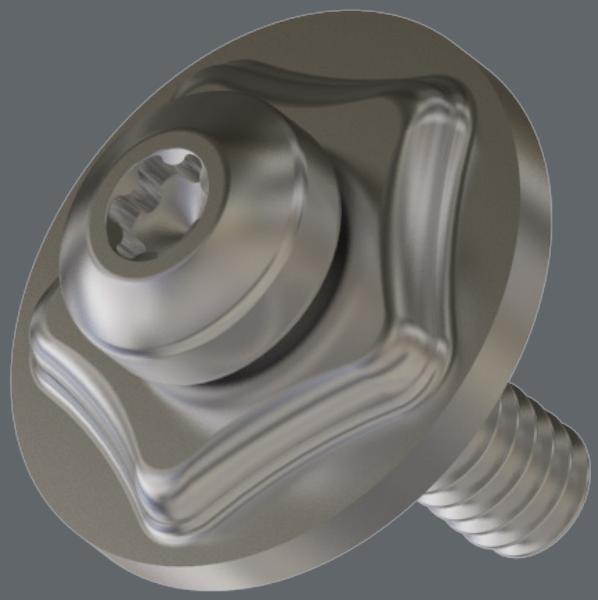
STANLEY®
Engineered Fastening



STANLEY® Crest Cup
Spring Washer Assembly Solutions

When high clamp load is required, STANLEY® Crest Cup spring washer assembly is the solution.

Its performance-engineered compression washer provides a flat and smooth bearing surface to provide higher tension, resulting in a reliable assembly for the life of the product.

Provides Complete Design Versatility

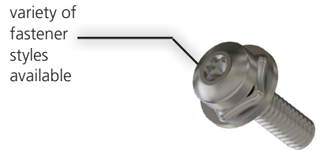
Outstanding engineering and versatility make the STANLEY Crest Cup spring washer assembly the ideal alternative to costly helical/flat washer assemblies and most other commonly used spring washers.

Features

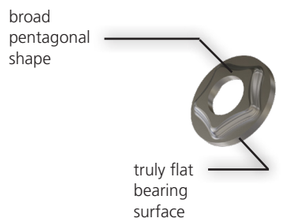
- Stamped into a broad pentagonal shape
- Manufacturing method forms burr upwards, producing a truly flat bearing surface, free of sharp edges
- Preassembled to fasteners

Benefits

- Can eliminate double washer combinations
- Eliminates handling of loose washers and screws
- Adapts easily to automatic assembly equipment
- Maximizes joint integrity
- Helps prevent embedding, notching, and marring in application materials



STANLEY Crest Cup Assembly



STANLEY Crest Cup Washer

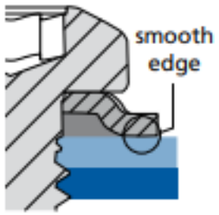
Stanley Engineered Fastening offers a complete range of engineered fasteners and installation equipment for industrial applications. Our engineering expertise in delivering a complete application solution helps our customers to reduce complexity in the assembly process and achieve the lowest total cost of ownership.

STANLEY ENGINEERED FASTENING FAMILY OF BRANDS

AVDEL · INTEGRA · NELSON · OPTIA · POP · STANLEY Assembly Technologies · TUCKER

Ideal for Use with Soft Materials

The manufacturing process for STANLEY® Crest Cup washers forms the burr away from the bearing surface, providing a smooth edge, which prevents the washer from embedding in soft materials or marring low-ductile materials.



The broad surface of the STANLEY Crest Cup washer spreads clamp force over a large area, helping to retain tension even in soft materials.

Standard Guidelines

Washer Diameter	.210" – .880" (5.3mm – 22.3mm)*
Fastener Sizes	#2 – 5/16" (M2 – M8)*
Fastener Length	3/16" – 5" (4mm – 127mm) threaded length
Fastener Style	Can be used with virtually any head, thread and point style
Washer Material	Carbon Steel or Stainless steel
Finish	As required
***other washer and fastener sizes available upon request**	

Ready to Meet Your Assembly Needs

STANLEY Crest Cup spring washer assemblies are available in virtually any head or thread style, in inch or metric sizes to meet your specific needs.

Since STANLEY Crest Cup washers are preassembled to fasteners, hand-assembly of loose washers and fasteners – and the possibility of dropped, missing or incorrect washers – is eliminated. This also simplifies inventory and ordering. The result is higher productivity and further cost savings.

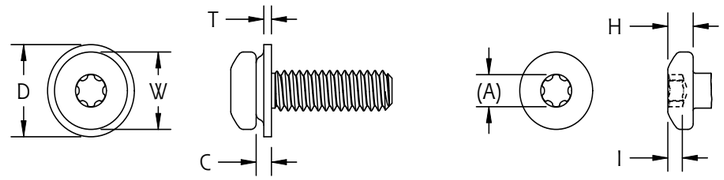
Many STANLEY Crest Cup assemblies are in-stock and ready for delivery. Please contact your STANLEY Engineered Fastening representative for more information.

STANLEY® Crest Cup Fasteners

Dimensional Specifications

TORX PLUS® Drive System shown; specifications for other drive systems available upon request

Pan Head



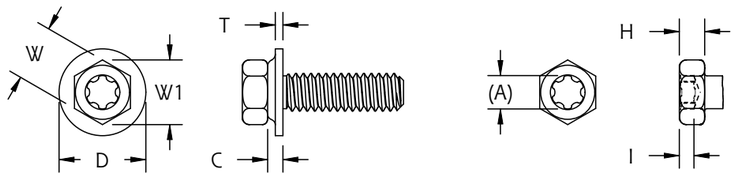
	Screw Size	Pan Head W Max. – Min.	Pan Head H Max. – Min.	Drive I Max. – Min.	Drive A_{REF}	Drive Size	Washer Diameter D	Washer Thickness T	Washer Height C
Inch Sizes	#2	.167 - .155	.062 - .053	.037 - .032	.081	7IP	.210 - .200	.020 - .010	.040 - .020
	#4	.219 - .205	.080 - .070	.051 - .043	.111	10IP	.250 - .244	.025 - .015	0.50 - .030
	#6	.270 - .256	.097 - .087	.061 - .051	.132	15IP	.320 - .307	.035 - .025	.070 - .050
	#8	.322 - .306	.115 - .105	.071 - .060	.155	20IP	.380 - .370	.040 - .030	.080 - .060
	#10	.373 - .357	.133 - .122	.082 - .069	.178	25IP	.446 - .433	.040 - .030	.080 - .060
	#12	.425 - .407	.151 - .139	.092 - .078	.200	27IP	.446 - .433	.040 - .030	.080 - .060
	1/4"	.492 - .473	.175 - .162	.102 - .086	.221	30IP	.505 - .495	.050 - .040	.100 - .080
	5/16"	.615 - .594	.218 - .203	.122 - .104	.266	40IP	.880 - .870	.075 - .065	.150 - .130
Metric Sizes	M2.0	4.00 - 3.70	1.60 - 1.40	0.81 - 0.68	1.75	6IP	5.33 - 5.08	0.50 - 0.25	1.00 - 0.50
	M2.5	5.00 - 4.70	2.10 - 1.90	1.10 - 0.93	2.39	8IP	6.35 - 6.20	0.63 - 0.38	1.26 - 0.76
	M3.0	5.60 - 5.30	2.40 - 2.20	1.30 - 1.10	2.82	10IP	6.35 - 6.20	0.63 - 0.38	1.26 - 0.76
	M3.5	7.00 - 6.60	2.60 - 2.30	1.54 - 1.31	3.35	15IP	8.12 - 7.79	0.88 - 0.63	1.76 - 1.26
	M4.0	8.00 - 7.60	3.10 - 2.80	1.81 - 1.54	3.94	20IP	9.65 - 9.40	1.00 - 0.76	2.00 - 1.53
	M5.0	9.50 - 9.10	3.70 - 3.40	2.08 - 1.75	4.52	25IP	11.33 - 11.00	1.00 - 0.76	2.00 - 1.53
	M6.0	12.00 - 11.50	4.60 - 4.30	2.58 - 2.19	5.61	30IP	12.90 - 12.57	1.27 - 1.00	2.54 - 2.00
	M8.0	16.00 - 15.50	6.00 - 5.60	3.11 - 2.64	6.76	40IP	22.35 - 22.09	1.90 - 1.65	3.81 - 3.30

STANLEY® Crest Cup Fasteners

Dimensional Specifications

TORX PLUS® Drive System shown; specifications for other drive systems available upon request

Hex Head



	Screw Size	Hex Head			Drive			Washer		
		W Max. – Min.	W_1 Min.	H Max. – Min.	I Max. – Min.	A_{REF}	Size	Diameter D	Thickness T	Height C
Inch Sizes	#4	.188 - .181	.202	.090 - .080	.046 - .038	.111	10IP	.250 - .244	.025 - .015	0.50 - .030
	#6	.205 - .244	.272	.100 - .090	.054 - .045	.132	15IP	.320 - .307	.035 - .025	.070 - .050
	#8	.250 - .244	.272	.121 - .111	.064 - .053	.155	20IP	.380 - .370	.040 - .030	.080 - .060
	#10	.312 - .305	.340	.133 - .122	.073 - .061	.178	25IP	.446 - .433	.040 - .030	.080 - .060
	#12	.312 - .305	.340	.155 - .139	.082 - .068	.200	27IP	.446 - .433	.040 - .030	.080 - .060
	1/4"	.375 - .367	.409	.190 - .172	.102 - .075	.221	30IP	.630 - .610	.050 - .040	.100 - .080
	5/16"	.500 - .489	.545	.230 - .208	.109 - .090	.266	40IP	.880 - .870	.075 - .065	.150 - .130
Metric Sizes	M2.0	3.20 - 3.02	3.38	1.60 - 1.30	0.72 - 0.60	1.75	6IP	5.33 - 5.08	0.50 - 0.25	1.00 - 0.50
	M2.5	4.00 - 3.82	4.28	2.10 - 1.80	0.98 - 0.81	2.39	8IP	6.35 - 6.20	0.63 - 0.38	1.26 - 0.76
	M3.0	5.00 - 4.82	5.40	2.40 - 2.10	1.16 - 0.96	2.82	10IP	6.35 - 6.20	0.63 - 0.38	1.26 - 0.76
	M3.5	5.50 - 5.32	5.96	2.70 - 2.40	1.37 - 1.14	3.35	15IP	8.12 - 7.79	0.88 - 0.63	1.76 - 1.26
	M4.0	7.00 - 6.78	7.59	3.30 - 2.90	1.62 - 1.34	3.94	20IP	9.65 - 9.40	1.00 - 0.76	2.00 - 1.53
	M5.0	8.00 - 7.78	8.71	3.80 - 3.30	1.85 - 1.54	4.52	25IP	11.33 - 11.00	1.00 - 0.76	2.00 - 1.53
	M6.0	10.00 - 9.78	10.95	4.70 - 4.10	2.30 - 1.91	5.61	30IP	12.90 - 12.57	1.27 - 1.00	2.54 - 2.00
	M8.0	13.00 - 12.73	14.26	6.00 - 5.20	2.77 - 2.30	6.76	40IP	22.35 - 22.09	1.90 - 1.65	3.81 - 3.30

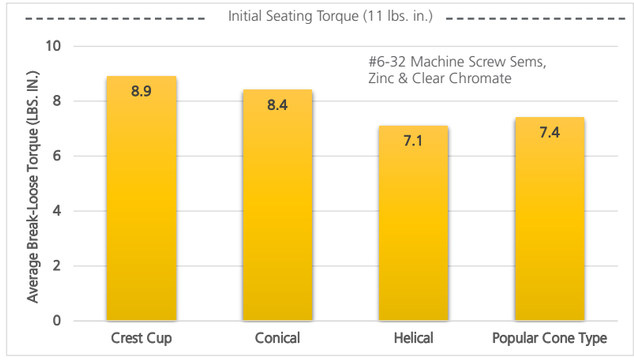
STANLEY® Crest Cup Test Data

TEST: Heat Cycling

OBJECTIVE: Determine effect on break-loose torque of thermal changes.

PROCEDURE: Fasteners seated at equal torque values (11 lbs. in.) in a steel test bar are heated to 212°F (100°C) and held for 30 minutes. Fasteners are removed from heat source and allowed to slowly cool to room temperature (70°F). This is one cycle and fasteners are subjected to two cycles. A third and final cycle is similar except fasteners are quenched in cold water following heat up. Break-loose torque is then determined for each fastener.

RESULTS: Refer to the following chart.

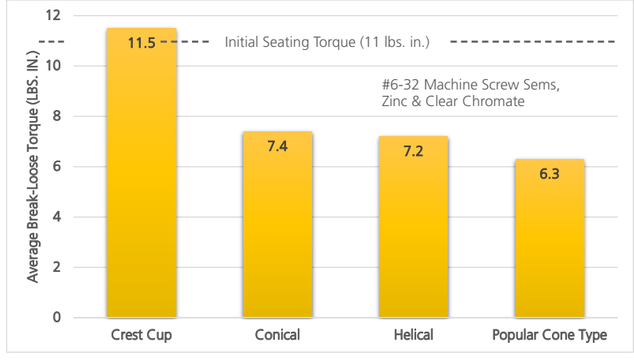


TEST: Plastic Creep Compensation

OBJECTIVE: Determine effect on break-loose torque of plastic creep properties of a glass filled nylon commonly used in various industries.

PROCEDURE: Fasteners were torqued at equal seating torques (11 lbs. in.) into a nylon test bar, 700,000 PSI Flexural Modulus.

RESULTS: Refer to the following chart.



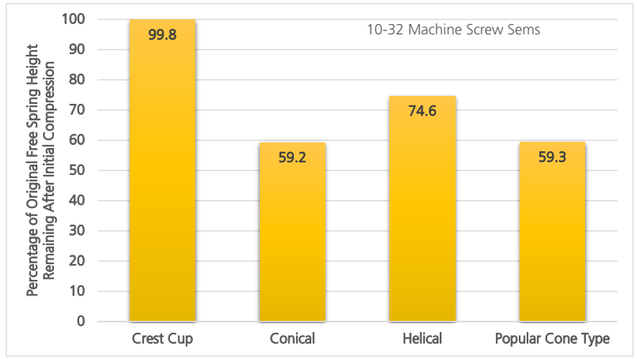
These reports are intended to inform our customer of the test performed under laboratory conditions. Actual assembly conditions could not be duplicated in our laboratories and the test results contained herein are not to be construed as representative thereof.

TEST: Spring Returnability

OBJECTIVE: Determine the percentage of original free spring height remaining after initial compression.

PROCEDURE: Measure and document the washer free height prior to initial compression. Assembled and seated fasteners in a steel test bar to an equal torque value of 35 lbs. inch. Removed fasteners, remeasuring and documenting the remaining washer free height after compression.

RESULTS: Refer to the following chart.



These reports are intended to inform our customer of the test performed under laboratory conditions. Actual assembly conditions could not be duplicated in our laboratories and the test results contained herein are not to be construed as representative thereof.

Suggested Tightening Torques

INCH	Values = lbs. in.
GRADE	**2**
2-56	1.84
4-40	5.52
6-32	7.09
8-32	13.14
10-32	35.29
METRIC	**Values = Nm**
CLASS	**4.8**
M3	0.84
M4	2.10

Note: Zinc Plated Fasteners assembled into plain steel nut member (reference CoF 0.20-0.28)
All Fasteners seated at 75% Proof Load
Reference Test Report 1002756

For Superior Fastening in Both Plastic and Metal...
STANLEY® Crest Cup Sems Keeps Its Clamp

The STANLEY Crest Cup Sems is designed for dependable fastening in both hard and soft materials. This pre-assembled screw and washer makes costly helical/flat and other cone-type washers obsolete by creating a more reliable assembly at a lower cost.

The STANLEY Crest Cup Sems has a "performance engineered" washer, providing maximum joint integrity regardless of mating materials used.

No Burrs

Due to an innovative manufacturing process, the STANLEY Crest Cup washer provides a truly flat bearing surface, free of all burrs and sharp edges. The washer edge is smooth which prevents edges from embedding in soft materials like plastics and die casts, or marring surfaces like porcelain or enamel. Because of this smooth surface, the STANLEY Crest Cup is also ideally suited to the increased productivity of automated assembly equipment.

High Spring Returnability

The STANLEY Crest Cup retains much more of its spring capability than other washer assemblies. This keeps the fastener tight and provides greater fastened joint integrity.

Ideal Seating Against Soft Material

The STANLEY Crest Cup washer's broad surface spreads the clamp force over a large area. This reduces the loss of tension common to other washers caused by embedment or notching into the clamped material. It is, therefore, ideal for "notch-sensitive" plastics and other soft surfaces such as aluminum or zinc castings.

Hand Assembly Eliminated

Because the STANLEY Crest Cup is a sems with a pre-assembled washer, it can create even further cost savings and gains in productivity by eliminating hand assembly.The handling of loose washers and fasteners is no longer necessary, and production rates can drastically increase. The chance for dropped, missing, or incorrect washers in an assembly is eliminated. Even ordering and inventory control are simplified.

Complete Design Versatility

The STANLEY Crest Cup Sems is available in virtually any head or thread style to meet your special needs. It can be supplied in most standard fastener materials, including stainless steel, and in either inch or metric sizes.
The STANLEY Crest Cup Sems assemly can provide a higher level of integrity to your finished product while increasing productivity and reducing your total fastening costs. For more information or samples, contact our Product Application Specialists at: **https://www.stanleyengineeredfastening.com/support/contact-us**

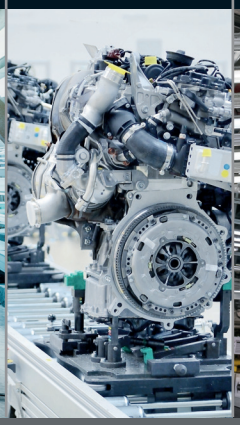
STANLEY Engineered Fastening

Product Portfolios

AVDEL	INTEGRA	NELSON	OPTIA	POP	STANLEY Assembly Technologies	TUCKER
Structural Blind Fasteners	Plastic Components	Stud Welding	Threaded Fasteners	Non-structural Blind Fasteners	Specialist Assembly	Automated Fastener Systems






STANLEY Engineered Fastening

Stanley Engineered Fastening — a division of Stanley Black and Decker — is the global leader in precision fastening and assembly solutions. Our industry-leading brands, Avdel®, Integra™, Nelson®, Optia™, POP®, Stanley® Assembly Technologies, and Tucker®, elevate what our customers create. Backed by a team of passionate and responsive problem-solvers, we empower engineers to create the future.

STANLEY ENGINEERED FASTENING FAMILY OF BRANDS

AVDEL INTEGRA NELSON OPTIA POP STANLEY Assembly Technologies TUCKER

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Your local STANLEY Engineered Fastening representative is at your disposal should you need to confirm latest information.