

AUTOMOTIVE



Monarch® #2001

- ASTM D 1056-07 2C1 grade closed cell material
- Fine cell – manufactured in blocks (buns)
- ASTM D 6576-07 Type II, Grades A and B, Condition Soft
- Approved source for Delphi SD2-207, paragraph 6.7

Monarch®



General Information

Armacell Monarch® #2001: Armacell LLC (Spencer, WV Plant) manufactures a black, closed cell, $9 \pm 2 \text{ lb./ft}^3$ ($144 \pm 32 \text{ kg/m}^3$) density Neoprene based rubber product #2001, that meets all the physical property requirements of ASTM D 1056-07 2A1 / 2C1 and SAE J-18 APR2002 2A1 / 2C1. #2001 is manufactured with non-staining oils and anti-oxidants. #2001 meets the flame resistance requirements of FMVSS-302 at most thicknesses.

Bun Size Information

| Product | Bun Size (Inches) | | | Bun Size (mm) | | | Color |
|---------|-------------------|----|---|---------------|------|------|-------|
| | W | L | T | W | L | T | |
| 2001 | 42 | 54 | 2 | 1067 | 1372 | 50.8 | Black |
| 2001 | 42 | 72 | 2 | 1067 | 1829 | 50.8 | Black |

Automotive and Industrial Specifications

The following is a list of automotive and industrial specifications that Armacell Monarch® #2001 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.

| Source | Specification | Armacell Monarch® #2001 | Comments |
|-------------|---------------------|---------------------------------------|--|
| ASTM | ASTM D1056-07 | 2A1 / 2C1 | Additional (optional) suffixes can be added |
| ASTM | ASTM D 6576-07 | Type II, Grades A & B, Condition Soft | Formerly MILR6130-C |
| ASTM | ASTM G 21-09 | Pass, rating 1 | Fungus resistance test method |
| Bombardier | Bombardier SMP 205 | Pass with multiple exceptions | Expanded rubber closed cell |
| Caterpillar | 1E0720 | 1E0720D (soft) | Exception to compression set |
| Chrysler | Chrysler MSZ-75 J18 | 2A1 / 2C1 | Additional (optional) suffixes can be added |
| Chrysler | Chrysler MS JP9-4 | Meets at most thicknesses | Flame resistance (horizontal burn rate) |
| Delphi | SD2-207 | Paragraph 6.7 | See note 4. On approved source list |
| Federal | FMVSS-302 | Meets at most thicknesses | Flame resistance (horizontal burn rate), See note 3 |
| FORD | FORD WSK M2D 419-A | Type 2 | See note 2 |
| GM | GM 6086-M | Type II | CD tested at 50% deflection. See note 1 |
| GM | GM 6090-M | (B4A) Meets at most thicknesses | Flame resistance tested per GM 9070-P (horizontal burn rate) |
| GM | GMN11106 | Type II | CD tested at 50% deflection. See note 1 |
| GM | GMW15473 | Class I Type IV | CD tested at 50% deflection. See note 1 |
| ISO | ISO 6916 | 2A1 / 2C1 | No exceptions |
| Military | ASTM D 6576-07 | Type II, Grades A & B, Condition Soft | Formerly MILR6130-C |
| SAE | SAE J 18 APR2002 | 2A1 / 2C1 | Additional (optional) suffixes can be added |
| SAE | SAE J 369 | Meets at most thicknesses | Flame resistance (horizontal burn rate) |
| SAE | SAE J 1351 | Rating 2 | Odor specification |
| Toyota | TSM 1501G | 2A1 / 2C1 | No exceptions |
| Toyota | TSM 0500G | Meets at most thicknesses | Flame resistance (horizontal burn rate) |

Note 1: For all GM 6086-M, GMN11106 & GMW15473 callouts, Armacell Monarch® certifies to the “basic” requirements only. Request additional information for each product. Providing application (interior, exterior or under-hood) and part thickness is helpful.

Note 2: For all FORD WSK M2D 419-A callouts, request full information for each product due to some exceptions with non-tested staining requirements.

Note 3: A number of horizontal burn tests can also be listed (GM 6090, BMW, Volvo, etc.), Request additional information.

Note 4: See QMPL-3621 Revision 12. Effective date August 24, 2009.



Polymer Base: Neoprene (CR Based)

F-02001 (Black)

| Physical Properties | Unit | Test Method | Typical Results |
|--|--------------------|--------------------|--------------------------|
| Density | kg/m ³ | ASTM D 1056 | 144 ± 32 |
| | lb/ft ³ | ASTM D 1056 | 9 ± 2 |
| Hardness, Durometer Shore 00 | | ASTM D 2240 | 50 ± 5 |
| Compression Deflection (25%) | kPa | ASTM D 1056 | 24 ± 10 |
| | psi | ASTM D 1056 | 3.5 ± 1.5 |
| Compression Set (Room temp) | % | ASTM D 1056 | ≤ 25% |
| Tensile Strength | kPa | ASTM D 412 (Die A) | 550 |
| | psi | ASTM D 412 (Die A) | 80 |
| Tear Strength | kN/m | ASTM D 624 (Die C) | 2.5 |
| | lb/in | ASTM D 624 (Die C) | 14 |
| Elongation | % | ASTM D 412 (Die A) | 150% |
| Resilience | % | ASTM D 2632 | 15% |
| Service Temperature | | | |
| Low | °F (°C) | ASTM D 746 | -40°F (-40°C) |
| High Continuous | °F (°C) | ASTM D 746 | 150°F (65.5°C) |
| High Intermittent | °F (°C) | ASTM D 746 | 200 °F (93.3°C) |
| Water Absorption | | | |
| Maximum Weight Change | % | ASTM D 1056 | < 10% |
| Fluid Immersion (7 days at 23°C [73.4°F]) | | | |
| ASTM Ref. Fuel B, Weight Change (%) | % | ASTM D 1056 | < 250% |
| Accelerated Aging (7 days at 70°C [158°F]) | | | |
| Flexibility (180° bend without cracking) | | ASTM D 1056 | Pass |
| Appearance change | | ASTM D 1056 | None |
| Change in Compression Deflection | % | ASTM D 1056 | ± 30% |
| Combustion Characteristics | | | Comments |
| FMVSS-302 | | | Pass at most thicknesses |

ASTM D 1056 designation: 2A1 / 2C1
 SAE J 18 APR2002 designation: 2A1 / 2C1
 ASTM D 6576: Type II, Grades A & B, Condition Soft
 Neoprene = polychloroprene (CR = chloroprene rubber)



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