

# GENERAL INFORMATION & REFERENCE SPECIFICATIONS

**FLAT WASHER AVAILABILITY** - The flat washers listed in this catalog represent only a small portion of the many that are available. The Anillo inventory contains over 25,000 different Part Numbers in different materials and sizes, etc. These are not listed here because of space limitations. Source tooling is available for many others not shown.

**QUALITY ASSURANCE** - Anillo has a Quality Assurance System Certified to ISO 9001/AS9100 ensuring the integrity of all the products we sell. We are a manufacturer with a reputation for consistently providing high quality parts, and we maintain complete procurement data and certifications from our suppliers and processors on pertinent Stock Reference items.

**SPECIFICATIONS, TESTING AND CERTIFICATIONS** - A detailed explanation of the test requirements called for under the various military specifications and a listing of the many certifications available through Anillo appear on the section titled "*MIL-SPEC test requirements*". Anillo can be an indispensable source for parts conforming to all MIL-SPEC requirements. If parts not tested to MIL-SPEC requirements, they are not MIL-SPEC parts. If parts are not plated to MIL-SPEC requirements, they are not MIL-SPEC parts.

**NOMINAL DIMENSIONS** - Nominal dimensions are provided on all flat washers and are so identified. They are provided for reference only. Parts are produced to standard commercial tolerance and are appropriate for all commercial applications. With regard to thickness dimensions indicated, parts conform to stamping industry standards. Anillo frequently stocks popular washer sizes in more than one thickness and this is indicated in the charts. For specific tolerances and thicknesses on other referenced parts, please contact Anillo. Parts with special tolerances and thicknesses can be provided as specified.

**INSIDE DIAMETER PROFILE** - The inside diameter of a conventional flat washer traditionally has three distinct profiles as a result of the punch press process. As the punch enters, there is some pushing in of the material which results in a rounded corner section. Then, as the punch advances, it creates a substantially parallel section until it approaches the exit point and a tapered breakout occurs. Dimensions given for inside diameters, and their accepted tolerances, apply to the parallel sections. At the break out side of the washer, the specified maximum inside diameter may be exceeded by a maximum taper allowance of 25% of the specified thickness.

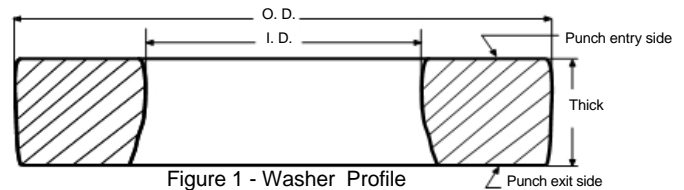


Figure 1 - Washer Profile  
(Exaggerated for clarity)

**MATERIALS AND PLATING** - The charts contained in the section titled "*AN, MS & NAS Washer Reference Guide*" show the availability of washers in the more popular materials. Many of these washers are available in other non-ferrous materials and non-metallics. In the appropriate materials availability columns, standard dash reference numbers are used for AN, MS and NAS parts as well as for some commercial references to indicate the availability of these parts in the designated materials and finishes. For commercial parts, an "X" designation is used. (See Figure 2.)

**SYMBOLS AND ABBREVIATIONS** - In the appropriate materials availability columns for the parts on the following pages, standard dash numbers are used for AN, MS and NAS parts, and for some commercial references, to indicate the availability of these parts in designated materials and finishes. Other non-ferrous and non-metallic washers are also available.

**EXAMPLE** - Here is a listing for one of the MS parts that appear among the 1/4" diameter metallic flat washers on Page 7. In addition to the nominal dimensional data and basic part specifications, the listing shows the availability of this part in steel plated in the thickness specified (X), and in one additional thickness as indicated by the \* after the X. This specific part is also available in stainless steel, passivated and plated, as indicated by the appropriate dash numbers.

Size	Nominal Dimensions			Reference Part Numbers	Steel Plated	AN - MS - NAS Dash Numbers						
	I.D.	O.D.	Thick			Stainless Steel		Brass		Aluminum Alloy		
						Pass.	Plated	Plain	Plated	Plain	Chem Treat	Anodize
M6	0.266	0.504	0.058	ANSI	X							
1/4	0.266	0.625	0.032	MS15795	X*	852	852B					
1/4	0.266	0.625	0.049	TYPE A	X**			X***		X**		

Figure 2

The **Type A** washer is available in brass with five thicknesses (X\*\*\*\*), in aluminum alloy plain in the designated thickness, and two additional thicknesses (X\*\*).

**“STK-STD”** - This symbol designates standard commercial parts carried in stock in the predominant dimensions shown and in the materials designated by an “X” in the appropriate columns. (See figure 3.)

### REFERENCE PART NUMBERS

Washers listed in the charts on the following pages are referenced to appropriate commercial and government part numbers. The following observations on these particular references may be of help.

**AMERICAN NATIONAL STANDARD WASHERS** - Designated by ANSI B18.22.1, these washers are of two types: **A** and **B**. Many washers are available in either narrow (-N), regular (-R), or wide (-W) series.

**AN 960** - Most AN960 steel washers now in stock are made to Revision 21, which specifies steel to MIL-S-7952. Some remaining stock is made to Revision 18, which may still be used in accordance with the government's “phase-in, phase-out” policy on most specification revisions. The entire 960 series will eventually be replaced by the NAS 1149 specification, which is now recommended for use in new designs. AN960 washers are stocked, in accordance with the specification, with Cad II plating. AN960 washers are also stocked in other materials and platings, including: Stainless Steel, passivated (-C) and black oxide (-XC); Brass (-B); Aluminum, plain (-D); Aluminum with a Chemical Film (-JD); and Aluminum Anodized (-KD). (See Figure 3 for example of 5/8" washer.)

designated by “961-1016.” (See Figure 3 - Brass Plated column.)

AN 970 - washers have oversized outside diameters and are stocked in Steel, plated Cad II (yellow) or, commercially, with a zinc finish. (See Figure 3 for example in Steel and Stainless, AN 970-10 & -C10).

NAS 620 - washers are used to mount small items with bent radii and other interferences, most commonly found in electronic components. Stocked in steel, stainless steel, brass and aluminum.

NAS 1149 - this new specification was introduced in 1992 to eventually replace the AN960 specification which is now classified, per revision 21, as “inactive for new design.” This means that on all new products NAS1149 washers may be specified. AN960 washers may continue to be ordered and used in the ongoing production or repair of already designed products. NAS1149 duplicates most of the AN960 parts, but additional material options permit specification of Titanium and other special high strength alloy materials. Selected NAS1149 parts are referenced in the following charts as an indication of the availability of this series. Anillo stocks many of these washers and can supply detailed information and prints when requested. Boeing is one particular user who requires this series. (See Figure 3.)

Size	Nominal Dimensions			Reference Part Numbers	AN - MS - NAS Dash Numbers							
	I.D.	O.D.	Thick		Steel Plated	Stainless Steel		Brass		Aluminum Alloy		
						Pass.	Plated	Plain	Plated	Plain	Chem Treat	Anodize
5/8	0.640	1.188	0.063	AN960	1016	C1016	XC1016	B1016	961-1016	D1016	JD1016	KD1016
5/8	0.640	1.188	0.063	NAS1149	F1062P	C1063R	C1063B	B1062H		D1063H	D1063J	D1063K
5/8	0.640	1.312	0.010	STK STD	X							

Figure 3

MS 15795 - designates general purpose washers and the Dash Numbers show Stainless Steel, Brass and Aluminum. Other materials are available, as well as conventional plated steel. Not specifically listed, but also available from stock are Copper (-500 series) and Nickel Copper alloy (-400 series).

MS 27183 - specifies general purpose washers in Steel, grades 1008 through 1020 ASTM-A109, #4 temper with Cadmium Plate. This series is also available commercially with zinc and other finishes. MS27183 supersedes MS 15795-200 series.

MS 51496 - these Army and Air Force customer numbers have a reduced outside diameter (narrow series) and are made from Stainless Steel, 20 HRC minimum, passivated, with a 2.0 magnetic permeability or less. This specification may be subject to modification by the Committee on MIL Specifications as a result of difficulties experienced in meeting some dimensional, material and hardness requirements.

MS 9321 - these washers are made from AMS 5510 Stainless Steel.

MS 9549 - also specifies AMS 5510 material, but includes a wider variety of sizes.

MS 14151 - washers are made from Stainless Type 304 and are normally used in electrical and other non-corrosive applications.

MS 16212 - specifies a medium series washer made from non-magnetic Stainless having minimum tensile strength of 50,000 psi.

N 400, N 401, N 402 - this series of washers are General Electric reference numbers for flat washers. Many of these G.E. part numbers cross over to MS series, but have tighter tolerances. Anillo makes MS series to G.E.’s tighter tolerances.

**OTHER REFERENCED PART NUMBERS** - washers meeting other specific OEM references are also shown. These include Boeing, McDonnell Douglas (now Boeing), Sikorsky, Honeywell, etc.

Taking a commercial part with equivalent physical characteristic and plating it to military spec does not make it MILSPEC hardware unless the part can be certified as passing all required tests.

As a service to its valued customers, Anillo offers the following as a general guide to test and certification requirements for the MIL-SPEC hardware items it sells:

### **HELICAL SPRING LOCKWASHERS**

MIL-SPEC designations include, but are not limited to, MS35338, MS35340, MS51848 and NAS1676. These are covered by military procurement specification FF-W-84 which has, as minimum requirements:

1. Interlinking test
2. Free height test
3. Twist test
4. Pressure test
5. Hardness test
7. Chemical analysis (mill certification acceptable)
8. Magnetic permeability (on stainless steel)
9. Process certification on protective finish

### **FLAT WASHERS**

MIL-SPEC designations for flat washers include, but are not limited to, AN960, MS15795, MS27183, NAS620, and NAS1252. These are covered by military procurement specification FF-W-92 which has, as minimum requirements:

1. Chemical analysis (mill certification acceptable)
2. Process certification on protective finish
3. Workmanship (flat, smooth and burr free)
4. Magnetic permeability (stainless steel only)

### **TOOTH LOCKWASHERS**

MIL-SPEC designations for tooth lockwashers include, but are not limited to MS35333, MS35335, MS35336, MS35790 and MS45904. These are covered by military procurement specification FF-W-100 which has, as minimum requirements:

1. Hardness test
2. Process certification on protective finish
3. Chemical analysis (mill certification acceptable)
4. Compression and flatness test
5. Spread test

### **SPRING WASHERS - CURVED, WAVE AND BELLEVILLE**

MIL-SPEC designations for spring washers include M12133/1 through M12133/9 and are covered by military specification MIL-W-12133 which has, as minimum requirements:

1. Chemical analysis (mill certification acceptable)
2. Process certification on protective coating and surface treatment
3. Inspection for cracks
4. Hardness test
5. Decarburization (carbon steel only)
6. Load deflection
7. Permanent set
8. Repeated loading

The above list provides a guide relating to the most popular types of MIL-SPEC washers. It should not be construed as a complete list of all military specifications and documents pertaining to washers or as a list of all tests or analysis that may be required.

Many O.E.M.'s also have special requirements (including testing) that must be met to be in compliance with their part specifications and purchase requirements.

**Review all relevant documents carefully before requesting quotations to avoid unexpected costs for testing and analysis. When in doubt, discuss the requirements with the Anillo's sales department when requesting a quotation.**

**Remember, if it is has not been properly tested, it is not MIL-SPEC hardware.**

M1.2	0.051	0.118	0.012	DIN433	X	X						
M1.2	0.051	0.149	0.012	DIN125A	X	X			X			
00	0.055	0.156	0.010	STK STD		X						
0	0.065	0.099	0.016	NAS620	0	C0	C0P		B0	A0		
0	0.065	0.125	0.015	STK STD		X		X				
0	0.065	0.125	0.025	MS51496		P61						
0	0.065	0.166	0.016	MS51496		P62						
M1.6	0.067	0.140	0.012	DIN433	X				X			
M1.6	0.067	0.158	0.012	DIN125A	X	X			X			
0	0.068	0.188	0.025	N402 -	B32							
0	0.068	0.250	0.025	TYPE B-W								
0	0.075	0.205	0.020	STK STD		X						
0	0.075	0.159	0.023	STK STD	X	X						
0	0.078	0.188	0.020	MS15795		801	801B		901		701	
0	0.078	0.188	0.020	MS27183	1							
0	0.078	0.250	0.016	MS15795							744	
0	0.078	0.140	0.016	STK STD		X						
M1.6	0.080	0.152	0.024	ANSI								
M1.6	0.080	0.191	0.024	ANSI	X							
M1.6	0.080	0.230	0.030	ANSI								
1	0.084	0.156	0.025	TYPE B-N								
1	0.084	0.219	0.025	N402 -	B32							
1	0.084	0.281	0.032	TYPE B-W								
M2	0.086	0.177	0.012	DIN433	X		X	X	X			
M2	0.086	0.197	0.020	DIN125A	X	X	X	X	X	X		
2	0.088	0.118	0.010	STK STD								
2	0.089	0.149	0.016	NAS620	2	C2	C2P		B2	A2		
2	0.089	0.187	0.032	STK STD		X		X***				
2	0.089	0.216	0.020	STK STD		X						
2	0.094	0.135	0.011	MS51496		P79		X**				
2	0.094	0.158	0.025	MS51496		P63						
2	0.094	0.188	0.025	TYPE B-N	X	X**		X***		X**		
2	0.094	0.218	0.020	MS15795	X**	844	844B	X**		X		
2	0.094	0.250	0.020	MS15795	X*	802	802B		902	X**		702
2	0.094	0.250	0.025	21D9 -		15-4-3-2						
2	0.094	0.250	0.032	N402 -	B33							
2	0.094	0.281	0.020	STK STD	X	X				X		
2	0.094	0.344	0.032	TYPE B-W								
2	0.094	0.375	0.035	AN940	13					X		
2	0.094	0.500	0.062	MS15795						X**		756
2	0.094	0.625	0.021	STK STD						X		
2	0.094	0.880	0.032	STK STD		X						
2	0.099	0.156	0.020	STK STD		X		X				
2	0.099	0.250	0.016	AN960	2L	C2L	XC2L			D2L	JD2L	KD2L
2	0.099	0.250	0.032	AN960	2	C2	XC2	B2		D2	JD2	KD2
2	0.099	0.312	0.020	STK STD				X				
M2	0.101	0.191	0.030	ANSI		X		X**				
M2	0.101	0.230	0.030	ANSI	X	X						
M2	0.101	0.308	0.030	ANSI	X							
3	0.102	0.180	0.016	NAS620	3L	C3L	C3LP		B3L	A3L		
3	0.102	0.180	0.032	NAS620	3	C3	C3P		B3	A3		
3	0.105	0.156	0.020	STK STD		X						
3	0.105	0.190	0.016	STK STD		X						
3	0.105	0.205	0.045	STK STD		X						
3	0.105	0.250	0.016	AN960	3L	C3L	XC3L			D3L	JD3L	KD3L
3	0.105	0.250	0.032	AN960	3	C3	XC3	B3		D3	JD3	KD3
M2.5	0.106	0.197	0.020	DIN433	X	X		X	X			
3	0.106	0.216	0.025	MS51496		P64						

3	0.109	0.219	0.025	TYPE B-N	X							
3	0.109	0.281	0.015	STK STD	X	X		X***				
3	0.109	0.312	0.032	N402 -	B34							
3	0.109	0.380	0.040	STK STD					X*** *			
3	0.109	0.406	0.040	TYPE B-W								
4	0.115	0.209	0.016	NAS620	4L	C4L	C4LP		B4L	A4L		
4	0.115	0.209	0.032	NAS620	4	C4	C4L		B4	A4		
4	0.115	0.289	0.025	STK STD		X		X**	X**			
M3	0.119	0.236	0.032	DIN1440	X			X				
4	0.119	0.250	0.016	MS9549	X	04		X**				
4	0.119	0.250	0.031	MS9321	X	04		X**		X		
4	0.119	0.375	0.025	STK STD	X*			X	X	X**		
4	0.119	0.432	0.032	STK STD	X							
4	0.119	0.469	0.025	STK STD	X							
M2.5	0.121	0.231	0.030	ANSI								
M2.5	0.121	0.281	0.020	STK STD	X*	X						
M2.5	0.121	0.308	0.030	ANSI	X**							
M2.5	0.121	0.387	0.030	ANSI	X*							
4	0.122	0.175	0.016	MS51496			P80			X		
4	0.122	0.175	0.031	MS51496			P65					
4	0.122	0.190	0.040	MS51496			P81					
4	0.122	0.253	0.016	MS51496			P66					
4	0.122	0.253	0.032	MS51496			P67	X		X*		
4	0.122	0.500	0.040	STK STD	X	X		X				
4	0.125	0.203	0.032	STK STD		X		X		X		
4	0.125	0.219	0.020	STK STD	X*							
4	0.125	0.250	0.022	MS15795	X	803	803B		903	X***		703
4	0.125	0.250	0.042	STK STD		X		X*** *				
4	0.125	0.312	0.016	AN960	4L	C4L	XC4L			D4L	JD4L	KD4L
4	0.125	0.312	0.032	AN960	4	C4	XC4	B4	961-4	D4	JD4	KD4
4	0.125	0.312	0.032	MS15795	X	804	B804	X	904			704
4	0.125	0.312	0.032	MS27183	4							
4	0.125	0.375	0.032	MS27183	44							
4	0.125	0.375	0.040	N402 -	B35					X		
4	0.125	0.400	0.006	STK STD		X						
4	0.125	0.438	0.040	TYPE B-W	X			X**				
M3	0.126	0.236	0.020	DIN433	X	X		X**	X			
M3	0.126	0.276	0.020	DIN125A	X	X		X***	X**	X		
M3	0.126	0.355	0.032	DIN9021B	X	X		X				
M3	0.126	0.355	0.040	DIN7349	X							
5	0.126	0.415	0.032	STK STD		X						
5	0.128	0.238	0.016	NAS620	5L	C5L	C5LP		B5L	A5L		
5	0.128	0.238	0.032	NAS620	5	C5	C5P	X	B5	A5		
5	0.130	0.190	0.092	STK STD		X						
5	0.130	0.375	0.040	STK STD	X***	X						
5	0.130	0.500	0.062	STK SPEC	X*							
5	0.135	0.250	0.006	STK STD	X*	X						
5	0.135	0.312	0.016	MS9549		05		X**				
5	0.135	0.312	0.031	MS9321	X	05						
5	0.135	0.312	0.043	AN122578	X							
5	0.135	0.438	0.047	STK STD	X					X**		
5	0.135	2.275	0.047	STK STD	X							
5	0.140	0.250	0.025	STK STD	X*	X**		X***	X			
5	0.140	0.281	0.032	MS27183	45			X**				
5	0.140	0.438	0.016	NAS1149	FN516P	CN516R	CN516B	BN516H		DN516H	DN516J	DN516K
5	0.140	0.438	0.032	NAS1149	FN532P	CN532R	CN532B	BN532H		DN532H	DN532J	DN532K
5	0.140	0.438	0.042	AN960	5	C5	XC5	B5		D5	JD5	KD5
5	0.141	0.312	0.028	MS15795	X			X	944			

M3	0.141	0.387	0.040	ANSI	X*	X		X**				
M3	0.141	0.464	0.047	ANSI		X						
6	0.143	0.267	0.016	NAS620	6L	C6L	C6LP	X	B6L	A6L		
6	0.143	0.267	0.032	NAS620	6	C6	C6P	X	B6	A6		
6	0.145	0.234	0.032	STK STD	X			X	X			
6	0.145	0.312	0.032	STK STD	X	X		X**	X**			
6	0.145	0.375	0.042	1135998	BKO							
6	0.145	0.500	0.025	STK STD	X**	X						
6	0.145	0.750	0.025	STK STD		X		X**	X**		X**	
6	0.149	0.219	0.010	STK STD		X						
6	0.149	0.375	0.016	AN960	6L	C6L	XC6L	**		D6L	JD6L	KD6L
6	0.149	0.375	0.032	AN960	6	C6	XC6	B6	961-6	D6	JD	KD6
6	0.149	0.406	0.032	631865	ZN1							
6	0.149	0.480	0.020	MS14151	X	1						
6	0.149	0.500	0.062	STK STD	X					X***		
6	0.150	0.312	0.016	MS9549	X**	06		X				
6	0.150	0.312	0.034	MS9321		06				X***		
6	0.151	0.279	0.016	MS51496		P68		X***				
6	0.151	0.279	0.032	MS51496	X*	P69						
6	0.156	0.250	0.005	STK STD	X***							
6	0.156	0.250	0.016	MS27183	43	X				X**		
6	0.156	0.312	0.035	MS15795	X***	805	805B	X	905			705
6	0.156	0.312	0.035	MS27183	5	X						
6	0.156	0.375	0.049	MS15795	X	806	806B	X	906			706
6	0.156	0.375	0.049	MS27183	6							
6	0.156	0.375	0.020	STK STD	X	X		X**		X		
6	0.156	0.438	0.040	N402 -	B37	X		X		X**		
6	0.156	0.500	0.032	STK STD	X	X						
6	0.156	0.562	0.040	TYPE B-W	X*							
6	0.156	0.750	0.062	STK STD	X							
6	0.156	0.812	0.049	STK STD	X							
6	0.156	0.900	0.062	STK STD	X							
6	0.156	1.125	0.062	STK STD	X							
M4	0.158	0.315	0.032	DIN1440	X**	X		X				
6	0.159	0.375	0.016	MS9549		07						
6	0.159	0.375	0.043	MS9321	9320-07	07						
M3.5	0.161	0.348	0.040	ANSI	X	X						
M3.5	0.161	0.387	0.047	ANSI	X	X						
M3.5	0.161	0.583	0.058	ANSI	X	X						
8	0.164	0.174	0.032	NAS1252						8L *		
M4	0.166	0.265	0.010	STK STD	X*	X		X***				
M4	0.169	0.315	0.020	DIN433	X*	X		X**	X**			
M4	0.169	0.355	0.032	DIN125A	X	X		X	X	X		
M4	0.169	0.473	0.040	DIN9021B	X*	X				X		
8	0.169	0.304	0.016	NAS620	8L	C8L	C8LP		B8L	A8L		
8	0.169	0.304	0.032	NAS620	8	C8	C8P		B8	A8		
8	0.172	0.281	0.032	MS15795	X*	845	845B	X				
8	0.172	0.312	0.032	MS15795	X	856	856B					
8	0.172	0.375	0.032	STK STD	X***	X		X***	X	X		
8	0.172	0.437	0.032	STK STD	X**	X			X	X		
8	0.172	0.515	0.032	STK STD	X							
8	0.172	0.875	0.032	AN8013	1					X**	D1	
8	0.172	1.000	0.040	MS15795								745
8	0.174	0.265	0.014	STK STD	X							
8	0.174	0.375	0.016	AN960	8L	C8L	XC8L	X		D8L	JD8L	KD8L
8	0.174	0.375	0.032	AN960	8	C8	XC8	B8	961-8	D8	JD8	KD8
8	0.174	0.500	0.042	STK STD	X	*		X***	X**	X**		
8	0.174	0.550	0.020	MS14151	X	6						

	8	0.184	0.375	0.016	MS9549		08		X***				
	8	0.184	0.375	0.050	MS9320	X	08						
	8	0.184	0.375	0.050	MS9321	08							
	8	0.188	0.250	0.010	STK STD	X**	X						
	8	0.188	0.281	0.025	STK STD	X	X		X		X		
	8	0.188	0.312	0.025	STK STD	X*	X***		X*** *				
	8	0.188	0.375	0.016	STK STD	X**	X				X***		
	8	0.188	0.375	0.049	MS15795	X*	807	807B		907			707
	8	0.188	0.438	0.049	MS15795	X	841	841B		941			741
	8	0.188	0.500	0.040	N402 -	B38	X**						
	8	0.188	0.500	0.049	AN960	9	C9	XC9	B9		D9	JD9	KD9
	8	0.188	0.500	0.065	MS27183	46							
	8	0.188	0.562	0.049	TYPE A	X	X						
	8	0.188	0.625	0.063	TYPE B-W	X			X**				
	8	0.188	0.750	0.062	STK STD	X	X		X**				
	8	0.188	1.000	0.032	50-7N -						6-6-8		
	8	0.188	1.125	0.032	50-7N -						6-6-9		
	M4	0.189	0.387	0.040	ANSI	X							
	M4	0.189	0.464	0.047	ANSI		X						
	M4	0.189	0.622	0.077	ANSI	X							
	10	0.190	0.203	0.032	NAS1252								10L
	10	0.190	0.240	0.015	5414088	ZN1							
	10	0.190	0.260	0.010	STK STD		X						
	10	0.190	0.312	0.012	STK STD		X		X**				
	10	0.190	0.375	0.010	STK STD	X	X*** **		X*** **	X***			
	10	0.190	0.438	0.062	STK STD	X	X**		X**	X**	X		
	10	0.195	0.354	0.032	NAS620	10L	C10L	C10LP		B10L	A10L		
	10	0.195	0.354	0.063	NAS620	10	C10	C10P		B10	A10		
	10	0.195	0.375	0.010	STK STD		X***		X	X**			
	10	0.195	0.469	0.016	NAS1587		3					D3	
	10	0.195	0.750	0.046	120789	ZN2							
	10	0.196	0.531	0.078	49374	ZN2	X						
	10	0.196	0.625	0.032	STK STD	X							
	M5	0.197	0.394	0.032	DIN1440	X							
	M5	0.197	0.788	0.040	Car body	X							
	10	0.198	0.364	0.010	STK STD		X						
	10	0.198	0.615	0.062	STK STD	X							
	10	0.198	0.625	0.040	STK STD	X**			X				*
	10	0.198	0.719	0.062	STK STD	X	X						
	10	0.203	0.312	0.032	STK STD	X			X***		X**		
	10	0.203	0.375	0.020	MS15795	X**	846	846B	X***	X**			
	10	0.203	0.406	0.040	MS15795	X	X			946			
	10	0.203	0.438	0.016	AN960		C10LL	XC10LL			D10LL	JD10LL	KD10LL
	10	0.203	0.438	0.032	AN960	10L	C10L	XC10L	X	X**	D10L	JD10L	KD10L
	10	0.203	0.438	0.063	AN960	10	C10	XC10	B10	961-10	D10	JD10	KD10
	10	0.203	0.469	0.049	TYPE A	X					X**		
	10	0.203	0.500	0.047	STK STD	X	X**		X**		X*** *		
	10	0.203	0.530	0.062	STK STD	X							
	10	0.203	0.562	0.032	MS15795	X	847	847B					
	10	0.203	0.562	0.040	N402 -	B39	X**		X		X		
	10	0.203	0.562	0.063	MS15795	X	848	848B					
	10	0.203	0.610	0.020	MS14151		2						
	10	0.203	0.625	0.040	MS15795	X*	849	849B					
	10	0.203	0.625	0.064	MS15795	X	X				X		746
	10	0.203	0.688	0.040	MS15795						X		747
	10	0.203	0.734	0.035	MS15795	X	857	857B					
	10	0.203	0.734	0.063	TYPE B-W		X		X		X		
	10	0.203	0.875	0.063	AN970	3	C3						



10	0.205	0.360	0.062	MS51496		P74						
10	0.209	0.333	0.025	STK STD	X	X		X**				
M5	0.209	0.374	0.040	DIN433	X	X		X	X			
M5	0.209	0.394	0.040	DIN125A	X	X		X	X	X		
M5	0.209	0.591	0.063	DIN9021B	X	X						
10	0.213	0.438	0.032	MS9549	X	09						
10	0.215	0.438	0.062	MS9321		09						
M5	0.216	0.394	0.040	DIN126	X							
10	0.219	0.312	0.032	STK STD	X	X**			X			
10	0.219	0.365	0.032	MS27183	47	X***		X***				
10	0.219	0.438	0.049	MS15795	X	808	808B		908			708
10	0.219	0.500	0.049	MS15795	X*	842	842B	X**	942			742
10	0.219	0.625	0.032	50-4-10-7-5	CD2							
10	0.219	0.750	0.062	21D9 -	X	12-7-6 **						
10	0.219	0.875	0.062	21D9 -		12-7-7						
M5	0.224	0.425	0.047	ANSI	X			X				
M5	0.224	0.778	0.077	ANSI	X							
12	0.234	0.438	0.040	TYPE B-N	X				X			
12	0.234	0.625	0.062	AN960	11	C11	XC11	B11		D11	JD11	KD11
12	0.234	0.875	0.062	TYPE B-W								
M6	0.236	0.473	0.062	DIN1440	X							
12	0.250	0.312	0.012	STK STD	X	X						
12	0.250	0.375	0.016	STK STD	X*							
12	0.250	0.438	0.016	MS15795	X	X**		X*** **	948			
12	0.250	0.500	0.049	MS15795	X	X***		X	949			
12	0.250	0.500	0.065	TYPE A	X							
12	0.250	0.562	0.032	MS27183	49							
12	0.250	0.562	0.049	TYPE A	X	X						
12	0.250	0.562	0.065	MS15795	X	809	809B		909			709
12	0.250	0.562	0.065	MS27183	9							
12	0.250	0.625	0.032	MS27183	50	X***		X				
12	0.250	0.938	0.065	MS27183	48							
12	0.250	1.000	0.065	MS27183	51				X			
12	0.250	1.250	0.062	MS15795								750
12	0.253	0.325	0.016	STK STD	X	X***						
M6	0.253	0.433	0.062	DIN433	X	X**		X	X			
M6	0.253	0.493	0.062	DIN125A	X	X		X	X	X		
M6	0.253	0.670	0.118	DIN7349	X							
M6	0.253	0.709	0.062	DIN9021B	X	X						
1/4	0.253	0.820	0.062	139050	X							
1/4	0.255	0.407	0.010	STK STD		X***		X***				
1/4	0.255	0.427	0.032	STK STD	X**							
1/4	0.255	0.468	0.032	NAS620	416L	C416L	C416LP		B416L	A416L		
1/4	0.255	0.468	0.062	NAS620	416	C416	C416P		B416	A416		
1/4	0.255	0.531	0.062	NAS1587	X	4						
1/4	0.255	0.750	0.062	STK STD	X***	X		X	X	X		
1/4	0.260	0.375	0.062	STK STD	X*			X***				
M6	0.260	0.493	0.062	DIN126	X							
1/4	0.260	0.600	0.040	STK STD	X							
1/4	0.265	0.437	0.032	STK STD	X	X*** *		X*** *		X		
1/4	0.265	0.455	0.062	MS51496		P76						
1/4	0.265	0.500	0.016	AN960	X**					D416L	JD416L	KD416L
1/4	0.265	0.500	0.032	AN960	416L	C416L	XC416L					
1/4	0.265	0.500	0.063	AN960	416	C416	XC416	B416	961-416S	D416	JD416	KD416
1/4	0.265	0.562	0.015	STK STD	X*	X**		X***		X**		
1/4	0.265	0.680	0.093	2744263	ZN1							
1/4	0.265	0.750	0.032	STK STD	X***	X**		X***				
1/4	0.265	0.750	0.125	126520	CD1							

1/4	0.266	0.458	0.036	MS15795		858	858B					
1/4	0.266	0.500	0.109	MS15795					950			
M6	0.266	0.504	0.058	ANSI	X							
1/4	0.266	0.625	0.032	MS15795	X*	852	852B					
1/4	0.266	0.625	0.049	TYPE A	X**			X***		X**		
1/4	0.266	0.688	0.050	MS15795	X*	853	853B					
1/4	0.266	1.375	0.051	AN8013	2							D2
1/4	0.270	0.360	0.025	MS51496		P84						
1/4	0.270	0.500	0.062	STK STD	X*	X			X**	X		
1/4	0.270	0.660	0.063	BACW10	P70S							
1/4	0.276	0.500	0.032	MS9549	X*	10						
1/4	0.276	0.500	0.062	MS9320	X	10						
1/4	0.281	0.395	0.032	STK STD					X			
1/4	0.281	0.500	0.062	TYPE B-N	X	X						
1/4	0.281	0.531	0.032	MS15795								752
1/4	0.281	0.625	0.062	MS15795	X	810	810B	X**	910			710
1/4	0.281	0.625	0.062	MS27183	10							
1/4	0.281	0.734	0.062	MS27183	52							
1/4	0.281	0.750	0.062	N402 -	B41							
1/4	0.281	1.000	0.062	TYPE B-W	X*			X		**		
1/4	0.281	1.500	0.062	STK STD	X*							
1/4	0.296	0.438	0.032	MS15795		854	854B	X				
1/4	0.308	0.625	0.045	STK STD	X*							
1/4	0.312	0.500	0.035	MS27183	54	X		X***	X**			
1/4	0.312	0.734	0.062	MS15795	X	811	811B	X**	911			711
1/4	0.312	0.750	0.062	MS16212	X*	11				X		
1/4	0.312	0.875	0.062	MS27183	53			X				
1/4	0.312	0.900	0.083	STK STD	X							
1/4	0.312	1.062	0.062	MS15795				X**				753
1/4	0.312	1.125	0.062	2277476	ZN1							
M8	0.315	0.463	0.020	STK STD		X						
1/4	0.315	0.583	0.051	STK STD	X							
M8	0.315	0.630	0.079	DIN1440	X							
5/16	0.325	0.500	0.025	STK STD	X*	X**		X***				
5/16	0.325	0.537	0.025	STK STD		X						
5/16	0.325	0.750	0.048	STK STD	X**	X**		X***		X		
5/16	0.325	0.870	0.125	STK STD	X	X**		X**				
5/16	0.325	0.944	0.062	2760654	X							
5/16	0.328	0.562	0.016	AN960						D516L	JD516L	KD516L
5/16	0.328	0.562	0.020	STK STD	X	X				X		
5/16	0.328	0.562	0.032	AN960	516L	C516L	XC516L	X				
5/16	0.328	0.562	0.062	AN960	516	C516	XC516	B516	961-516	D516	JD516	KD516
5/16	0.328	0.625	0.046	STK STD	X**	X		X**				
5/16	0.328	1.080	0.020	MS14151		4						
5/16	0.328	1.375	0.062	AN970	5	C5						
M8	0.331	0.591	0.062	DIN433	X	X		X	X			
M8	0.331	0.670	0.062	DIN125A	X	X		X	X	X		
M8	0.331	0.827	0.158	DIN7349	X							
M8	0.331	0.985	0.079	DIN9021B	X							
5/16	0.338	0.625	0.032	MS9549		11		X				
5/16	0.338	0.625	0.062	MS9321	X	11						
5/16	0.338	0.875	0.160	STK STD	X*							
5/16	0.344	0.500	0.025	STK STD	X*	X		X***		X		
5/16	0.344	0.531	0.080	STK STD	X							
5/16	0.344	0.593	0.045	STK STD	X							
5/16	0.344	0.625	0.062	TYPE B-N	X			X				
5/16	0.344	0.688	0.062	MS15795	X*	812	812B		912			712
5/16	0.344	0.875	0.062	N402 -	B42	X***		X				

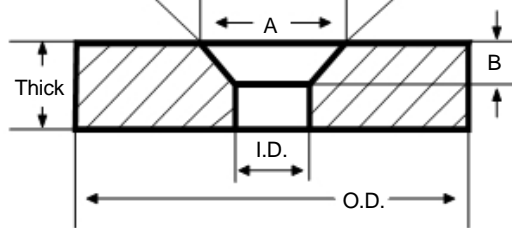
5/16	0.375	0.734	0.065	TYPE A	X*							
5/16	0.375	0.734	0.083	MS27183	55			X**	X**			
5/16	0.375	0.750	0.065	MS16212	X**	12		X**				
5/16	0.375	0.875	0.040	MS15795	X***	X				951		
5/16	0.375	0.875	0.083	MS15795	X	813	813B			913		713
5/16	0.375	1.000	0.042	STK STD	X*			X***				
5/16	0.375	1.125	0.065	TYPE A	X							
3/8	0.380	0.750	0.125	STK STD	X*	X						
3/8	0.383	0.687	0.062	NAS1587		6						
3/8	0.390	0.562	0.020	STD STD	X*			X***	X**	X		
3/8	0.390	0.625	0.016	AN960	616LL	C616LL	XC616LL	X		D616L	JD616L	KD616L
3/8	0.390	0.625	0.032	AN960	616L	C616L	XC616L					
3/8	0.390	0.625	0.063	AN960	616	C616	XC616	B616	961-616	D616	JD616	KD616
3/8	0.390	0.750	0.032	8176103	X**							
3/8	0.390	1.000	0.062	4M36 -	03003							
3/8	0.390	1.080	0.020	MS14151		5						
3/8	0.390	1.125	0.062	8014989	CD2							
3/8	0.390	1.250	0.062	STK STD	X							
3/8	0.390	1.625	0.063	AN970	6	C6						
3/8	0.390	1.875	0.062	AN8013	3						D3	
3/8	0.390	2.000	0.125	STK STD	X							
3/8	0.401	0.750	0.032	MS9549	X**	12		X**				
3/8	0.401	0.750	0.078	MS9321		12						
3/8	0.403	0.500	0.018	STK STD	X*							
3/8	0.406	0.688	0.032	MS15795					952			
3/8	0.406	0.734	0.063	TYPE B-N	X							
3/8	0.406	0.812	0.065	MS15795	X*	814	814B			914		714
3/8	0.406	0.875	0.063	MS27183	57							
3/8	0.406	1.000	0.063	N402 -	B43							
3/8	0.412	0.625	0.032	MS27183	58	X*				X		
M10	0.414	0.709	0.063	DIN433	X	X		X	X			
M10	0.414	0.827	0.079	DIN125A	X	X		X	X	X		
M10	0.414	1.182	0.099	DIN9021B	X*							
M10	0.433	0.778	0.095	ANSI	X	X						
M10	0.433	0.827	0.079	DIN126	X							
M10	0.433	1.093	0.095	ANSI	X	X						
M10	0.433	1.524	0.118	ANSI	X	X						
3/8	0.438	0.550	0.020	STK STD		X						
3/8	0.438	0.567	0.047	STK STD	X*	X		X**				
3/8	0.438	0.687	0.109	STK STD	X**	X			X			
3/8	0.438	0.750	0.083	MS16212	X**	13						
3/8	0.438	0.773	0.062	MS21206	7							
3/8	0.438	0.875	0.062	MS27183	60			X				
3/8	0.438	1.000	0.062	MS51412	7							
3/8	0.438	1.000	0.083	MS15795	X*	815	815B	615	915			715
3/8	0.438	1.365	0.083	MS27183	59							
3/8	0.438	1.625	0.062	MS27183	61							
7/16	0.443	0.683	0.051	AN901						4A		
7/16	0.446	0.781	0.062	NAS1587	X	7						
7/16	0.453	0.625	0.032	STK STD	X							
7/16	0.453	0.750	0.016	AN960		C716LL	XC716LL			D716L	JD716L	KD716L
7/16	0.453	0.750	0.032	AN960	716L	C716L	XC716L	X				
7/16	0.453	0.750	0.062	AN960	716	C716	XC716	B716		D716	JD716	KD716
7/16	0.453	1.000	0.062	STK STD	X							
7/16	0.453	1.812	0.109	AN970	7	C7						
7/16	0.469	0.734	0.062	MS27183	62 *							
7/16	0.469	0.875	0.062	TYPE B-N	X***			X				
7/16	0.469	0.922	0.062	MS15795	X*	816	816B			916		716

M12	0.472	0.985	0.118	DIN1440	X								
7/16	0.484	0.625	0.023	STK STD	X*								
7/16	0.488	0.787	0.020	STK STD		X							
7/16	0.495	0.618	0.016	STK STD	X								
7/16	0.495	0.750	0.016	STK STD	X*								
7/16	0.500	1.125	0.077	STK STD	X								
7/16	0.500	1.250	0.083	MS15795	X**	817	817B		917				
7/16	0.500	1.500	0.035	STK STD	X*								
7/16	0.500	1.625	0.083	TYPE A	X								
1/2	0.505	0.638	0.020	STK STD	X	X		X**					
1/2	0.505	0.745	0.051	AN901						5A			
1/2	0.505	1.155	0.175	STK STD	X								
1/2	0.509	0.875	0.062	NAS1587	X	8		X					
1/2	0.512	0.691	0.032	STK STD	X			X		X**			
M12	0.512	0.788	0.079	DIN433	X	X		X					
M12	0.512	0.946	0.099	DIN125A	X	X				X			
M12	0.512	1.182	0.236	DIN7349	X								
1/2	0.515	0.750	0.032	STK STD	X	X**							
1/2	0.515	0.875	0.016	AN960	X***					D816L	JD816L	KD816L	
1/2	0.515	0.875	0.032	AN960	816L	C816L	XC816L						
1/2	0.515	0.875	0.063	AN960	816	C816	XC816	B816	961-816	D816	JD816	KD816	
1/2	0.515	1.250	0.188	STK STD	*								
1/2	0.515	2.000	0.109	AN970	8	C8							
1/2	0.526	1.000	0.032	MS9549	X*	14							
1/2	0.526	1.000	0.109	MS9320	14	9321-14							
M12	0.529	0.994	0.095	ANSI	X								
M12	0.529	1.327	0.118	ANSI	X								
M12	0.529	1.721	0.118	ANSI	X								
1/2	0.531	1.000	0.063	TYPE B-N	X								
1/2	0.531	1.062	0.095	MS15795	X	818	818B		918			718	
1/2	0.531	1.250	0.100	MS15795	X	855	855B						
1/2	0.531	1.500	0.120	50-4-20-17-	12								
1/2	0.531	1.750	0.100	TYPE B-W	X*								
M12	0.552	0.946	0.099	DIN126	X								
1/2	0.562	0.968	0.049	MS15795	X				953				
1/2	0.562	1.000	0.093	STK STD	X	X							
1/2	0.562	1.125	0.093	STK STD	X	X							
1/2	0.562	1.139	0.071	BACW10	AKP9								
1/2	0.562	1.250	0.109	MS16212	X*	14		X*		X*			
1/2	0.562	1.375	0.109	MS15795	X	819	819B		919			719	
1/2	0.562	1.375	0.109	MS51412	10		X		X**				
1/2	0.562	1.500	0.160	STK STD	X**								
1/2	0.568	0.808	0.051	AN901						6A			
9/16	0.575	0.940	0.070	STK STD	X								
9/16	0.578	1.062	0.016	AN960	X*					D916L	JD916L	KD916L	
9/16	0.578	1.062	0.032	AN960	916L	C916L	XC916L						
9/16	0.578	1.062	0.063	AN960	916	C916	XC916	B916		D916	JD916	KD916	
9/16	0.578	2.188	0.125	AN970	9								
9/16	0.588	0.715	0.032	STK STD	X*								
9/16	0.588	0.938	0.032	MS9549		15							
9/16	0.588	1.125	0.125	MS9320	15 *	9321-15							
9/16	0.594	0.968	0.100	MS15795								755	
9/16	0.594	1.125	0.063	TYPE B-N	X*								
9/16	0.594	1.156	0.095	MS27183	20								
9/16	0.594	1.469	0.100	MS15795		843	843B		943			743	
9/16	0.620	1.000	0.062	STK STD	X*								
9/16	0.620	1.125	0.020	STK STD		X							
5/8	0.620	1.250	0.130	STK STD	X*	X							

5/8	0.630	0.880	0.062	BACW10P	251W							
5/8	0.630	1.000	0.032	STK STD	X							
M16	0.630	1.103	0.118	DIN1440	X							
5/8	0.630	1.250	0.047	STK STD	X							
5/8	0.630	1.375	0.080	STK STD	X**					X		
5/8	0.640	1.188	0.016	AN960						D1016L	JD1016L	KD1016L
5/8	0.640	1.188	0.016	NAS1149	F1016P	C1016R	C1016B	B1016H		D1016H	D1016J	D1016K
5/8	0.640	1.188	0.032	AN960	1016L	C1016L	XC1016L					
5/8	0.640	1.188	0.032	NAS1149	F1032P	C1032R	C1032B	B1032H		D1032H	D1032J	D1032K
5/8	0.640	1.188	0.063	AN960	1016	C1016	XC1016	B1016	961-1016	D1016	JD1016	KD1016
5/8	0.640	1.188	0.063	NAS1149	F1062P	C1063R	C1063B	B1062H		D1063H	D1063J	D1063K
5/8	0.640	1.312	0.010	STK STD	X							
5/8	0.640	1.625	0.047	STK STD	X							
5/8	0.640	2.375	0.125	AN970	10	C10						
5/8	0.651	1.000	0.032	MS9549		16						
5/8	0.651	1.250	0.141	MS9320	16	9321-16						
5/8	0.656	1.031	0.106	8756545	X							
5/8	0.656	1.250	0.100	TYPE B-N	X**	X						
5/8	0.656	1.312	0.095	MS15795	X	820			920			720
5/8	0.656	1.312	0.095	MS27183	21							
5/8	0.656	1.750	0.100	N402 -	B47							
5/8	0.656	2.125	0.095	MS27183	63							
5/8	0.656	2.250	0.160	TYPE B-W	X							
M16	0.670	1.064	0.079	DIN433	X	X			X	*		
M16	0.670	1.182	0.118	DIN125A	X	X		X	X	X		
5/8	0.688	0.812	0.047	STK STD		X		X		X		
5/8	0.688	1.000	0.020	STK STD		X**						
5/8	0.688	1.500	0.134	MS16212	X*	15						
5/8	0.688	1.750	0.134	MS15795	X	821	821B		921			721
5/8	0.688	1.750	0.134	MS27183	22							
5/8	0.700	0.980	0.062	STK STD	X							
M16	0.709	1.182	0.118	DIN126	X							
5/8	0.715	0.937	0.024	7766555	CD2							
5/8	0.715	1.300	0.131	STK STD	X							
5/8	0.750	1.250	0.015	SHIMS	X*** *							
3/4	0.755	1.000	0.051	AN901						8A		
3/4	0.755	1.125	0.109	STK STD	X	X**						
3/4	0.755	1.500	0.125	STK STD	X	X						
3/4	0.765	1.250	0.062	NAS1587	X*	12						
3/4	0.765	1.312	0.016	AN960						D1216L	JD1216L	KD1216L
3/4	0.765	1.312	0.032	AN960	1216L	C1216L	XC1216L					
3/4	0.765	1.312	0.090	AN960	1216	C1216	XC1216	B1216		D1216	JD1216	KD1216
3/4	0.765	1.375	0.125	STK STD	X**							
3/4	0.776	1.188	0.032	MS9549	X*	17						
3/4	0.780	1.312	0.029	7006236	CD2							
3/4	0.780	1.625	0.125	STK STD	X							
3/4	0.790	1.203	0.079	STK STD	X							
3/4	0.812	1.000	0.062	STK STD	X							
3/4	0.812	1.115	0.032	STK STD	X							
3/4	0.812	1.375	0.100	TYPE B-N	X							
3/4	0.812	1.469	0.134	MS15795		822	822B		922			722
3/4	0.812	1.469	0.134	MS27183	23							
3/4	0.812	1.750	0.148	MS16212		16						
3/4	0.812	2.000	0.148	MS15795	X*	823	823B		923			723
3/4	0.812	2.000	0.148	MS27183	24							
3/4	0.821	1.250	0.125	12297749	S							
M20	0.827	1.300	0.099	DIN433	X	X			X			
M20	0.867	1.458	0.118	DIN126	X							

7/8	0.875	1.562	0.071	MS21206	14						
7/8	0.880	1.036	0.032	STK STD		X					
7/8	0.880	1.120	0.051	AN901	X*				10A		
7/8	0.890	1.250	0.032	STK STD		X***					
7/8	0.890	1.375	0.078	STK STD	X				X**		
7/8	0.890	1.500	0.016	AN960	X				D1416L	JD1416L	KD1416L
7/8	0.890	1.500	0.032	AN960	1416L	C1416L	XC1416L				
7/8	0.890	1.500	0.090	AN960	1416	C1416	XC1416	B1416	D1416	JD1416	PD1416
7/8	0.890	2.310	0.042	11646725	CD2						
7/8	0.901	1.275	0.062	STK STD		X					
7/8	0.901	1.375	0.032	MS9549		18					
7/8	0.906	1.250	0.010	SHIM	X						
7/8	0.906	1.500	0.032	8731389	CD2						
M22	0.906	1.537	0.118	DIN125A	X	X					
7/8	0.938	1.750	0.134	MS15795		824	824B		924		724
7/8	0.938	1.750	0.134	MS27183	25						
7/8	0.938	2.000	0.165	MS16212		17					
7/8	0.938	2.250	0.165	MS15795		825	825B		925		725
7/8	0.938	2.250	0.165	MS27183	26						
7/8	1.000	2.000	0.090	50-4-18-32-	16						
1"	1.015	1.250	0.012	STK STD					X		
1"	1.015	1.750	0.016	AN960					D1616L	JD1616L	KD1616L
1"	1.015	1.750	0.032	AN960	1616L	C1616L	XC1616L				
1"	1.015	1.750	0.090	AN960	1616	C1616	XC1616	B1616	D1616	JD1616	KD1616
1"	1.025	1.375	0.080	STK STD	X						
1"	1.026	1.562	0.032	MS9549		19					
1"	1.062	1.425	0.032	STK STD	X						
1"	1.062	1.575	0.083	STK STD	X						
1"	1.062	1.671	0.065	MS15795					954		
1"	1.062	1.750	0.100	TYPE B-N	X						
1"	1.062	2.000	0.134	MS15795	X	826	826B		926		726
1"	1.062	2.000	0.134	MS27183	27						
1"	1.062	2.250	0.165	MS16212		18					
1"	1.062	2.500	0.165	MS15795	X*	827	827B		927		727
1"	1.062	2.500	0.165	MS27183	28						
1'	1.068	1.370	0.051	AN901	X				12A		
1-1/16	1.078	1.812	0.016	AN960					D1716L	JD1716L	KD1716L
1-1/16	1.078	1.812	0.032	AN960	1716L						
1-1/16	1.078	1.812	0.090	AN960	1716	C1716	XC1716	B1716	D1716	JD1716	KD1716
1-1/16	1.125	1.625	0.032	STK STD	X**						
1-1/8	1.140	1.687	0.062	STK STD		X					
1-1/8	1.140	1.875	0.016	AN960					D1816L	JD1816L	KD1816L
1-1/8	1.140	1.875	0.032	AN960	1816L	C1816L	XC1816L				
1-1/8	1.140	1.875	0.090	AN960	1816	C1816	XC1816	B1816	D1816	JD1816	KD1816
1-1/8	1.150	2.000	0.125	STK STD	X						
1-1/8	1.155	1.875	0.120	18063407	X						
1-1/8	1.188	1.320	0.225	STK STD	X						
1-1/8	1.188	2.000	0.100	TYPE B-N	X						
1-1/8	1.188	2.250	0.134	STK STD	X						
1-1/8	1.188	3.250	0.160	TYPE B-W							
1-1/8	1.190	1.500	0.062	STK STD					X		
1-1/8	1.220	1.500	0.125	STK STD	X						
M30	1.221	2.206	0.158	DIN125A	X						
1-1/8	1.250	1.828	0.032	STK STD	X						
1-1/8	1.250	2.000	0.090	STK STD	X						
1-1/8	1.250	2.250	0.125	50-4-20-40-	18						
1-1/8	1.250	2.500	0.165	TYPE A		X					
1-1/8	1.250	2.750	0.165	MS15795	X	828	828B		928		

1-1/4	1.265	2.000	0.090	AN960	2016	C2016	XC2016	B2016		D2016	JD2016	KD2016
1-1/4	1.281	2.250	0.125	50-4-20-41-	18							
M30	1.289	2.183	0.179	ANSI	X							
M30	1.300	2.206	0.158	DIN126	X							
1-1/4	1.320	2.875	0.032	STK STD						X		
1-5/16	1.328	1.562	0.062	STK STD		X						
1-5/16	1.328	2.062	0.016	AN960						D2116L	JD2116L	KD2116L
1-5/16	1.328	2.062	0.032	AN960	2116L							
1-5/16	1.328	2.062	0.090	AN960	2116	C2116	XC2116	B2116		D2116	JD2116	KD2116
1-5/16	1.328	2.240	0.125	STK STD	X*							
1-5/16	1.375	1.625	0.025	STK STD		X						
1-5/16	1.375	2.000	0.032	STK STD	X							
1-5/16	1.375	2.500	0.165	TYPE A-N	X							
1-5/16	1.375	3.000	0.165	MS15795		829	829B		929			729
1-5/16	1.375	3.000	0.165	MS27183	30							
1-3/8	1.406	2.500	0.220	4183271	X							
1-3/8	1.500	2.100	0.032	STK STD	X							
1-3/8	1.500	3.125	0.156	STK STD	X							
1-3/8	1.500	3.250	0.181	MS15795	X	830	830B		930			730
1-1/2	1.515	1.935	0.125	STK STD	X							
1-1/2	1.515	2.250	0.016	NAS1149	F2416P	C2416R	C2416B	B2416H		D2416H	D2416J	D2416K
1-1/2	1.515	2.250	0.032	NAS1149	F2432P	C2432R	C2432B	B2432H		D2432H	D2432J	D2432K
1-1/2	1.515	2.250	0.090	NAS1149	F2490P	C2490R	C2490B	B2490H		D2490H	D2490J	D2490K
M36	1.521	2.577	0.199	ANSI	X							
1-1/2	1.530	2.000	0.141	12296711	X							
M36	1.537	2.600	0.158	DIN126	X							
1-1/2	1.562	2.000	0.125	4163564	X							
1-1/2	1.624	1.872	0.062	STK STD	X							
1-1/2	1.625	3.500	0.181	MS15795		831	831B		931			731
1-1/2	1.625	3.500	0.181	MS27183	32							
1-5/8	1.640	2.375	0.016	NAS1149	F2616P	C2616R	C2616B	B2616H		D2616H	D2616J	D2616K
1-5/8	1.640	2.375	0.032	NAS1149	F2632P	C2632R	C2632B	B2632H		D2632H	D2632J	D2632K
1-5/8	1.640	2.375	0.090	NAS1149	F2690P	C2690R	C2690B	B2690H		D2690H	D2690J	D2690K
1-5/8	1.655	2.020	0.062	STK STD	X*	X**						
1-5/8	1.738	2.750	0.062	7521048	X							
1-5/8	1.750	3.750	0.180	MS15795		832	832B		932			732
1-5/8	1.750	3.750	0.180	MS27183	33							
1-5/8	1.773	2.000	0.024	STK STD		X				X		
M42	1.773	3.073	0.276	DIN126	X							
1-3/4	1.875	4.000	0.180	MS15795		833	833B		933			
1-3/4	1.875	4.000	0.180	MS27183	34							
1-3/4	1.890	2.625	0.032	AN960	3016L	C3016L	XC3016L	B3016L				
1-3/4	1.890	2.625	0.090	AN960	3016	C3016	XC3016	B3016		D3016	JD3016	KD3016
1-3/4	1.940	2.236	0.062	STK STD	X							
1-7/8	2.000	2.750	0.032	STK STD	X							
1-7/8	2.000	2.875	0.032	STK STD						X		
1-7/8	2.000	4.250	0.180	MS15795	X	834	834B		934			
1-7/8	2.000	4.250	0.180	MS27183	35							
2"	2.062	3.062	0.104	9152013	CD2							
2"	2.125	4.500	0.180	MS15795		835	835B		935			
2"	2.125	4.500	0.180	MS27183	36							
2-1/4	2.265	3.000	0.032	AN960	3616L	C3616L	XC3616L	B3616				
2-1/4	2.265	3.000	0.090	AN960	3616	C3616	XC3616	B3616		D3616	JD3616	KD3616
2-1/4	2.375	4.750	0.220	MS27183	37							
2-1/2	2.515	3.250	0.090	AN960	4016	C4016	XC4016	B4016		D4016	JD4016	KD4016
2-1/2	2.625	5.000	0.238	MS27183	38							
2-7/8	2.968	3.395	0.010	SHIM	X							
3"	3.155	3.500	0.025	STK STD	X							



from 4130 Chrome Molybdenum Steel. They are available with **both plain and a 45° countersink**, heat treated and plated. They are primarily for use with 160,000 psi bolts.

Screw/ Bolt Size	Nominal Dimensions			Countersunk Dimensions				MS - NAS Ordinance Dash Numbers		
	I.D.	O.D.	Thick	CTSK P/N	A CTSK I.D.	B CTSK Depth	C CTSK Degree	Reference Part Numbers	Steel Plated P/N	Stainless Steel P/N
3	0.093	0.187	0.019					2W1G-6-6-	19	
3	0.119	0.250	0.031					MS9320	04	
4	0.124	0.245	0.040					ALLOY 4	X	
4	0.135	0.312	0.031					MS9320	05	
5	0.150	0.312	0.043					MS9320	06	
6	0.159	0.375	0.043					MS9320	07	
8	0.184	0.375	0.050					MS9320	08	
10	0.193	0.367	0.062	C3	0.285	0.063	45*	MS21206	3	
10	0.193	0.377	0.062					MS21299	3	
10	0.195	0.469	0.032					NAS1587	3	
10	0.213	0.438	0.062					MS9320	09	
1/4	0.253	0.465	0.062	C4	0.345	0.063	45*	MS21206	4	
1/4	0.253	0.481	0.062					MS21299	4	
1/4	0.255	0.485	0.057					BACW10BP	4P	
1/4	0.255	0.531	0.062	C4	0.339	0.078	45*	MS20002	4	
1/4	0.256	0.531	0.062	4C	0.339	0.078	45*	NAS1587		4
1/4	0.265	0.500	0.063					NAS1149	G0463P	
1/4	0.276	0.500	0.062					MS9320	10	
1/4	0.281	0.500	0.089					10910174	1	
1/4	0.281	0.625	0.089					10910174	34	
1/4	0.281	1.000	0.089					10910174	20	
5/16	0.316	0.568	0.062	C5	0.407	0.063		MS21206	5	
5/16	0.319	0.593	0.062	C5	0.401	0.078	45*	MS20002	5	
5/16	0.319	0.593	0.062	5C	0.401	0.078	45*	NAS1587		5
5/16	0.328	0.562	0.063					NAS1149	G0563P	
5/16	0.338	0.625	0.062					MS9320	11	
5/16	0.343	0.625	0.062					10910174	17	
5/16	0.343	0.625	0.104					10910174	2	
5/16	0.343	0.875	0.119					10910174	19	
3/8	0.378	0.674	0.062	C6	0.502	0.078	45*	MS21206	6	
3/8	0.383	0.687	0.062	C6	0.489	0.078	45*	MS20002	6	
3/8	0.383	0.687	0.062	6C	0.489	0.078	45*	NAS1587		6
3/8	0.390	0.625	0.063					NAS1149	G0663P	
3/8	0.390	0.937	0.045					S6135-64028-	3	
3/8	0.401	0.750	0.078					MS9320	12	
3/8	0.406	0.700	0.158					10910174	33	
3/8	0.406	0.750	0.119					10910174	3	
3/8	0.406	0.875	0.134					10910174	22	
3/8	0.406	1.125	0.199					10910174	16	
7/16	0.438	0.922	0.065					ASTM A-325	X	
7/16	0.441	0.778	0.062	C7	0.564	0.078	45*	MS21206	7	
7/16	0.446	0.781	0.062	C7	0.550	0.078	45*	MS20002	7	
7/16	0.446	0.781	0.062	7C	0.550	0.078	45*	NAS1587		7



thrust washers, available in 23 sizes from Anillo. They are designed primarily for supporting end load thrust bearings. Call for information.

**MS 21206**— Washers available in this series are both plain and countersunk, made from Alloy Steel, heat treated and plated. They are normally used with

and **MS 21084** nuts.

**MS 9320**— Washers are made from AMS 6350 Corrosion Resistant Steel with Diffused Cadmium Nickel Plate.

**NAS 1587**— Available both flat and with a 45° countersink, these washers are made from Corrosive Resistant Steel with 75,000 psi, UTS min.

Screw/ Bolt Size	Nominal Dimensions			Countersunk Dimensions				MS - NAS Ordinance Dash Numbers		
	I.D.	O.D.	Thick	CTSK P/N	A CTSK I.D.	B CTSK Depth	C CTSK Degree	Reference Part Numbers	Steel Plated P/N	Stainless Steel P/N
7/16	0.453	0.750	0.063	7C	0.550	0.078	45*	NAS1149	G0763P	
7/16	0.463	0.875	0.094					MS9320	13	
7/16	0.468	0.750	0.119					10910174	26	
7/16	0.468	0.875	0.119					10910174	4	
7/16	0.468	0.875	0.250					10910174	35	
7/16	0.482	0.905	0.290					12376084		
1/2	0.501	0.888	0.062					4130	X	
1/2	0.503	0.893	0.062	C8	0.627	0.078	45*	MS21206	8	
1/2	0.509	0.875	0.062	C8	0.612	0.078	45*	MS20002	8	
1/2	0.509	0.875	0.062	8C	0.612	0.078	45*	NAS1587		8
1/2	0.515	0.875	0.063					NAS1149	G0863P	
1/2	0.516	0.875	0.125					11678182		
1/2	0.526	1.000	0.109					MS9320	14	
1/2	0.531	0.875	0.060					10910174	37	
1/2	0.531	0.875	0.089					10910174	30	
1/2	0.531	0.875	0.127					10910174	43	
1/2	0.531	1.000	0.134					10910174	5	
1/2	0.531	1.500	0.060					10910174	40	
1/2	0.531	2.000	0.209					10910174	28	
1/2	0.562	1.500	0.160					9152386	X	
9/16	0.566	1.004	0.062	C9	0.689	0.078	45*	NS21206	9	
9/16	0.570	0.968	0.062	C9	0.677	0.078	45*	MS20002	9	
9/16	0.570	0.968	0.062	9C	0.677	0.078	45*	NAS1587		9
9/16	0.578	1.062	0.063					NAS1149	G0963P	
9/16	0.588	1.125	0.125					MS9320	15	
9/16	0.594	1.125	0.164					10910174	6	
5/8	0.626	1.182	0.062					MS21299	10	
5/8	0.629	1.120	0.062	C10	0.783	0.078	45*	MS21206	10	
5/8	0.638	1.062	0.062	C10	0.775	0.078	45*	MS20002	10	
5/8	0.638	1.062	0.062	10C	0.775	0.078	45*	NAS1587		10
5/8	0.640	1.188	0.063	10C	0.775	0.078	45*	NAS1149	G1063P	
5/8	0.651	1.250	0.141					MS9320	16	
5/8	0.656	1.000	0.119					10910174	31	
5/8	0.656	1.000	0.250					10910174	21	
5/8	0.656	1.250	0.164					10910174	7	
5/8	0.656	1.250	0.250					10910174	18	
5/8	0.656	1.500	0.089					10910174	44	
5/8	0.656	1.750	0.179					10941915	7	
5/8	0.656	1.750	0.250					10910174	38	
5/8	0.656	2.500	0.125					10910174	25	
5/8	0.687	1.312	0.093					A-325	X	
3/4	0.754	1.345	0.062	C12	0.908	0.078	45*	MS21206	12	
3/4	0.765	1.250	0.062	C12	0.900	0.078	45*	MS20002	12	

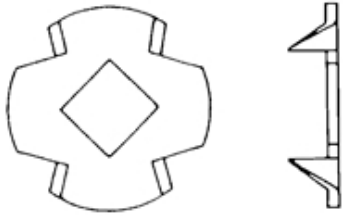
covers to various sizes of washers made from Alloy Steel, heat treated and Cadmium Plated for military use. All are stocked by WCL. These washers also account for many commercial applications.

**Available, but not listed**— The following Double Countersunk 45° MS Series washers are available from WCL, but space limitations prevent their

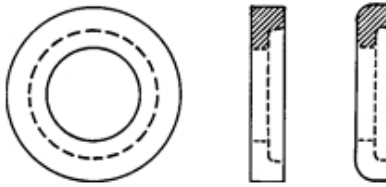
Also available but not shown are countersunk washers with 100° angles and other special configurations.

Many other sizes of unlisted hardened washers are also in stock. If not listed here, call Anillo to check availability and get samples and a quotation.

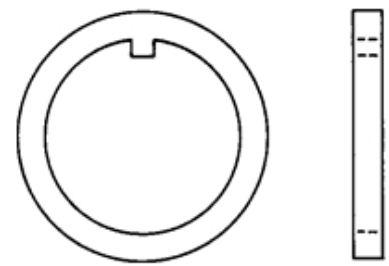
Screw/ Bolt Size	Nominal Dimensions			Countersunk Dimensions				MS - NAS Ordinance Dash Numbers		
	I.D.	O.D.	Thick	CTSK P/N	A CTSK I.D.	B CTSK Depth	C CTSK Degree	Reference Part Numbers	Steel Plated P/N	Stainless Steel P/N
3/4	0.765	1.250	0.062	12C	0.900	0.078	45*	NAS1587		12
3/4	0.765	1.312	0.090					NAS1149	G1290P	
3/4	0.765	1.380	0.125					4130	X	
3/4	0.776	1.500	0.172					MS9320	17	
3/4	0.780	1.500	0.062					10910174	41	
3/4	0.781	1.500	0.093					10910174	24	
3/4	0.781	1.500	0.125					10910174	42	
3/4	0.781	1.687	0.250					10910174	23	
3/4	0.812	2.000	0.179					10910174	15	
3/4	0.812	2.000	0.194					10910174	8	
7/8	0.879	1.567	0.062	C14	1.033	0.078	45*	MS21206	14	
7/8	0.877	2.250	0.187					MS17811	18	
7/8	0.888	1.437	0.062	C14	1.025	0.078	45*	MS20002	14	
7/8	0.888	1.437	0.062	14C	1.025	0.078	45*	NAS1587		14
7/8	0.890	1.500	0.090					NAS1149	G1490P	
7/8	0.901	1.750	0.203					MS9320	18	
7/8	0.938	1.781	0.194					10910174	9	
1"	1.015	1.625	0.062	C16	1.150	0.078	45*	MS20002	16	
1"	1.015	1.625	0.062	16C	1.150	0.078	45*	NAS1587		16
1"	1.015	1.750	0.090					NAS1149	G1690P	
1"	1.020	1.720	0.060					10910174	29	
1"	1.026	2.000	0.234					MS9320	19	
1"	1.062	2.031	0.209					10910174	10	
1-1/16	1.078	1.812	0.090					NAS1149	G1790P	
1-1/8	1.140	1.875	0.090					NAS1149	G1890P	
1-1/8	1.145	1.875	0.062	C18	1.275	0.078	45*	MS20002	18	
1-1/8	1.145	1.875	0.062	18C	1.275	0.078	45*	NAS1587		18
1-1/4	1.265	2.000	0.090					NAS1149	G2090P	
1-1/4	1.269	2.125	0.062	C20	1.437	0.094	45*	MS20002	20	
1-1/4	1.269	2.125	0.094	20C	1.437	0.094	45*	NAS1587		20
1-5/16	1.328	2.062	0.090					NAS1149	G2190P	
1-3/8	1.395	2.313	0.062	C22	1.562	0.094	45*	MS20002	22	
1-1/2	1.515	2.500	0.062	C24	1.687	0.094	45*	MS20002	24	



Torque Washer



AN 975-3 thru -14's



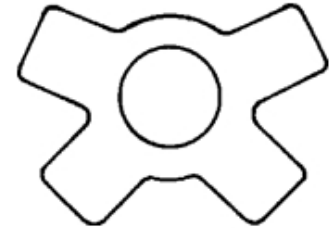
AN 7503-15 thru - AN 7503 -17  
MS 21258-15 thru 71's



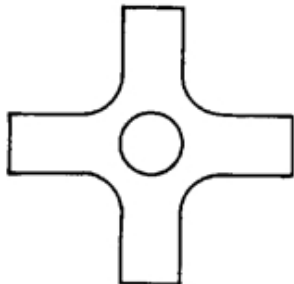
Various Sizes in Stock



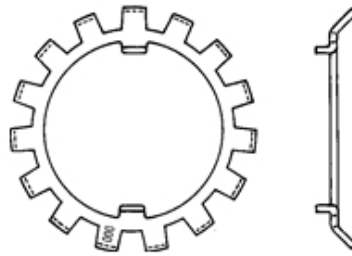
10863380 AND 108866190



10917945



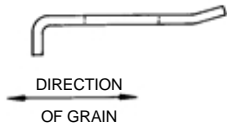
8704692



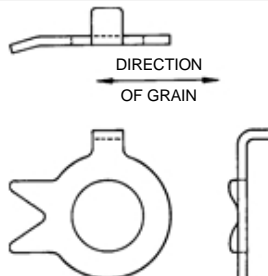
MS 99081-10 thru -32's



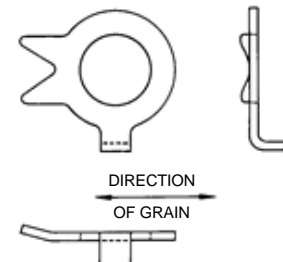
MS 15820-1 thru -8's



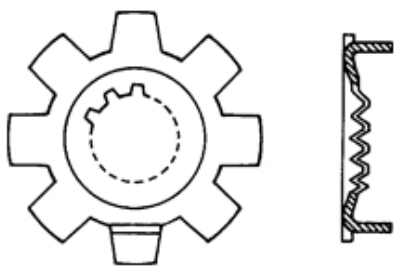
MS 9276-08 thru -19's  
Stainless Steel AMS 5510 Heat Treated



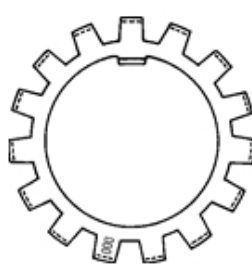
MS 9581-08 thru -19's  
Stainless Steel AMS 5510 Heat Treated



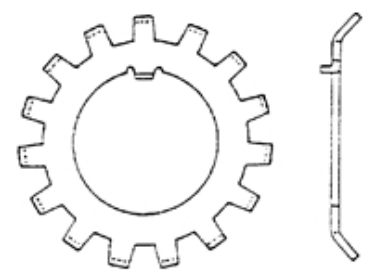
MS 9582-08 thru -19's stocked  
Stainless Steel MS 5510 Heat Treated



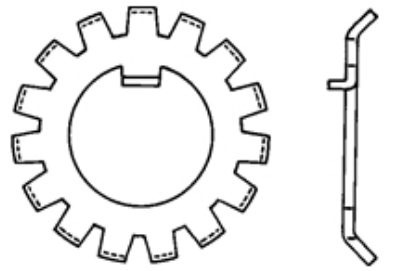
MS 17186-1 thru -8's



MS 172201 thru MS 172235's  
MS 172271 thru MS172320



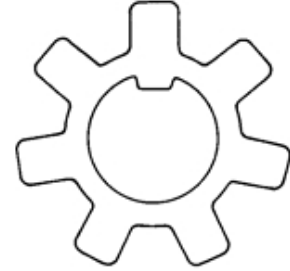
MS 172271 thru 172320



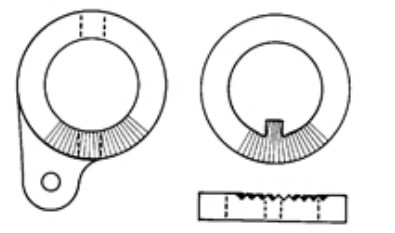
MS 190069-A00 thru -A22's  
MS 19070-00 thru -40's



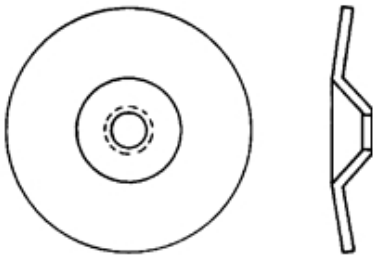
MS 25081-0 thru 8's



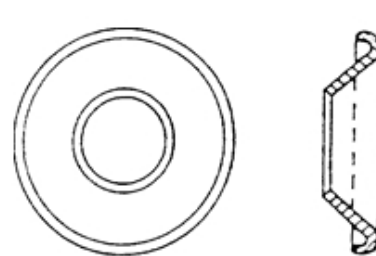
NAS 460-416 thru 3216  
MS 27111-1 thru -16's



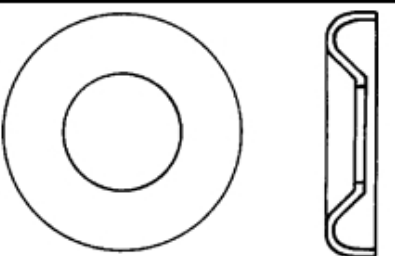
NAS1193-4 thru -36's  
Locking device positive index



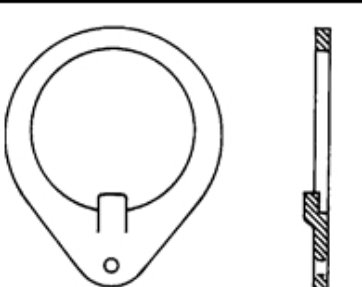
NAS 1169 - Full Series



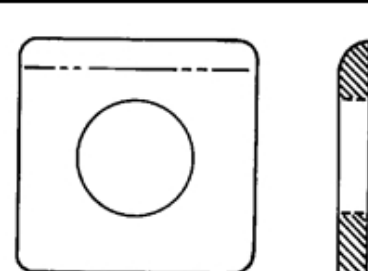
NAS 390 Flush



NAS 391 and MS 27129



NAS 513-4 thru -36's



NAS 1401-3 thru -12's

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
0	0.035	0.101	0.031	5610-214-03
0	0.042	0.312	0.031	
0	0.050	0.109	0.020	DELTRIN
0	0.063	0.188	0.021	MS51859-11
0	0.063	0.312	0.031	5610-218-31
0	0.064	0.122	0.031	5610-50-31
0	0.064	0.190	0.016	
0	0.070	0.250	0.015	MTW-NYLATRON
0	0.070	0.281	0.015	MTW-NYLATRON
0	0.076	0.156	0.010	DELTRIN
0	0.076	0.156	0.021	MS51859-12
0	0.076	0.160	0.016	5610-4-15
0	0.077	0.240	0.031	
0	0.077	0.500	0.031	
1	0.079	0.501	0.031	
1	0.085	0.190	0.016	
2	0.091	0.280	0.021	
2	0.093	0.187	0.021	5610-9-20
2	0.093	0.187	0.031	DELTRIN
2	0.093	0.187	0.031	MS51859-1
2	0.093	0.245	0.015	MS51859-13
2	0.094	0.193	0.041	5610-9-40
2	0.094	0.218	0.008	5610-6-8
2	0.094	0.218	0.016	5610-6-15
2	0.094	0.218	0.031	5610-6-31
2	0.094	0.218	0.062	5610-6-62
2	0.094	0.230	0.031	
2	0.094	0.255	0.031	5610-11-31
2	0.098	0.187	0.031	3114, 760-2518
2	0.098	0.187	0.047	3151, 760-2540
2	0.098	0.187	0.062	3356, 760-2562
2	0.098	0.223	0.008	MYLAR
2	0.098	0.250	0.031	3347, 760-2501
2	0.098	0.250	0.062	3357, 760-2563
2	0.098	0.312	0.031	3115, 760-2519
2	0.098	0.312	0.062	3195, 760-2564
2	0.098	0.610	0.062	POLYPROP
3	0.100	0.235	0.010	ACETAL DELTRIN
3	0.105	0.250	0.022	
3	0.105	0.250	0.031	NAS1515-H02L
3	0.105	0.250	0.062	NAS1515-H02
3	0.108	0.247	0.021	5610-8-20
3	0.108	0.528	0.062	
3	0.109	0.218	0.016	
3	0.110	0.271	0.045	
4	0.115	0.185	0.031	5610-230-31
4	0.115	0.200	0.031	5610-51-31
4	0.115	0.250	0.062	FM-2671
4	0.115	0.280	0.021	15083-020
4	0.115	0.280	0.051	5610-17-50
4	0.115	0.280	0.062	5610-16-62
4	0.115	0.290	0.062	

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
4	0.120	0.220	0.021	5610-19-20
4	0.120	0.250	0.031	3348, 760-2520
4	0.120	0.250	0.047	345, 760-2577
4	0.120	0.250	0.062	3358, 760-2520
4	0.120	0.280	0.021	5610-21-20
4	0.120	0.280	0.031	
4	0.120	0.280	0.041	
4	0.120	0.280	0.051	5610-21-50
4	0.120	0.280	0.062	5610-21-62
4	0.120	0.285	0.071	5610-21-70
4	0.120	0.312	0.031	3359, 760-2521
4	0.120	0.312	0.047	3157, 760-2543
4	0.120	0.312	0.062	3198, 760-2565
4	0.120	0.375	0.031	3118, 760-2522
4	0.120	0.375	0.047	3158, 760-2544
4	0.120	0.375	0.062	3200, 760-2566
4	0.125	0.228	0.007	MYLAR
4	0.125	0.250	0.016	FM-6593
4	0.125	0.250	0.021	
4	0.125	0.250	0.062	
4	0.125	0.271	0.020	
4	0.125	0.281	0.047	MS51859-2
M3	0.125	0.285	0.020	DIN125A
4	0.125	0.310	0.016	5610-10-15
4	0.125	0.312	0.031	NAS1515-H04L
4	0.125	0.312	0.062	NAS1515-H04
4	0.125	0.343	0.031	MS51859-14
4	0.125	0.354	0.031	DIN9021, ISO7093
4	0.125	0.365	0.006	
4	0.128	0.187	0.011	5610-233-10
4	0.128	0.187	0.021	227-0008-004
4	0.128	0.245	0.011	5610-55-10
4	0.128	0.312	0.005	MYLAR
4	0.128	0.312	0.052	
4	0.128	0.440	0.021	5610-23-20
4	0.130	0.375	0.008	210-1011-00
4	0.130	0.375	0.031	
4	0.133	0.250	0.015	MTW-NYLATRON
4	0.133	0.281	0.015	MTW-NYLATRON
4	0.136	0.250	0.062	FM-2670, DELTRIN
4	0.136	0.375	0.031	5610-12-32
6	0.140	0.250	0.031	3122, 760-2523
6	0.140	0.250	0.047	3162, 760-2504
6	0.140	0.250	0.062	3360, 760-2504
6	0.140	0.260	0.082	
6	0.140	0.267	0.031	5610-244-31
6	0.140	0.290	0.031	5610-248-31
6	0.140	0.290	0.062	
6	0.140	0.312	0.031	3120, 5610-35-31
6	0.140	0.312	0.047	MS51859-3, 3160
6	0.140	0.312	0.062	3360, 760-2567
6	0.140	0.375	0.031	3123, 760-2525

manufacturing purposes.

conventional operating temperatures. It has good

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
6	0.140	0.375	0.047	3164, 760-2546
6	0.140	0.375	0.062	3203, 760-2506
6	0.140	0.750	0.051	5610-34-50
6	0.143	0.375	0.091	5610-58-91
6	0.144	0.270	0.031	5610-59-31
6	0.144	0.315	0.062	
6	0.147	0.250	0.091	5610-250-90
6	0.147	0.500	0.031	5610-41-31
6	0.147	0.500	0.062	5610-41-62
6	0.147	0.643	0.031	5610-60-31
6	0.149	0.375	0.031	NAS1515-H06L
6	0.149	0.375	0.062	NAS1515-H06
6	0.150	0.312	0.025	5610-44-25
6	0.150	0.312	0.031	5610-44-31
6	0.150	0.345	0.031	
6	0.150	0.510	0.062	
6	0.156	0.250	0.021	MS51859-15
6	0.156	0.312	0.031	FM-6594
6	0.156	0.312	0.041	MS51859-3
6	0.156	0.375	0.031	5610-45-31
6	0.156	0.443	0.051	
6	0.158	0.281	0.015	MTW-NYLATRON
6	0.158	0.343	0.015	MTW-NYLATRON
6	0.158	0.375	0.015	MTW-NYLATRON
6	0.158	0.406	0.015	MTW-NYLATRON
6	0.160	0.250	0.062	5610-46-62
6	0.160	0.490	0.008	
6	0.160	0.562	0.062	5610-48-62
6	0.165	0.235	0.010	ACETAL DELRIN
6	0.165	0.500	0.011	210-0847-00
6	0.165	0.500	0.041	
6	0.165	0.625	0.062	
6	0.165	1.250	0.062	
M4	0.169	0.354	0.031	DIN125A, ISO7089
M4	0.169	0.472	0.039	DIN9021, ISO7093
8	0.171	0.312	0.031	3127, 760-2526
8	0.171	0.312	0.047	3167, 760-2547
8	0.171	0.312	0.062	3205, 760-2568
8	0.171	0.340	0.031	
8	0.171	0.375	0.031	3350, 760-2527
8	0.171	0.375	0.047	3168, 760-2548
8	0.171	0.375	0.062	3363, 760-2507
8	0.171	0.437	0.031	3128, 760-2528
8	0.171	0.437	0.047	3169, 760-2549
8	0.171	0.437	0.062	3207, 760-2569
8	0.171	0.515	0.091	5610-61-90
8	0.174	0.375	0.021	5610-18-20
8	0.174	0.375	0.031	NAS1515-H08L
8	0.174	0.375	0.062	NAS1515-H08
8	0.175	0.271	0.025	
8	0.178	0.375	0.020	
8	0.180	0.281	0.031	MTW-NYLATRON

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
8	0.180	0.375	0.015	MTW-NYLATRON
8	0.180	0.406	0.015	MTW-NYLATRON
8	0.182	0.375	0.008	MYLAR
8	0.185	0.362	0.062	
8	0.185	0.437	0.031	POLYETHYLENE
8	0.185	0.437	0.031	5610-62-31
8	0.185	0.437	0.041	5610-62-40
8	0.187	0.375	0.015	5610-90-15
8	0.187	0.375	0.045	MS51859-4
8	0.187	0.375	0.062	5610-90-92
8	0.187	0.390	0.031	
8	0.187	0.437	0.032	
8	0.187	0.437	0.045	
8	0.187	0.500	0.020	BLK VINYL PLASTIC
8	0.189	0.281	0.015	MTW-NYLATRON
8	0.189	0.343	0.015	MTW-NYLATRON
8	0.189	0.375	0.031	MTW-NYLATRON
8	0.189	0.406	0.015	MTW-NYLATRON
8	0.189	0.437	0.015	MTW-NYLATRON
8	0.189	0.625	0.057	
8	0.189	1.005	0.031	
10	0.192	0.312	0.016	5610-96-15
10	0.192	0.375	0.031	5606-4-31
10	0.192	0.438	0.021	6/6
10	0.192	0.505	0.015	5606-8-15
10	0.196	0.427	0.031	6/6
10	0.196	0.312	0.031	3364, 760-2529
10	0.196	0.312	0.047	3174, 760-2550
10	0.196	0.312	0.062	3211, 760-2570
10	0.196	0.375	0.031	3352, 760-2530
10	0.196	0.375	0.047	3175, 760-2551
10	0.196	0.375	0.062	3212, 760-2509
10	0.196	0.437	0.031	3132, 760-2531
10	0.196	0.437	0.047	3167, 760-2552
10	0.196	0.437	0.062	3213, 760-2510
10	0.196	0.500	0.031	3133, 760-2532
10	0.196	0.500	0.047	3177, 760-2553
10	0.196	0.500	0.062	3214, 760-2571
10	0.196	0.550	0.031	6/6
10	0.196	0.562	0.031	MTW-NYLATRON
10	0.201	0.309	0.031	5610-63-31
10	0.201	0.500	0.041	6/6
10	0.201	0.562	0.041	6/6
10	0.203	0.307	0.011	6/6
10	0.203	0.437	0.031	NAS1515-H3L
10	0.203	0.437	0.041	6/6
10	0.203	0.437	0.062	NAS1515-H3
10	0.203	0.437	0.092	NAS1515-H3H
10	0.203	0.470	0.041	5610-108-40
10	0.205	0.307	0.010	6/6
10	0.205	0.450	0.041	6/6
10	0.205	0.465	0.051	6/6

Resistance, living hinge, light weight, are resistance,

polypropylene with a CE rating of CE 0 (1/8" thick),

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
10	0.205	0.465	0.051	6/6
10	0.205	0.500	0.091	5610-64-90
10	0.208	0.280	0.021	5610-109-20
M5	0.208	0.393	0.039	DIN125A, ISO7089
M5	0.208	0.590	0.062	DIN9021, ISO7093
10	0.210	0.300	0.031	6/6
10	0.210	0.312	0.031	5610-287-31
10	0.210	0.450	0.041	6/6
10	0.214	0.470	0.041	6/6
10	0.218	0.375	0.052	6/6
10	0.218	0.406	0.011	210-1098-00
10	0.218	0.437	0.015	MTW-NYLATRON
10	0.218	0.437	0.031	6/6
10	0.218	0.437	0.041	MS51859-5
10	0.218	0.437	0.062	6/6
10	0.218	0.625	0.041	MS51859-16
12	0.223	0.375	0.031	6/6
12	0.225	0.437	0.062	6/6
12	0.225	0.500	0.041	6/6
12	0.230	0.440	0.040	ABS
12	0.237	0.375	0.031	MTW-NYLATRON
12	0.237	0.437	0.031	MTW-NYLATRON
12	0.250	0.312	0.031	6/6
12	0.250	0.350	0.031	6/6
12	0.250	0.375	0.020	6/6
12	0.250	0.375	0.062	6/6
12	0.250	0.610	0.062	5610-290-62
12	0.250	0.690	0.041	6/6
1/4	0.251	0.452	0.062	MTW-NYLATRON
M6	0.251	0.492	0.062	DIN125A, ISO7089
1/4	0.251	0.500	0.062	MTW-NYLATRON
1/4	0.251	0.562	0.031	MTW-NYLATRON
1/4	0.251	0.687	0.031	MTW-NYLATRON
M6	0.251	0.708	0.062	DIN9021, ISO7093
1/4	0.252	0.375	0.031	MTW-NYLATRON
1/4	0.252	0.406	0.031	MTW-NYLATRON
1/4	0.252	0.437	0.031	MTW-NYLATRON
1/4	0.252	0.625	0.015	MTW-NYLATRON
1/4	0.252	0.752	0.062	5610-69-62
1/4	0.253	0.437	0.016	5606-12-15
1/4	0.253	0.437	0.031	5606-12-31
1/4	0.253	0.506	0.041	5606-16-40
1/4	0.253	0.568	0.062	5606-20-62
1/4	0.253	0.687	0.021	6/6
1/4	0.255	0.330	0.007	MYLAR
1/4	0.255	0.375	0.021	5610-120-20
1/4	0.255	0.375	0.062	5610-120-62
1/4	0.257	0.500	0.031	5610-293-31
1/4	0.257	0.562	0.062	5610-124-62
1/4	0.257	0.740	0.062	RULON
1/4	0.260	0.437	0.031	3138, 760-2533
1/4	0.260	0.437	0.047	3182, 760-2554

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
1/4	0.260	0.437	0.062	3218, 760-2572
1/4	0.260	0.500	0.031	3353, 760-2534
1/4	0.260	0.500	0.047	3183, 760-2555
1/4	0.260	0.500	0.062	3365, 760-2511
1/4	0.260	0.562	0.062	FM-2518
1/4	0.260	0.600	0.031	5610-125-31
1/4	0.260	0.625	0.031	3139, 760-2535
1/4	0.260	0.625	0.047	3184, 760-2556
1/4	0.260	0.625	0.062	3219, 760-2573
1/4	0.260	0.688	0.051	6/6
1/4	0.260	0.750	0.031	3140, 760-2536
1/4	0.260	0.750	0.047	3185, 760-2557
1/4	0.260	0.750	0.062	3220, 760-2574
1/4	0.260	0.880	0.002	MYLAR
1/4	0.265	0.500	0.031	NAS1515-H4L
1/4	0.265	0.500	0.062	NAS1515-H4
1/4	0.265	0.500	0.094	NAS1515-H4H
1/4	0.269	0.520	0.015	MTW-NYLATRON
1/4	0.275	0.500	0.062	6/6
1/4	0.275	0.562	0.062	6/6
1/4	0.281	0.500	0.045	6/6
1/4	0.281	0.562	0.062	MS51859-17
1/4	0.281	0.625	0.015	5610-302-15
1/4	0.281	0.625	0.062	5610-302-62
1/4	0.281	0.625	0.045	MS51859-6
1/4	0.281	0.625	0.062	FM-6597
1/4	0.281	0.875	0.031	MS51859-18 *
1/4	0.285	0.493	0.020	6/6
1/4	0.307	0.490	0.032	6/6
5/16	0.314	0.500	0.031	MTW-NYLATRON
5/16	0.314	0.500	0.062	MTW-NYLATRON
5/16	0.314	0.520	0.015	MTW-NYLATRON
5/16	0.314	0.562	0.015	MTW-NYLATRON
5/16	0.314	0.687	0.031	MTW-NYLATRON
5/16	0.315	0.420	0.031	6/6
5/16	0.315	0.507	0.015	5606-24-15
5/16	0.315	0.507	0.021	5606-24-20
5/16	0.315	0.615	0.026	6/6
5/16	0.315	0.625	0.031	MTW, 5610-307-31
5/16	0.317	0.500	0.031	MS51848-19
5/16	0.320	0.438	0.062	6/6
5/16	0.320	1.500	0.021	6/6
5/16	0.325	0.750	0.015	6/6
M8	0.330	0.669	0.062	DIN125A, ISO7089
M8	0.330	0.985	0.078	DIN9021, ISO7093
5/16	0.328	0.504	0.045	210-1261-00
5/16	0.328	0.562	0.031	NAS1515-H5L
5/16	0.328	0.562	0.062	NAS1515-H5
5/16	0.328	0.562	0.094	NAS1515-H5H
5/16	0.330	0.520	0.016	5610-144-16
5/16	0.338	0.437	0.015	MTW-NYLATRON
5/16	0.344	0.625	0.045	MS51859-7

cable; and as thermal barriers in wire and cable tapes.

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
5/16	0.365	0.750	0.062	6/6
5/16	0.365	1.125	0.062	6/6
5/16	0.375	0.440	0.062	6/6
5/16	0.375	0.500	0.062	5610-76-62
5/16	0.375	0.625	0.031	FM STD
5/16	0.375	0.750	0.031	5610-77-31
5/16	0.375	0.750	0.062	5610-77-62, 2679
5/16	0.375	1.000	0.021	6/6
3/8	0.378	0.630	0.011	5606-28-10
3/8	0.379	0.812	0.062	5610-149-62
3/8	0.383	0.684	0.062	5610-81-62
3/8	0.385	0.500	0.031	3145, 760-2537
3/8	0.385	0.500	0.047	3190, 760-2558
3/8	0.385	0.500	0.062	3225, 760-2575
3/8	0.385	0.625	0.031	3354, 760-2517
3/8	0.385	0.625	0.047	3191, 760-2559
3/8	0.385	0.625	0.062	3226, 760-2515
3/8	0.385	0.750	0.031	3146, 760-2538
3/8	0.385	0.750	0.047	3192, 760-2560
3/8	0.385	0.750	0.062	3227, 760-2516
3/8	0.385	1.000	0.031	3147, 760-2539
3/8	0.385	1.000	0.047	3193, 760-2561
3/8	0.385	1.000	0.062	3228, 760-2576
3/8	0.390	0.500	0.021	6/6
3/8	0.390	0.615	0.031	6/6
3/8	0.390	0.625	0.016	BACW10P274G
3/8	0.390	0.625	0.031	NAS1515-H6L
3/8	0.390	0.625	0.062	NAS1515-H6
3/8	0.390	0.625	0.094	NAS1515-H6H
3/8	0.390	0.750	0.151	GOVT # - BLK
3/8	0.390	0.875	0.031	#101 NYLON
3/8	0.400	0.500	0.062	
3/8	0.406	0.812	0.047	MS51859-8
3/8	0.406	1.000	0.081	MS51859-20
3/8	0.410	0.730	0.160	FM-MOLDED
M10	0.413	0.825	0.078	DIN125A, ISO7089
M10	0.413	1.181	0.098	DIN9021, ISO7093
7/16	0.437	0.687	0.062	MTW-NYLATRON
7/16	0.440	0.692	0.016	5605-32-15
7/16	0.453	0.750	0.031	NAS1515-H7L
7/16	0.453	0.750	0.062	NAS1515-H7
7/16	0.453	0.750	0.094	NAS1515-H7H
7/16	0.455	1.000	0.062	5610-162-62
7/16	0.460	1.750	0.031	MS51859-21
7/16	0.475	0.687	0.062	MTW-NYLATRON
7/16	0.469	0.922	0.047	MS51859-9
7/16	0.482	0.780	0.031	6/6
7/16	0.490	0.745	0.062	6/6
1/2	0.500	1.125	0.093	6/6
1/2	0.503	0.756	0.032	5606-44-32
1/2	0.505	0.688	0.025	210-1429-00
1/2	0.505	0.843	0.031	MTW-NYLATRON

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
1/2	0.505	0.875	0.031	5610-170-31
1/2	0.505	1.000	0.062	FM
1/2	0.510	0.906	0.015	5610-173-15
M12	0.511	0.995	0.098	DIN125A, ISO7089
M12	0.511	1.575	0.118	DIN9021, ISO7093
1/2	0.515	0.750	0.062	
1/2	0.515	0.875	0.031	NAS1515-H8L
1/2	0.515	0.875	0.062	NAS1515-H8
1/2	0.515	0.875	0.094	NAS1515-H8H
1/2	0.516	0.656	0.011	5610-175-15
1/2	0.530	1.062	0.047	MSS1859-10
1/2	0.530	1.621	0.021	MS51848-22
1/2	0.535	1.000	0.062	
1/2	0.535	1.250	0.120	
1/2	0.540	0.732	0.051	
1/2	0.545	0.760	0.021	
9/16	0.565	0.818	0.031	5606-48-31
9/16	0.578	1.062	0.031	NAS1515-H9L
9/16	0.578	1.062	0.062	NAS1515-H9
9/16	0.578	1.062	0.094	NAS1515-H9H
9/16	0.605	1.595	0.031	
9/16	0.605	1.595	0.062	
9/16	0.628	0.882	0.031	5606-52-31
9/16	0.630	0.812	0.062	5610-190-62
5/8	0.640	1.188	0.031	NAS1515-H10L
5/8	0.640	1.188	0.062	NAS1515-H10
5/8	0.640	1.188	0.094	NAS1515-H10H
5/8	0.640	1.312	0.062	5610-364-62
M16	0.669	1.181	0.118	DIN125A, ISO7089
5/8	0.689	0.812	0.031	5610-199-31
5/8	0.690	0.943	0.031	5606-60-31
5/8	0.753	1.000	0.062	5606-64-62
5/8	0.755	1.125	0.031	210-0922-00
5/8	0.765	1.312	0.031	NAS1515-H12L
5/8	0.765	1.312	0.062	NAS1515-H12
5/8	0.765	1.312	0.094	NAS1515-H12H
5/8	0.767	1.317	0.062	6/6
M20	0.825	1.456	0.118	DIN125A, ISO7089
7/8	0.870	1.500	0.031	6/6
7/8	0.880	1.750	0.062	6/6
7/8	0.890	1.500	0.031	NAS1515-H14L
7/8	0.890	1.500	0.062	NAS1515-H14
7/8	0.890	1.500	0.094	NAS1515-H14H
1"	1.005	1.940	0.112	6/6
1"	1.015	1.750	0.062	NAS1515-H16
1"	1.060	2.250	0.054	12300137-PLASTIC
1-1/4	1.281	1.750	0.031	5610-213-31
2-5/16	2.312	2.810	0.125	12307267-2
2-5/16	2.312	2.810	0.250	12307267-1
2-7/16	2.440	2.875	0.406	12294962
2-7/16	2.440	3.060	0.050	12297804-2
2-7/16	2.440	3.060	0.115	12297804-1



material also has excellent electrical and dielectric

other industry standards are listed here.

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
0	0.036	0.201	0.010	TEFLON
0	0.042	0.135	0.010	"
0	0.062	0.201	0.062	"
0	0.077	0.156	0.015	"
2	0.091	0.250	0.010	"
3	0.094	0.312	0.021	"
3	0.098	0.185	0.031	"
3	0.100	0.220	0.031	"
3	0.105	0.250	0.031	NAS1515-M02L
3	0.105	0.250	0.062	NAS1515-M02
3	0.110	0.250	0.031	TEFLON
4	0.120	0.185	0.015	"
4	0.120	0.185	0.021	"
4	0.122	0.312	0.011	"
4	0.125	0.250	0.005	"
4	0.125	0.250	0.031	"
4	0.125	0.312	0.031	NAS1515-M04L
4	0.125	0.312	0.062	NAS1515-M04
4	0.130	0.350	0.025	TEFLON
4	0.130	0.510	0.015	"
4	0.130	0.375	0.015	"
4	0.130	0.375	0.062	"
5	0.135	0.250	0.032	"
5	0.135	0.280	0.015	"
5	0.135	0.375	0.002	"
5	0.140	0.200	0.050	BACW10P287TF
5	0.142	0.250	0.062	TEFLON
6	0.149	0.278	0.015	"
6	0.149	0.375	0.031	NAS1515-M06L
6	0.149	0.375	0.062	NAS1515-M06
6	0.165	0.500	0.055	TEFLON
6	0.165	0.800	0.021	"
8	0.170	0.410	0.021	"
8	0.174	0.365	0.021	"
8	0.174	0.375	0.010	"
8	0.174	0.375	0.031	NAS1515-M08L
8	0.174	0.375	0.062	NAS1515-M08
8	0.180	0.235	0.015	TEFLON
8	0.180	0.235	0.018	"
8	0.185	0.235	0.015	"
8	0.185	0.235	0.021	"
8	0.185	0.271	0.041	"
8	0.185	0.620	0.021	"
8	0.187	0.281	0.062	"
8	0.187	0.625	0.050	"
10	0.190	0.275	0.045	"
10	0.190	0.500	0.010	"
10	0.195	0.220	0.031	"
10	0.203	0.270	0.040	"
10	0.203	0.438	0.031	NAS1515-M3L
10	0.203	0.438	0.062	NAS1515-M3
10	0.203	0.438	0.093	NAS1515-M3H

Screw Size	Nominal Dimensions			Alternate Part Number
	I.D.	O.D.	Thick	
12	0.215	0.330	0.020	TEFLON
12	0.220	0.365	0.031	"
12	0.235	0.505	0.010	"
1/4	0.250	0.281	0.050	TEFLON SPACER
1/4	0.250	0.355	0.015	TEFLON
1/4	0.250	0.490	0.005	"
1/4	0.250	0.680	0.008	"
1/4	0.255	0.375	0.031	"
1/4	0.255	0.505	0.016	"
1/4	0.255	0.515	0.031	"
1/4	0.255	0.530	0.016	"
1/4	0.255	0.625	0.016	"
1/4	0.260	0.565	0.020	"
1/4	0.265	0.390	0.020	"
1/4	0.265	0.438	0.010	"
1/4	0.265	0.500	0.031	NAS1515-M4L
1/4	0.265	0.500	0.062	NAS1515-M4
1/4	0.265	0.525	0.010	TEFLON
1/4	0.265	0.525	0.031	"
1/4	0.275	0.375	0.052	"
5/16	0.312	0.440	0.031	"
5/16	0.312	0.515	0.031	"
5/16	0.312	0.677	0.016	"
5/16	0.312	0.875	0.020	"
5/16	0.316	0.625	0.020	"
5/16	0.316	0.677	0.062	"
5/16	0.325	0.750	0.010	"
5/16	0.325	0.800	0.020	"
5/16	0.328	0.510	0.016	BACW10P219F
5/16	0.343	0.562	0.062	AMS3651
3/8	0.385	0.562	0.020	TEFLON
3/8	0.390	0.490	0.100	BACW10P293TF
3/8	0.390	0.750	0.062	350AS279
3/8	0.405	0.562	0.020	TEFLON
3/8	0.405	1.000	0.016	"
7/16	0.453	0.750	0.031	NAS1515-M7L
7/16	0.453	0.750	0.062	NAS1515-M7
7/16	0.460	0.755	0.034	TEFLON
1/2	0.515	0.875	0.031	NAS1515-M8L
1/2	0.515	0.875	0.062	NAS1515-M8
1/2	0.535	0.645	0.062	TEFLON
1/2	0.568	1.015	0.031	"
9/16	0.578	1.062	0.031	NAS1515-M9L
9/16	0.578	1.062	0.062	NAS1515-M9
5/8	0.640	1.188	0.031	NAS1515-M10L
5/8	0.640	1.188	0.062	NAS155-M10
3/4	0.765	1.312	0.031	NAS1515-M12L
3/4	0.765	1.312	0.062	NAS1515-M12
7/8	0.875	1.250	0.062	TEFLON
1"	1.015	1.750	0.031	NAS1515-M16L
1 1/4	1.285	1.385	0.031	TEFLON