



PRODUCT DATA SHEET

FDA Silicone 70 Durometer O-Ring

Food and medical grade static sealing compound, extreme temperature range

Compound designation	TORS VMQ-70 (legacy compound S70)
Material type	Silicone rubber, methyl vinyl siloxane. ISO 1629 designation VMQ
Nominal hardness	70 $\pm$ 5 Shore A
Color	Not specified on the compound record. FDA-grade silicone is commonly supplied translucent, white, or red for color coding; confirm on order.
Manufacturing method	Compression or transfer molded
Regulatory status	FDA compliant to 21 CFR 177.2600, see Section 8

1. What this material is

Silicone rubber runs on a silicon-oxygen backbone instead of the carbon backbone every other elastomer in this handbook uses. That inorganic backbone is what gives silicone its huge service temperature range and its outstanding resistance to sun, ozone, and long term aging. It is also why silicone is mechanically weak. This is not a strong material and it is not trying to be one. This particular compound is compounded and tested to qualify as an FDA compliant material under 21 CFR 177.2600, which is what makes it a fit for food, beverage, and medical work rather than just a general purpose silicone.

At 70 durometer, this compound sits where most food and medical silicone sealing lives: soft enough to seal at low closing force on a sanitary fitting or a light-duty static joint, in the applications where a nitrile or EPDM ring would either fail FDA review outright or would not survive the temperature swings of a steam-in-place or autoclave cycle.

2. What this material does

The short version: it is the compound you reach for when the job needs FDA compliance and a wide temperature range more than it needs strength, and it only works when the joint is not moving.

Performance area	How this compound behaves
Abrasion and cut resistance	Poor. A fraction of nitrile's resistance to nicks and cuts on a sharp machined edge or a burred gland. Handle and install with care.
Tensile and tear strength	Low compared to nearly every other O-Ring compound. This is the trade you make for the temperature range and the FDA status.
Compression set	Very good. 15% measured against a 50% max D2000 requirement at 22 hours, 175°C, so it holds a static seal load well over time and temperature.
Heat aging	Excellent. Essentially no hardness shift after 70 hours at 225°C. This is the standout property of this compound.
Low temperature flexibility	Excellent. Passed brittleness testing at -55°C with no cracking, and stays serviceable well below where nitrile or EPDM would stiffen up.
Ozone, UV, and weathering	Excellent, essentially immune. Outdoor and sunlight exposure that would crack nitrile in a season does nothing to this compound.
Water and steam resistance	Good below 212°F. Volume swell stayed under 3% after 70 hours at 100°C in the certified testing. Reversion sets in above roughly 250°F in steam.
Petroleum oil resistance	Fair at best. Certified IRM 901 testing showed manageable swell, but IRM 903 (harsher oil) showed a much larger volume increase. Static, low-pressure service only.
Gas permeability	High. This compound leaks gas by diffusion even with a perfect seal, so it is not a fit for gas retention or long term pressure holding.
Food and medical compliance	This is the reason to pick this grade over a general purpose silicone: documented compliance to 21 CFR 177.2600.

3. Typical physical properties

Values below are from The O-Ring Store's compound test record for this material against ASTM D2000 callout MBGE606 A19 B37 EA14 EO36 F19 Z. They represent this specific compound rather than a generic silicone class typical, but they are still not a lot-by-lot specification. Lot specific results are reported on the Certificate of Conformance supplied with each shipment.

Property	Test method	Compound test value
Hardness	ASTM D2240-10	70 Shore A (spec 70 $\pm$ 5)
Tensile strength	ASTM D412-13	6.9 (spec 6 min)*
Elongation at break	ASTM D412-13	269% (spec 150% min)
Specific gravity	ASTM D297-13	1.38
Heat age, durometer change, 70 hr at 225°C	ASTM D573-10	+0 (spec +10 max)
Heat age, tensile change, 70 hr at 225°C	ASTM D573-10	-17% (spec -17% max)
Heat age, elongation change, 70 hr at 225°C	ASTM D573-10	-12% (spec -30% max)
Compression set, 22 hr at 175°C	ASTM D395 B	15% (spec 50% max)

Water resistance, durometer / volume change, 70 hr at 100°C	ASTM D395-08	-2 Shore A / +3%
IRM 901 oil resistance, durometer / volume change, 70 hr at 100°C	ASTM D471-12A	-3 Shore A / +5%
IRM 903 oil resistance, durometer / volume change, 70 hr at 100°C	ASTM D471-12A	-16 Shore A / +36%
Low temperature brittleness, 3 min at -55°C	ASTM D2137-11	Pass
Tear strength, Die C	ASTM D624	40 to 90 lbf/in, class typical, not tested on this lot

**The tensile figure above is carried forward exactly as recorded on the source test record. 6.9 psi would be far below what any silicone compound can hold together with, so this number almost certainly reflects the ASTM D2000 shorthand convention of stating tensile in hundreds of psi rather than a literal 6.9 psi result. Confirm the real value with the lab report before this number goes in front of a customer's quality department.*

4. Service temperature

Condition	Range
Continuous, dry air	-80°F to +400°F (-62°C to +204°C)
Intermittent, short excursion	To +500°F (+260°C), class typical, unconfirmed for this compound
Continuous, in hot water	Below +212°F (+100°C)
Low temperature brittleness, ASTM D2137	Passed at -55°C

This compound stays flexible at temperatures that would stiffen and eventually crack nitrile or EPDM, and the certified heat aging shows essentially no hardness shift after 70 hours at 225°C. Steam and hot water are a different story: expect reversion, a soft, sticky breakdown of the rubber, above roughly 250°F, so this is not the compound for a superheated steam line even though the dry air rating looks generous. Wet steam-in-place cycles under 212°F are fine.

5. Media compatibility

RECOMMENDED Hot dry air to 400°F. Cold to -80°F. Water below 212°F. Dilute salt solutions and sea water. Ozone, UV, and outdoor weathering. Fire resistant hydraulic fluids of the HFD-R and HFD-S type. High and low voltage electrical service. Food and beverage contact service such as coffee and beer lines, given the FDA compliance.	LIMITED OR CONDITIONAL Petroleum engine and gear oils cause moderate swell, tolerable in low pressure static service only, not dynamic. Animal and vegetable oils and greases are generally fine in FDA grades but confirm at temperature. High molecular weight chlorinated aromatic hydrocarbons, the electrical insulating and transformer coolant type, are tolerated; this does not extend to chlorinated solvents. Steam above roughly 250°F causes reversion.	NOT RECOMMENDED Ketones such as MEK. Concentrated acids and alkalis. Automatic transmission fluid. Low molecular weight chlorinated hydrocarbons such as trichloroethylene. Aromatic mineral oil and hydrocarbon fuels. Aromatic hydrocarbons such as benzene and toluene. Superheated steam above 250°F. Silicone oils and greases, which swell this compound badly, and standard automotive brake fluid.
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6. Mechanical weakness caution

This is a static compound. Do not put it on a moving part.

Tear strength and abrasion resistance on this compound are a fraction of what nitrile offers. In a moving gland it shreds, and it tears more easily than almost anything else on the shelf if it is dragged over a sharp machined edge or a burred bore during installation. The most common way a customer's own crew ruins these rings before they ever run: greasing them with silicone grease as an installation lubricant. Silicone grease swells silicone rubber badly, and it is the single most common installation mistake we see with this compound.

Exposure	Guidance
Any moving or rotating gland	Do not specify this compound. Move to fluorosilicone if fuel resistance is also needed, or to a stronger elastomer entirely if the joint truly moves.
Installation over a sharp edge, burr, or thread	Deburr the gland and chamfer the lead-in. Use an installation tool, not a screwdriver blade.
Choosing an installation lubricant	Never use a silicone-based grease. Use a compatible FDA grade lubricant instead and confirm it against Section 5 before applying it.

If the application has any rotation, reciprocation, or repeated flexing, ask us about fluorosilicone (FVMQ), which keeps most of the temperature range and adds fuel resistance without solving the strength problem, or about a completely different polymer family sized for dynamic service. Silicone earns its place on the static, FDA, or extreme temperature jobs, and it should stay there.

7. Design and installation guidance

Item	Guidance
Gland type	A5568 standard static gland. Not rated for a dynamic gland design.
Squeeze, static	15 to 30%. Toward the high end for the best seal margin given this compound's low modulus.
Squeeze, dynamic	Not applicable. This compound is not intended for dynamic service; see Section 6.
Stretch on installation	Keep under 5%. This compound tears more readily than nitrile or EPDM under installation stress.
Gland fill	65 to 85% at temperature. Silicone's thermal expansion is higher than most elastomers, size the gland accordingly for the top of the service range.
Surface finish, static	16 to 32 microinch Ra is adequate for a static joint. Deburr any sharp edges in the bore or gland completely.
Backup rings	Rarely needed given the static-only use, but add them above roughly 1,500 psi given this compound's low extrusion resistance.

Lubrication	Use a compatible FDA grade lubricant. Never use silicone grease, it swells this compound badly. See the caution in Section 6.
Handling	Handle by the edges, not by stretching over sharp corners. This compound cuts easily during installation.

8. Regulatory status

FDA compliant to 21 CFR 177.2600.

This compound is formulated and tested to the Z callout on its ASTM D2000 line designation, MBGE606 A19 B37 EA14 EO36 F19 Z, where Z is defined on the compound's test record as FDA compliance per 21 CFR 177.2600. This is a formulation and test based claim from the compound record on file, not a third party certificate. If your project needs a formal FDA statement of compliance or a customer specific letter, ask us and we will get you the paperwork behind this line.

If your application does not actually need FDA compliance, a non-FDA general purpose silicone or a different polymer family entirely may cost less for the same physical performance. Ask us before you pay the FDA premium on a part that will never see food or drug contact.

Standard	Status
FDA 21 CFR 177.2600	Compliant
NSF/ANSI 51, food equipment	Not certified
NSF/ANSI/CAN 61, potable water	Not certified
USP Class VI	Not certified
3-A Sanitary Standards	Not certified
RoHS 2011/65/EU	Not on file for this compound, ask us to confirm
Natural rubber latex	Contains none, silicone contains no natural rubber latex

9. Storage, handling, and shelf life

Storage follows SAE ARP5316 and ISO 2230. Silicone is one of the compounds where shelf life is effectively unlimited under proper storage, so do not throw away good stock over a stamped date alone.

- Store below 100°F, away from direct sunlight and away from any ozone source such as motors, transformers, or fluorescent lighting ballasts.
- Keep parts in their original packaging until use to protect against dust and physical damage; this compound cuts and nicks easily in loose storage.
- No special humidity control needed; silicone does not hydrolyze or absorb moisture the way polyurethane does.
- Store relaxed, not stretched or compressed, to avoid a permanent set before the part ever goes into service.
- Effectively unlimited shelf life under ARP5316 when stored properly. Do not discard usable stock on cure date alone.
- Clean with mild soap and water or isopropyl alcohol. Avoid solvent cleaners; see Section 5.

10. Typical applications

This compound shows up wherever food, beverage, or medical contact meets a static seal: coffee and beer dispensing equipment, food processing gaskets, pharmaceutical and lab equipment seals, baby and personal care product manufacturing, and medical device housings. Outside of food and medical work, its extreme temperature range and weather resistance make it a common choice for outdoor electrical enclosures, oven and appliance door seals, and any static joint that needs to survive both a hard freeze and a long bake without attention. Anywhere a customer needs an FDA compliant static seal that also has to survive a wide temperature swing, this is the compound to reach for instead of a general purpose, non-FDA silicone.

11. What you get from The O-Ring Store

We stock the most common O-Ring sizes, plus the ones our customers ask for and use. Every batch is certified by the Olypsys® O-Ring Measurement System from The O-Ring Store LLC, an ISO 9001:2015 certified distributor.

- Certificate of Conformance with every shipment, no charge and no asking twice.
- Dimensional verification on every lot through the Olypsys® system, reporting actual measured ID, cross section, and out of round rather than a pass or fail stamp.
- Full AS568 size range, plus metric and custom sizes.
- Lot traceability maintained on all material. Cure date and lot number on every bag.
- Technical support on gland design, compound selection, and failure analysis at no charge. Send us the failed part along with the fluid and the temperature, and we will tell you what happened to it.

THE O-RING STORE LLC

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ISO 9001:2015 Certified | CAGE Code 72PR0

We make getting O-Rings easy!

The information in this data sheet is offered in good faith for engineering reference. Typical values represent the compound class and are not specification limits, guarantees, or warranties of performance. Compatibility, service life, and suitability for any specific application must be verified by the user under actual service conditions. Revision A, September 2026.

