1,56	45 x 90	0,67	50 x 170	1,94
30	55 x 165	2,02	45 x 90	0,60	55 x 185	2,62
35	65 x 190	3,30	50 x 120	0,82	60 x 210	3,34
43	80 x 225	6,10	65 x 160	2,08	79 x 245	7,24
50	90 x 235	7,72	70 x 170	2,21	-	-
57,5	102 x 275	11,36	83 x 180	3,53	-	-
63,5	108 x 285	12,71	90 x 200	4,24	-	-
75	108 x 290	9,70	102 x 230	5,79	-	-

# Barra SAS de pretensado | SAS stress bars



Barra SAS de pretensado laminada en caliente - rosca a derechas | SAS thread bar hot rolled, ribbed - right hand thread

SAS 950 / 1050 Ø 18 - 47 mm | SAS 835 / 1035 Ø 57 - 75 mm | grado 150

según ASTM A722

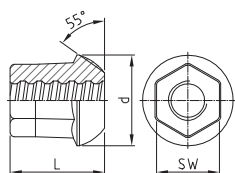
$\emptyset_{NENN} / \emptyset_{NOM}$	[mm]	18	26,5	32	36	40	47	57	65	75
max $d_A$	[mm]	21	31	37	42	46	53	64	72	82
c	[mm]	8	13	16	18	20	21	21	21	24
$f_{p0,1k}/f_{pk}/A_{gt}$ <sup>1)</sup>		950 N/mm <sup>2</sup> / 1050 N/mm <sup>2</sup> / ≥ 5%						835 N/mm <sup>2</sup> / 1035 N/mm <sup>2</sup> / ≥ 4%		
$F_{yk} (F_{p0,1k})$	[kN]	230	525	760	960	1190	1650	2155	2780	3690
$F_{pk}$	[kN]	255	580	845	1070	1320	1820	2671	3447	4572
A	[mm <sup>2</sup> ]	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

<sup>1)</sup> Deformación total porcentual para carga máxima | Percentage total elongation at maximum force

Los pesos reales pueden variar dentro de las tolerancias de fabricación. | Weight specifications are average values. The actual values may deviate due to fabrication tolerances.

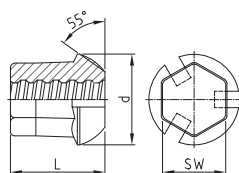
SAS SYSTEMS

tuercas asiento esférico 55°  
dome nut 55°



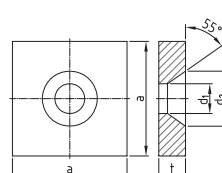
Ø [mm]      SW x L x d [mm]      [kg]

tuercas asiento esférico 55° con ranuras de inyección  
domed nut 55° with grout slots



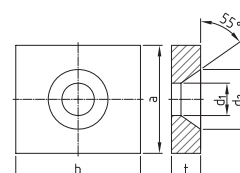
SW x L x d [mm]      [kg]

placa de anclaje asiento esférico 55° cuadrada  
anchor plate square 55°



a x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

placa de anclaje asiento esférico 55° rectangular  
anchor plate rectangular 55°

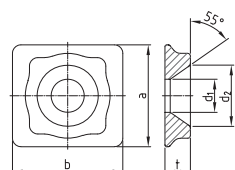


a x b x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

	WR 2001 - Ø		WR 2099 - Ø		WR 2011 - Ø**		WR 2012 - Ø**	
18	36 x 55 x 50	0,43	36 x 55 x 50	0,40	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	-	-	-	-	-	-	-	-

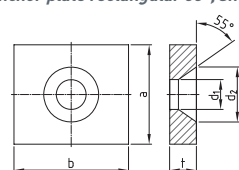
SAS SYSTEMS

placa QR  
QR plate



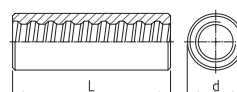
Ø [mm]      b x a x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

placa de anclaje asiento esférico 55° rectangular pequeña  
anchor plate rectangular 55°, small



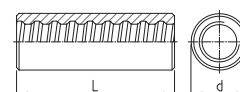
a x b x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

manguito estándar  
coupler standard



d x L [mm]      [kg]

manguito largo  
coupler long



d x L [mm]      [kg]

	WR 2074 - Ø**		WR 2076 - Ø**		WR 3003 - Ø		WR 3303 - Ø	
18	-	-	80 x 90 x 25 x 28 x 45	1,25	36 x 100	0,56	36 x 115	0,64
26,5	130 x 120 x 30 x 39 x 72	2,00	120 x 130 x 30 x 39 x 72	3,15	50 x 170	1,73	50 x 195	2,00
32	165 x 140 x 35 x 45 x 82	3,30	140 x 165 x 35 x 45 x 82	5,57	60 x 200	2,91	60 x 230	3,40
36	180 x 160 x 40 x 49 x 93	4,90	160 x 180 x 40 x 49 x 92	7,94	68 x 210	3,98	68 x 245	4,68
40	195 x 180 x 45 x 54 x 100	7,20	180 x 195 x 45 x 54 x 100	10,95	70 x 245	4,59	70 x 285	5,38
47	-	-	210 x 235 x 55 x 64 x 110	19,20	83 x 270	7,23	-	-
57	-	-	-	-	95 x 240	7,75	-	-
65	-	-	-	-	106 x 260	10,37	-	-
75	-	-	-	-	114 x 290	12,14	-	-

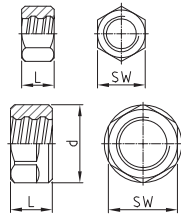
\* Para más información respecto de la capacidad de carga e instalación, consulte por favor la ficha técnica incluida en nuestra página web  
with regard to load capacity and installation, please note data sheet available on the homepage

\*\* La formación de óxido no se puede descartar debido al almacenamiento y a las condiciones de transporte | Rust formation cannot be ruled out due to storage and transport conditions

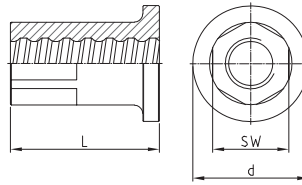
# Accesorios | accessories

SAS SYSTEMS

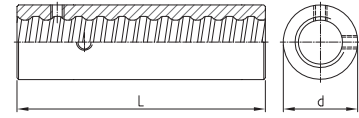
**tuerca de fijación**  
*fix nut*



**anclaje de tesado**  
*stressing anchorage*



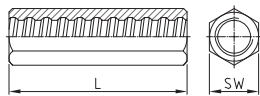
**manguito de tesado**  
*stressing-coupler*



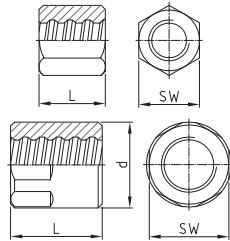
Ø [mm]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]	d x L [mm]	[kg]
<b>WR 5005 - Ø</b>			<b>WR 8002 - Ø</b>		<b>WR 8003 - Ø</b>	
18	30 x 22	0,08	41 x 70 x 65	0,82	45 x 100	1,00
26,5	36 x 22	0,08	46 x 90 x 70	1,03	45 x 150	1,17
32	41 x 22	0,09	50 x 110 x 70	1,30	55 x 180	2,02
36	46 x 25	0,12	55 x 120 x 80	1,78	60 x 200	2,55
40	50 x 25	0,13	55 x 130 x 80	1,90	65 x 220	3,44
47	60 x 30	0,24	65 x 140 x 90	2,81	75 x 240	4,87
57	85 x 40 x 90	1,02	90 x 160 x 110	7,28	95 x 270	9,40
65	90 x 40 x 102	1,15	100 x 180 x 120	9,66	110 x 290	13,13
75	105 x 50 x 114	1,90	105 x 200 x 135	12,85	120 x 320	15,45

SAS SYSTEMS

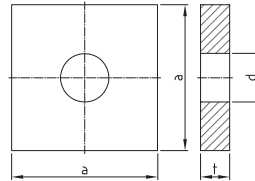
**manguito hexagonal**  
*hexagonal coupler*



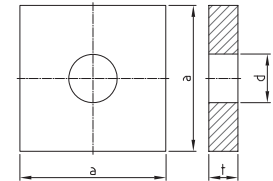
**tuerca hexagonal**  
*anchor nut flat*



**placa de anclaje lisa**  
*anchor plate flat*



**placa de anclaje lisa**  
*anchor plate flat*

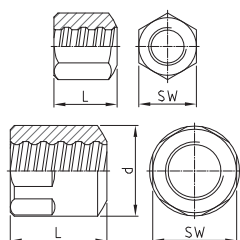


Ø [mm]	SW x L [mm]	[kg]	SW x L x d [mm]	[kg]	a x t x d [mm]	[kg]	a x t x d [mm]	[kg]
<b>WR 3009 - Ø</b>			<b>WR 2002 - Ø</b>		<b>WR 2139 - Ø**</b>		<b>WR 2140 - Ø**</b>	
18	36 x 100	0,67	41 x 60	0,55	120 x 20 x 25	2,20	-	-
26,5	50 x 170	2,09	46 x 80	0,73	150 x 35 x 32	5,90	-	-
32	60 x 200	3,54	55 x 90	1,18	180 x 40 x 38	9,82	-	-
36	70 x 210	5,01	60 x 110	1,63	200 x 45 x 45	13,57	-	-
40	70 x 245	5,61	70 x 120	2,63	220 x 45 x 50	16,40	-	-
47	79 x 270	7,49	79 x 140	3,72	240 x 55 x 58	23,73	-	-
57	-	-	90 x 120 x 95	3,79	285 x 65 x 70	39,48	220 x 50 x 70	17,49
65	-	-	100 x 130 x 106	4,99	325 x 70 x 78	55,42	245 x 60 x 78	26,02
75	-	-	105 x 145 x 114	5,68	370 x 80 x 88	82,15	275 x 70 x 88	38,21

\*\* La formación de óxido no se puede descartar debido al almacenamiento y a las condiciones de transporte | *Rust formation cannot be ruled out due to storage and transport conditions*

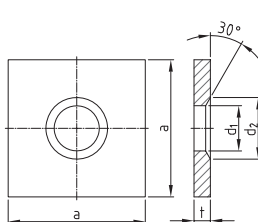
SAS SYSTEMS

tuercas hexagonal 30°  
bull nose nut 30°



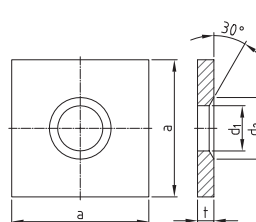
∅ [mm]      SW x L x d [mm]      [kg]

placa de anclaje cono 30°  
anchor plate cone 30°



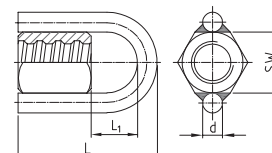
a x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

placa de anclaje cono 30°  
anchor plate cone 30°



a x t x d<sub>1</sub> x d<sub>2</sub> [mm]      [kg]

tuercas hexagonal con argolla  
(Carga máxima de uso del anillo 60 kN)  
ring nut  
(working load of ring max. 60 kN)

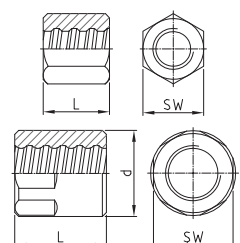


SW x L x L<sub>1</sub> x d [mm]      [kg]

	WR 2963 - ∅ *		WR 1928 - ∅ **		WR 1929 - ∅ **		WR 2927 - ∅	
18	41 x 60	0,52	120 x 20 x 25 x 35	2,18	-	-	41 x 135 x 59 x 16	0,99
26,5	46 x 80	0,71	150 x 35 x 32 x 45	5,95	-	-	46 x 165 x 69 x 16	1,28
32	55 x 90	1,14	180 x 40 x 38 x 50	9,81	-	-	55 x 190 x 84 x 16	1,81
36	60 x 110	1,57	200 x 45 x 45 x 60	13,55	-	-	60 x 219 x 89 x 20	2,78
40	70 x 120	2,53	220 x 45 x 50 x 70	16,36	-	-	70 x 244 x 104 x 20	3,87
47	79 x 140	3,60	240 x 55 x 58 x 80	23,50	-	-	79 x 274 x 114 x 20	5,10
57	90 x 120 x 95	3,67	285 x 65 x 70 x 90	39,30	220 x 50 x 70 x 90	17,43	90 x 255 x 115 x 20	5,08
65	100 x 130 x 106	4,90	325 x 70 x 78 x 110	55,50	245 x 60 x 78 x 110	25,86	100 x 280 x 130 x 20	6,48
75	105 x 145 x 114	5,51	370 x 80 x 88 x 120	82,00	275 x 70 x 88 x 120	38,03	105 x 305 x 140 x 20	7,31

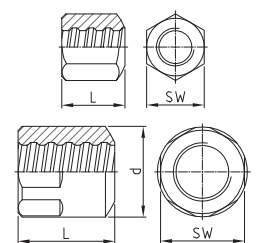
SAS SYSTEMS

tuercas hexagonal EP  
anchor nut EP flat



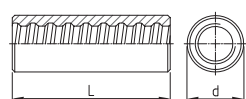
∅ [mm]      SW x L x d [mm]      [kg]

tuercas hexagonal asiento esférico 30°  
bull nose nut EP 30°



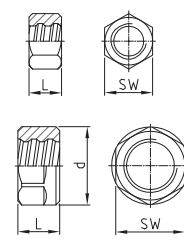
SW x L x d [mm]      [kg]

manguito EP estándar  
coupler EP standard



d x L [mm]      [kg]

tuercas de fijación EP  
fix nut EP



SW x L x d [mm]      [kg]

	WR 2002 - ∅ EP		WR 2963 - ∅ EP		WR 3003 - ∅ EP		WR 5005 - ∅ EP	
18	41 x 70	0,62	41 x 70	0,60	36 x 120	0,69	30 x 22	0,08
26,5	46 x 90	0,81	46 x 90	0,79	50 x 185	1,94	36 x 22	0,08
32	55 x 100	1,30	55 x 100	1,27	60 x 220	3,33	41 x 22	0,09
36	60 x 120	1,75	60 x 120	1,71	68 x 240	4,72	46 x 25	0,11
40	70 x 130	2,77	70 x 130	2,70	70 x 270	5,26	50 x 25	0,12
47	79 x 150	3,92	79 x 150	3,81	83 x 310	8,65	60 x 30	0,23
57	90 x 145 x 95	4,59	90 x 145 x 95	4,46	95 x 270	9,32	85 x 40 x 90	1,01
65	100 x 155 x 106	5,82	100 x 155 x 106	5,66	106 x 290	12,01	90 x 40 x 102	1,13
75	105 x 180 x 114	7,60	105 x 180 x 114	6,96	114 x 320	14,15	105 x 50 x 114	1,92

# SAS barra lisa | SAS smooth bars



barra de pretensado lisa SAS con rosca laminada en frío - rosca a derechas | SAS smooth bar with cold rolled thread - right hand thread

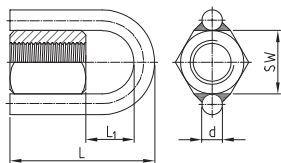
SAS 950 / 1050 Ø 32 - 40 mm | grade 150 | lisa | smooth

según ASTM A722

$\emptyset_{NENN} / \emptyset_{NOM}$	[mm]	32	36
c	[mm]	3	3
$f_{p0,1k} / f_{pk} / A_{gt}$		950 N/mm <sup>2</sup> / 1050 N/mm <sup>2</sup> / $\geq 7\%$	
$F_{yk} (F_{p0,1k})$	[kN]	760	960
$F_{pk}$	[kN]	845	1070
A	[mm <sup>2</sup> ]	804	1018
G	[kg/m]	6,31	7,99

## SAS SYSTEMS

tuera hexagonal con argolla  
(Carga máxima de uso del anillo 60 kN)  
ring nut (working load of ring max. 60 kN)

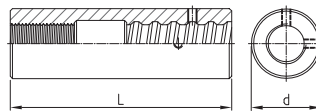


Ø [mm]      SW x L x L<sub>1</sub> x d [mm]      [kg]

WS 2927 - Ø \*

32	55 x 125 x 59 x 16	1,22
36	60 x 149 x 64 x 20	1,86

manguito de tesado  
stressing coupler for WS

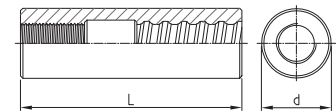


d x L [mm]      [kg]

WS 8004 - Ø

60 x 190	2,74
65 x 230	3,80

manguito de transición  
transition coupler



d x L [mm]      [kg]

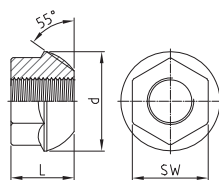
WS 3004 - Ø

60 x 200	2,94
68 x 235	4,47

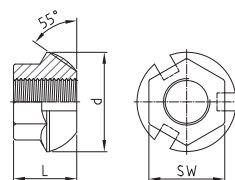
\* Para más información respecto de la capacidad de carga e instalación, consulte por favor la ficha técnica incluida en nuestra página web  
with regard to load capacity and installation, please note data sheet available on the homepage

SAS SYSTEMS

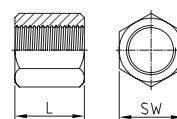
tuerca asiento esférico 55°  
dome nut 55°



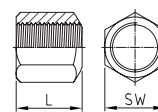
tuerca asiento esférico 55°  
con muescas por inyección  
domed nut 55° with grout slots



tuerca hexagonal  
anchor nut flat



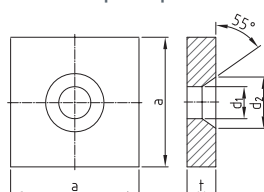
tuerca hexagonal  
asiento esférico  
bull nose 30°



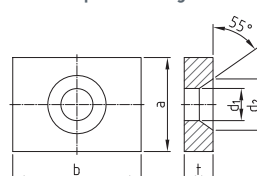
Ø [mm]	SW x L x d [mm]	[kg]	SW x L x d [mm]	[kg]	SW x L [mm]	[kg]	SW x L [mm]	[kg]
WS 2001 - Ø			WS 2099 - Ø		WS 2002 - Ø		WS 2963 - Ø	
32	55 x 46 x 72	0,78	55 x 46 x 72	0,74	55 x 50	0,79	55 x 50	0,68
36	65 x 60 x 90	1,55	65 x 60 x 90	1,41	60 x 65	1,06	60 x 65	1,03

SAS SYSTEMS

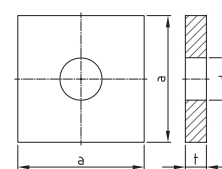
placa de anclaje asiento esférico  
55° cuadrada  
anchor plate square 55°



placa de anclaje asiento esférico  
55° rectangular  
anchor plate rectangular 55°



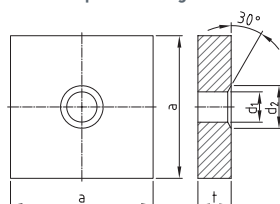
placa de anclaje lisa  
anchor plate flat



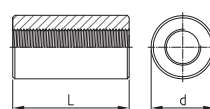
Ø [mm]	a x t x d <sub>1</sub> x d <sub>2</sub> [mm]	[kg]	a x b x t x d <sub>1</sub> x d <sub>2</sub> [mm]	[kg]	a x t x d [mm]	[kg]
WS 2011 - Ø **			WS 2012 - Ø **		WS 2139 - Ø **	
32	180 x 40 x 45 x 72	9,50	140 x 180 x 40 x 45 x 72	7,24	180 x 40 x 38	9,82
36	200 x 45 x 49 x 92	12,95	150 x 220 x 50 x 49 x 92	11,70	200 x 45 x 45	13,57

SAS SYSTEMS

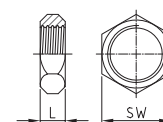
placa de anclaje asiento esférico  
30° rectangular  
anchor plate rectangular 30°



manguito estándar  
coupler standard



tuerca de fijación  
fix nut



Ø [mm]	a x t x d <sub>1</sub> x d <sub>2</sub> [mm]	[kg]	d x L [mm]	[kg]	SW x L [mm]	[kg]
WS 1928 - Ø **			WS 3003 - Ø		WS 5005 - Ø	
32	180 x 40 x 38 x 50	9,81	60 x 110	1,74	41 x 15	0,08
36	200 x 45 x 45 x 60	13,55	68 x 160	3,25	46 x 15	0,09

\*\* La formación de óxido no se puede descartar debido al almacenamiento y a las condiciones de transporte | Rust formation cannot be ruled out due to storage and transport conditions

# Barras roscadas SAS | SAS thread bar

Límite elástico / Tensión última | *yield stress / ultimate stress*  
 Áreas de aplicación | *areas of application*

Ø-nominal  
*nom.-Ø*

Carga en límite elástico  
*yield load*

Carga última  
*ultimate load*

Sección  
*cross section area*

Peso  
*weight*

Elongación  
*elongation*

[mm]

[kN]

[kN]

[mm²]



[m/to]

[kg/m]

A<sub>gt</sub> [%]


A<sub>11,3</sub> [%]

## SAS 500 / 550 – grado 75/80


	Sistemas de armadura de hormigón   <i>reinforcing systems</i>	12	57	62	113	1123,6	0,89	6	10
		14	77	85	154	826,4	1,21		
		16	100	110	201	632,9	1,58		
		20	160	175	314	404,9	2,47		
		25	245	270	491	259,7	3,85		
		28	310	340	616	207,0	4,83		
		32	405	440	804	158,5	6,31		
		36	510	560	1020	125,2	7,99		
		40	630	690	1260	101,3	9,87		
		43	726	799	1452	87,7	11,40		
	Sistemas geotécnicos   <i>geotechnical systems</i>	50	980	1080	1960	64,9	15,40	5	---
		57,5	1441	1818	2597	49,1	20,38		
		63,5	1760	2215	3167	40,2	24,86		
SAS 500 / 550 – grado 75		75	2209	2430	4418	28,8	34,68	5	---

Disponible también SAS 550 | *alternative SAS 550 grade 75 available*




## SAS 450 / 700 – grado 60

	Minería   <i>mining</i>	16	93	145	207	617,3	1,62	(A) 15
		25	220	345	491	259,7	3,85	(A) 20



## SAS 650 / 800 – grado 90

	Minería   <i>mining</i>	22	247	304	380	335,6	2,98	(A) 18
		25	319	393	491	259,7	3,85	
		28	400	493	616	207,0	4,83	
		30	460	565	707	180,2	5,55	


## SAS 670 / 800 – grado 97

	Sistemas geotécnicos   <i>geotechnical systems</i>	18	170	204	254	500,0	2,00	5	10			
		22	255	304	380	335,6	2,98					
		25	329	393	491	259,7	3,85					
		28	413	493	616	207,0	4,83					
			Túneles y minería   <i>tunneling &amp; mining</i>	30	474	565	707			180,2	5,55	
				35	645	770	962			132,5	7,55	
				43	973	1162	1452			87,7	11,40	
			Sistemas de armadura de hormigón de alta resistencia   <i>high-strength reinforcement</i>	57,5	1740	2077	2597			49,1	20,38	---
				63,5	2122	2534	3167			40,2	24,86	
				75	2960	3535	4418			28,8	34,68	
---	---			---	---	---	---					


## SAS 950 / 1050 – grado 150

	Sistemas de postesado   <i>post-tensioning systems</i>	18	230	255	241	510,2	1,96	5	7
		26,5	525	580	551	223,2	4,48		
		32	760	845	804	153,1	6,53		
		36	960	1070	1020	120,9	8,27		
	Sistemas geotécnicos   <i>geotechnical systems</i>	40	1190	1320	1257	97,9	10,21		
		47	1650	1820	1735	70,9	14,10		


## SAS 835 / 1035 – grado 150

	Sistemas geotécnicos   <i>geotechnical systems</i>	57	2131	2641	2552	48,2	20,73	4	---
		65	2771	3434	3318	37,1	26,96		
		75	3689	4572	4418	27,9	35,90		


## SAS 900 / 1100 FA – grado 160 FA

	Sistemas de encofrado   <i>formwork ties</i>	15	159	195	177	694,4	1,44	3	7
		20	283	345	314	390,6	2,56		
		26,5	495	606	551	223,2	4,48		

## SAS 900 / 1050 FC – grado 150 FC

	Sistemas de encofrado   <i>formwork ties</i>	15	159	186	177	694,4	1,44	3	7
		20	283	330	314	390,6	2,56		
		26,5	525	580	551	223,2	4,48		

## SAS 950 / 1050 E – grado 150

	Sistemas de encofrado   <i>formwork ties</i>	12,5	90	120	132,5	961,5	1,04	2	5,5
		15	142	165	189	675,7	1,48		
		20	245	285	326	390,6	2,56		

Accesorios disponibles para todas las dimensiones y aplicaciones | *accessories for all dimensions and applications available*