

AUTOMOTIVE



## Ensolite® IG1

- UL 94 5VA, 5VB, V-0, V-1, HF-1 and HBF listed for flame
- ASTM D 1056-07 2A1 / 2C1 / 2B1 grade product
- PVC / NBR / CR closed cell rubber material manufactured in continuous rolls
- ASTM D 6576-07 Type II, Grades A & B, Condition Soft material

### General Information

**Armacell Ensolite® IG1:** Armacell LLC (Conover, NC Plant) manufactures a black, continuous (rolls / sheets), closed cell, low density (4 - 6 lb./ft<sup>3</sup>) (64 - 96 kg/m<sup>3</sup>) PVC/NBR/CR rubber product IG1, that meets all the physical property requirements of ASTM D 1056-07 2A1 / 2C1 / 2B1 and SAE J-18 APR2002 2A1 / 2C1 / 2B1. IG1 has excellent resistance to oil and fuel. IG1 meets the requirements of FMVSS-302 at most thicknesses and is listed to UL94 HF-1 at 1.5 mm (0.059”) and higher and UL94 V-0/5VA at 6.2 mm (0.244”) and higher (UL File#: QMFZ2.E55798).

### Automotive and Industrial Specifications

The following is a list of automotive and industrial specifications that Armacell Ensolite® IG1 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	IG1	Comments
ASTM	ASTM D1056-07	2A1 / 2C1 / 2B1	Additional (optional) suffixes can be added
ASTM	ASTM G21-09	Pass, Rating 0	Fungus resistance test method
ASTM	ASTM D 925 Method B	Pass, No migration staining	Method A
ASTM	ASTM D 1149	Pass	Ozone resistance test method
ASTM	ASTM D 6576-07	Type II, Grades A & B Condition Soft	Formerly MILR6130-C
CAL	CAL 117	Pass	Flame resistance
Chrysler	Chrysler MSZ-75 J18	2A1 / 2C1 / 2B1	Additional (optional) suffixes can be added
Chrysler	Chrysler MS JP9-4	Meets at most thicknesses	Flame resistance (horizontal burn rate)
Federal	FMVSS-302	Meets at most thicknesses	Flame resistance (horizontal burn rate). See note 1
Federal	FAR 25.853	Pass at 1/8” and 1/4”	12 Second vertical burn test. (Test report available upon request)
FORD	FORD WSK M2D 419-A	Type 2	See note 2

## Automotive and Industrial Specifications (continued)

Source	Specification	IG1	Comments
GM	GM 6086-M	Type II	CD tested at 50% deflection. See note 3
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 3
GM	GMW15473	Class I Type IV	CD tested at 50% deflection. See note 3
ISO	ISO 6916	2A1 / 2C1 / 2B1	No exceptions
Military	ASTM D 6576-07	Type II, Grades A & B Condition Soft	Formerly MILR6130-C
SAE	SAE J18 APR2002	2A1 / 2C1 / 2B1	Additional (optional) suffixes can be added
SAE	SAE J369	Meets at most thicknesses	Flame resistance (horizontal burn rate)
SAE	SAE J 1351	Pass, rating 2	Odor specification
Toyota	TSM 1501G	2A1 / 2C1 / 2B1	No exceptions
Toyota	TSM 0500G	Meets at most thicknesses	Flame resistance (horizontal burn rate)
UL	UL94 5VA	5VA UL Listed at 6.2 mm (.244") and higher	Flame resistance specification. (UL file# QMFZ2.E55798). See note 4
UL	UL94 5VB	5VB UL Listed at 6.2 mm (.244") and higher	Flame resistance specification. (UL file# QMFZ2.E55798). See note 4
UL	UL94 V-0	V-0 UL Listed at 6.2 mm (.244") and higher	Flame resistance specification. (UL file# QMFZ2.E55798). See note 4
UL	UL94 V-1	V-1 UL Listed at 6.2 mm (.244") and higher	Flame resistance specification. (UL file# QMFZ2.E55798). See note 4
UL	UL94 HF-1	HF-1 UL Listed at 1.5 mm (.059") and higher	Flame resistance specification. (UL file# QMFZ2.E55798). See note 4
UL	UL94 HBF	HBF UL Listed at 1.5 mm (.059") and higher	Flame resistance specification. (UL file# QMFZ2.E55798). See note 4

Note 1: A number of horizontal burn tests can also be listed (GM 6090, BMW, Volvo, etc.). Request additional information.

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: For all GM 6086-M, GMN11106 & GMW15473 callouts, Armacell (Ensolite®) 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 4: In reference to UL listing: May be used with Armaflex "520" adhesive.

## Roll Size Information

Gauge (in)	Gauge (fraction of an inch)	Gauge (mm)	Tolerance (inches)	Tolerance (mm)	Roll Size W (in)	Roll Size L (ft)	Roll Size W (m)	Roll Size L (m)	Comments
1.25	1-1/4	31.75	1.250 - 1.450	31.75 - 36.83	54	100	1.37	30.48	U, S2S
1.25	1-1/4	31.75	1.250 - 1.450	31.75 - 36.83	54	50	1.37	15.24	U, S2S
1.25	1-1/4	31.75	1.250 - 1.450	31.75 - 36.83	60	50	1.52	15.24	U, S2S

U = untrimmed

S2S = skin 2 sides



## IG1 Continuous Rolls/Sheets (Black)

Physical Properties	Unit	Test Method	Typical Results
<b>Density</b>	kg/m <sup>3</sup>	ASTM D 1056	64 - 96
	lb/ft <sup>3</sup>	ASTM D 1056	4.0 - 6.0
<b>Hardness, Durometer Shore 00</b>		ASTM D 2240	35 ± 10
<b>Compression Deflection (25%)</b>	kPa	ASTM D 1056	13 - 34
	psi	ASTM D 1056	2.0 - 5.0
<b>50% Compression Set (Room temp)</b>	%	ASTM D 1056	≤ 25%
<b>Tensile Strength</b>	kPa	ASTM D 412 (Die A)	344 minimum
	psi	ASTM D 412 (Die A)	50 minimum
<b>Tear Strength</b>	kN/m	ASTM D 624 (Die C)	1.6
	lb/in	ASTM D 624 (Die C)	9
<b>Elongation</b>	%	ASTM D 412 (Die A)	75 minimum
<b>Service Temperature (1)</b>			
Low	°F (°C)	ASTM D 746	-20°F (-28.9°C)
High Continuous	°F (°C)	ASTM D 746	---
High Intermittent (2)	°F (°C)	ASTM D 746	200 °F (93.3°C)
<b>Water Absorption</b>			
Maximum Weight Change	%	ASTM D 1056	< 10%
<b>Fluid Immersion (7 days at 23°C [73.4°F])</b>			
ASTM Ref. Fuel B, Weight Change (%)	%	ASTM D 1056	< 100%
<b>Accelerated Aging (7 days at 70°C [158°F])</b>			
Flexibility (180° bend without cracking)		ASTM D 1056	Pass
Appearance change		ASTM D 1056	None
Change in Compression Deflection	%	ASTM D 1056	± 30%
<b>Combustion Characteristics (3)</b>		<b>Thicknesses</b>	<b>Comments</b>
FMVSS-302			Pass at most thicknesses
FAR 25.853		1/8" (3.18 mm) & 1/4" (6.35 mm)	Pass
UL94			
5VA / V-0		0.244" (6.2 mm) & higher	Listed, UL file# QMFZ2.E55798
HF-1		0.059" (1.5 mm) & higher	Listed, UL file# QMFZ2.E55798

ASTM D 1056 designation: 2A1 / 2C1 / 2B1  
 SAE J 18 APR2002 designation: 2A1 / 2C1 / 2B1  
 ASTM D 6576: Type II, Grades A & B, Condition Soft  
 In reference to UL listing: May be used with Armaflex "520" adhesive  
 Standard Roll Widths: 54" (1.37 m)  
 Maximum Gauge: 1.25" (31.75 mm)

(1) This recommendation is based on polymer type only. For specific application requirements please contact technical service.  
 (2) This temperature is the maximum allowable for intermittent exposure only. For continuous use temperature please contact technical service.  
 (3) Flammability – This item and any corresponding data refer to typical performance in the specific test indicated and should not be construed to imply this material's behavior in other fire conditions.  
 NBR – Acrylonitrile Butadiene Rubber  
 PVC – Polyvinyl Chloride  
 CR – Chloroprene (Neoprene)

## UL File Number for Armacell Ensolite® IG1

**UL File Number: QMFZ2.E55798**  
**Plastics – Component [UL94]**

									<b>H</b>	<b>D</b>	
		<b>Min.</b>		<b>H</b>	<b>H</b>	<b>R T I</b>			<b>V</b>	<b>4</b>	<b>C</b>
		<b>Thk</b>	<b>Flame</b>	<b>W</b>	<b>A</b>	<b>Elec</b>	<b>Mech</b>		<b>T</b>	<b>9</b>	<b>T</b>
<b>Material Dsg</b>	<b>Color</b>	<b>mm</b>	<b>Class</b>	<b>I</b>	<b>I</b>		<b>Imp</b>	<b>Str</b>	<b>R</b>	<b>5</b>	<b>I</b>

**Nitrile Rubber/Polyvinylchloride/Neoprene(NBR/PVC/CR), closed-cell foam with skin, “Ensolite”, furnished as tubes or sheets.**

<b>IG1(ad)(al)</b>	<b>BK</b>	<b>1.5</b>	<b>HF-1</b>	-	-	<b>50</b>	-	<b>50</b>	-	-	-
		<b>6.2</b>	<b>V-0, 5VA</b>	-	-	<b>50</b>	-	<b>50</b>			

(ad) - May be used with Armaflex “520” adhesive  
 (al) - Density range 0.05 - 0.08 g/cc

## UL Yellow Card Listing Verification Online

**To obtain verification online:**

1. [www.ul.com](http://www.ul.com)
2. Click on “Certifications”
3. Click on “Company Name” in the general search area
4. Type in “Armacell” & click “Search”
5. 8 (Eight) Armacell file numbers come up (2 belong to Armacell Germany)
  - For Armacell Ensolite® & Monarch® products (Flame / UL94)  
**Click on QMFZ2.E55798**
  - For Armacell Ensolite® products listed to JMST2 (Gaskets & Seals)  
**Click on JMST2.MH30018 and JMST2.MH10189**
  - For Armacell Monarch® products listed to JMLU2 (Gaskets & Seals)  
**Click on JMST2.MH10189 or JMST2.MH30018**

**Vertical Flame / 12 Second Burn per FAR 25.853**  
**Appendix F — Part I Test Criteria and Procedures for Showing Compliance with Sec. 25.853 or Sec. 25.855**

<b>Armacell Ensolite® Product #</b>	<b>Min. Thickness</b>	<b>Pass / Fail</b>	<b>Independent Test Lab Report</b>	<b>Test Report ID #</b>	<b>Polymer</b>	<b>ASTM D 1056 Grade</b>	<b>Density lb./ft<sup>3</sup></b>	<b>25% CD (psi)</b>
IG1	1/4"	Pass	2/18/10	0129	PVC/NBR/CR	2B1	3.5 - 5	2 - 5
IG1	1/8"	Pass	2/18/10	0128	PVC/NBR/CR	2B1	3.5 - 5	2 - 5

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