NITRILE O-RING OVERVIEW (Buna N)

MATERIAL: Butadiene Acrylonitrile Copolymer (Nitrile Rubber, NBR)

MATERIAL DESCRIPTION

Nitrile rubber (NBR), also known as Buna N, is one of the most commonly used sealing elastomers due to its resistance to petroleum-based fuels and lubricants and its relatively low price. Nitrile elastomers are copolymers of acrylonitrile and butadiene. There are a number of common variations of nitrile compounds.

ACRYLONITRILE CONTENT

The acrylonitrile (ACN) content of the polymer chains can vary from 18% to 50%. Lower ACN content gives better low-temperature properties but inferior resistance to fuels and polar lubricants. Higher ACN content gives lesser quality low-temperature properties but improved fuels and polar lubricants resistance. Standard NBRs typically have 34% ACN content.

CURE SYSTEM: SULFUR-CURED

Standard Nitriles are usually sulfur-cured. Sulfur-cured compounds offer better low-temperature properties but are more prone to hardening with high temperatures. Peroxide-cured nitriles have better heat resistance and lower compression sets but are more expensive and more difficult to process.

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NITRILE O-RING OVERVIEW (Buna N) continued

OTHER COMMON VARIATIONS

- Nitriles often are internally lubricated to improve ease of installation or reduce friction for dynamic applications.
- Nitriles can be formulated with only “white list” ingredients, as specified in 21.CFR 177.2600, for use in applications where the elastomer will be in contact with food or beverages.
- Nitriles can be submitted for approval by the National Sanitation Foundation (NSF) for use in drinking water applications.
- Nitriles can also be submitted for approval to Underwriters Laboratories (UL) for use in applications as prescribed in UL 157.
- Nitrile rubber can be combined with polyvinyl chloride (PVC) to create fuel, ozone and weathering resistance NBR-PVC blends.

GENERAL INFORMATION

ASTM D1418 DESIGNATION	NBR	**STANDARD COLOR**	Black
ISO/DIN 1629 DESIGNATION	NBR	**HARDNESS RANGE**	40 to 90 Shore A
ASTM D2000/ SAE J 200 CODES	BF, BG, BK, CH	**RELATIVE COST**	Low

SERVICE TEMPERATURES

STANDARD LOW TEMPERATURE	-40°F -40°C	**SPECIAL COMPOUND LOW TEMPERATURE**	-67°F -55°C
STANDARD LOW TEMPERATURE	212°F 100°C	**SPECIAL COMPOUND HIGH TEMPERATURE**	275°F 135°C

PERFORMS WELL IN

- Petroleum based oils and fuels
- Aliphatic hydrocarbons
- Vegetable oils
- Silicone oils and greases
- Ethylene glycol
- Dilute acids
- Water to below 100°C (212°F)

DOESN'T PERFORM WELL IN

- Aromatic hydrocarbons
- Automotive brake fluid
- Chlorinated hydrocarbons
- Ketones
- Ethers
- Esters
- Phosphate ester hydraulic fluids
- Strong acids
- Ozone/weathering/sunlight

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NITRILE-70 O-RING (Buna-70)

TEST REPORT FOR COMPOUND N70 DUROMETER: 70 COLOR: BLACK

ASTM* D2000, M2BG714, A14, B14, EA14, EF11, EF21, EO14, EO34, Z1

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	70 ± 5	70.5	D2240-05
	Tensile Strength	2031 PSI (min)	2206 PSI (15.2 MPa)	D412-06a
	Elongation	250% (min)	326%	D412-06a
	Modulus at 100%		530 PSI (3.66 MPa)	D412-06a
	Specific Gravity		1.23 g/cm^3	
	HEAT AGE: 70 hours at 100°C (212°F)			
	Hardness Change	± 15 points	+4 points	
A14	Tensile Strength Change	-20% (max)	9%	D573-04
	Elongation Change	-40% (max)	-13%	
	Weight Change	± 15%	-1%	
B14	**COMPRESSION SET: 22 hours at 100°C (212°F)**	25% (button) (max)	7%	D395-03, Method B
	WATER RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	± 10 points	+1 points	
EA14	Tensile Strength Change		+1%	D471-06
	Elongation Change		-11%	
	Volume Change	± 15%	+0.1%	
	FUEL A RESISTANCE: 70 hours at 23°C (73.4°F)			
	Hardness Change	± 10 points	-1 points	
EF11	Tensile Strength Change	-25% (max)	-3%	D471-06
	Elongation Change	-25% (max)	-6%	
	Volume Change	-5% to +10%	+0.3%	
	FUEL B RESISTANCE: 70 hours at 23°C (73.4°F)			
	Hardness Change	0 to -30 points	-12 points	
EF21	Tensile Strength Change	-60 (max)	-31%	D471-06
	Elongation Change	-60 (max)	-29%	
	Volume Change	0% to +40%	+18.9%	
	IRM 901 OIL: 70 hours at 100°C (212°F)			
	Hardness Change	-5 to +10 points	+7 points	
EO14	Tensile Strength Change	-25% (max)	5%	D471-06
	Elongation Change	-45% (max)	-21%	
	Volume Change	-10% to +5%	+9.8%	
	IRM 903 OIL: 70 hours at 100°C (212°F)			
	Hardness Change	-10 to +5 points	+1 points	
EO34	Tensile Strength Change	-45 (max)	+5%	D471-06
	Elongation Change	-45 (max)	-15%	
	Volume Change	0% to +25%	+0.6%	

*American Society for Testing and Materials

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NITRILE-90 O-RING (Buna-90)

TEST REPORT FOR COMPOUND N90 DUROMETER: 90 COLOR: BLACK

ASTM* D2000, M7BG910, B14, EO14, EO34, EF11, EF21, EA14, Z1

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	90 ± 5	87	D2240-05
	Tensile Strength	1450 PSI (min)	2499 PSI (15.2 MPa)	D412-06a
	Elongation	100% (min)	133%	D412-06a
	Modulus at 100%		1990 PSI (13.72 MPa)	D412-06a
	Specific Gravity		1.381 g/cm^3	
B14	**COMPRESSION SET: 22 hours at 100°C (212°F)**	25% (button) (max)	7.8%	D395-04, Method B
	WATER RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	± 10 points	-2 points	
EA14	Tensile Strength Change		+5%	D471-06
	Elongation Change		-11%	
	Volume Change	± 15%	+3.3%	
	FUEL A RESISTANCE: 70 hours at 23°C (73.4°F)			
	Hardness Change	± 10 points	-3 points	
EF11	Tensile Strength Change	-25% (max)	0%	D471-06
	Elongation Change	-25% (max)	-5%	
	Volume Change	-5% to +10%	+1.8%	
	FUEL B RESISTANCE: 70 hours at 23°C (73.4°F)			
	Hardness Change	0 to -30 points	-14 points	
EF21	Tensile Strength Change	-60 (max)	-28%	D471-06
	Elongation Change	-60 (max)	-30%	
	Volume Change	0% to +40%	+18.9%	
	IRM 901 OIL: 70 hours at 100°C (212°F)			
	Hardness Change	-5 to +5 points	+3 points	
EO14	Tensile Strength Change	-25% (max)	-2%	D471-06
	Elongation Change	-45% (max)	-17%	
	Volume Change	-10% to +5%	-2.8%	
	IRM 903 OIL: 70 hours at 100°C (212°F)			
	Hardness Change	-10 to +5 points	-5 points	
EO34	Tensile Strength Change	-45 (max)	-3%	D471-06
	Elongation Change	-45 (max)	-16%	
	Volume Change	0% to +25%	+6%	

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VITON® O-RING OVERVIEW

MATERIAL: Fluorocarbon Rubber

MATERIAL DESCRIPTION

Fluorocarbon is a well-known high-performance rubber that has excellent resistance to high temperature, ozone, weather, oxygen, mineral oil, fuels, hydraulic fluids, aromatics and many organic solvents and chemicals.

FLUORINE CONTENT

Viton® variations include: general type (A: 66% fluorine), middle fluorine content type (B, GBL: 67 to 68.5% fluorine), high fluorine content type (F, GF: 70% fluorine), improving low temperature flexibility type (GLT, GFLT) and excellent resistance to more chemicals and solvents (Viton® ETP Extreme). We also can supply excellent acid and alkali resistance parts made by VITON® TBR.

CURE SYSTEM: BISPHENOL-CURED

Standard FKM compounds are Bisphenol-cured. FKM compounds with peroxide- cured possess better acid solution resistance than the bisphenol-cured and can replace litharge-cured applied in acid solutions. In some lubricants, adding a few organic amide or amine, or choosing peroxide-cured system Viton® will be better than bisphenol curing systems.

OTHER COMMON VARIATIONS

- FKM can also be submitted for approval to Underwriters Laboratories (UL) for use in applications as prescribed in UL157.
- FKM has excellent resistance to high temperature, oil, solvent, flame, chemical and weather, and is usually applied in automotive, chemical processing, aerospace and many other industries.
- Viton® GLT is broadly used in thermal range of -40°C to 250°C (-40°F to 482°F) and has outstanding resistance to aggressive HTS-type oils which are commonly used in aerospace industries.
- Viton® ETP is usually applied in chemical industries.
- In some fuels, adding several methanols, Viton® F and B-type are more usable
- than A-type, especially F-type. If it requires lower temperature, GFLT and GBLT
- will be available.
- Viton® TBR 605C (TFE/propylene polymer) is better base and steam resistant
- than other general Viton®. It can be used in amine, amide and some bases.

GENERAL INFORMATION

ASTM D1418 DESIGNATION	FKM	**STANDARD COLOR**	Black
ISO/DIN 1629 DESIGNATION	FKM	**HARDNESS RANGE**	50 to 90 Shore A
ASTM D2000/ SAE J 200 CODES	HK	**RELATIVE COST**	High

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SERVICE TEMPERATURES

STANDARD LOW TEMPERATURE	-15°F -26°C	**SPECIAL COMPOUND LOW TEMPERATURE**	-40°F -40°C
STANDARD LOW TEMPERATURE	232°F 450°C	**SPECIAL COMPOUND HIGH TEMPERATURE**	525°F 275°C

PERFORMS WELL IN

- Petroleum products
- Fuel or blend with methanol or ethanol
- Diesel or blend with biodiesel
- Mineral oil and grease
- Silicone oil and grease
- High vacuum
- Ozone, weather and very high temperature air
- Strong acid

DOESN'T PERFORM WELL IN

- Ketones
- Low molecular weight organic acids (formic and acetic acids)
- Superheat steam
- Low molecular weight esters and ethers
- Phosphate ester based hydraulic fluids-Skydrol®

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TEST REPORT FOR COMPOUND V75

DUROMETER: 75 **COLOR: BLACK**

ASTM* D2000, M2HK810, A1-10, B38, EF31, EO78, Z1, Z2

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	75 ± 5	75	D2240-05
Z1	Tensile Strength	1450 PSI (min)	2273 PSI (15.6 MPa)	D412-06a
	Elongation	150% (min)	203%	D412-06a
	Modulus at 100%		932 PSI (6.4 MPa)	D412-06a
	Specific Gravity		1.85 g/cm^3	
	HEAT AGE: 70 hours at 250°C (482°F)			
	Hardness Change	± 10 points	+2 points	
A1-10	Tensile Strength Change	-25% (max)	-1%	D573-04
	Elongation Change	-25% (max)	-3%	
	Weight Change		-1.7%	
B38	**COMPRESSION SET: 22 hours at 200°C (392°F)**	50% (plied) (max)	11%	D395-03, Method B
	FUEL C RESISTANCE: 70 hours at 23°C (73.4°F)			
	Hardness Change	± 5 points	-2 points	
EF31	Tensile Strength Change	-25% (max)	-7%	D471-06
	Elongation Change	-20% (max)	-10%	
	Volume Change	0% to +10%	+3.4%	
	NO. 101 OIL: 70 hours at 200°C (392°F)			
	Hardness Change	-15 to +5 points	-9 points	
EO78	Tensile Strength Change	-40% (max)	-30%	D471-06
	Elongation Change	-20% (max)	-6%	
	Volume Change	0% to +15%	+13.3%	

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VITON®-90 O-RING

TEST REPORT FOR COMPOUND V90 DUROMETER: 75 COLOR: BLACK

ASTM* D2000, M2HK810, A1-10, B38, EF31, EO78, Z1, Z2

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	90 ± 5	90	D2240-05
	Tensile Strength	1450 PSI (min)	2256 PSI (15.56 MPa)	D412-06a
	Elongation	100% (min)	137%	D412-06a
	Modulus at 100%		1656 PSI (11.42 MPa)	D412-06a
	Specific Gravity		1.837 g/cm^3	
	HEAT AGE: 70 hours at 250°C (482°F)			
	Hardness Change	± 10 points	+3 points	
A1-10	Tensile Strength Change	-25% (max)	-11%	D573-04
	Elongation Change	-25% (max)	-12%	
	Weight Change		-1.7%	
B38	**COMPRESSION SET: 22 hours at 200°C (392°F)**	50% (plied) (max)	20.4%	D395-03, Method B
	FUEL C RESISTANCE: 70 hours at 23°C (73.4°F)			
	Hardness Change	± 5 points	-1 points	
EF31	Tensile Strength Change	-25% (max)	-14%	D471-06
	Elongation Change	-20% (max)	-10%	
	Volume Change	0% to +10%	+2.7%	
	NO. 101 OIL: 70 hours at 200°C (392°F)			
	Hardness Change	-15 to +5 points	-8 points	
EO78	Tensile Strength Change	-40% (max)	-24%	D471-06
	Elongation Change	-20% (max)	-1%	
	Volume Change	0% to +15%	+10.9%	
	7700/SAE OIL: 70 hours at 200°C (392°F)			
	Hardness Change	-15 to +5 points	-11 points	
EF31	Tensile Strength Change	-40% (max)	-16%	D471-06
	Elongation Change	-20% (max)	-8%	
	Volume Change	+25%	+15.3%	

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NEOPRENE-70 O-RING

MATERIAL: Neoprene (Chloroprene Rubber)

MATERIAL DESCRIPTION

Chloroprene (CR), also known by its trade name "Neoprene", was one of the first successful synthetic elastomers in 1931 made by Dupont. It is prepared by emulsion polymerization of chloroprene, or 2-chlorobutadiene. CR is a multi-purposed elastomer which yields a balanced combination of properties. It performs well in contact with oils and many chemicals and has good resistance to sun, ozone and weather. It also displays outstanding toughness and good resistance to fire.

CURE SYSTEM: SULFUR-CURED

Standard FKM compounds are Bisphenol-cured. FKM compounds with peroxide- cured possess better acid solution resistance than the bisphenol-cured and can replace litharge-cured applied in acid solutions. In some lubricants, adding a few organic amide or amine, or choosing peroxide-cured system Viton® will be better than bisphenol curing systems.

OTHER COMMON VARIATIONS

- CR has been used in thousands of diverse environments, including the automotive, wire and cable industries.
- CR is most often used in air condition systems, especially old refrigerated media like R12 or R22 and lubricants with mineral oils.

GENERAL INFORMATION

ASTM D1418 DESIGNATION	CR	**STANDARD COLOR**	Black
ISO/DIN 1629 DESIGNATION	CR	**HARDNESS RANGE**	30 to 90 Shore A
ASTM D2000/ SAE J 200 CODES	BC, BE	**RELATIVE COST**	Low

SERVICE TEMPERATURES

STANDARD LOW TEMPERATURE	-40°F -40°C	**SPECIAL COMPOUND LOW TEMPERATURE**	-67°F -55°C
STANDARD LOW TEMPERATURE	212°F 100°C	**SPECIAL COMPOUND HIGH TEMPERATURE**	257°F 125°C

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PERFORMS WELL IN

- Refrigerants
- Ammonia
- Water
- Silicone grease and oils
- High aniline point mineral oil

DOESN'T PERFORM WELL IN

- Aromatic hydrocarbons
- Ketones
- Esters
- Ethers
- Strong oxidizing acids
- Chlorinated hydrocarbons

TEST REPORT FOR COMPOUND C70

DUROMETER: 70 **COLOR: BLACK**

ASTM* D2000, M2BC710, A14, C12, F17, Z1, Z2

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	70 ± 5	70	D2240-04
	Tensile Strength	1450 PSI (min)	2269 PSI (15.65 MPa)	D412-98a
	Elongation	250% (min)	282%	D412-98a
	Modulus at 100%		652 PSI (4.50 MPa)	D412-98a
	Specific Gravity		1.388 g/cm^3	
	HEAT AGE: 70 hours at 100°C (212°F)			
	Hardness Change	± 15 points (max)	+9 points	
A14	Tensile Strength Change	-15% (max)	-1%	D573-04
	Elongation Change	-40% (max)	-9%	
	Weight Change		-2.8%	
Z1	**COMPRESSION SET: 70 hours at 100°C (212°F)**	35% (button) (max)	33.2%	D395-03, Method B
C12	**OZONE RESISTANCE: 50 pphm, 70 hours at 40°C (104°F)**	No crack	Pass	D1171-99
	LOW-TEMPERATURE BRITTLENESS POINT: 3 minutes at-40°C (-40°F)			
F17	Sample type: T-50			D2137-94, Method A
	Coolant : Methanol			
	Brittleness temperature to nearest 1°C (1°F)	No crack	Pass	

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EPDM-70 O-RING

MATERIAL: Ethylene Propylene (EPR, EPDM)

MATERIAL DESCRIPTION

Ethylene Propylene Rubber (EPDM) is a Copolymer of ethylene and propylene. Furthermore, it is a terpolymer of ethylene and propylene with a small amount of a third monomer (usually a diolefin) to permit vulcanization with sulfur. Generally, EPDM possesses an excellent resistance to ozone, sunlight and weathering, and has very good flexibility at low temperature, good chemical resistance (many dilute acids and alkalis as well as polar solvents) and good electrical insulation property.

CURE SYSTEM: PEROXIDE-CURED

Standard EPDMs are usually sulfur-cured. Sulfur-cured compounds offer better flexible properties but are more prone to hardening and have an inferior compression set with high temperature. Peroxide-cured EPDMs have better heat resistance and a lower compression set. It complies with long- time usage, especially for hose systems in the construction industry, but is more expensive and more difficult for production than the sulfur-cured EPDMs.

OTHER COMMON VARIATIONS

- EPDMs often are internally lubricated to improve ease of installation or reduce friction for dynamic applications.
- EPDMs can be formulated with only “white list” ingredients, as specified in 21.CFR 177.2600, for use in applications where the elastomer will be in contact with food or beverages.
- EPDMs can be submitted for approval by the National Sanitation Foundation (NSF) for use in drinking water applications.
- EPDMs are usually used in automotive air conditioning systems where there is use of R134a refrigerant gas and POE or PAG lubricant and new refrigerant for environment protection R744. R744 air conditioning systems require excellent resistance to explosive decompression in hydrogen dioxide at high pressure and high temperature.
- EPDMs are usually used in phosphate ester type hydraulic fluids.

GENERAL INFORMATION

ASTM D1418 DESIGNATION	EPM, EPDM	**STANDARD COLOR**	Black
ISO/DIN 1629 DESIGNATION	EPM, EPDM	**HARDNESS RANGE**	30 to 90 Shore A
ASTM D2000/ SAE J 200 CODES	AA, BA, CA, DA	**RELATIVE COST**	Low

SERVICE TEMPERATURES

STANDARD LOW TEMPERATURE	-67°F -55°C	**SPECIAL COMPOUND LOW TEMPERATURE**	-67°F -55°C
STANDARD LOW TEMPERATURE	257°F 125°C	**SPECIAL COMPOUND HIGH TEMPERATURE**	302°F 150°C

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PERFORMS WELL IN

- Alcohols
- Automotive brake fluid
- Ketones
- Dilute acids and alkalis
- Silicone oils and greases
- Steam up to 204.4°C (400°F)
- Water
- Phosphate ester based hydraulic fluids-Skydrol®
- Ozone, aging and weathering

DOESN'T PERFORM WELL IN

- Aliphatic and aromatic hydrocarbons
- Di-ester based lubricants
- Halogenated solvents
- Petroleum based oils and greases

TEST REPORT FOR COMPOUND E70

DUROMETER: 70 **COLOR: BLACK**

ASTM* D2000, M4CA714, A25, B44, EA14, F17, Z1, Z2

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	70 ± 5	75	D2240-05
	Tensile Strength	2031 PSI (min)	2429 PSI (16.75 MPa)	D412-06a
	Elongation	200% (min)	259%	D412-06a
	Modulus at 100%		753 PSI (5.19 MPa)	D412-06a
	Specific Gravity		1.144 g/cm^3	
	HEAT AGE: 70 hours at 125°C (257°F)			
	Hardness Change	± 10 points	+4 points	
A25	Tensile Strength Change	-20% (max)	-7%	D573-04
	Elongation Change	-40% (max)	-6%	
	Weight Change		-2.9%	
B44	**COMPRESSION SET: 70 hours at 100°C (212°F)**	50% (plied) (max)	8.5%	D395-03, Method B
	WATER RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change		-3 points	
EA14	Tensile Strength Change		-13%	D471-06
	Elongation Change		+2%	
	Volume Change	± 5%	+4.1%	
	LOW-TEMPERATURE BRITTLENESS POINT: 3 minutes at -40°C (-40°F)			
	Sample type: T-50			D2137-05, Method A
F17	Coolant : Methanol			
	Brittleness temperature to nearest 1°C (1°F)	No crack	Pass	

*American Society for Testing and Materials

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SILICONE-70 O-RING

MATERIAL: Silicone Rubber (MQ, VMQ, PVMQ)

MATERIAL DESCRIPTION

Physically, silicones are based on silicon, an element derived from quartz. To create this class of synthetic elastomers, pendant organic groups such as methyl, phenyl and vinyl are attached to silicon atoms. Different additions of side chains can achieve significant variations in properties. Silicones have excellent heat, ozone and corona resistance and have good dielectric stability and resistance to many oils, chemicals and solvents. Silicones possess the best flexible property at low temperature but have low tensile strength and poor wear and tear resistance.

CURE SYSTEM: PEROXIDE-CURED

Standard silicone compounds are usually peroxide-cured. Platinum- cured compounds offer better flexible properties and very low volatile matter. Platinum-cured silicones usually are applied in medical systems or other required low volatile matter. However, they need to be produced in a clean room and with a higher cost of platinum catalyzer, making them more expensive than peroxide-cured ones.

OTHER COMMON VARIATIONS

- Silicones can be formulated with only “white list” ingredients, as specified in 21.CFR 177.2600, for use in applications where the elastomer will be in contact with food or beverages.
- Silicones can be submitted for approval by the National Sanitation Foundation (NSF) for use in drinking water applications.
- Silicones are most often used in automotive systems in boots, oil filter valves, gasket in light, etc.
- Silicone parts can be used in medical systems which especially require compliance to USP CLASS VI

GENERAL INFORMATION

ASTM D1418 DESIGNATION	Q, MQ, VMQ, PVMQ	**STANDARD COLOR**	Rust
ISO/DIN 1629 DESIGNATION	Q, MQ, VMQ, PVMQ	**HARDNESS RANGE**	25 to 90 Shore A
ASTM D2000/ SAE J 200 CODES	FC, FE, GE	**RELATIVE COST**	Medium to High

SERVICE TEMPERATURES

STANDARD LOW TEMPERATURE	-76°F -60°C	**SPECIAL COMPOUND LOW TEMPERATURE**	-150°F -100°C
STANDARD LOW TEMPERATURE	437°F 225°C	**SPECIAL COMPOUND HIGH TEMPERATURE**	572°F 300°C

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PERFORMS WELL IN

- Petroleum products
- Fuel or blend with methanol or ethanol
- Diesel or blend with biodiesel
- Mineral oil and grease
- Silicone oil and grease
- High vacuum
- Ozone, weather and very high temperature air
- Strong acid

DOESN'T PERFORM WELL IN

- Ketones
- Low molecular weight organic acids (formic and acetic acids)
- Superheat steam
- Low molecular weight esters and ethers
- Phosphate ester based hydraulic fluids-Skydrol®

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TEST REPORT FOR COMPOUND S70 DUROMETER: 70 COLOR: RUST

ASTM* D2000, M5GE706, A19, B37, EO16, EO36, EA14, F19, Z1

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	70 ± 5	69.5	D2240-05
	Tensile Strength	870 PSI (min)	910 PSI (6.3 MPa)	D412-06a
	Elongation	150% (min)	247%	D412-06a
	Modulus at 100%		567 PSI (3.9 MPa)	D412-06a
	Specific Gravity		1.33 g/cm^3	
	HEAT AGE: 70 hours at 225°C (437°F)			
	Hardness Change	± 10 points	+6 points	
A19	Tensile Strength Change	-25% (max)	+4%	D573-04
	Elongation Change	-30% (max)	-28%	
	Weight Change		-4%	
B37	**COMPRESSION SET: 22 hours at 175°C (347°F)**	25% (plied) (max)	17.6%	D395-03, Method B
	IRM 901 OIL: 70 hours at 150°C (302°F)			
	Hardness Change	0 to -15	-4 points	
EO16	Tensile Strength Change	-20 (max)	+11%	D471-06
	Elongation Change	-20 (max)	0%	
	Volume Change	0% to +10%	+4%	
	IRM 903 OIL: 70 hours at 150°C (302°F)			
	Hardness Change	-30 points (max)	-19 points	
EA036	Tensile Strength Change		-14%	D471-06
	Elongation Change		+3%	
	Volume Change	+60% (max)	+33.7%	
	WATER RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	± 5%	0 points	
EA14	Tensile Strength Change		-3%	D471-06
	Elongation Change		-20%	
	Volume Change	± 5%	+1.9%	
	LOW-TEMPERATURE BRITTLENESS POINT: 3 minutes at -55°C (-40°F)			
	Sample type: T-50			D2137-05, Method A
F17	Coolant : Methanol			
	Brittleness temperature to nearest 1°C (1°F)	No crack	Pass	

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TEFLON® O-RING

MATERIAL: Polytetrafluoroethylene (PTFE)

MATERIAL DESCRIPTION

Polytetrafluoroethylene (PTFE) is a high molecular weight polymer, one of the most versatile plastic materials known and useful for a large range of products for applications excluded to other materials.

PTFE is generally considered a thermoplastic polymer; at 327°C (620.6°F) it retains a very high viscosity, thus requiring particular transformation techniques for manufacturing of finished and semi-finished goods. PTFE can be used in a temperature range from -200°C (-328°F) to +260°C (500°F).

OUTSTANDING CHARACTERISTICS

- High heat resistance
- High resistance to chemical agents and solvents • High anti-adhesiveness
- High dielectric properties
- Low friction coefficient
- Non-toxicity

THERMAL PROPERTIES

PTFE is one of the most thermally stable plastic materials. There is no appreciable decomposition at 260°C (500°F), so that PTFE, at this temperature, still possesses the greater part of its properties. Appreciable decomposition begins at over 400°C (932°F). The coefficient of the thermal conductivity of PTFE does not vary with the temperature. It is relatively high, so that PTFE can be considered to be a good insulating material. The mixing of suitable fillers improves the thermal conductivity.

BEHAVIOR IN PRESENCE OF FOREIGN AGENTS

PTFE is practically inert against known elements and compounds. It is attacked only by the alkaline metals in the elementary state, by Chlorine trifluoride and by elementary Fluorine at high temperatures and pressures. PTFE is insoluble in almost all solvents at temperatures up to about 300°C (572°F). Fluorinated hydrocarbons cause a certain swelling which is however reversible; some highly fluorinated oils, at temperatures over 300°C (572°F), exercise a certain dissolving effect upon PTFE. High energy radiation tends to cause the breaking of the PTFE molecule, so that the resistance of the product to radiation is rather poor. The gas permeability of PTFE is similar to other plastic materials. The permeability does not depend only on the thickness and pressure, but also on the working techniques.

PHYSICAL-MECHANICAL PROPERTIES

The tensile and compressive properties are to a large degree influenced by the working processes and the polymer used. PTFE, however, can be used continuously at temperatures up to 260°C (500°F), while possessing still a certain compressive plasticity at temperatures near to the absolute Zero.

The hardness Shore D, measured according to the method ASTM D 2240, has values comprised between D50 and D60. According DIN 53456 (load 13.5 Kg for 30 sec.) results in an hardness range between 27 and 32 N/mm^2.

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TEST REPORT FOR COMPOUND TEF

DUROMETER: 50 - 60 SHORE D **COLOR: WHITE**

PROPERTIES	RESULTS	ASTM* TEST METHOD
Density	2.14 - 2.18 g/cm^3	D792
Tensile Strength	$\geq$ 20 N/mm^2	D4894
Elongation at Break	$\geq$ 200%	D4894
Compressive Strength at 1% Deformation	4 -5 N/mm^2	D695
Coefficient of Friction (dynamic)	0.06	D1894
Service Temperature (min-max)	-200°C (-328°F) min +260°C (500°F) max	
Dielectric Strength in Air	1.33 g/cm^3	D149

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POLYURETHANE O-RING OVERVIEW

MATERIAL: Polyurethane Rubber (PU, AU, EU)

MATERIAL DESCRIPTION

The millable Polyurethane (PU) rubbers are distinguished into two types; the first is polyester urethane (AU) and the other is polyether urethane (EU). AU type urethanes have outstanding oil, fuel and solvent resistance but can be attacked by hydrolysis. EU type urethanes are not attacked by hydrolysis and still offer a fuel and oil resistance comparable to low ACN (18 to 22% ACN) Nitriles or HNBRs. Any type polyurethane has excellent wear resistance, high tensile strength and high elasticity in comparison with any other elastomers. We can also offer any type thermoplastic urethane (TPU).

CURE SYSTEM: PEROXIDE-CURED

Standard PU compounds are peroxide-cured.

OTHER COMMON VARIATIONS

- Polyurethane usually is applied in the mechanical industry, especially in places where material must have higher wear resistance and strength.
- In some applying environments, moisture condensing will happen on the surface of the rubber seal; this will cause hydrolysis of AU so choosing EU is better in these cases. However, EU does not resist oil very well, thus higher aniline point oil must be used for lubricant application.
- TPU will be better than millable polyurethane when applied in hydraulic systems.

GENERAL INFORMATION

ASTM D1418 DESIGNATION	AU, EU	**STANDARD COLOR**	Transparent
ISO/DIN 1629 DESIGNATION	AU, EU	**HARDNESS RANGE**	60 to 93 Shore A
ASTM D2000/ SAE J 200 CODES	BG	**RELATIVE COST**	Medium to High

SERVICE TEMPERATURES

STANDARD LOW TEMPERATURE	-40°F -40°C	**SPECIAL COMPOUND LOW TEMPERATURE**	-67°F -55°C
STANDARD LOW TEMPERATURE	176°F 80°C	**SPECIAL COMPOUND HIGH TEMPERATURE**	212°F 100°C

PERFORMS WELL IN

- Aliphatic hydrocarbon
- Mineral oil and grease
- Silicone oil and grease
- Ozone
- Water up to 50°C (122°F) EU type

DOESN'T PERFORM WELL IN

- Ketones
- Alcohols
- Esters
- Ethers
- Hot water and steam
- Alkalis, amines
- Acids
- Glycols

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POLYURETHANE-70 O-RING

TEST REPORT FOR COMPOUND U70

DUROMETER: 70 **COLOR: TRANSPARENT**

ASTM* D2000, M3BG714, B14, EA14, EO14, Z1, Z2

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	70 ± 5	69	D2240-05
	Tensile Strength	2031 PSI (min)	2922 PSI (20.15 MPa)	D412-06a
	Elongation	250% (min)	458%	D412-06a
	Modulus at 100%		310 PSI (2.14 MPa)	D412-06a
	Specific Gravity		1.147 g/cm^3	
B14	**COMPRESSION SET: 22 hours at 100°C (212°F)**	50% (button) (max)	45.6%	D395-03, Method B
	WATER RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	± 10 points	-5 points	
EA14	Tensile Strength Change		-27%	D471-06
	Elongation Change		-16%	
	Volume Change	± 15%	+5%	
	NO. 1 OIL RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	-7 to +5 points	-4 points	
EO14	Tensile Strength Change	-20% (max)	-6%	D471-06
	Elongation Change	-40% (max)	-8%	
	Volume Change	-5% to +10%	+6.4%	
	NO. 3 OIL RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change		-30 points	
Z2	Tensile Strength Change		-46%	D471-06
	Elongation Change		-32%	
	Volume Change		+56.1%	

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POLYURETHANE-90 O-RING

TEST REPORT FOR COMPOUND U90 DUROMETER: 90 COLOR: TRANSPARENT

ASTM* D2000, M3BG910, A14, B14, EA14, EO14, Z1, Z2, Z3

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	90 ± 5	91	D2240-04
	Tensile Strength	1450 PSI (min)	2847 PSI (19.63 MPa)	D412-98a
	Elongation	100% (min)	180%	D412-98a
	Modulus at 100%		1659 PSI (11.44 MPa)	D412-98a
	Specific Gravity		1.231 g/cm^3	
	HEAT AGE: 70 hours at 100°C (212°F)			
	Hardness Change	± 15 points	0 points	
A14	Tensile Strength Change	-20% (max)	-15%	D573-04
	Elongation Change	-40% (max)	-18%	
	Weight Change		+0.1%	
B14	**COMPRESSION SET: 22 hours at 100°C (212°F)**	50% (button) (max)	29.5%	D395-03, Method B
	WATER RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	± 10 points	-1 points	
EA14	Tensile Strength Change		-1%	D471-98
	Elongation Change		+8%	
	Volume Change	± 15%	+3.9%	
	NO. 1 OIL RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	-7 to +5 points	-2 points	
EO14	Tensile Strength Change	-20% (max)	-17%	D471-98
	Elongation Change	-40% (max)	-16%	
	Volume Change	-5% to +10%	+4.8%	
Z3	**TENSILE SET: Hold 100% Elongation for 2 minutes, Release tension and rest 2 minutes**		10.2%	

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
001	1/32	1/32	3/32	0.040	0.029	± 0.004	1.02	0.74	± 0.10
002	3/64	3/64	9/64	0.050	0.042	± 0.004	1.27	1.07	± 0.10
003	1/16	1/16	3/16	0.060	0.056	± 0.004	1.52	1.42	± 0.10
004	1/16	5/64	13/64	0.070	0.070	± 0.005	1.78	1.78	± 0.13
005	1/16	3/32	7/32	0.070	0.101	± 0.005	1.78	2.57	± 0.13
006	1/16	1/8	1/4	0.070	0.114	± 0.005	1.78	2.90	± 0.13
007	1/16	5/32	9/32	0.070	0.145	± 0.005	1.78	3.68	± 0.13
008	1/16	3/16	5/16	0.070	0.176	± 0.005	1.78	4.47	± 0.13
009	1/16	7/32	11/32	0.070	0.208	± 0.005	1.78	5.28	± 0.13
010	1/16	1/4	3/8	0.070	0.239	± 0.005	1.78	6.07	± 0.13
011	1/16	5/16	7/16	0.070	0.301	± 0.005	1.78	7.65	± 0.13
012	1/16	3/8	1/2	0.070	0.364	± 0.005	1.78	9.25	± 0.13
013	1/16	7/16	9/16	0.070	0.426	± 0.005	1.78	10.82	± 0.13
014	1/16	1/2	5/8	0.070	0.489	± 0.005	1.78	12.42	± 0.13
015	1/16	9/16	11/16	0.070	0.551	± 0.007	1.78	14.00	± 0.18
016	1/16	5/8	3/4	0.070	0.614	± 0.009	1.78	15.60	± 0.23
017	1/16	11/16	13/16	0.070	0.676	± 0.009	1.78	17.17	± 0.23
018	1/16	3/4	7/8	0.070	0.739	± 0.009	1.78	18.77	± 0.23
019	1/16	13/16	15/16	0.070	0.801	± 0.009	1.78	20.35	± 0.23
020	1/16	7/8	1	0.070	0.864	± 0.009	1.78	21.95	± 0.23
021	1/16	15/16	1-1/16	0.070	0.926	± 0.009	1.78	23.52	± 0.23
022	1/16	1	1-1/8	0.070	0.989	± 0.010	1.78	25.12	± 0.25
023	1/16	1-1/16	1-3/16	0.070	1.051	± 0.010	1.78	26.70	± 0.25
024	1/16	1-1/8	1-1/4	0.070	1.114	± 0.010	1.78	28.30	± 0.25
025	1/16	1-3/16	1-5/16	0.070	1.176	± 0.011	1.78	29.87	± 0.28
026	1/16	1-1/4	1-3/8	0.070	1.239	± 0.011	1.78	31.47	± 0.28
027	1/16	1-5/16	1-7/16	0.070	1.301	± 0.011	1.78	33.05	± 0.28
028	1/16	1-3/8	1-1/2	0.070	1.364	± 0.013	1.78	34.65	± 0.33
029	1/16	1-1/2	1-5/8	0.070	1.489	± 0.013	1.78	37.82	± 0.33
030	1/16	1-5/8	1-3/4	0.070	1.614	± 0.013	1.78	41.00	± 0.33
031	1/16	1-3/4	1-7/8	0.070	1.739	± 0.015	1.78	44.17	± 0.38
032	1/16	1-7/8	2	0.070	1.864	± 0.015	1.78	47.35	± 0.38
033	1/16	2	2-1/8	0.070	1.989	± 0.018	1.78	50.52	± 0.46
034	1/16	2-1/8	2-1/4	0.070	2.114	± 0.018	1.78	53.70	± 0.46
035	1/16	2-1/4	2-3/8	0.070	2.239	± 0.018	1.78	56.87	± 0.46
036	1/16	2-3/8	2-1/2	0.070	2.364	± 0.018	1.78	60.05	± 0.46
037	1/16	2-1/2	2-5/8	0.070	2.489	± 0.018	1.78	63.22	± 0.46
038	1/16	2-5/8	2-3/4	0.070	2.614	± 0.020	1.78	66.40	± 0.51
039	1/16	2-3/4	2-7/8	0.070	2.739	± 0.020	1.78	69.57	± 0.51
040	1/16	2-7/8	3	0.070	2.864	± 0.020	1.78	72.75	± 0.51
041	1/16	3	3-1/8	0.070	2.989	± 0.024	1.78	75.92	± 0.61

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
042	1/16	3-1/4	3-3/8	0.070	3.239	± 0.024	1.78	82.27	± 0.61
043	1/16	3-1/2	3-5/8	0.070	3.489	± 0.024	1.78	88.62	± 0.61
044	1/16	3-3/4	3-7/8	0.070	3.739	± 0.027	1.78	94.97	± 0.69
045	1/16	4	4-1/8	0.070	3.989	± 0.027	1.78	101.32	± 0.69
046	1/16	4-1/4	4-3/8	0.070	4.239	± 0.030	1.78	107.67	± 0.76
047	1/16	4-1/2	4-5/8	0.070	4.489	± 0.030	1.78	114.02	± 0.76
048	1/16	4-3/4	4-7/8	0.070	4.739	± 0.030	1.78	120.37	± 0.76
049	1/16	5	5-1/8	0.070	4.989	± 0.037	1.78	126.72	± 0.94
050	1/16	5-1/4	5-3/8	0.070	5.239	± 0.037	1.78	133.07	± 0.94
102	3/32	1/16	1/4	0.103	0.049	± 0.005	2.62	1.24	± 0.13
103	3/32	3/32	9/32	0.103	0.081	± 0.005	2.62	2.06	± 0.13
104	3/32	1/8	5/16	0.103	0.112	± 0.005	2.62	2.84	± 0.13
105	3/32	5/32	11/32	0.103	0.143	± 0.005	2.62	3.63	± 0.13
106	3/32	3/16	3/8	0.103	0.174	± 0.005	2.62	4.42	± 0.13
107	3/32	7/32	13/32	0.103	0.206	± 0.005	2.62	5.23	± 0.13
108	3/32	1/4	7/16	0.103	0.237	± 0.005	2.62	6.02	± 0.13
109	3/32	5/16	1/2	0.103	0.299	± 0.005	2.62	7.59	± 0.13
110	3/32	3/8	9/16	0.103	0.362	± 0.005	2.62	9.19	± 0.13
111	3/32	7/16	5/8	0.103	0.424	± 0.005	2.62	10.77	± 0.13
112	3/32	1/2	11/16	0.103	0.487	± 0.005	2.62	12.37	± 0.13
113	3/32	9/16	3/4	0.103	0.549	± 0.007	2.62	13.94	± 0.18
114	3/32	5/8	13/16	0.103	0.612	± 0.009	2.62	15.54	± 0.23
115	3/32	11/16	7/8	0.103	0.674	± 0.009	2.62	17.12	± 0.23
116	3/32	3/4	15/16	0.103	0.737	± 0.009	2.62	18.72	± 0.23
117	3/32	13/16	1	0.103	0.799	± 0.010	2.62	20.29	± 0.25
118	3/32	7/8	1-1/16	0.103	0.862	± 0.010	2.62	21.89	± 0.25
119	3/32	15/16	1-1/8	0.103	0.924	± 0.010	2.62	23.47	± 0.25
120	3/32	1	1-3/16	0.103	0.987	± 0.010	2.62	25.07	± 0.25
121	3/32	1-1/16	1-1/4	0.103	1.049	± 0.010	2.62	26.64	± 0.25
122	3/32	1-1/8	1-5/16	0.103	1.112	± 0.010	2.62	28.24	± 0.25
123	3/32	1-3/16	1-3/8	0.103	1.174	± 0.012	2.62	29.82	± 0.30
124	3/32	1-1/4	1-7/16	0.103	1.237	± 0.012	2.62	31.42	± 0.30
125	3/32	1-5/16	1-1/2	0.103	1.299	± 0.012	2.62	32.99	± 0.30
126	3/32	1-3/8	1-9/16	0.103	1.362	± 0.012	2.62	34.59	± 0.30
127	3/32	1-7/16	1-5/8	0.103	1.424	± 0.012	2.62	36.17	± 0.30
128	3/32	1-1/2	1-11/16	0.103	1.487	± 0.012	2.62	37.77	± 0.30
129	3/32	1-9/16	1-3/4	0.103	1.549	± 0.015	2.62	39.34	± 0.38
130	3/32	1-5/8	1-13/16	0.103	1.612	± 0.015	2.62	40.94	± 0.38
131	3/32	1-11/16	1-7/8	0.103	1.674	± 0.015	2.62	42.52	± 0.38
132	3/32	1-3/4	1-15/16	0.103	1.737	± 0.015	2.62	44.12	± 0.38
133	3/32	1-13/16	2	0.103	1.799	± 0.015	2.62	45.69	± 0.38

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
134	3/32	1-7/8	2-1/16	0.103	1.862	± 0.015	2.62	47.29	± 0.38
135	3/32	1-15/16	2-1/8	0.103	1.925	± 0.017	2.62	48.90	± 0.43
136	3/32	2	2-3/16	0.103	1.987	± 0.017	2.62	50.47	± 0.43
137	3/32	2-1/16	2-1/4	0.103	2.050	± 0.017	2.62	52.07	± 0.43
138	3/32	2-1/8	2-5/16	0.103	2.112	± 0.017	2.62	53.64	± 0.43
139	3/32	2-3/16	2-3/8	0.103	2.175	± 0.017	2.62	55.25	± 0.43
140	3/32	2-1/4	2-7/16	0.103	2.237	± 0.017	2.62	56.82	± 0.43
141	3/32	2-5/16	2-1/2	0.103	2.300	± 0.020	2.62	58.42	± 0.51
142	3/32	2-3/8	2-9/16	0.103	2.362	± 0.020	2.62	59.99	± 0.51
143	3/32	2-7/16	2-5/8	0.103	2.425	± 0.020	2.62	61.60	± 0.51
144	3/32	2-1/2	2-11/16	0.103	2.487	± 0.020	2.62	63.17	± 0.51
145	3/32	2-9/16	2-3/4	0.103	2.550	± 0.020	2.62	64.77	± 0.51
146	3/32	2-5/8	2-13/16	0.103	2.612	± 0.020	2.62	66.34	± 0.51
147	3/32	2-11/16	2-7/8	0.103	2.675	± 0.022	2.62	67.95	± 0.56
148	3/32	2-3/4	2-15/16	0.103	2.737	± 0.022	2.62	69.52	± 0.56
149	3/32	2-13/16	3	0.103	2.800	± 0.022	2.62	71.12	± 0.56
150	3/32	2-7/8	3-1/16	0.103	2.862	± 0.022	2.62	72.69	± 0.56
151	3/32	3	3-3/16	0.103	2.987	± 0.024	2.62	75.87	± 0.61
152	3/32	3-1/4	3-7/16	0.103	3.237	± 0.024	2.62	82.22	± 0.61
153	3/32	3-1/2	3-11/16	0.103	3.487	± 0.024	2.62	88.57	± 0.61
154	3/32	3-3/4	3-15/16	0.103	3.737	± 0.028	2.62	94.92	± 0.71
155	3/32	4	4-3/16	0.103	3.987	± 0.028	2.62	101.27	± 0.71
156	3/32	4-1/4	4-7/16	0.103	4.237	± 0.030	2.62	107.62	± 0.76
157	3/32	4-1/2	4-11/16	0.103	4.487	± 0.030	2.62	113.97	± 0.76
158	3/32	4-3/4	4-15/16	0.103	4.737	± 0.030	2.62	120.32	± 0.76
159	3/32	5	5-3/16	0.103	4.987	± 0.035	2.62	126.67	± 0.89
160	3/32	5-1/4	5-7/16	0.103	5.237	± 0.035	2.62	133.02	± 0.89
161	3/32	5-1/2	5-11/16	0.103	5.487	± 0.035	2.62	139.37	± 0.89
162	3/32	5-3/4	5-15/16	0.103	5.737	± 0.035	2.62	145.72	± 0.89
163	3/32	6	6-3/16	0.103	5.987	± 0.035	2.62	152.07	± 0.89
164	3/32	6-1/4	6-7/16	0.103	6.237	± 0.040	2.62	158.42	± 1.02
165	3/32	6-1/2	6-11/16	0.103	6.487	± 0.040	2.62	164.77	± 1.02
166	3/32	6-3/4	6-15/16	0.103	6.737	± 0.040	2.62	171.12	± 1.02
167	3/32	7	7-3/16	0.103	6.987	± 0.040	2.62	177.47	± 1.02
168	3/32	7-1/4	7-7/16	0.103	7.237	± 0.045	2.62	183.82	± 1.14
169	3/32	7-1/2	7-11/16	0.103	7.487	± 0.045	2.62	190.17	± 1.14
170	3/32	7-3/4	7-15/16	0.103	7.737	± 0.045	2.62	196.52	± 1.14
171	3/32	8	8-3/16	0.103	7.987	± 0.045	2.62	202.87	± 1.14
172	3/32	8-1/4	8-7/16	0.103	8.237	± 0.050	2.62	209.22	± 1.27
173	3/32	8-1/2	8-11/16	0.103	8.487	± 0.050	2.62	215.57	± 1.27
174	3/32	8-3/4	8-15/16	0.103	8.737	± 0.050	2.62	221.92	± 1.27

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
175	3/32	9	9-3/16	0.103	8.987	± 0.050	2.62	228.27	± 10.27
176	3/32	9-1/4	9-7/16	0.103	9.237	± 0.055	2.62	234.62	± 10.40
177	3/32	9-1/2	9-11/16	0.103	9.487	± 0.055	2.62	240.97	± 10.40
178	3/32	9-3/4	9-15/16	0.103	9.737	± 0.055	2.62	247.32	± 10.40
201	1/8	3/16	7/16	0.139	0.171	± 0.005	3.53	4.34	± 0.13
202	1/8	1/4	1/2	0.139	0.234	± 0.005	3.53	5.94	± 0.13
203	1/8	5/16	9/16	0.139	0.296	± 0.005	3.53	7.52	± 0.13
204	1/8	3/8	5/8	0.139	0.359	± 0.005	3.53	9.12	± 0.13
205	1/8	7/16	11/16	0.139	0.421	± 0.005	3.53	10.69	± 0.13
206	1/8	1/2	3/4	0.139	0.484	± 0.005	3.53	12.29	± 0.13
207	1/8	9/16	13/16	0.139	0.546	± 0.007	3.53	13.87	± 0.18
208	1/8	5/8	7/8	0.139	0.609	± 0.009	3.53	15.47	± 0.23
209	1/8	11/16	15/16	0.139	0.671	± 0.009	3.53	17.04	± 0.23
210	1/8	3/4	1	0.139	0.734	± 0.010	3.53	18.64	± 0.25
211	1/8	13/16	1-1/16	0.139	0.796	± 0.010	3.53	20.22	± 0.25
212	1/8	7/8	1-1/8	0.139	0.859	± 0.010	3.53	21.82	± 0.25
213	1/8	15/16	1-3/16	0.139	0.921	± 0.010	3.53	23.39	± 0.25
214	1/8	1	1-1/4	0.139	0.984	± 0.010	3.53	24.99	± 0.25
215	1/8	1-1/16	1-5/16	0.139	1.046	± 0.010	3.53	26.57	± 0.25
216	1/8	1-1/8	1-3/8	0.139	1.109	± 0.012	3.53	28.17	± 0.30
217	1/8	1-3/16	1-7/16	0.139	1.171	± 0.012	3.53	29.74	± 0.30
218	1/8	1-1/4	1-1/2	0.139	1.234	± 0.012	3.53	31.34	± 0.30
219	1/8	1-5/16	1-9/16	0.139	1.296	± 0.012	3.53	32.92	± 0.30
220	1/8	1-3/8	1-5/8	0.139	1.359	± 0.012	3.53	34.52	± 0.30
221	1/8	1-7/16	1-11/16	0.139	1.421	± 0.012	3.53	36.09	± 0.30
222	1/8	1-1/2	1-3/4	0.139	1.484	± 0.015	3.53	37.69	± 0.38
223	1/8	1-5/8	1-7/8	0.139	1.609	± 0.015	3.53	40.87	± 0.38
224	1/8	1-3/4	2	0.139	1.734	± 0.015	3.53	44.04	± 0.38
225	1/8	1-7/8	2-1/8	0.139	1.859	± 0.018	3.53	47.22	± 0.46
226	1/8	2	2-1/4	0.139	1.984	± 0.018	3.53	50.39	± 0.46
227	1/8	2-1/8	2-3/8	0.139	2.109	± 0.018	3.53	53.57	± 0.46
228	1/8	2-1/4	2-1/2	0.139	2.234	± 0.020	3.53	56.74	± 0.51
229	1/8	2-3/8	2-5/8	0.139	2.359	± 0.020	3.53	59.92	± 0.51
230	1/8	2-1/2	2-3/4	0.139	2.484	± 0.020	3.53	63.09	± 0.51
231	1/8	2-5/8	2-7/8	0.139	2.609	± 0.020	3.53	66.27	± 0.51
232	1/8	2-3/4	3	0.139	2.734	± 0.024	3.53	69.44	± 0.61
233	1/8	2-7/8	3-1/8	0.139	2.859	± 0.024	3.53	72.62	± 0.61
234	1/8	3	3-1/4	0.139	2.984	± 0.024	3.53	75.79	± 0.61
235	1/8	3-1/8	3-3/8	0.139	3.109	± 0.024	3.53	78.97	± 0.61
236	1/8	3-1/4	3-1/2	0.139	3.234	± 0.024	3.53	82.14	± 0.61
237	1/8	3-3/8	3-5/8	0.139	3.359	± 0.024	3.53	85.32	± 0.61

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
238	1/8	3-1/2	3-3/4	0.139	3.484	± 0.024	3.53	88.49	± 0.61
239	1/8	3-5/8	3-7/8	0.139	3.609	± 0.028	3.53	91.67	± 0.71
240	1/8	3-3/4	4	0.139	3.734	± 0.028	3.53	94.84	± 0.71
241	1/8	3-7/8	4-1/8	0.139	3.859	± 0.028	3.53	98.02	± 0.71
242	1/8	4	4-1/4	0.139	3.984	± 0.028	3.53	101.19	± 0.71
243	1/8	4-1/8	4-3/8	0.139	4.109	± 0.028	3.53	104.37	± 0.71
244	1/8	4-1/4	4-1/2	0.139	4.234	± 0.030	3.53	107.54	± 0.76
245	1/8	4-3/8	4-5/8	0.139	4.359	± 0.030	3.53	110.72	± 0.76
246	1/8	4-1/2	4-3/4	0.139	4.484	± 0.030	3.53	113.89	± 0.76
247	1/8	4-5/8	4-7/8	0.139	4.609	± 0.030	3.53	117.07	± 0.76
248	1/8	4-3/4	5	0.139	4.734	± 0.030	3.53	120.24	± 0.76
249	1/8	4-7/8	5-1/8	0.139	4.859	± 0.035	3.53	123.42	± 0.89
250	1/8	5	5-1/4	0.139	4.984	± 0.035	3.53	126.59	± 0.89
251	1/8	5-1/8	5-3/8	0.139	5.109	± 0.035	3.53	129.77	± 0.89
252	1/8	5-1/4	5-1/2	0.139	5.234	± 0.035	3.53	132.94	± 0.89
253	1/8	5-3/8	5-5/8	0.139	5.359	± 0.035	3.53	136.12	± 0.89
254	1/8	5-1/2	5-3/4	0.139	5.484	± 0.035	3.53	139.29	± 0.89
255	1/8	5-5/8	5-7/8	0.139	5.609	± 0.035	3.53	142.47	± 0.89
256	1/8	5-3/4	6	0.139	5.734	± 0.035	3.53	145.64	± 0.89
257	1/8	5-7/8	6-1/8	0.139	5.859	± 0.035	3.53	148.82	± 0.89
258	1/8	6	6-1/4	0.139	5.984	± 0.035	3.53	151.99	± 0.89
259	1/8	6-1/4	6-1/2	0.139	6.234	± 0.040	3.53	158.34	± 1.02
260	1/8	6-1/2	6-3/4	0.139	6.484	± 0.040	3.53	164.69	± 1.02
261	1/8	6-3/4	7	0.139	6.734	± 0.040	3.53	171.04	± 1.02
262	1/8	7	7-1/4	0.139	6.984	± 0.040	3.53	177.39	± 1.02
263	1/8	7-1/4	7-1/2	0.139	7.234	± 0.045	3.53	183.74	± 1.14
264	1/8	7-1/2	7-3/4	0.139	7.484	± 0.045	3.53	190.09	± 1.14
265	1/8	7-3/4	8	0.139	7.734	± 0.045	3.53	196.44	± 1.14
266	1/8	8	8-1/4	0.139	7.984	± 0.045	3.53	202.79	± 1.14
267	1/8	8-1/4	8-1/2	0.139	8.234	± 0.050	3.53	209.14	± 1.27
268	1/8	8-1/2	8-3/4	0.139	8.484	± 0.050	3.53	215.49	± 1.27
269	1/8	8-3/4	9	0.139	8.734	± 0.050	3.53	221.84	± 1.27
270	1/8	9	9-1/4	0.139	8.984	± 0.050	3.53	228.19	± 1.27
271	1/8	9-1/4	9-1/2	0.139	9.234	± 0.055	3.53	234.54	± 1.40
272	1/8	9-1/2	9-3/4	0.139	9.484	± 0.055	3.53	240.89	± 1.40
273	1/8	9-3/4	10	0.139	9.734	± 0.055	3.53	247.24	± 1.40
274	1/8	10	10-1/4	0.139	9.984	± 0.055	3.53	253.59	± 1.40
275	1/8	10-1/2	10-3/4	0.139	10.484	± 0.055	3.53	266.29	± 1.40
276	1/8	11	11-1/4	0.139	10.984	± 0.065	3.53	278.99	± 1.65
277	1/8	11-1/2	11-3/4	0.139	11.484	± 0.065	3.53	291.69	± 1.65
278	1/8	12	12-1/4	0.139	11.984	± 0.065	3.53	304.39	± 1.65

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
279	1/8	13	13-1/4	0.139	12.984	± 0.065	3.53	329.79	± 1.65
280	1/8	14	14-1/4	0.139	13.984	± 0.065	3.53	355.19	± 1.65
281	1/8	15	15-1/4	0.139	14.984	± 0.065	3.53	380.59	± 1.65
282	1/8	16	16-1/4	0.139	15.955	± 0.075	3.53	405.26	± 1.91
283	1/8	17	17-1/4	0.139	16.955	± 0.080	3.53	430.66	± 2.03
284	1/8	18	18-1/4	0.139	17.955	± 0.085	3.53	456.06	± 2.16
309	3/16	7/16	13/16	0.210	0.412	± 0.005	5.33	10.46	± 0.13
310	3/16	1/2	7/8	0.210	0.475	± 0.005	5.33	12.07	± 0.13
311	3/16	9/16	15/16	0.210	0.537	± 0.007	5.33	13.64	± 0.18
312	3/16	5/8	1	0.210	0.600	± 0.009	5.33	15.24	± 0.23
313	3/16	11/16	1-1/16	0.210	0.662	± 0.009	5.33	16.81	± 0.23
314	3/16	3/4	1-1/8	0.210	0.725	± 0.010	5.33	18.42	± 0.25
315	3/16	13/16	1-3/16	0.210	0.787	± 0.010	5.33	19.99	± 0.25
316	3/16	7/8	1-1/4	0.210	0.850	± 0.010	5.33	21.59	± 0.25
317	3/16	15/16	1-5/16	0.210	0.912	± 0.010	5.33	23.16	± 0.25
318	3/16	1	1-3/8	0.210	0.975	± 0.010	5.33	24.77	± 0.25
319	3/16	1-1/16	1-7/16	0.210	1.037	± 0.010	5.33	26.34	± 0.25
320	3/16	1-1/8	1-1/2	0.210	1.100	± 0.012	5.33	27.94	± 0.30
321	3/16	1-3/16	1-9/16	0.210	1.162	± 0.012	5.33	29.51	± 0.30
322	3/16	1-1/4	1-5/8	0.210	1.225	± 0.012	5.33	31.12	± 0.30
323	3/16	1-5/16	1-11/16	0.210	1.287	± 0.012	5.33	32.69	± 0.30
324	3/16	1-3/8	1-3/4	0.210	1.350	± 0.012	5.33	34.29	± 0.30
325	3/16	1-1/2	1-7/8	0.210	1.475	± 0.015	5.33	37.47	± 0.38
326	3/16	1-5/8	2	0.210	1.600	± 0.015	5.33	40.64	± 0.38
327	3/16	1-3/4	2-1/8	0.210	1.725	± 0.015	5.33	43.82	± 0.38
328	3/16	1-7/8	2-1/4	0.210	1.850	± 0.015	5.33	46.99	± 0.38
329	3/16	2	2-3/8	0.210	1.975	± 0.018	5.33	50.17	± 0.46
330	3/16	2-1/8	2-1/2	0.210	2.100	± 0.018	5.33	53.34	± 0.46
331	3/16	2-1/4	2-5/8	0.210	2.225	± 0.018	5.33	56.52	± 0.46
332	3/16	2-3/8	2-3/4	0.210	2.350	± 0.018	5.33	59.69	± 0.46
333	3/16	2-1/2	2-7/8	0.210	2.475	± 0.020	5.33	62.87	± 0.51
334	3/16	2-5/8	3	0.210	2.600	± 0.020	5.33	66.04	± 0.51
335	3/16	2-3/4	3-1/8	0.210	2.725	± 0.020	5.33	69.22	± 0.51
336	3/16	2-7/8	3-1/4	0.210	2.850	± 0.020	5.33	72.39	± 0.51
337	3/16	3	3-3/8	0.210	2.975	± 0.024	5.33	75.57	± 0.61
338	3/16	3-1/8	3-1/2	0.210	3.100	± 0.024	5.33	78.74	± 0.61
339	3/16	3-1/4	3-5/8	0.210	3.225	± 0.024	5.33	81.92	± 0.61
340	3/16	3-3/8	3-3/4	0.210	3.350	± 0.024	5.33	85.09	± 0.61
341	3/16	3-1/2	3-7/8	0.210	3.475	± 0.024	5.33	88.27	± 0.61
342	3/16	3-5/8	4	0.210	3.600	± 0.028	5.33	91.44	± 0.71
343	3/16	3-3/4	4-1/8	0.210	3.725	± 0.028	5.33	94.62	± 0.71

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
344	3/16	3-7/8	4-1/4	0.210	3.850	± 0.028	5.33	97.79	± 0.71
345	3/16	4	4-3/8	0.210	3.975	± 0.028	5.33	100.97	± 0.71
346	3/16	4-1/8	4-1/2	0.210	4.100	± 0.028	5.33	104.14	± 0.71
347	3/16	4-1/4	4-5/8	0.210	4.225	± 0.030	5.33	107.32	± 0.76
348	3/16	4-3/8	4-3/4	0.210	4.350	± 0.030	5.33	110.49	± 0.76
349	3/16	4-1/2	4-7/8	0.210	4.475	± 0.030	5.33	113.67	± 0.76
350	3/16	4-5/8	5	0.210	4.600	± 0.030	5.33	116.84	± 0.76
351	3/16	4-3/4	5-1/8	0.210	4.725	± 0.030	5.33	120.02	± 0.76
352	3/16	4-7/8	5-1/4	0.210	4.850	± 0.030	5.33	123.19	± 0.76
353	3/16	5	5-3/8	0.210	4.975	± 0.037	5.33	126.37	± 0.94
354	3/16	5-1/8	5-1/2	0.210	5.100	± 0.037	5.33	129.54	± 0.94
355	3/16	5-1/4	5-5/8	0.210	5.225	± 0.037	5.33	132.72	± 0.94
356	3/16	5-3/8	5-3/4	0.210	5.350	± 0.037	5.33	135.89	± 0.94
357	3/16	5-1/2	5-7/8	0.210	5.475	± 0.037	5.33	139.07	± 0.94
358	3/16	5-5/8	6	0.210	5.600	± 0.037	5.33	142.24	± 0.94
359	3/16	5-3/4	6-1/8	0.210	5.725	± 0.037	5.33	145.42	± 0.94
360	3/16	5-7/8	6-1/4	0.210	5.850	± 0.037	5.33	148.59	± 0.94
361	3/16	6	6-3/8	0.210	5.975	± 0.037	5.33	151.77	± 0.94
362	3/16	6-1/4	6-5/8	0.210	6.225	± 0.040	5.33	158.12	± 1.02
363	3/16	6-1/2	6-7/8	0.210	6.475	± 0.040	5.33	164.47	± 1.02
364	3/16	6-3/4	7-1/8	0.210	6.725	± 0.040	5.33	170.82	± 1.02
365	3/16	7	7-3/8	0.210	6.975	± 0.040	5.33	177.17	± 1.02
366	3/16	7-1/4	7-5/8	0.210	7.225	± 0.045	5.33	183.52	± 1.14
367	3/16	7-1/2	7-7/8	0.210	7.475	± 0.045	5.33	189.87	± 1.14
368	3/16	7-3/4	8-1/8	0.210	7.725	± 0.045	5.33	196.22	± 1.14
369	3/16	8	8-3/8	0.210	7.975	± 0.045	5.33	202.57	± 1.14
370	3/16	8-1/4	8-5/8	0.210	8.225	± 0.050	5.33	208.92	± 1.27
371	3/16	8-1/2	8-7/8	0.210	8.475	± 0.050	5.33	215.27	± 1.27
372	3/16	8-3/4	9-1/8	0.210	8.725	± 0.050	5.33	221.62	± 1.27
373	3/16	9	9-3/8	0.210	8.975	± 0.050	5.33	227.97	± 1.27
374	3/16	9-1/4	9-5/8	0.210	9.225	± 0.055	5.33	234.32	± 1.40
375	3/16	9-1/2	9-7/8	0.210	9.475	± 0.055	5.33	240.67	± 1.40
376	3/16	9-3/4	10-1/8	0.210	9.725	± 0.055	5.33	247.02	± 1.40
377	3/16	10	10-3/8	0.210	9.975	± 0.055	5.33	253.37	± 1.40
378	3/16	10-1/2	10-7/8	0.210	10.475	± 0.060	5.33	266.07	± 1.52
379	3/16	11	11-3/8	0.210	10.975	± 0.060	5.33	278.77	± 1.52
380	3/16	11-1/2	11-7/8	0.210	11.475	± 0.065	5.33	291.47	± 1.65
381	3/16	12	12-3/8	0.210	11.975	± 0.065	5.33	304.17	± 1.65
382	3/16	13	13-3/8	0.210	12.975	± 0.065	5.33	329.57	± 1.65
383	3/16	14	14-3/8	0.210	13.975	± 0.070	5.33	354.97	± 1.78
384	3/16	15	15-3/8	0.210	14.975	± 0.070	5.33	380.37	± 1.78

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
385	3/16	16	16-3/8	0.210	15.955	± 0.075	5.33	405.26	± 1.91
386	3/16	17	17-3/8	0.210	16.955	± 0.080	5.33	430.66	± 2.03
387	3/16	18	18-3/8	0.210	17.955	± 0.085	5.33	456.06	± 2.16
388	3/16	19	19-3/8	0.210	18.955	± 0.090	5.33	481.46	± 2.29
389	3/16	20	20-3/8	0.210	19.955	± 0.095	5.33	506.86	± 2.41
390	3/16	21	21-3/8	0.210	20.955	± 0.095	5.33	532.26	± 2.41
391	3/16	22	22-3/8	0.210	21.955	± 0.095	5.33	557.66	± 2.41
392	3/16	23	23-3/8	0.210	22.940	± 0.105	5.33	582.68	± 2.67
393	3/16	24	24-3/8	0.210	23.940	± 0.110	5.33	608.08	± 2.79
394	3/16	25	25-3/8	0.210	24.940	± 0.115	5.33	633.48	± 2.92
395	3/16	26	26-3/8	0.210	25.940	± 0.120	5.33	658.88	± 3.05
400	1/4	1-3/8	1-7/8	0.275	1.350	± 0.012	6.99	34.29	± 0.30
401	1/4	1-1/2	2	0.275	1.475	± 0.015	6.99	37.47	± 0.38
402	1/4	1-5/8	2-1/8	0.275	1.600	± 0.015	6.99	40.64	± 0.38
403	1/4	1-3/4	2-1/4	0.275	1.725	± 0.015	6.99	43.82	± 0.38
404	1/4	1-7/8	2-3/8	0.275	1.850	± 0.015	6.99	46.99	± 0.38
405	1/4	2	2-1/2	0.275	1.975	± 0.018	6.99	50.17	± 0.46
406	1/4	2-1/8	2-5/8	0.275	2.100	± 0.018	6.99	53.34	± 0.46
407	1/4	2-1/4	2-3/4	0.275	2.225	± 0.018	6.99	56.52	± 0.46
408	1/4	2-3/8	2-7/8	0.275	2.350	± 0.018	6.99	59.69	± 0.46
409	1/4	2-1/2	3	0.275	2.475	± 0.020	6.99	62.87	± 0.51
410	1/4	2-5/8	3-1/8	0.275	2.600	± 0.020	6.99	66.04	± 0.51
411	1/4	2-3/4	3-1/4	0.275	2.725	± 0.020	6.99	69.22	± 0.51
412	1/4	2-7/8	3-3/8	0.275	2.850	± 0.020	6.99	72.39	± 0.51
413	1/4	3	3-1/2	0.275	2.975	± 0.024	6.99	75.57	± 0.61
414	1/4	3-1/8	3-5/8	0.275	3.100	± 0.024	6.99	78.74	± 0.61
415	1/4	3-1/4	3-3/4	0.275	3.225	± 0.024	6.99	81.92	± 0.61
416	1/4	3-3/8	3-7/8	0.275	3.350	± 0.024	6.99	85.09	± 0.61
417	1/4	3-1/2	4	0.275	3.475	± 0.024	6.99	88.27	± 0.61
418	1/4	3-5/8	4-1/8	0.275	3.600	± 0.028	6.99	91.44	± 0.71
419	1/4	3-3/4	4-1/4	0.275	3.725	± 0.028	6.99	94.62	± 0.71
420	1/4	3-7/8	4-3/8	0.275	3.850	± 0.028	6.99	97.79	± 0.71
421	1/4	4	4-1/2	0.275	3.975	± 0.028	6.99	100.97	± 0.71
422	1/4	4-1/8	4-5/8	0.275	4.100	± 0.028	6.99	104.14	± 0.71
423	1/4	4-1/4	4-3/4	0.275	4.225	± 0.030	6.99	107.32	± 0.76
424	1/4	4-3/8	4-7/8	0.275	4.350	± 0.030	6.99	110.49	± 0.76
425	1/4	4-1/2	5	0.275	4.475	± 0.033	6.99	113.67	± 0.84
426	1/4	4-5/8	5-1/8	0.275	4.600	± 0.033	6.99	116.84	± 0.84
427	1/4	4-3/4	5-1/4	0.275	4.725	± 0.033	6.99	120.02	± 0.84
428	1/4	4-7/8	5-3/8	0.275	4.850	± 0.033	6.99	123.19	± 0.84
429	1/4	5	5-1/2	0.275	4.975	± 0.037	6.99	126.37	± 0.94

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
430	1/4	5-1/8	5-5/8	0.275	5.100	± 0.037	6.99	129.54	± 0.94
431	1/4	5-1/4	5-3/4	0.275	5.225	± 0.037	6.99	132.72	± 0.94
432	1/4	5-3/8	5-7/8	0.275	5.350	± 0.037	6.99	135.89	± 0.94
433	1/4	5-1/2	6	0.275	5.475	± 0.037	6.99	139.07	± 0.94
434	1/4	5-5/8	6-1/8	0.275	5.600	± 0.037	6.99	142.24	± 0.94
435	1/4	5-3/4	6-1/4	0.275	5.725	± 0.037	6.99	145.42	± 0.94
436	1/4	5-7/8	6-3/8	0.275	5.850	± 0.037	6.99	148.59	± 0.94
437	1/4	6	6-1/2	0.275	5.975	± 0.037	6.99	151.77	± 0.94
438	1/4	6-1/4	6-3/4	0.275	6.225	± 0.040	6.99	158.12	± 1.02
439	1/4	6-1/2	7	0.275	6.475	± 0.040	6.99	164.47	± 1.02
440	1/4	6-3/4	7-1/4	0.275	6.725	± 0.040	6.99	170.82	± 1.02
441	1/4	7	7-1/2	0.275	6.975	± 0.040	6.99	177.17	± 1.02
442	1/4	7-1/4	7-3/4	0.275	7.225	± 0.045	6.99	183.52	± 1.14
443	1/4	7-1/2	8	0.275	7.475	± 0.045	6.99	189.87	± 1.14
444	1/4	7-3/4	8-1/4	0.275	7.725	± 0.045	6.99	196.22	± 1.14
445	1/4	8	8-1/2	0.275	7.975	± 0.045	6.99	202.57	± 1.14
446	1/4	8-1/2	9	0.275	8.475	± 0.055	6.99	215.27	± 1.40
447	1/4	9	9-1/2	0.275	8.975	± 0.055	6.99	227.97	± 1.40
448	1/4	9-1/2	10	0.275	9.475	± 0.055	6.99	240.67	± 1.40
449	1/4	10	10-1/2	0.275	9.975	± 0.055	6.99	253.37	± 1.40
450	1/4	10-1/2	11	0.275	10.475	± 0.060	6.99	266.07	± 1.52
451	1/4	11	11-1/2	0.275	10.975	± 0.060	6.99	278.77	± 1.52
452	1/4	11-1/2	12	0.275	11.475	± 0.060	6.99	291.47	± 1.52
453	1/4	12	12-1/2	0.275	11.975	± 0.060	6.99	304.17	± 1.52
454	1/4	12-1/2	13	0.275	12.475	± 0.060	6.99	316.87	± 1.52
455	1/4	13	13-1/2	0.275	12.975	± 0.060	6.99	329.57	± 1.52
456	1/4	13-1/2	14	0.275	13.475	± 0.070	6.99	342.27	± 1.78
457	1/4	14	14-1/2	0.275	13.975	± 0.070	6.99	354.97	± 1.78
458	1/4	14-1/2	15	0.275	14.475	± 0.070	6.99	367.67	± 1.78
459	1/4	15	15-1/2	0.275	14.975	± 0.070	6.99	380.37	± 1.78
460	1/4	15-1/2	16	0.275	15.475	± 0.070	6.99	393.07	± 1.78
461	1/4	16	16-1/2	0.275	15.955	± 0.075	6.99	405.26	± 1.91
462	1/4	16-1/2	17	0.275	16.455	± 0.075	6.99	417.96	± 1.91
463	1/4	17	17-1/2	0.275	16.955	± 0.080	6.99	430.66	± 2.03
464	1/4	17-1/2	18	0.275	17.455	± 0.085	6.99	443.36	± 2.16
465	1/4	18	18-1/2	0.275	17.955	± 0.085	6.99	456.06	± 2.16
466	1/4	18-1/2	19	0.275	18.455	± 0.085	6.99	468.76	± 2.16
467	1/4	19	19-1/2	0.275	18.955	± 0.090	6.99	481.46	± 2.29
468	1/4	19-1/2	20	0.275	19.455	± 0.090	6.99	494.16	± 2.29
469	1/4	20	20-1/2	0.275	19.955	± 0.095	6.99	506.86	± 2.41
470	1/4	21	21-1/2	0.275	20.955	± 0.095	6.99	532.26	± 2.41

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AS568 SIZE CHART (continued)

AS568	Nominal Reference			Actual Dimensions					
				Inches			Metric		
Dash #	CS (IN)	ID (IN)	OD (IN)	CS	ID	ID Tol	CS	ID	ID Tol
471	1/4	22	22-1/2	.275	21.955	± .100	6.99	557.66	± 2.54
472	1/4	23	23-1/2	.275	22.940	± .105	6.99	582.68	± 2.67
473	1/4	24	24-1/2	.275	23.940	± .110	6.99	608.08	± 2.79
474	1/4	25	25-1/2	.275	24.940	± .115	6.99	633.48	± 2.92
475	1/4	26	26-1/2	.275	25.940	± .120	6.99	658.88	± 3.05
901				.056	.185	± .005	1.42	4.70	± .13
902				.064	.239	± .005	1.63	6.07	± .13
903				.064	.301	± .005	1.63	7.65	± .13
904				.072	.351	± .005	1.83	8.92	± .13
905				.072	.414	± .005	1.83	10.52	± .13
906				.078	.468	± .005	1.98	11.89	± .13
907				.082	.530	± .007	2.08	13.46	± .18
908				.087	.644	± .009	2.21	16.36	± .23
909				.097	.706	± .009	2.46	17.93	± .23
910				.097	.755	± .009	2.46	19.18	± .23
911				.116	.863	± .009	2.95	21.92	± .23
912				.116	.924	± .009	2.95	23.47	± .23
913				.116	.986	± .010	2.95	25.04	± .25
914				.116	1.047	± .010	2.95	26.59	± .25
916				.116	1.171	± .010	2.95	29.74	± .25
918				.116	1.355	± .012	2.95	34.42	± .30
920				.118	1.475	± .014	3.00	37.47	± .36
924				.118	1.720	± .014	3.00	43.69	± .36
928				.118	2.090	± .018	3.00	53.09	± .46
932				.118	2.337	± .018	3.00	59.36	± .46

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O-RING CORD

STANDARD O-RING CORD

NOMINAL CROSS SECTION (IN)	ACTUAL CROSS SECTION (IN)	TOLERANCE (IN)
1/16	0.063	0.005
1/16	0.070	0.007
3/32	0.093	0.007
3/32	0.103	0.007
1/8	0.125	0.007
1/8	0.139	0.007
3/16	0.188	0.007
3/16	0.210	0.007
1/4	0.250	0.008
1/4	0.275	0.008
5/16	0.313	0.008
3/8	0.375	0.010
7/16	0.437	0.012
1/2	0.500	0.015
9/16	0.562	0.015
5/8	0.625	0.015
3/4	0.750	0.015
7/8	0.875	0.020
1	1.000	0.020
1 1/16	1.062	0.030
1 1/8	1.125	0.030
1 1/4	1.250	0.040
1 1/2	1.500	0.060

METRIC O-RING CORD

DIAMETER (MM)	DIAMETER (IN)	TOLERANCE (MM)
2.0	0.079	+/- 0.10
2.5	0.098	+/- 0.10
3.0	0.118	+/- 0.12
3.5	0.139	+/- 0.15
4.0	0.158	+/- 0.15
4.5	0.177	+/- 0.15
5.0	0.197	+/- 0.20
5.7	0.224	+/- 0.25
6.0	0.236	+/- 0.25
7.0	0.275	+/- 0.25
7.5	0.295	+/- 0.25
8.4	0.330	+/- 0.25
9.0	0.354	+/- 0.25
10.0	0.393	+/- 0.25
12.0	0.472	+/- 0.45
14.0	0.550	+/- 0.50

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STANDARD O-RING KIT

70 DURO BLACK 30 SIZES, 382 PCS AS568 STANDARD SIZES

This kit contains 382 O-Rings in the 30 most popular sizes, providing an extremely low cost per size value. O-Rings conform dimensionally to AS568 universal series. **Standard kit material is 70-duro buna.** Kits are available in a wide variety of compounds and durometers.

KIT CONTENTS

		NOMINAL REF			ACTUAL SIZE	
DASH #	KIT QTY	CS	ID	OD	CS	ID
-006	20	1/16	1/8	1/4	.070"	.114"
-007	20	1/16	5/32	9/32	.070"	.145"
-008	20	1/16	3/16	5/16	.070"	.176"
-009	20	1/16	7/32	11/32	.070"	.208"
-010	20	1/16	1/4	3/8	.070"	.239"
-011	20	1/16	5/16	7/16	.070"	.301"
-012	20	1/16	3/8	1/2	.070"	.364"
-110	13	3/32	3/8	9/16	.103"	.362"
-111	13	3/32	7/16	5/8	.103"	.424"
-112	13	3/32	1/2	11/16	.103"	.487"
-113	13	3/32	9/16	3/4	.103"	.549"
-114	13	3/32	5/8	13/16	.103"	.612"
-115	13	3/32	11/16	7/8	.103"	.674"
-116	13	3/32	3/4	15/16	.103"	.737"
-210	10	1/8	3/4	1	.139"	.734"
-211	10	1/8	13/16	1-1/16	.139"	.796"
-212	10	1/8	7/8	1-1/8	.139"	.859"
-213	10	1/8	15/16	1-3/16	.139"	.921"
-214	10	1/8	1	1-1/4	.139"	.984"
-215	10	1/8	1-1/16	1-5/16	.139"	1.046"
-216	10	1/8	1-1/8	1-3/8	.139"	1.109"
-217	10	1/8	1-3/16	1-7/16	.139"	1.171"
-218	10	1/8	1-1/4	1-1/2	.139"	1.234"
-219	10	1/8	1-5/16	1-9/16	.139"	1.296"
-220	10	1/8	1-3/8	1-5/8	.139"	1.359"
-221	10	1/8	1-7/16	1-11/16	.139"	1.421"
-222	10	1/8	1-1/2	1-3/4	.139"	1.484"
-325	7	3/16	1-1/2	1-7/8	.210"	1.475"
-326	7	3/16	1-5/8	2	.210"	1.600"
-327	7	3/16	1-3/4	2-1/8	.210"	1.725"

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METRIC O-RING KIT

70 DURO BLACK 32 SIZES, 401 PCS METRIC SIZES

This Metric O-Ring kit contains 401, 70 Durometer O-Rings in 32 different sizes mostly used in industrial and automotive type applications. An extremely valuable kit to have in the warehouse or maintenance department. **Standard kit material is 70-duro buna.** Kits are available in a wide variety of compounds and durometers.

KIT CONTENTS

ACTUAL SIZE		
CS	ID	KIT QTY
1	3	19
1	3	19
1	4	17
2	5	9
2	6	17
2	8	17
2	10	17
2	11	17
2	12	17
2	14	17
2	17	17
2	20	17
3	10	12
3	12	12
3	16	12
3	18	12
3	22	12
4	20	9
4	22	9
4	24	9
4	25	9
4	30	9
4	34	9
4	36	9
4	40	9
4	45	9
4	47	9
4	50	9
5	16	7
5	25	7
5	25	7
5	30	7
5	32	7
5	35	7

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NITRILE SPLICING KIT

70 DURO BLACK 5 PIECES, 7 FEET EACH

The splicing kit for on the job repairs with rapid set adhesives. This Splicing kit will enable you to construct rings to your custom requirements. There are no special skills required, just follow instructions. This kit contains everything you need to produce a perfect o-ring. Standard kit material is 70-duro buna. Kits are available in a wide variety of compounds and durometers.

CONTENTS

- Stock of O-ring Cord
- Razor Blade
- Cutting JIG
- Tube of Adhesive
- Instructional Card

LENGTH (FT)	**CS** (IN)	**CS** (MM)
7	.070	1.78
7	.103	2.62
7	.139	3.53
7	.210	5.33
7	.275	6.99

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