



ALSTONE[®]
WPC & SILICONE

High Performance Foam Division

www.alstoneindia.in



Lasting -Long Comfort

By guaranteeing a performance degradation of no more than 10% over ten years, Alstone MF-1 seating materials reduce ergonomic hot spots and improve rider comfort. With a warranty of ten years (see complete warranty for details) to enforce this guarantee, Alstone MF-1 materials are a smart choice for seating applications. With consistent, lasting comfort resulting from lasting quality comes the nee

What is Silicone Foam MF 1?

Silicone Rubber Foam blocks are produced by mixing the two liquid silicone compositions,

Part – A: Base Compound

Part-B: Cross-linker or curing agent.

Mixing of these two compositions leads to generation of hydrogen. While the two compositions cross-linked together to form a solid rubber, the mixture simultaneously expands due to hydrogen gas formation and produces small air bubbles within the rubber which results into production of a cushioning foam material.

MF1 silicone is a lightweight cellular silicone foam cast into block form up to 8 inches thick. This lightweight, high quality material is typically used in cushioning and sealing applications and features FST (flame, smoke, toxicity) resistance. and is most often used as cushioning in passenger rail car seating. MF1 silicone's proven durability and fire resistance means reliable comfort, longevity and safety. Alstone MF1 is available in three firmness ranges, allowing engineers to optimize seat designs and maximize passenger comfort while reducing weight and size. MF1 Silicone foam comes in soft, medium, and firm in its traditional white color and is targeted more toward general industrial applications.

Features

- Available in blocks up to 8 in. thick
- Tested for a UL94 V-0 and HF-1 rating
- Low compression set
- Used most often as cushion foam in passenger rail car seating

Benefits

- Exceptional flame, smoke and toxicity (FST) resistance performance
- Superior weather and UV resistance
- Outperforms competitive cushion foams in durability
- Ensures safety, long cushion life and lasting passenger comfort

Applications

- Shock absorption, sound blocking and absorption, vibration management



Technical Properties of MF1 Silicone cushion Foam {Indian Railways}

Property	Value	Method
Density (Kg/cm ³) Maximum	140	IS :7888 C1.4
Tensile Strength (Kg/cm ²)maximum	0.5	IS:7888 C1.5
Elongation at break (%) Minimum	50	IS:7888 C1.5
Indentation hardness index (Kgf)	10-20 @25% 15-25 @40%	IS:7888
Compression Set (%) (50% at 70 C for 22 hrs)	5% Max	IS:7888 C1.8
Humidity ageing (%) Harness Loss	<10%	ISO:2440
Fatigue testing (%)		IS:7888 C1.7
Indentation Stiffness loss (%)	<15%	
Thickness loss	<5%	
Cycles	100,000	

Technical Properties of MF1 Silicone cushion Foam {Indian Railways}

Physical Properties	Test standard	Result
Resistance to spread of Flame	Class A	UIC 564-2 Appenix-8
Deterioration of visibility due to smoke	Class A	UIC 564-2 Appedix-15
Limiting Oxygen Index	30 Min.	IS:13501
Toxicity Index	<1	NCD 1409

Comfort and Life performance Test Values {Indian Railways}

Properties	Pre-Fatigue Specified Value	Post Fatigue Specified Value
Comfort factor	Min 2.3@ 50 mm	Min 2.1 @ 50 mm
Thickness Loss %	--	5% Max
Stiffness Loss %	--	15% Max
Pressure Mapping	--	--
Change in max pressure	--	10% Max
Change In pressure gradient	--	10% Max
Change in Max Pressure/contact area	--	10% Max

Alstone Silicone Foam Offerings :

Alstone product family offers a wide range of multi-functional silicone based elastomeric foams and solids for use in many rail interior applications such as seals, gaskets, floor isolation pads, thermal insulation, sound barriers and anti-squeak / rattle pads. These materials are offered in continuous sheet form, enabling ease of fabrication whether slitting, die-cutting or laminating with adhesive.

In addition, Alstone offers a highly durable silicone seat cushion foam supplied in stock form or as a fabricated cushion shaped to the customer's design requirements.

SLAB STOCK FOAMS - The foam shall be manufactured via continuous foam technology

Color – Natural White



Alstone MF1 seat cushion foam provides reliable comfort, longevity, and safety. Available in three firmness ranges, MF1 foam allows engineers to optimize seat designs, providing exceptional passenger comfort all the while reducing weight and size. MF1 foam is a durable seat cushion material that utilizes proprietary silicone technology to deliver a product which maintains firmness and thickness longer than traditional urethane foams. Additionally, all grades of MF1 foam are formulated to meet various global fire safety standards including BS 6853, EN 45545, DIN 5510, NFF 16-101, and NFPA 130.

3 Types of MF1 Foam : MF1 -35 (Soft), MF1 -55 (Medium)
& MF1 -75 (Firm)

MF1 Properties :

Property	Test Method	MF1-35 SOFT	MF1-55 MEDIUM	MF1-75 FIRM
FIRMNESS @ 50MM (N)	ASTM D3574-B1,ISO 2439 (25%)	155	245	334
COMFORT FACTOR	65%/25% IFD	2.5:1	2.5:1	2.5:1
COMPRESSION FORCE DEFLECTION Kpa	ASTM D1056	5.5	6.2	6.9
DENSITY KG/M3	ISO 845	104	112	128
TENSILE STRENGTH Kpa	ASTM D412	86	86	93
ELONGATION %	ASTM D412	45	45	35
ANTI-MICROBIAL	ASTM G21	PASS(NO GROWTH)	PASS(NO GROWTH)	PASS(NO GROWTH)
WATER ABSORPTION %	ASTM D570	<5	<5	<5
THERMAL CONDUCTIVITY,W/Mk	ASTM C518	0.045		
MAXIMUM CONSTANT USE TEMPERATURE,C	Alstone internal	200 C	200 C	200 C
Low temperature FLEX,C	ASTM D1056	-40 C	-40 C	-40 C

Fire Test

Fire Standard : EN 45545 – R21

Test Method : ISO 5660 /
ISO 5659 (Ds,CIT)

Result : HL 3



Warranty for MF1 Silicone Foam

When designed appropriately in a rail seating application, MF1 foam is warranted for firmness and thickness retention for up to 10 years to ensure long-term comfort.



Alstom Industries: Engineering Ideas for Indian Railways