

DRIVEN BY PERFORMANCE

Monarch[®] 5031

Closed cell EPDM / CR / SBR / blend foam in bun form

- // UL50E (periodic and continuous compression), UL508 and UL48 listed for gaskets and seals (recent upgrade)
- // Widely used general purpose EPDM / CR / SBR blend, an industry standard
- // ASTM D 1056-14 2A1 grade closed cell material
- // Manufactured in blocks (buns)
- // Listed on the approved source list of GMW 17408 Class I Type IV (MATSPC)

www.armacell.us



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Monarch[®]

MONARCH 5031 | Closed cell EPDM / CR / SBR / blend foam in bun form

Armacell LLC (Spencer, WV Plant) manufactures a black, closed cell, $6 \pm 2 \text{ lb/ft}^3$ ($96 \pm 32 \text{ kg/m}^3$) density, general purpose, EPDM / Neoprene / SBR blended rubber product 5031, that meets all the physical property requirements of ASTM D 1056-14 2A1.

// Manufactured with non-staining oils and anti-oxidants.

// Incorporates flame retardants, meets the requirements of FMVSS-302 at 2.5 mm (0.098") and higher and is listed with UL to UL 94 HF-1 (UL file# QMFZ2.E55798).

// Listed with UL to UL 50E (periodic and continuous compression), UL 48 and UL 508 (UL file# JMLU2.MH25062).

// Also available in gray (5931 - UL 50E / 48 / 508 listed but not UL 94 listed).

BUN SIZE INFORMATION

Product	Bun Size Options (in)			Bun Size Options (mm)			Color
	Width	Length	Thickness	Width	Length	Thickness	
5031	42	72	2.0	1067	1829	51	Black
5031	54	80	2.0	1372	2032	51	Black
5031	42	72	2.5	1067	1829	64	Black

The following is a list of automotive and industrial specifications that Armacell Monarch® 5031 has been tested to or can meet. Additional specifications are listed that have a few exceptions. Feel free to suggest other automotive, military or industrial specifications, and a full review will be made.

AUTOMOTIVE AND INDUSTRIAL SPECIFICATIONS

Source	Specification	Armacell Monarch® 5031	Comments
ASTM	ASTM D 1056-14	2A1	Additional (optional) suffixes can be added
ASTM	ASTM G 21-09	Data available	Fungus resistance test method
ASTM	ASTM D 925	Pass, no migration staining	Method B
ASTM	ASTM D 518 Method A	Pass (no cracks)	This is a test method. Outdoor ozone / 2000 hours
ASTM	ASTM D 1149	Pass, no cracking, rating 0	Ozone resistance
ASTM	ASTM D 1171	Pass, no cracking, rating 0	Ozone resistance
ASTM	ASTM D 6576-13	Type II grade A, B & C condition soft	Formerly MIL-R-6130-C
BEHR	BEHR 30.42.08	Meets with exceptions	Exceptions: fluid immersion and elongation
Bombardier	Bombardier SMP 205	Multiple exceptions	Expanded rubber closed cell
CAL	CAL 117-2013	Pass (Section 3)	Flame resistance
Caterpillar	1E0720	1E0720D (soft)	Exception to compression set and fluid immersion
Caterpillar	1E1576	D (soft)	No exceptions
Chrysler	Chrysler MSZ-75 J18	2A1	Additional (optional) suffixes can be added
Chrysler	Chrysler MS JP9-4	Meets at thicknesses of 2.5 mm (0.098") and higher	Flame resistance (horizontal burn rate)
Delphi	SD2-207	Paragraph 6.1	See note 3. On approved source list
Federal	FMVSS-302	Meets at thicknesses of 2.5 mm (0.098") and higher	Flame resistance (horizontal burn rate). See note 2
Ford	ESB M9 P1-A	Pass	Ozone specification
Ford	WSK M2D 419-A	Type 2	See note 1
Ford	WSS M99 P32 E1	Data available	Contact Technical Service Department for additional information
Ford	WSS M99 P32 E6	Data available	Contact Technical Service Department for additional information
Ford	WSS M99 P48 A1	Data available	Contact Technical Service Department for additional information
GM	GM 6090-M	(B4A) Meets at thicknesses of 2.5 mm (0.098") and higher	Flame resistance tested per GM 9070-P. (horizontal burn rate)
GM	GME 60-251	2A2U; pass, grade 0	Ozone resistance
GM	GM 9308P	Pass	Stress resistance of plastics
GM	GM 9305P	Request test report	Fogging
GM	GMW17408	Class I Type IV	Interior and exterior applications. On GM approved source list (MATSPC)
ISO	ISO 6916	2A1	Exception to compression set
Military	MIL STD 810C / 508	Data available	Fungus resistance
Military	ASTM D 6576-13	Type II grade A, B & C condition soft	Formerly MIL-R-6130-C
Mitsubishi	ES-X 60410	Meets at 0.100" (2.54 mm) and above	Flame specification
Mitsubishi	ES-X 60154	ER C1, F1 (EPDM / CR / SBR blend)	Compression deflection (hardness) is stated on the drawing
SAE	SAE J18 APR2002	2A1	Additional (optional) suffixes can be added
SAE	SAE J 1960	Request data	Xenon weathering (2481 kJ/m2 exposure)
SAE	SAE J369	Meets at thicknesses of 2.5 mm (0.098") and higher	Flame resistance (horizontal burn rate)
SAE	SAE J 1351	Rating 2	Odor test method

AUTOMOTIVE AND INDUSTRIAL SPECIFICATIONS (continued)

Source	Specification	Armacell Monarch® 5031	Comments
Toyota	TSM 1501G	2A1	Exception to compression set
Toyota	TSM 0500G	Meets at thicknesses of 2.5 mm (0.098") and higher	Flame resistance (horizontal burn rate)
UL	UL 94 HF-1	HF-1 listed at 1.5 mm (0.059") and higher	Horizontal flame resistance specification. (UL file # QMFZ2.E55798)
UL	UL 48 / UL 50E / UL 508	Suitable for UL 48, UL 50E (periodic and continuous compression), UL 508 in all colors	Gasket and seals / UL listed. (UL file # JMLU2.MH25062)
Visteon	VEF 4VH-80A100-AA	Pass	Biocide performance specification
Volvo	Volvo STD 5031.1	Meets at thicknesses of 0.125" (1/8") (3.18 mm) and higher	Meets the horizontal burn requirements listed on Volvo STD 5031.1 This test has slightly different requirements than those of FMVSS-302

Note 1: For all Ford WSK M2D 419-A callouts, request full information for each product due to some exceptions. Example: staining requirements.

Note 2: A number of horizontal burn tests can also be listed (GM 6090, BMW, Volvo, etc.). Request additional information.

Note 3: See QMPL-3621 revision 10. Effective date June 5, 2007.

DATA SHEET:

Physical Properties	Unit	Test Method	Typical Result
Density	lb/ft ³	ASTM D 1056	4 - 8
	kg/m ³	ASTM D 1056	64 - 128
Hardness, Durometer Shore 00		ASTM D 2240	40 - 60
Compression Deflection (25%)	psi	ASTM D 1056	2 - 5
	kPa	ASTM D 1056	13.8 - 34.5
Compression Set (Room temp)	%	ASTM D 1056	40 max
Tensile Strength	psi	ASTM D 412 (Die A)	75
	kPa	ASTM D 412 (Die A)	517
Tear Strength	lb/in	ASTM D 624 (Die C)	9.6
	kN/m	ASTM D 624 (Die C)	1.7
Elongation	%	ASTM D 412 (Die A)	125
Resilience	%	ASTM D 2632	35
Service Temperature			
Low	°F (°C)	ASTM D 1056	-40 (-40)
High Continuous	°F (°C)		200 (93.3)
High Intermittent	°F (°C)		250 (121.1)
Water Absorption			
Maximum weight change	%	ASTM D 1056	10
Fluid Immersion (7 days @ 23°C [73.4 °F]) ASTM Ref. Fuel B, Weight Change	%	ASTM D 1056	Not Applicable
Accelerated Aging (7 days at 70°C [158°F])			
Flexibility (180° bend without cracking)			Pass
Appearance Change			None
Change in Compression Deflection	%	ASTM D 1056	± 30
Combustion Characteristics		Thicknesses	Comments
FMVSS-302		0.098" (2.5 mm) and higher	Pass
UL 94			
HF-1		0.059" (1.5 mm) and higher	Listed, UL file # QMFZ2.E55798

ASTM D 1056 designation: 2A1

SAE J 18 APR2002 designation: 2A1

ASTM D 6576: Type II, Grades A, B & C, Condition Soft

Additionally UL Listed to: UL 48, UL 50E, and UL 508 (UL file# JMLU2.MH25062)

EPDM = [ethylene-propylene-diene-methylene]

SBR = styrene-butadiene rubber

Neoprene = polychloroprene (CR = chloroprene rubber)

UL FILE NUMBER FOR ARMACELL MONARCH® 5031

UL File Number: QMFZ2.E55798
Plastics – Component (UL 94)

CLOSED CELL EPDM / NEOPRENE / SBR BLEND

UL File number for Armacell Monarch® 5031, 5032, 5013, 5055 & 5955
UL File Number: JMLU2.MH25062 Gaskets and Seals – Component

Mtl Dsg	Max Serv Temp	Min Serv Temp	Density pcf	Tnst Str	Elong	Max Comp Set	Nom Thkns Range In.	Use (1)
F-005X13	60°C	-40°C	11.4	155	140	25.4	—	{2,3}
F-005X31	60°C	-40°C	6.8	95	135	35.5	—	{2,3}
F-005X32	60°C	-40°C	6.7	85	105	34.2	—	{2,3}
F-005055	60°C	-40°C	9.54	160	116	18.6	—	{2}
F-005955	60°C	-40°C	9.54	160	116	18.6	—	{2}

(1) See explanation of end-use environments in guide for this category.

(2) Also suitable for use in UL48, UL50E (continuous and periodic compression), UL508.

(3) X - Represents numbers 0 thru 9 for colors.

UL Spec	Test Method	Requirements
UL48	Tensile strength or elongation characteristics after 70 hours @ 100°C for a 60°C maximum service temperature	60% of original (For both tensile and elongation)
UL48	(OR) Heat aging 70 hours in an air oven at a temperature of 100 ± 2°C	No visible evidence of deterioration such as cracking after flexing, softening, or hardening after exposure
UL50E	Tensile strength and elongation after heat aging 168 h (7 d) @ 158°F (70°C)	75% of original for tensile strength 60% of original for elongation
UL50E	Oil immersion / oil aging (IRM # 903), % volume change after 70 h @ room temperature	Shall not swell more than 25% or shrink more than 1% of original volume
UL157	Tensile strength and elongation after heat aging 70 h @ 212°F (100°C)	60% of original (For both tensile and elongation)
UL508	Tensile strength and elongation after heat aging 70 h @ 212°F (100°C)	75% of original (For both tensile and elongation)

UL YELLOW CARD LISTING VERIFICATION ON-LINE

To obtain verification on-line:

1. www.ul.com - THEN
2. Click on "On-Line Certifications Directory" in gray area at bottom of web page - THEN
3. Click on "Company Name" in the general search area - THEN
4. Type in "Armacell" - & click "SEARCH"
5. 17 (seventeen) Armacell file numbers come up
6. Click on QMFZ2.E55798 for Armacell (Ensolite®), [ArmaSport®] & [Monarch®] products [Flame/UL94]
7. Click on JMLU2.MH25062 for Armacell (Monarch®) products listed to JMLU2 [Gaskets & Seals]
8. Click on JMST2.MH10189 or JMST2.MH30018 for Armacell (Ensolite®) and or Armacell (Monarch®) products listed to JMST2 [Gasket Materials]
9. Click on OPET2.MQ1977 for Armacell (ArmaSport®) products listed to Lifesaving Equipment, Marine - Component

All data and technical information are based on results achieved under typical application conditions. It is the customer's responsibility to verify if the product is suitable for the intended application. The responsibility for professional and correct installation and compliance with relevant building regulations lies with the customer. By ordering/receiving product you accept the **Armacell General Terms and Conditions of Sale** applicable in the region. Please request a copy if you have not received these.

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ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,000 employees and 25 production plants in 16 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.



For more information, please visit:
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