Pin, Swage Locking, Stump Type
100° Countersunk Intermediate Head

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1 Scope

This standard specifies the dimensions and tolerances of a 100° countersunk stump type swage locking pin for use in aerospace applications.

2 Normative References

This Airbus Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Airbus Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 2000	Aerospace series – Quality assurance EN aerospace products – Approval of the quality system of manufacturers.
EN2424	Marking of aerospace products.
ASNA2025	Aluminium alloy collars
AMS4967	Titanium alloy, bars, wire, forgings and rings 6AL-4V annealed, heat-treatable.
ANSI B46.1	Surface texture (surface roughness, waviness and lay)
EN6117	Specification for Lubricant of fasteners with Cetyl alcohol.
NAS4006	Aluminium coating.
HPS C 2010	Technical specification

3 Requirements

3.1 Configuration, dimensions, tolerances and mechanical properties.

3.1.1 The configuration, dimensions, tolerances and mechanical properties shall conform with Figure 1 and Tables 2,3 & 4

3.1.2 Shank straightness to be within ‘S’ values TIR per inch of shank length. See table 2

3.1.3 The conical surface of the countersunk head shall be concentric with the shank Diameter ‘A’ within 0.005 inch (0,127mm).

3.1.4 Pins shall be permanently and legibly marked on the head with at least the manufacturer's part number and trademark and the material code, by depressed characters 0.006 inch (0,15 mm) maximum depth.

3.1.5 Surface texture before coating (Ra max in accordance with ANSI B46.1) conical surface of head, head to shank fillet radius, shank and transition radius, 32 µin (0,8µm) all other surfaces 125 µin (3,2µm)

3.2 Material and surface treatment

3.2.1 Heat treated to 95 KSI (662 N/mm^2) minimum ultimate shear strength.

Table 1: Material and surface treatment

Material	Surface treatment	Code
6AL-4V Titanium alloy per AMS4967	Resin based Aluminium per NAS4006 plus Cetyl alcohol lube per EN6117	VHK

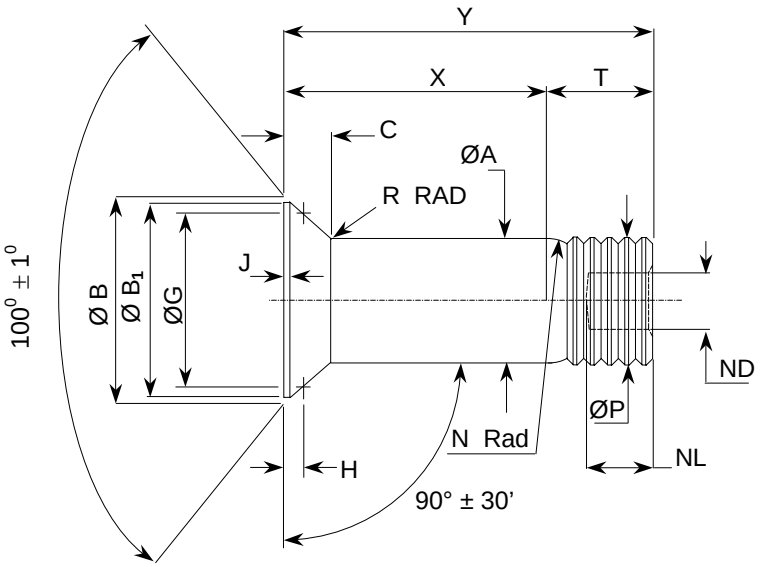


Figure 1 : Configuration

Table 2 : Nominal Dimensions

Dimensions in inch (mm) continued

Dash No	Nominal Dia	ØA		ØB Nom	$ØB_1$		C Nom	G Gauge Ø		H Gauge Height	
		Max	Min		Max	Min		Max	Min	Max	Min
3	3/16	0.1895 (4,813)	0.1885 (4,788)	0.322 (8,19)	0.3100 (7,874)	0.2921 (7,419)	0.056 (1,42)	0.2441 (6,200)	0.2439 (6,195)	0.0345 (0,876)	0.0313 (0,795)
3A	7/32	0.2182 (5,542)	0.2172 (5,517)	0.371 (9,44)	0.3595 (9,131)	0.3527 (8,959)	0.065 (1,64)	0.2982 (7,574)	0.2980 (7,569)	0.0323 (0,820)	0.0293 (0,744)
4	1/4	0.2495 (6,337)	0.2485 (6,312)	0.423 (10,75)	0.4108 (10,434)	0.3933 (9,990)	0.073 (1,86)	0.3315 (8,420)	0.3313 (8,415)	0.0402 (1,021)	0.0370 (0,940)
5	5/16	0.3120 (7,925)	0.3110 (7,899)	0.530 (13,47)	0.5174 (13,142)	0.5011 (12,728)	0.092 (2,33)	0.4320 (10,973)	0.4318 (10,968)	0.0432 (0,869)	0.0396 (1,006)
6	3/8	0.3745 (9,512)	0.3735 (9,487)	0.636 (16,15)	0.6216 (15,789)	0.6071 (15,420)	0.110 (2,79)	0.4854 (12,329)	0.4852 (12,324)	0.0649 (1,648)	0.0613 (1,557)
7	7/16	0.4370 (11,100)	0.4360 (11,074)	0.736 (18,69)	0.7227 (18,357)	0.6900 (17,526)	0.126 (3,19)	0.6582 (16,718)	0.6580 (16,713)	0.0347 (0,881)	0.0307 (0,780)

Table 2 : Nominal Dimensions (concluded)

Dash No	Nominal Dia	J Max	N Rad Min	ØP Max	R		S See Note 3.1.2	T Ref	Ø ND Max	NL Max
					Max	Min				
3	3/16	0.015 (0,38)	0.079 (2,01)	0.184 (4,67)	0.030 (0,76)	0.020 (0,51)	0.0045 (0,114)	0.171 (4,34)	0.086 (2,18)	0.118 (3,00)
3A	7/32	0.010 (0,25)	0.242 (6,15)	0.213 (5,41)	0.030 (0,76)	0.020 (0,51)	0.0045 (0,114)	0.231 (5,87)	0.086 (2,18)	0.118 (3,00)
4	1/4	0.015 (0,38)	0.242 (6,15)	0.244 (6,20)	0.030 (0,76)	0.020 (0,51)	0.0045 (0,114)	0.231 (5,87)	0.109 (2,77)	0.162 (4,11)
5	5/16	0.015 (0,38)	0.420 (10,67)	0.306 (7,77)	0.040 (1,02)	0.030 (0,76)	0.0045 (0,114)	0.296 (7,52)	0.141 (3,58)	0.216 (5,49)
6	3/8	0.015 (0,38)	0.388 (9,86)	0.370 (9,40)	0.040 (1,02)	0.030 (0,76)	0.0060 (0,152)	0.345 (8,76)	0.171 (4,34)	0.243 (6,17)
7	7/16	0.022 (0,56)	0.319 (8,10)	0.431 (10,95)	0.050 (1,27)	0.040 (1,02)	0.0060 (0,152)	0.392 (9,96)	0.199 (5.05)	0.260 (6,60)

Table 3 : Grip Dimensions and Mass

Dimensions in inch (mm)

Grip Dash No	Grip range		X		Ø Dash No 3 Y		Mass	Ø Dash No 3A Y		Mass
	Max	Min	Max	Min	Max	Min	grammes	Max	Min	grammes
03	0.188 (4,78)	0.126 (3,20)	0.193 (4,90)	0.183 (4,65)	0.369 (9,37)	0.349 (8,86)	0.76	0.429 (10.90)	0.409 (10.39)	1.37
04	0.250 (6,35)	0.189 (4,80)	0.255 (6,48)	0.245 (6,22)	0.431 (10,95)	0.411 (10,44)	0.89	0.491 (12,47)	0.471 (11,96)	1.54
05	0.312 (7,92)	0.251 (6,38)	0.317 (8,05)	0.307 (7,80)	0.493 (12,52)	0.473 (12,01)	1.02	0.553 (14,05)	0.533 (13,54)	1.71
06	0.375 (9,52)	0.313 (7,95)	0.380 (9,65)	0.370 (9,40)	0.556 (14,12)	0.536 (13,61)	1.23	0.616 (15,65)	0.596 (15,14)	1.88
07	0.438 (11,13)	0.376 (9,55)	0.443 (11,25)	0.433 (11,00)	0.619 (15,72)	0.599 (15,21)	1.36	0.679 (17,25)	0.659 (16,74)	2.08
08	0.500 (12,70)	0.439 (11,15)	0.505 (12,83)	0.495 (12,57)	0.681 (17,30)	0.661 (16,79)	1.49	0.741 (18,82)	0.721 (18,31)	2.22
09	0.562 (14,27)	0.501 (12,73)	0.567 (14,40)	0.557 (14,15)	0.743 (18,87)	0.723 (18,36)	1.62	0.803 (20,40)	0.783 (19,89)	2.38
10	0.625 (15,88)	0.563 (14,30)	0.630 (16,00)	0.620 (15,75)	0.806 (20,47)	0.786 (19,96)	1.69	0.866 (22,00)	0.846 (21,49)	2.55
11	0.688 (17,48)	0.626 (15,90)	0.693 (17,60)	0.683 (17,35)	0.869 (22,07)	0.849 (21,56)	1.81	0.929 (23,60)	0.909 (23,09)	2.72
12	0.750 (19,05)	0.689 (17,50)	0.755 (19,18)	0.745 (18,92)	0.931 (23,64)	0.911 (23,14)	1.94	0.991 (25,17)	0.971 (24,66)	2.89
13	0.812 (20,62)	0.751 (19,08)	0.817 (20,75)	0.807 (20,50)	0.993 (25,22)	0.973 (24,71)	2.07	1.053 (26,75)	1.033 (26,24)	3.06
14	0.875 (22,22)	0.813 (20,65)	0.880 (22,35)	0.870 (22,10)	----	----	----	1.116 (28,35)	1.096 (27,84)	3.24
15	0.938 (23,83)	0.876 (22,25)	0.943 (23,95)	0.933 (23,70)	----	----	----	1.179 (29,95)	1.159 (29,44)	3.40
16	1.000 (25,40)	0.939 (23,85)	1.005 (25,53)	0.995 (25,27)	----	----	----	1.241 (31,52)	1.221 (31,01)	3.58
17	1.062 (26,97)	1.001 (25,43)	1.067 (27,10)	1.057 (26,85)	----	----	----	1.303 (33,10)	1.283 (32,59)	3.75
18	1.125 (28,58)	1.063 (27,00)	1.130 (28,70)	1.120 (28,45)	----	----	----	1.366 (34,70)	1.346 (34,19)	3.91
19	1.188 (30,18)	1.126 (28,60)	1.193 (30,30)	1.183 (30,05)	----	----	----	1.429 (36,30)	1.409 (35,79)	4.08
20	1.250 (31,75)	1.189 (30,20)	1.255 (31,88)	1.245 (31,62)	----	----	----	1.491 (37,87)	1.471 (37,36)	4.25
21	1.312 (33,32)	1.251 (31,78)	1.317 (33,45)	1.307 (33,20)	----	----	----	1.553 (39,45)	1.533 (38,94)	4.42
22	1.375 (34,92)	1.313 (33,35)	1.380 (35,05)	1.370 (34,80)	----	----	----	----	----	----
23	1.438 (36,53)	1.376 (34,95)	1.443 (36,65)	1.433 (36,40)	----	----	----	----	----	----

Continued

Table 3 : Grip Dimensions and Mass (Continued)

Dimensions in inch (mm)

Grip Dash No	Grip range		X		Ø Dash No 4 Y		Mass	Ø Dash No 5 Y		Mass
	Max	Min	Max	Min	Max	Min	grammes	Max	Min	grammes
03	0.188 (4,78)	0.126 (3,20)	0.193 (4,90)	0.183 (4,65)	0.429 (10.90)	0.409 (10,39)	1.64	----	----	----
04	0.250 (6,35)	0.189 (4,80)	0.255 (6,48)	0.245 (6,22)	0.491 (12,47)	0.471 (11,96)	1.87	0.556 (14,12)	0.536 (13,61)	3.52
05	0.312 (7,92)	0.251 (6,38)	0.317 (8,05)	0.307 (7,80)	0.553 (14,05)	0.533 (13,54)	2.10	0.618 (15,70)	0.598 (15,19)	3.69
06	0.375 (9,52)	0.313 (7,95)	0.380 (9,65)	0.370 (9,40)	0.616 (15,65)	0.596 (15,14)	2.33	0.681 (17,30)	0.661 (16,79)	4.04
07	0.438 (11,13)	0.376 (9,55)	0.443 (11,25)	0.433 (11,00)	0.679 (17,25)	0.659 (16,74)	2.44	0.744 (18,90)	0.724 (18,39)	4.39
08	0.500 (12,70)	0.439 (11,15)	0.505 (12,83)	0.495 (12,57)	0.741 (18,82)	0.721 (18,31)	2.64	0.806 (20,47)	0.786 (19,96)	4.74
09	0.562 (14,27)	0.501 (12,73)	0.567 (14,40)	0.557 (14,15)	0.803 (20,40)	0.783 (19,89)	2.86	0.868 (22,05)	0.848 (21,54)	5.08
10	0.625 (15,88)	0.563 (14,30)	0.630 (16,00)	0.620 (15,75)	0.866 (22,00)	0.846 (21,49)	3.08	0.931 (23,65)	0.911 (23,14)	5.45
11	0.688 (17,48)	0.626 (15,90)	0.693 (17,60)	0.683 (17,35)	0.929 (23,60)	0.909 (23,09)	3.30	0.994 (25,25)	0.974 (24,74)	5.80
12	0.750 (19,05)	0.689 (17,50)	0.755 (19,18)	0.745 (18,92)	0.991 (25,17)	0.971 (24,66)	3.52	1.056 (26,82)	1.036 (26,31)	6.16
13	0.812 (20,62)	0.751 (19,08)	0.817 (20,75)	0.807 (20,50)	1.053 (26,75)	1.033 (26,24)	3.91	1.118 (28,40)	1.098 (27,89)	6.51
14	0.875 (22,22)	0.813 (20,65)	0.880 (22,35)	0.870 (22,10)	1.116 (28,35)	1.096 (27,84)	4.13	1.181 (30,00)	1.161 (29,49)	6.86
15	0.938 (23,83)	0.876 (22,25)	0.943 (23,95)	0.933 (23,70)	1.179 (29,95)	1.159 (29,44)	4.36	1.244 (31,60)	1.224 (31,09)	7.22
16	1.000 (25,40)	0.939 (23,85)	1.005 (25,53)	0.995 (25,27)	1.241 (31,52)	1.221 (31,01)	4.58	1.306 (33,17)	1.286 (32,66)	7.57
17	1.062 (26,97)	1.001 (25,43)	1.067 (27,10)	1.057 (26,85)	1.303 (33,10)	1.283 (32,59)	4.69	1.368 (34,75)	1.348 (34,24)	7.92
18	1.125 (28,58)	1.063 (27,00)	1.130 (28,70)	1.120 (28,45)	1.366 (34,70)	1.346 (34,19)	4.92	1.431 (36,35)	1.411 (35,84)	8.27
19	1.188 (30,18)	1.126 (28,60)	1.193 (30,30)	1.183 (30,05)	1.429 (36,30)	1.409 (35,79)	5.14	1.494 (37,95)	1.474 (37,44)	8.63
20	1.250 (31,75)	1.189 (30,20)	1.255 (31,88)	1.245 (31,62)	1.491 (37,87)	1.471 (37,36)	5.36	1.556 (39,52)	1.536 (39,01)	8.98
21	1.312 (33,32)	1.251 (31,78)	1.317 (33,45)	1.307 (33,20)	1.553 (39,45)	1.533 (38,94)	5.59	1.618 (41,10)	1.598 (40,59)	9.11
22	1.375 (34,92)	1.313 (33,35)	1.380 (35,05)	1.370 (34,80)	----	----	----	1.681 (42,70)	1.661 (42,19)	9.46
23	1.438 (36,53)	1.376 (34,95)	1.443 (36,65)	1.433 (36,40)	----	----	----	1.744 (44,30)	1.724 (43,79)	9.81

Continued

Table 3 : Grip Dimensions and Mass (Continued)

Dimensions in inch (mm)

Grip Dash No	Grip range		X		Ø Dash No 6 Y		Mass	Ø Dash No 7 Y		Mass
	Max	Min	Max	Min	Max	Min	Grammes	Max	Min	grammes
05	0.312 (7,92)	0.251 (6,38)	0.317 (8,05)	0.307 (7,80)	0.667 (16,94)	0.647 (16,43)	5.94	----	----	----
06	0.375 (9,52)	0.313 (7,95)	0.380 (9,65)	0.370 (9,40)	0.730 (18,54)	0.710 (18,03)	5.87	0.777 (19,74)	0.757 (19,23)	8.58
07	0.438 (11,13)	0.376 (9,55)	0.443 (11,25)	0.433 (11,00)	0.793 (20,14)	0.773 (19,63)	6.38	0.840 (21,34)	0.820 (20,83)	9.31
08	0.500 (12,70)	0.439 (11,15)	0.505 (12,83)	0.495 (12,57)	0.855 (21,72)	0.835 (21,21)	6.90	0.902 (22,91)	0.882 22,40)	10.04
09	0.562 (14,27)	0.501 (12,73)	0.567 (14,40)	0.557 (14,15)	0.917 (23,29)	0.897 (22,78)	7.39	0.964 (24,49)	0.944 (23,98)	10.77
10	0.625 (15,88)	0.563 (14,30)	0.630 (16,00)	0.620 (15,75)	0.980 (24,89)	0.960 (24,38)	7.89	1.027 (26,09)	1.007 (25,58)	11.40
11	0.688 (17,48)	0.626 (15,90)	0.693 (17,60)	0.683 (17,35)	1.043 (26,49)	1.023 (25,98)	8.40	1.090 (27,69)	1.070 (27,18)	12.10
12	0.750 (19,05)	0.689 (17,50)	0.755 (19,18)	0.745 (18,92)	1.105 (28,07)	1.085 (27,56)	8.91	1.152 (29,26)	1.132 (28,75)	12.80
13	0.812 (20,62)	0.751 (19,08)	0.817 (20,75)	0.807 (20,50)	1.167 (29,64)	1.147 (29,13)	9.41	1.214 (30,84)	1.194 (30,33)	13.50
14	0.875 (22,22)	0.813 (20,65)	0.880 (22,35)	0.870 (22,10)	1.230 (31,24)	1.210 (30,73)	9.92	1.277 (32,44)	1.257 (31,93)	14.70
15	0.938 (23,83)	0.876 (22,25)	0.943 (23,95)	0.933 (23,70)	1.293 (32,84)	1.273 (32,33)	10.42	1.340 (34,04)	1.320 (33,53)	15.40
16	1.000 (25,40)	0.939 (23,85)	1.005 (25,53)	0.995 (25,27)	1.355 (34,42)	1.335 (33,91)	10.93	1.402 (35,61)	1.382 (35,10)	16.10
17	1.062 (26,97)	1.001 (25,43)	1.067 (27,10)	1.057 (26,85)	1.417 (35,99)	1.397 (35,48)	11.43	1.464 (37,19)	1.444 (36,68)	16.80
18	1.125 (28,58)	1.063 (27,00)	1.130 (28,70)	1.120 (28,45)	1.480 (37,59)	1.460 (37,08)	11.93	1.527 (38,79)	1.507 (38,28)	17.50
19	1.188 (30,18)	1.126 (28,60)	1.193 (30,30)	1.183 (30,05)	1.543 (39,19)	1.523 (38,68)	12.45	1.590 (40,39)	1.570 (39,88)	18.20
20	1.250 (31,75)	1.189 (30,20)	1.255 (31,88)	1.245 (31,62)	1.605 (40,77)	1.585 (40,26)	12.97	1.652 (41,96)	1.632 (41,45)	18.90
21	1.312 (33,32)	1.251 (31,78)	1.317 (33,45)	1.307 (33,20)	1.667 (42,34)	1.647 (41,83)	13.46	1.714 (43,54)	1.694 (43,03)	19.60
22	1.375 (34,92)	1.313 (33,35)	1.380 (35,05)	1.370 (34,80)	1.730 (43,94)	1.710 (43,43)	13.97	1.777 (45,14)	1.757 (44,63)	20.30
23	1.438 (36,53)	1.376 (34,95)	1.443 (36,65)	1.433 (36,40)	1.793 (45,54)	1.773 (45,03)	14.48	1.840 (46,74)	1.820 (46,23)	22.19
24	1.500 (38,10)	1.439 (36,55)	1.505 (38,23)	1.495 (37,97)	1.855 (47,12)	1.835 (46,61)	14.99	1.902 (48,31)	1.882 (47,80)	22.87
25	1.562 (39,67)	1.501 (38,13)	1.567 (39,80)	1.557 (39,55)	1.917 (48,69)	1.897 (48,18)	15.50	1.964 (49,89)	1.944 (49,38)	23.55
26	1.625 (41,28)	1.563 (39,70)	1.630 (41,40)	1.620 (41,15)	1.980 (50,29)	1.960 (49,78)	16.01	2.027 (51,49)	2.007 (50,98)	24.23
27	1.688 (42,88)	1.626 (41,30)	1.693 (43,00)	1.683 (42,75)	2.043 (51,89)	2.023 (51,38)	17.03	2.090 (53,09)	2.070 (52,58)	24.92

Continued

Table 3 : Grip Dimensions and Mass (Concluded)

Dimensions in inch (mm)

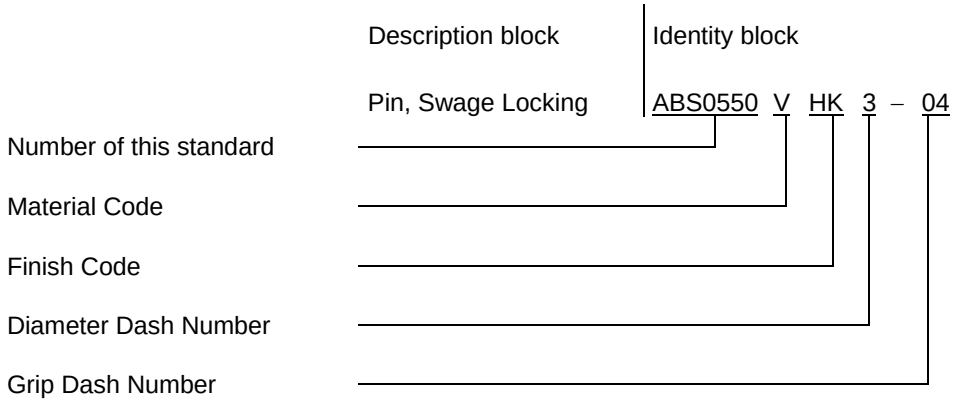
Grip Dash No	Grip range		X		Ø Dash No 6 Y		Mass	Ø Dash No 7 Y		Mass
	Max	Min	Max	Min	Max	Min	grammes	Max	Min	grammes
28	1.750 (44,45)	1.689 (42,90)	1.755 (44,58)	1.745 (44,32)	2.105 (53,47)	2.085 (52,96)	17.54	2.152 (54,66)	2.132 (54,15)	25.60
29	1.812 (46,02)	1.751 (44,48)	1.817 (46,15)	1.807 (45,90)	2.167 (55,04)	2.147 (54,53)	18.05	2.214 (56,24)	2.194 (55,73)	26.28
30	1.875 (47,62)	1.813 (46,05)	1.880 (47,75)	1.870 (47,50)	2.230 (56,64)	2.210 (56,13)	18.56	2.277 (57,84)	2.257 (57,33)	26.96
31	1.938 (49,23)	1.876 (47,65)	1.943 (49,35)	1.933 (49,10)	2.293 (58,24)	2.273 (57,73)	19.07	2.340 (59,44)	2.320 (58,93)	27.64
32	2.000 (50,80)	1.939 (49,25)	2.005 (50,93)	1.995 (50,67)	2.355 (59,82)	2.335 (59,31)	19.58	2.402 (61,01)	2.382 (60,50)	28.32

Table 4 : Mechanical Properties

Pin Part Number	Nominal Dia		Minimum Double Shear		Minimum Ultimate Tensile with collar **	
	in	mm	lbf	N	lbf	N
ABS0550VHK3-	0.1900	4,83	5380	23931	1600	7117
ABS0550VHK3A-	0.2190	5,55	7200	32027	2250	10008
ABS0550VHK4-	0.2500	6,35	9300	41368	3000	13344
ABS0550VHK5-	0.3125	7,92	14600	64944	5000	22241
ABS0550VHK6-	0.3750	9,53	21000	93412	7000	31137
ABS0550VHK7-	0.4375	11,11	28600	127219	9500	42258

** Minimum Ultimate Tensile Strengths using ASNA2025 Aluminium Alloy Collars.

4 Designation



5 Marking

Parts to be marked in accordance with EN2424 Style ‘B’ and paragraph 3.1.4

6 Technical specification

Product Specification HPS C 2010

RECORD OF REVISIONS

Issue	Clause modified	Description of modification
5 04/08	2	Normative reference amended to change MIL-L-87132 to EN6117.
	Table 1	Hi-Kote 1 and Kalgard 2245 replaced by 'Resin based Aluminium.
	Fig 1 & Table 1	Figure 1 and table 1 amended to include dimension Ø B_1
	Table 3	Grip lengths –30, -31 & -32 for diameter -6 added for A340 Aircraft
	5	Part marking amended from 'style A' to 'Style B'.
		Mass values added for all diameters.