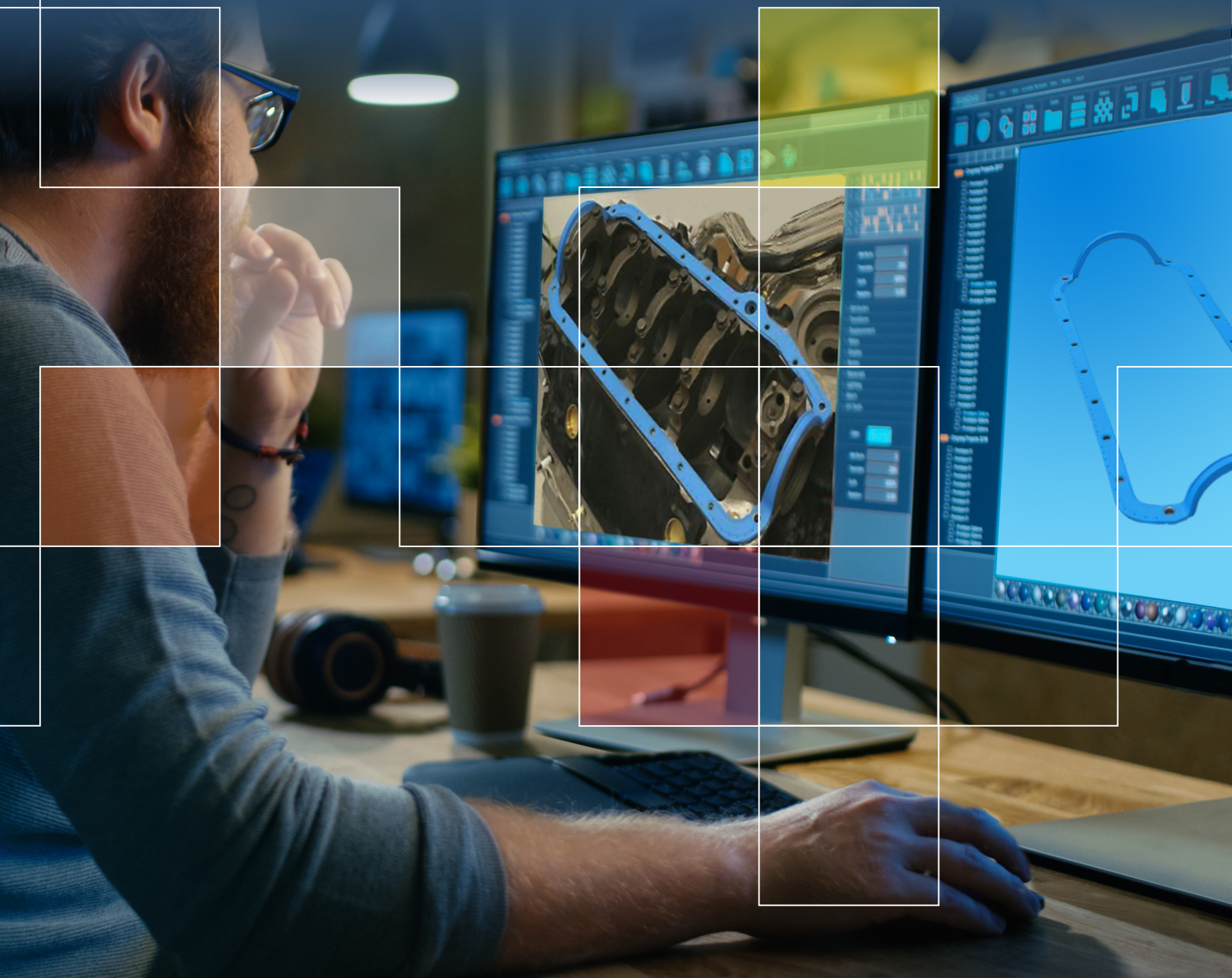


# TOMORROW'S TECHNOLOGY

IS DRIVEN BY AN INCREASE IN PERFORMANCE IMAGINED TODAY.  
SILICONE CAN HELP.



# INNOVATION IS A CONTINUUM



TOMORROW'S TECHNOLOGY  
WILL BE DRIVEN BY  
HIGHER PERFORMANCE  
IMAGINED TODAY.

Silicone is at the heart of performance. We know because we are an industry leader, manufacturing closed cell sponge or solid rubber in a variety of shapes and sizes. Our engineering team is the start of the manufacturing process, partnering with product designers to transform silicone into custom engineering solutions. This consultative process results in superior, advanced silicone barrier protection that fits your exact standards.

Our customers are always searching for improvements that will make them safer, more efficient, and perform better. Strategic planners always have their eyes on the next five to ten years and beyond. We understand this because it is our approach too.

Our experienced engineers speak the language of your industry. We share a common language and make arriving at an optimal solution a painless process.

We look to future innovations because that is where we build on our history of success. We strive to help product design and development go that much more smoothly. Every collaboration is an investment in the future.





Simply stated, if it negatively affects your product's performance, our critical seals keep it out. Whether it's temperatures, moisture, dust, wind, or other contaminants, critical seals can make or break product performance.

We retain heat in commercial ovens and kilns while keeping ambient temperatures out. Conversely, we keep cold temperatures steady in refrigeration. You'll find us in all facets of transportation, from the space shuttle to agricultural equipment. We keep damaging particles out of fuel lines, braking systems, and even clean rooms.

**Our engineers take excellent performance today and imagine it for tomorrow.**



A photograph of an industrial factory floor. On the left, there are large blue industrial machines with various pipes and hoses connected to them. The floor is covered with metal grating. In the background, more machinery and structural elements of the factory are visible, creating a sense of depth. The lighting is industrial, with some bright spots and shadows.

# ORDERING INFORMATION

Bellofram Silicones, a division of the Bellofram Group of Companies and a member of the Bellofram Elastomers group, is an industry leader in the design, development, and manufacture of extruded silicone, silicone sponge foam sheeting, and molded rubber products, including specialty rubber compounds. We have taken the very best technology, chemistry, and rubber know-how from antecedents Mold Ex, MTI Specialty Silicones, and Groendyk Manufacturing to become a one-stop shop for sealing, gasket, and insulation requirements. To view our entire selection of silicone products, visit the website below:

**[www.belloframsilicones.com](http://www.belloframsilicones.com)**

If you need silicone components that are custom made to very specific standards, we can help you. Just call our engineers at the number listed below, let us know what you need, and we can create the exact silicone tailored to your needs.

**RFQ Department: 1-800-727-5646**



# HOW TO READ ASTM DESIGNATIONS

The American Society for Testing Materials (ASTM) created the specification standard D1056 for both closed cell and open cell materials. The final three characters in a designation code describe the product's type, class, and grade.

Listed below is an example of an ASTM designation for our Silicone Sponge Extruded Product. We are going to use this as an example to demonstrate how to properly read an ASTM designation guide.

## ASTM D1056 2D1

**2= Type** Type 2 indicates this is a closed-cell product.

**D= Class** Class D means this is a silicone product with extreme temperature resistance.

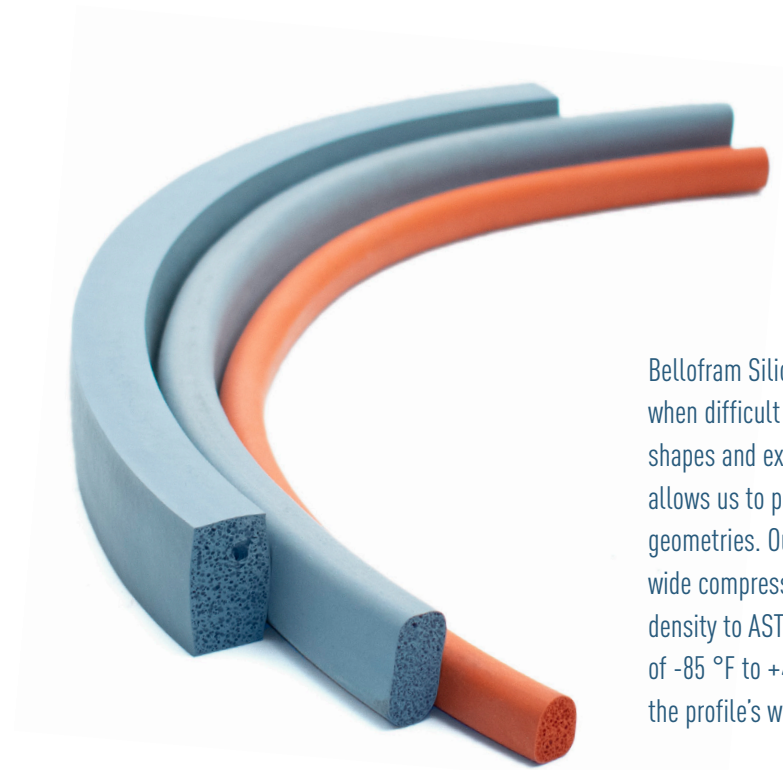
**1= Grade** This describes the product's compression deflection (the force needed to compress product thickness by 25%.) This product is Grade 1, meaning the force required is 2 to 5 psi (pounds per square inch).

ASTM Codes		
TYPE	CLASS	GRADE
1-Open Cell	A- Non-oil Resistant (EPDM or SBR)	0-less than 2 psi
2-Closed Cell	B- Oil Resistant, low swell (Nitrile)	1-2 to 5 psi
	C- Oil resistant, medium swell (Neoprene)	2-5 to 9 psi
	D- Extreme temperature resistance (Silicone)	3-9 to 13 psi
		4-13 to 17 psi
		5-17 to 25 psi

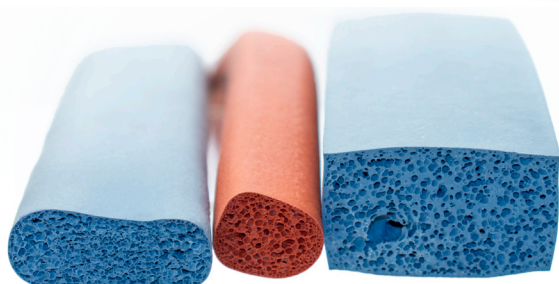


# BELLOFRAM

## Closed Cell Silicone Sponge Extrusion Products



Bellofram Silicones extruded closed cell silicone sponge profiles are used when difficult sealing problems require a combination of complex gasket shapes and extreme flexibility. Our full in-house die-making capability allows us to produce cords, rectangles, tubes, and any other complex geometries. Our in-house mixing provides a choice of materials with a wide compression deflection rating, ranging from ASTM D1056-2D1 soft density to ASTM D1056-2D5 extra firm density, with a temperature rating of -85 °F to +400 °F for continuous use. The self-forming skin enhances the profile's water absorption resistance.



Need to meet a BMS requirement? Bellofram is a certified supplier of BMS 1-23 and BMS 1-60 molded products. We offer a flame-retardant version in each density range that will make sealing possible in extreme environments. A fully certified NSF/ANSI 51 version produced from FDA ingredients is available for applications where FDA compliance is required. Available in any color to blend with the aesthetics of your assembly.

SPECS AT A GLANCE	
Common Shapes	Cords (0.093" to 2.25"), tubes (up to 2.5" diameter), and any other complex geometries
Typical Uses	Sponge tubing ideal for pipe insulation, cord ideal for gasketing and sealing
Compression Deflection Rating	From ASTM D1056 2D1 (soft density) to ASTM D1056 2D5 (firm density)
Temperature Range	-85 °F to +400 °F for continuous use
Water Absorption	3% Max (typical)
Flame Retardant	FR versions available in all density ranges
Performance Characteristics	UV resistance, low compression set, and high temperature resistance
Colors	Any variety, color matching available
Specifications	BMS 1-13, BMS 1-60, NSF/ANSI 51, UL 94, and ASTM D1056



### MATERIAL PROPERTIES FOR CLOSED CELL SILICONE SPONGE EXTRUDED PRODUCTS

Compound	ASTM D1056 Designation	Compression Deflection (psi)	Heat Age 22hrs @ +302°F	Water Absorption	Compression Set 22 hrs @ +212°F	Low Temperature Flex 5 hrs @ -67°F
5104	ASTM D1056-2D1	2 to 5	Change in Compression Deflection ±5%	10% Max	30% Max	Pass
5204	ASTM D1056-2D2	5 to 9			27% Max	Pass
5304	ASTM D1056-2D3	9 to 13			25% Max	Pass
5404	ASTM D1056-2D4	13 to 17			25% Max	Pass
5504	ASTM D1056-2D5	17 to 25			22% Max	Pass

### MATERIAL PROPERTIES FOR FLAME RETARDANT SILICONE SPONGE EXTRUDED PRODUCTS

Compound	ASTM D1056 Designation	Compression Deflection (psi)	Heat Age 22hrs @ +302°F	Water Absorption	Compression Set 22 hrs @ +212°F	Low Temperature Flex 5 hrs @ -67°F	Meets Burn Requirements of UL 94 V-0
5109	ASTM D1056 2D1	2 to 5	Change in Compression Deflection ±5%	10% Max	35% Max	Pass	Yes
5209	ASTM D1056 2D2	5 to 9			35% Max	Pass	Yes
5309	ASTM D1056 2D3	9 to 13			35% Max	Pass	Yes
5409	ASTM D1056 2D4	13 to 17			35% Max	Pass	Yes
5509	ASTM D1056 2D5	17 to 25			35% Max	Pass	Yes

### MATERIAL PROPERTIES FOR NSF/ANSI 51 CERTIFIED SILICONE SPONGE EXTRUDED PRODUCTS

Compound	ASTM D1056 Designation	Compression Deflection (psi)	Heat Age 22hrs @ +302°F	Water Absorption	Compression Set 22 hrs @ +212°F	Low Temperature Flex 5 hrs @ -67°F	NSF/ANSI 51 Certified
5104-NSF	ASTM D1056 2D1	2 to 5	Change in Compression Deflection ±5%	10% Max	47% Max	Pass	Yes
5204-NSF	ASTM D1056 2D2	5 to 9			47% Max	Pass	Yes
5304-NSF	ASTM D1056 2D3	9 to 13			58% Max	Pass	Yes
5404-NSF	ASTM D1056 2D4	13 to 17			46% Max	Pass	Yes
5504-NSF	ASTM D1056 2D5	17 to 25			42% Max	Pass	Yes

### BMS 1-60 CLOSED CELL SILICONE SPONGE

Compound	Grade Designation	Color	Compression Deflection (psi)	Density, Max (lb/ft³)	Water Absorption	Compression Set 22 hrs @ +212°F	Elongation %	Flammability Max	High Temperature Stability 70 hrs @ +350°F
5129-BMS	Grade A	Blue-Gray	2 to 6	37	15% Max	35% Max	100% Max	15.0 seconds extinguish time 3.0 seconds drip extinguish time 4.0 inches maximum burn length	No evidence of cracking, charring, surface tackiness or other forms of degradation
5329-BMS	Grade B	Blue-Gray	6 to 12	44	10% Max				
5529-BMS	Grade C	Blue-Gray	12 to 22	53	10% Max				

### BMS 1-23 CLOSED CELL SILICONE SPONGE

Compound	Compression Deflection (psi)	Compression Set 22 hrs @ +212 F	Water Absorption	Corrosion	Heat Age 72 hrs @ +350°F	Elongation %
5304-BMS	6 to 14	35% Max	10% Max	No Effect	Shrinkage 5% Max Disintegration None	150% Max



# BELLOFRAM

## Solid Silicone Elastomer Extrusions



Extensive expertise in customer formulations and toolmaking capabilities allow Bellofram Silicones to produce solid silicone elastomer extrusions in almost limitless shapes and hardnesses, and in diameters up to 2.5". Our extruded rubber cords, tubes, and custom profiles may be used to make gaskets, seals, and O-rings. They may also be used as grips and handles to ensure worker safety when operating hoses and nozzles. Larger diameter rubber extrusions are popular choices as bumpers and guards for equipment protection. Bellofram Silicones also offers solid silicone rubber extruded materials that can withstand 500,000 flexes, NSF/ANSI 51 certified versions from FDA ingredients, as well as commercial-grade silicones that are maintenance-free in less damaging environments. Bellofram Silicones solid extruded products are very resistant to compression set and high and low temperatures. Multiple extrusion manufacturing and production lines allow us to produce virtually any required quantities with very short lead times.

SPECS AT A GLANCE	
Common Shapes	Cords (0.093" to 2.25"), tubes (up to 2.5" diameter), and any other complex geometries
Typical Uses	Tubing and cords are ideal for gaskets, seals, O-rings, grips, handles, and protection on hoses and nozzles. Also ideal for bumpers and equipment guards. Custom extrusions allow for unlimited protection possibilities.
Temperature Range	-85°F to +400°F for continuous use
Hardness Range	Shore "A" ratings from 30 to 80
Flame Retardant	FR Versions available in all hardness ranges
Performance Characteristics	High tear, high flex, low compression set, low and high temperature rating
Colors	Any variety, color matching available



### MATERIAL PROPERTIES OF BELLOFRAM HIGH-TEAR AND FLEX-RESISTANT SOLID SILICONE EXTRUDED PRODUCTS

Solid Silicone Extruded Products to Spec to Spec A-A-59588 CL3B, GR30, GR50					ASTM D395	Heat Age 70 Hours @ +392°F (ASTM D573)			ASTM D2137	ASTM D471	ASTM D813	ASTM D2632
Compound Model	Durometer Shore "A"	Tensile Strength Min, psi	Elongation % Min	Tear Resistance, (ppi)	Compression Set 70 hrs @+212°F	Hardness Change	Tensile Change	Elongation Change	Brittle Point, Min. °C(°F)	Water Immersion, Volume Change (%)	DeMattia Flex, (1/2 inch max crack growth)	Impact Resilience, Min (%)
6305	30±5	1000	500	150	25	±5	-20%	-35%	-70(-94)	+5	500,000 cycles	40
6505	30±5	1200	500	150	20	±10	-25%	-30%	-70(-94)	+5	140,000 cycles	45

### MATERIAL PROPERTIES OF BELLOFRAM SOLID SILICONE EXTRUDED PRODUCTS

Compound Model	ASTM D2000-08 Designation	Durometer Shore "A"	Tensile (psi)	Heat Age, 70hrs @ +437°F	Oil Immersion IRM 903 70 hrs @ +302°F	Compression Set, 22 hrs @ +347°F
6304	ASTM D2000 M1GE305	30±5	1175	Change in Tensile Strength, ±30%	Volume Change, +63%	28%
6404	ASTM D2000 M1GE405	40±5	1150		Volume Change, +61%	42%
6504	ASTM D2000 M1GE505	50±5	930	Change in Elongation, -50%	Volume Change, +59%	61%
6604	ASTM D2000 M1GE605	60±5	925		Volume Change, +46%	33%
6704	ASTM D2000 M1GE705	70±5	820	Change in Durometer, ±15 pts	Volume Change, +41%	42%
6804	ASTM D2000 M1GE805	80±5	810		Volume Change, +35%	40%

### MATERIAL PROPERTIES OF BELLOFRAM SOLID SILICONE EXTRUDED PRODUCTS

Compound Model	ASTM D2000-08 Designation	Durometer Shore "A"	Tensile (psi)	Heat Age, 70 hrs @ +437°F	Oil Immersion IRM 903 70 hrs @ +302°F	Compression Set, 22 Hrs @ +347°F	Meets Burn Requirements of UL 94 V-0
6309	ASTM D2000 M1GE305	30±5	5 (725)	Change in Tensile Strength, ±30%	Volume Change, +80%	50% Max	Yes
6409	ASTM D2000 M1GE405	40±5		50% Max		Yes	
6509	ASTM D2000 M1GE505	50±5		Change in Elongation, -50%		50% Max	Yes
6609	ASTM D2000 M1GE605	60±5		50% Max		Yes	
6709	ASTM D2000 M1GE705	70±5		Change in Durometer, ±15 pts		50% Max	Yes
6809	ASTM D2000 M1GE805	80±5		50% Max		Yes	

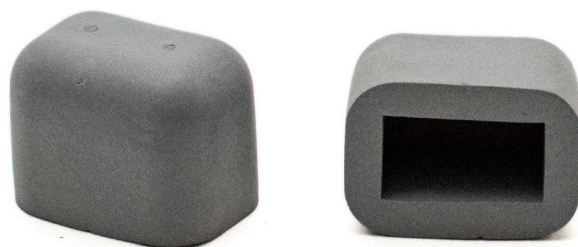
### MATERIAL PROPERTIES OF BELLOFRAM SOLID SILICONE EXTRUDED PRODUCTS

Compound Model	ASTM D2000-08 Designation	Durometer Shore "A"	Tensile (psi)	Heat Age, 70 Hrs @ +437°F	Oil Immersion IRM 903 70 hrs @ +302°F	Compression Set, 22 Hrs @ +347°F	NSF/ANSI 51 Certified
6304-NSF	ASTM D2000 M1GE305	30±5	1175	Change in Tensile Strength, ±30%	Volume Change, +63%	28%	Yes
6404-NSF	ASTM D2000 M1GE405	40±5	1150		Volume Change, +61%	42%	Yes
6504-NSF	ASTM D2000 M1GE505	50±5	930	Change in Elongation, -50%	Volume Change, +59%	61%	Yes
6604-NSF	ASTM D2000 M1GE605	60±5	925		Volume Change, +46%	33%	Yes
6704-NSF	ASTM D2000 M1GE705	70±5	820	Change in Durometer, ±15 pts	Volume Change, +41%	42%	Yes
6804-NSF	ASTM D2000 M1GE805	80±5	810		Volume Change, +35%	40%	Yes

# BELLOFRAM

## Closed Cell Silicone Sponge

### Molded Products



Bellofram Silicones is one of a very small number of closed cell silicone sponge molded elastomer manufacturers. Our own in-house mixing gives you the choice of materials with a wide compression deflection rating, from ASTM D1056-2D1 soft density to ASTM D1056-2D5 extra firm density, with a temperature range of  $-85^{\circ}\text{F}$  to  $+400^{\circ}\text{F}$  for continuous use. The self-forming skin enhances product resistance to water absorption and protects from contaminants.

Need to meet a BMS requirement? Bellofram is a certified supplier of BMS 1-23 and BMS 1-60 molded products. We offer a flame-retardant version in each density range that will make sealing possible in extreme environments. A fully certified NSF/ANSI 51 version produced from FDA ingredients is available, in applications where FDA compliance is required. Available in any color to match the aesthetics of your product vision.

SPECS AT A GLANCE	
Materials	Closed cell silicone sponge, solid silicone, neoprene sponge, EPDM sponge, neoprene, EPDM, SBM, nitrile, FKM, FVM
Flame Retardant	FR version available in each density range
Colors	Any variety, color matching available
Specifications	ASTM D1056, ASTM D2000, A-A-59588 (ZZR-765), BMS 1-23, BMS 1-60, NSF/ANSI 51 FDA



#### MATERIAL PROPERTIES FOR CLOSED CELL SILICONE SPONGE MOLDED PRODUCTS

Compound	ASTM D1056 Designation	Compression Deflection (psi)	Heat Age 22 hrs @ +302°F	Water Absorption	Compression Set 22 hrs @ +212°F	Low Temperature Flex 5 hrs @ -131°F
7104	ASTM D1056 2D1	2 to 5	Change in Compression Deflection ±5%	10% Max	41% Max	Pass
7204	ASTM D1056 2D2	5 to 9			39% Max	Pass
7304	ASTM D1056 2D3	9 to 13			19% Max	Pass
7404	ASTM D1056 2D4	13 to 17			16% Max	Pass
7504	ASTM D1056 2D5	17 to 25			23% Max	Pass

#### MATERIAL PROPERTIES FOR FLAME-RETARDANT SILICONE SPONGE MOLDED PRODUCTS

Compound	ASTM D1056-2D1 Designation	Compression Deflection (psi)	Heat Age 22 hrs @ +302°F	Water Absorption	Compression Set 22 hrs @ +212°F	Low Temperature Flex 5 hrs @ -131°F	Meets Burn Requirements of UL 94 V-0
7109	ASTM D1056 2D1	2 to 5	Change in Compression Deflection ±5%	10% Max	34% Max	Pass	Yes
7209	ASTM D1056 2D2	5 to 9			35% Max	Pass	Yes
7309	ASTM D1056 2D3	9 to 13			35% Max	Pass	Yes
7409	ASTM D1056 2D4	13 to 17			32% Max	Pass	Yes
7509	ASTM D1056 2D5	17 to 25			32% Max	Pass	Yes

#### MATERIAL PROPERTIES FOR NSF/ANSI 51 CERTIFIED SILICONE SPONGE MOLDED PRODUCTS

Compound	ASTM D1056 Designation	Compression Deflection (psi)	Heat Age 22 hrs @ +302°F	Water Absorption	Compression Set 22 hrs @ +212°F	Low Temperature Flex 5 hrs @ -131°F	NSF/ANSI 51 Certified
7104-NSF	ASTM D1056 2D1	2 to 5	Change in Compression Deflection ±5%	10% Max	42% Max	Pass	Yes
7209-NSF	ASTM D1056 2D2	5 to 9			38% Max	Pass	Yes
7309-NSF	ASTM D1056 2D3	9 to 13			19% Max	Pass	Yes
7409-NSF	ASTM D1056 2D4	13 to 17			16% Max	Pass	Yes
7509-NSF	ASTM D1056 2D5	17 to 25			23% Max	Pass	Yes

#### BMS 1-60 CLOSED CELL SILICONE SPONGE

Compound	Grade Designation	Color	Compression Deflection (psi)	Density, Max (lb/ft³)	Water Absorption	Compression Set 22 hrs @ +212°F	Elongation %	Flammability Max	High Temperature Stability 70 hrs @ +350°F
7129-BMS	Grade A	Blue-Gray	2 to 6	37	15% Max	35% Max	100% Max	15.0 seconds extinguish time 3.0 seconds drip extinguish time 4.0 inches maximum burn length	No evidence of cracking, charring, surface tackiness or other forms of degradation
7329-BMS	Grade B	Blue-Gray	6 to 12	44	10% Max				
7529-BMS	Grade C	Blue-Gray	12 to 22	53	10% Max				

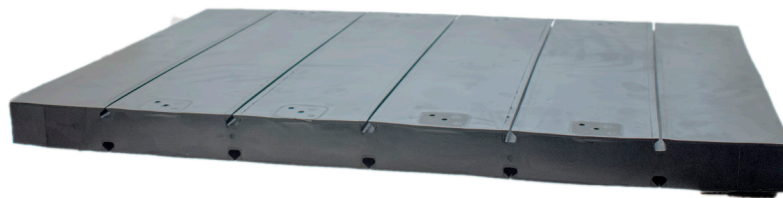
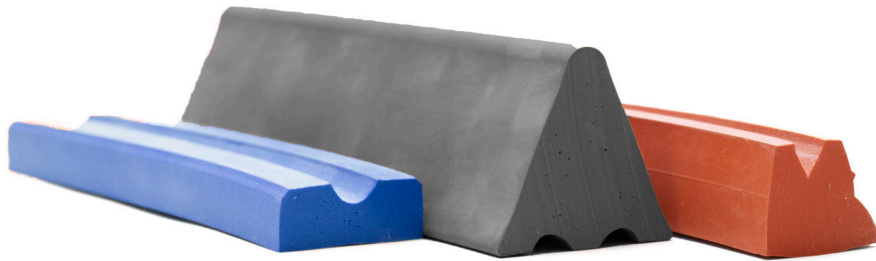
#### BMS 1-23 CLOSED CELL SILICONE SPONGE

Compound	Compression Deflection (psi)	Compression Set 22 hrs @ +212°F	Water Absorption	Corrosion	Heat Age 72 hrs @ +350°F	Elongation %
7304-BMS	6 to 14	35% Max	10% Max	No Effect	Shrinkage 5% Max Disintegration None	150% Max

# BELLOFRAM

## Solid Silicone

### Molded Products



Want to get started right away? No problem! Just refer to the charts below to match one of our 30 to 80 durometer Shore "A" compounds with a profile of your design, for a quick solution to even your most complex sealing needs.

Bellofram Silicones offers solid silicone molded products, available in 30 to 80 Shore "A" durometer, with a temperature range of  $-85^{\circ}\text{F}$  to  $+400^{\circ}\text{F}$  for continuous use. Material choices range from economical commercial grade to high-performance low-temperature, flex- and tear-resistant specification grades. These products can be tinted to most colors. Our in-house mixing of customer formulations also allows us to produce materials to the ASTM, SAE, MIL-STD, and other military and industrial specifications. Fully certified NSF/ANSI 51 formulations produced with FDA ingredients are also available.

SPECS AT A GLANCE	
Materials	Closed cell silicone sponge, solid silicone, neoprene sponge, EPDM sponge, neoprene, EPDM, SBM, nitrile, FKM, FVM
Flame Retardant	FR version available in each density range
Colors	Any variety, color matching available
Specifications	ASTM D1056, ASTM D2000, A-A-59588 (ZZR-765), BMS 1-23, BMS 1-60, NSF/ANSI 51 FDA



### MATERIAL PROPERTIES OF BELLOFRAM HIGH TEAR- AND FLEX-RESISTANT SOLID SILICONE EXTRUDED PRODUCTS

Solid Silicone Extruded Products to Spec to Spec A-A-59588 CL3B, GR30, GR50					ASTM D395	Heat Age 70 Hours @ +392°F (ASTM D573)			ASTM D2137	ASTM D471	ASTM D813	ASTM D2632
Compound Model	Durometer Shore "A"	Tensile Strength Min. (psi)	Elongation % Min	Tear Resistance, (ppi)	Compression Set, 70 hrs @ +212°F	Hardness Change	Tensile Change	Elongation Change	Brittle Point, Min. °C (°F)	Water Immersion, Volume Change (%)	DeMattia Flex, (1/2" crack growth)	Impact Resilience, Min (%)
8305	30±5	1000	500	150	25	±5	-20%	-35%	-70 (-94)	+5	500,000 cycles	40
8505	50±5	1200	500	150	20	±10	-25%	-30%	-70 (-94)	+5	140,000 cycles	45

### MATERIAL PROPERTIES OF BELLOFRAM SOLID SILICONE EXTRUDED PRODUCTS

Compound Model	ASTM D2000-08 Designation	Durometer Shore "A"	Tensile (psi)	Heat Age, 70 hrs @ +437°F	Oil Immersion IRM 903 70 hrs @ +302°F	Compression Set, 22 hrs @ +347°F
8304	ASTM D2000 M1GE305	30±5	1350	Change in Tensile Strength, ±30%	Volume Change, +64%	14%
8404	ASTM D2000 M1GE405	40±5	1235		Volume Change, +62%	16%
8504	ASTM D2000 M1GE505	50±5	1100	Change in Elongation, -50%	Volume Change, +49%	18%
8604	ASTM D2000 M1GE605	60±5	725		Volume Change, +47%	26%
8704	ASTM D2000 M1GE705	70±5	900	Change in Durometer, ±15 pts	Volume Change, +38%	28%
8804	ASTM D2000 M1GE805	80±5	1000		Volume Change, +30%	23%

### MATERIAL PROPERTIES OF BELLOFRAM FLAME-RETARDANT SOLID SILICONE MOLDED PRODUCTS

Compound Model	ASTM D2000-08 Designation	Durometer Shore "A"	Tensile (psi)	Heat Age, 70 hrs @ +437°F	Oil Immersion IRM 903 70 hrs @ +302°F	Compression Set, 22 Hrs @ +347°F	Meets Burn Requirements of UL 94 V-0
8309	ASTM D2000 M1GE305	30±5	1350	Change in Tensile Strength, ±30%	Volume Change, +80%	14%	Yes
8409	ASTM D2000 M1GE405	40±5	1235		Volume Change, +62%	16%	Yes
8509	ASTM D2000 M1GE505	50±5	1100	Change in Elongation, -50%	Volume Change, +49%	18%	Yes
8609	ASTM D2000 M1GE605	60±5	725		Volume Change, +47%	26%	Yes
8709	ASTM D2000 M1GE705	70±5	900	Change in Durometer, ±15 pts	Volume Change, +38%	28%	Yes
8809	ASTM D2000 M1GE805	80±5	1000		Volume Change, +30%	23%	Yes

### MATERIAL PROPERTIES OF BELLOFRAM NSF/ANSI 51 CERTIFIED SOLID SILICONE MOLDED PRODUCTS

Compound Model	ASTM D2000-08 Designation	Durometer Shore "A"	Tensile (psi)	Heat Age, 70 hrs @ +437°F	Oil Immersion IRM 903 70 hrs @ +302°F	Compression Set, 22 hrs @ +347°F	NSF/ANSI 51 Certified
8304-NSF	ASTM D2000 M1GE305	30±5	1350	Change in Tensile Strength, ±30%	Volume Change, +64%	14%	Yes
8404-NSF	ASTM D2000 M1GE405	40±5	1235		Volume Change, +62%	16%	Yes
8504-NSF	ASTM D2000 M1GE505	50±5	1100	Change in Elongation, -50%	Volume Change, +49%	18%	Yes
8604-NSF	ASTM D2000 M1GE605	60±5	725		Volume Change, +47%	26%	Yes
8704-NSF	ASTM D2000 M1GE705	70±5	900	Change in Durometer, ±15 pts	Volume Change, +38%	28%	Yes
8804-NSF	ASTM D2000 M1GE805	80±5	1000		Volume Change, +30%	23%	Yes

# BELLOFOAM

## Closed Cell Silicone

### Sponge Sheets



**BELLOFOAM** from Bellofram Silicones is the lightest high-consistency closed cell silicone rubber sheeting material on the market. It contains truly closed cells, as determined by the stringent ASTM D1056 water absorption under vacuum method, eliminating wicking. The formulation and construction of these sheets allows for continuous operation of materials over a wide temperature range of -85 °F to +400 °F, with outstanding recovery after compression. The sheets skived from buns can be supplied from 0.125" to 2.00" thickness, or buns can be skived into sheets using a customer's own equipment.

There are three available ASTM D1056 hardness version of the standard sheet, including one with the necessary enhanced fire retardant additives to meet UL 94 V-0 specifications, and a second version with fluorosilicone sponge properties, meeting the requirements of AMS3323. With these and other available options, BELLOFOAM silicone foam rubber sponge sheets cover a wide range of demanding physical, temperature, and chemical environments. BELLOFOAM Closed Cell Silicone Foam Rubber Sponge Sheets are also available for direct order via our online shopping cart. Please use the chart below to select the correct part number for your requirements.

SPECS AT A GLANCE	
Thickness	From 0.063" to 2.00" thickness
Compression Deflection Rating	From 2D0 to 2D3
Temperature Range	-85 °F to +400 °F
Flame Retardant	One version
Fluorosilicone	One version
Standards	UL 94 V-0 and UL 94 V-1
Specifications	ASTM D1056 and AMS3323





#### BELLOFOAM CLOSED CELL SILICONE SPONGE SHEETING

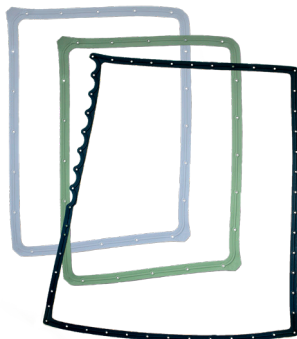
Bellofoam Material Type	Color	Compression Deflection (PSI) ASTM D1056	Compression Set ASTM-D-1056	Density (lb/ft <sup>3</sup> ) ASTM D1056	Water Absorption ASTM D1056	Flammability FMVSS302	Temperature Range (°F)	Material Specifications
7604	All	2 to 5	6%	12 Max	10% Max	PASS	-85° to +400°	ASTM D1056 D1
7605	All	0-2	6%	10 Max	10% Max	PASS	-85° to +400°	ASTM D1056 2D0
7704	All	5 to 9	6%	20 Max	10% Max	PASS	-85° to +400°	ASTM D1056 2D2
7804	All	9 to 13	4%	30 Max	10% Max	PASS	-85° to +400°	ASTM D1056 2D3, AMS 3195, BMS 1-23, & MIL-R-46089 GRADE M
7629	Grey	0 to 5	25%	12 Max	10% Max	PASS	-85° to +400°	ASTM D1056 2D0 and 2D1 UL 94, V-0

#### BELLOFOAM CLOSED CELL FLUROSILICONE (FVM) SPONGE SHEETING

Material	Color	Class Designation AMS3323	Compression Deflection (psi) ASTM D1056	Compression Set ASTM D1056	Density (lb/ft <sup>3</sup> ) ASTM D1056	Fluid Resistance ASTM D471 (Fuel B)	Temperature Range (°F)	Material Specifications
7748	Light Blue	Class 1	2 to 9	25% Max	43 Max	Weight Change Max 0 to 50%	-85° to +400°	AMS3323 SAE AMS3323
7848	Light Blue	Class 2	9-18	25% Max	52 Max	Weight Change Max 0 to 50%	-85° to +400°	AMS3323, SAE AMS3323, MIL-R-6130 Type 2, Grade A,B,C (Excluding Paragraph 15 Flame Resistance)

# BELLOFRAM

## Silicones Capabilities Guide



### AEROSPACE & AIRCRAFT

Custom molding and compounding processes allow us to produce aircraft window seals that can withstand both runway and in-flight temperature extremes, with materials that exceed BMS requirements. The strategic embedding of fabrics within our flex-resistant silicone adds strength and prevents stretching. Our other military specifications and custom compounds can yield open or closed cell construction. From highly engineered gaskets to flame-retardant components to simple squeak and rattle sponge, we can do it all.

Our in-house mixing capabilities allow us to produce materials to all five hardness ranges of ASTM D1056. For aerospace requirements, Bellofram Elastomers is on the qualified products list for Boeing BMS 1-23, and all three hardnesses of BMS 1-60. We are able to produce product with a compression set value of 10% and in a variety of colors.



### COMMERCIAL FOOD SERVICE

We offer solid silicone rubber extruded materials in NSF/ANSI 51-certified versions, FDA-approved ingredients for food service and food processing applications. We also manufacture commercial-grade silicones that are maintenance-free in less-demanding environments.

Extensive expertise in custom formulations and toolmaking capabilities allow us to produce solid silicone elastomer extrusions in almost limitless shapes and hardnesses, in diameters up to 2.5". Multiple extrusion manufacturing and production lines allow us to produce virtually any required quantities with very short lead times. All compounds have a continuous standard operating temperature of -85 °F to +400 °F.



### HVAC

Our silicone products and silicone gaskets are ideal for HVAC applications. Our products can operate under continuous use in temperatures as low as -85 °F to as high as 400 °F. All of our products can stand up to demanding physical, temperature, and chemical environments and offer seals and protection to ensure that machines run reliably and efficiently.

Bellofram Elastomers can make solid silicone products for O-rings and gaskets inside of HVAC machinery as well as softer closed cell silicone for pipe insulation and sealing purposes. Our products range from ASTM D1056-2D1 soft density to ASTM D1056-2D5 extra-firm density. These products can be extruded or molded to satisfy the needs of any HVAC machine or system.



### INDUSTRIAL SEALS & GASKETS

Difficult sealing applications require a combination of complex gasket shapes and extreme flexibility. Our full in-house die-making capabilities allow us to produce cords, rectangles, tubes, and any other complex geometries. Our in-house mixing provides a choice of materials with a wide compression deflection rating, ranging from ASTM D1056 2D1 soft density to ASTM D1056 2D5 extra-firm density, with a temperature range of -85 °F to +400 °F for continuous use.

Our industrial gaskets and seals stand up to harsh conditions, wet environments, high pressures, and other critical applications. Each piece is precision-engineered for improved quality, long product life, tight tolerances, and strict alignment.



## MEDICAL

Bellofram Elastomers is one of an elite few that manufactures molded sponge rubber. Our products have a skin on all surfaces that resists water absorption and contamination, and is easy to clean and disinfect. This skin also provides resistance to cracks and nicks that can become a safe haven for bacteria and other contaminants.

Our solid and closed cell silicone products can be custom molded and extruded to meet your needs. Our in-house mixing capabilities allow us to easily accommodate custom formulations for any application and in any color. Our products can withstand a wide range of demanding physical, temperature, and chemical environments.

## MILITARY & DEFENSE

Our in-house custom mixes create extrusions, molded parts, vulcanized and fabricated parts, and sheets to ASTM, SAE, MIL-STD and other stringent military specifications. We are industry experts in aerospace silicone gaskets and seals, producing materials to all five hardness ranges of ASTM D1056. Bellofram Elastomers is on the qualified products list for Boeing BMS 1-23, and all three hardnesses of BMS 1-60. We are able to produce product with a compression set value of 10%, and in a variety of colors.

Custom molding and compounding processes allow us to produce aircraft window seals that can withstand both runway and in-flight temperature extremes, with materials that exceed BMS requirements. The strategic embedding of fabrics within our flex-resistant silicone adds strength and prevents stretching. Our other military specifications and custom compounds can yield open or closed cell construction. From highly engineered gaskets to flame-retardant components to simple squeak and rattle sponge, we can do it all.

## OIL & GAS

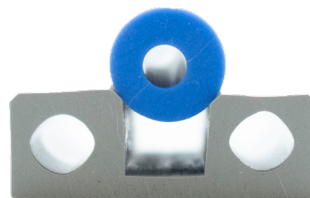
Our seals and gaskets can be fabricated to create seals for any oil and gas application. These seals can even be created for large perimeter areas. Our team can extrude our elastomer products to seal areas that make die-cut gaskets unworkable. The Bellofram Elastomers team can even create gaskets that are circular, rectangular, or unique shapes that are exclusive to a particular purpose.

The products we make are very resistant to compression, pressure, and high and low temperatures that oil and gas equipment is regularly subjected to. Match one of our 30 to 80 durometer shore "A" compounds with a profile of your design for your unique sealing problems.

## PROCESS TUBING & INSULATION

Our closed cell sponge tubing is an excellent piping insulator, with a high temperature rating of +400 °F, allowing it to be used in areas where elastomeric and plastic-based insulation tubing fail. At temperatures of +212 °F, it has a useful life of 10 to 20 years. Tooling is available for most ID and OD combinations. Its tough skin resists nicks, and its insulating values keep in the heat or cold. Product comes in 5 hardness ranges of standard silicone sponge, with 3 additional hardness ranges with fire-retardant additives.

Our process tubing is designed to perform to the standards of many industries and applications. Extruded solid silicone cords and tubes can be used to make gaskets, seals, and O-rings. They are also used as grips and handles to ensure personnel protection on hoses and nozzles. These parts can be produced up to 2.5", and make excellent bumpers and guards for equipment protection. Our mixing and compounding capabilities allow us to produce hardness ranges from 30 to 80 shore "A" durometer, using economical commercial grade or high-strength specification-grade materials.





# WE DELIVER.

## BELLOFRAM SILICONES IS THE FASTEST, MOST ACCURATE, AND MOST CONSISTENT PROVIDER.

High-performance products, short lead times, and pricing that's fiercely competitive. It all adds up to the most reliable partner you can choose.

- ▶ **Fast Delivery:** Made in the U.S.A. means high-quality products and efficient shipping.
- ▶ **Superior Products:** Made to fit your application and your budget.
- ▶ **Dynamic Capabilities:** From Pantone color matching to vulcanized rubber and beyond. We've done it all.






# Manufacturing excellence allows us to become supply-chain heroes.

We understand you want fewer suppliers, not more. We also know you want increased profits. This is where we shine. Once we engineer the product, we make you a supply-chain hero with consistent, right-time delivery.

Then, long after the initial sale, we keep improving your silicone for even greater performance. When we share information and work together, we make sure you always have the silicone products you need whether it's today, tomorrow, next year, or the next decade.

We are committed to reinvesting in your business.



8019 Ohio River Blvd.  
Newell, WV 26050 USA  
800-727-5646

**QUOTE**

DATE 09/21/2018  
QUOTE # BFS 327400  
CUSTOMER ID F942119  
VALID UNTIL 03/21/2019

**CUSTOMER**

Reidding Aircraft Co.  
8019 Grand River Blvd.  
Reidding, CA 94667 USA  
Prepared by: Robert Hall

DESCRIPTION	QUANTITY	COST
High tear and flex resistant solid molded silicone. Bellofram Silicone 8305	35,000	3100.00
NSF/ANSI Certified solid molded silicone. Bellofram Silicones 8304-NSF	15,500	725.00
Commercial Grade Solid Extruded Silicone Rubber	6,500	105.00

**TERMS AND CONDITIONS:**

**DELIVERY: 4 weeks**

Thank You for Your Business

[www.marshbellofram.com](http://www.marshbellofram.com)



Reidding Aircraft Co.  
8019 Grand River Blvd.  
Reidding, CA 94667 USA

**QUOTE**

DATE 09/21/2018

QUOTE # 147809194  
CUSTOMER ID RA-22004078  
VALID UNTIL 11/21/2018

**CUSTOMER**

Reidding Aircraft Co.  
8019 Grand River Blvd.  
Reidding, CA 94667 USA

DESCRIPTION	QUANTITY	COST
High tear and flex resistant solid molded silicone. Bellofram Silicone 8305	35,000	4999.00
Certified solid molded silicone. Bellofram Silicones 8304-NSF	15,500	832.00
Commercial Grade Solid Extruded Silicone Rubber	6,500	198.00

**delivery: 12-14 weeks**



### In-House Manufacturing Excellence

- Full in-house die-making capabilities allow us to produce virtually any shape, profile, or density to meet exacting specifications.
- In-house mixing provides a cost-competitive advantage in producing a wide range of closed cell silicone sponge materials. Material types include a wide range of compression deflection values from ASTM D1056-2D1 to ASTM D1056-2D5, available in NSF/ANSI 51 FDA, and flame resistant/retardant versions. Boeing Material Specification BMS 1-23 and all grades of BMS 1-60 are among our other capabilities.
- Our solid silicone rubber extruded materials can be manufactured to meet superior physical properties such as high-tear, high-flex, and low-temperature resistance per A-A-59588. They are available in FDA and NSF/ANSI 51 versions approved for all types of food contact as well as commercial grade ASTM D2000 that are maintenance free in less demanding environments.



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