

M-FLEX FR ONE

Insulation

PRODUCT SPECIFICATION

Rubber Foam
Thermal Insulation
for HVAC &
Refrigeration



BY Marcliff Engineering Co. Pty Ltd

marcliff.com.au

M-FLEX FR ONE

Insulation

TECHNICAL SPECIFICATIONS

Closed Cell Tubing, Sheet and Roll Insulation

TECHNICAL SPECIFICATION FOR MFLEX INSULATION FR		
Density	65 kg/m ³ to 80 kg/m ³ (Tubing) 55 kg/m ³ to 80 kg/m ³ (Roll)	ASTM D1667
Thermal Conductivity ('K' Value) at 20°C mean temperature	0.038 W/mK	ASTM C518
Service Temperature °C	-40°C to + 105°C	
Water Absorption (% by weight)	< 3%	ASTM D1056
Water Vapour Permeability Perm - in Max	0.09 Perm-inch	ASTM E96
Water Vapour Resistance μ Factor	> 5000	DIN 52615 - 73
Thermal Stability 7 Days 200°F (% shrinkage) 7 Days 200°F	4.5 5.5	ASTM C548
Average Fire Propagation Average Surface Spread of Flame	Class 0 Class 1	BS 476 PART 6 BS 476 PART 7
Flammability	FM Approved V-0, 5VA, HF-1	Class: 4924 UL 94
Reaction to Fire	Self-Extinguishing, No Dripping	
SIRIM QAS Listed Product		
Fire & Rescue Department of Malaysia Approval Class 0 Product (BOMBA)		
Singapore Certificate of Conformity (TUV/PSB Class 0)		
Singapore Green Building Council (Awarded)		
Green Building Council of Australia		
REACH and RoHS (SGS)		

PRODUCT TESTING EQUIPMENTS



Density Test



Flame Retardant Test



Smoke Density Test



Hardness Test



Batch Oven

M-FLEX FR ONE

CHARACTERISTICS & ADVANTAGES



The extreme flexibility of the material makes installation fast, easy and economical.



Dust, fiber free and resistance to fungus growth.



Low thermal conductivity ('K' Value) which makes it highly efficient and effective in the insulation of cooling or heating system.



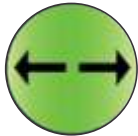
Self extinguished in nature.



Closed cell structure forms a good water vapor barrier.



Able to withstand tearing, rough handling and severe site conditions.



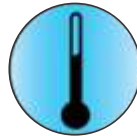
Tensile Stress

Tensile strength to 3 Mpa, hardness 55-80 density which provide safety and longer lifespan



Fire Resistance

Tested and conformed to British standard BS476: Part 6 & 7



Thermal Insulating

Closed cell structure, thermal conductivity 0.038W/mK, conforms to ASTM C534 Standard



Water Resistance

Negligible water absorption due to closed cell structure



Environment Friendly

Environment Friendly can be handling at anytime, unlike fire board system which is very dusty during cutting

Product Applications - HVAC-R



Refrigerant Media

Good flexibility, easy installation and operation, applicable to the field of air conditioning refrigerant heat medium system brass.



Chilled Water System

Excellent thermal insulation properties, can effectively prevent condensation generated, so air conditioning system performance significantly.



Hot Water Piping System

Good insulation properties, soft and easy to install, so that less heat loss, more convenient installation.



Ventilation Ductwork

Also comply with stringent multinational world fire standard. Greatly enhance the safety performance of the material for iron metal pipe thermal insulation field.



Condensate System

Excellent resistance to water vapor permeability, softer and easy to install, suitable for condensing water pipe systems.

Other Applications



Sound absorbing sheet is divided into flat and concave - convex surface, it mainly plays the role of sound absorption, vibration and noise reduction.



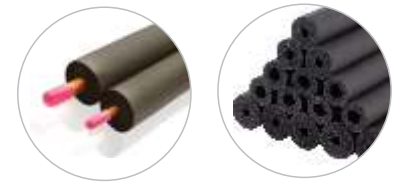
Act as good protection pads for walls and floors, safety for public area.



Rubber foam insulation board are widely used in the heat protection for roofing.

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MFLEX FR ONE INSULATION R-VALUES

R-value is the measure of thermal resistance used for the building and construction industry. It measures a material's ability to resist heat flow. The higher the R-value, the higher the thermal resistance and insulating effect. The Building Code of Australia and other Australian standards specify R-values to help determine what insulation material and thickness should be used. The Building Code of Australia lists the requested R-values for pipe insulation in Specification J5. The fire ratardant performance of Mflex FR ONE insulation pipe complies with AS1530.3-1999.

PIPE INSULATION							
Nominal ID		Insulation Wall Thickness					
		3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"
Inches	mm	10	13	19	25	32	38
1/4"	6	0.475	0.765	1.252	-	-	-
3/8"	10	0.412	0.659	1.076	1.536	-	-
1/2"	13	-	0.612	0.996	1.420	-	-
5/8"	16	0.385	0.579	0.938	1.336	-	-
3/4"	19	0.366	0.554	0.895	1.271	-	-
7/8"	22	0.342	0.535	0.860	1.219	1.675	2.091
1"	25	0.333	0.519	0.832	1.177	1.614	2.015
1 1/8"	28	0.326	0.507	0.808	1.142	1.563	1.950
1 1/4"	32	0.319	0.493	0.783	1.102	1.507	1.877
1 3/8"	35	0.314	0.484	0.767	1.077	1.471	1.830
1 1/2"	38	0.310	0.477	-	-	-	-
1 5/8"	42	0.306	0.468	0.736	1.031	1.402	1.741
1 7/8"	47	0.300	0.458	0.716	0.999	1.356	1.681
2"	51	0.298	0.453	0.708	0.986	1.336	1.655
2 1/8"	54	0.296	0.449	0.700	0.974	1.318	1.632
2 3/8"	60	0.292	0.442	0.687	0.952	1.286	1.590
2 1/2"	65	-	-	-	-	1.267	1.566
2 5/8"	67	0.289	0.436	0.674	0.932	1.255	1.549
2 7/8"	73	0.268	0.431	0.665	0.917	1.232	1.519
3"	76	0.285	0.429	0.660	0.910	1.222	1.505
3 1/8"	80	0.284	0.426	0.655	0.902	1.209	1.488
3 1/2"	89	0.282	0.421	0.645	0.885	1.184	1.455
4"	101	-	0.415	0.633	0.866	1.155	-
4 1/2"	114	0.276	0.411	0.624	0.851	1.131	-

FLAT SHEET INSULATION		
Thickness		R-Value
Inches	mm	
1/8"	3	0.08
1/4"	6	0.17
3/8"	10	0.28
1/2"	13	0.36
5/8"	16	0.45
3/4"	19	0.53
1"	25	0.70
1 1/4"	32	0.89
1 1/2"	38	1.06
2"	50	1.42

M-FLEX FR ONE

PRE-INSULATED PAIRCOIL

Mflex FR ONE SuperPair

Superior pre-insulated annealed copper tube is ideal for fast and cost effective split air-conditioning installation.

Mflex FR ONE SuperPair is made of high quality copper tube and pre-insulate with flexible closed cell nitrile rubber insulation.

The advantages of using Mflex FR ONE SuperPair.

- Manufactured to AS 1530:3 Standard
- Comply to R22/R410A/R407C/R404A/R134A
- Flexible, quick and easy installation
- Continuous length
- Joint-free

High quality fire retardant closed cell nitrile rubber insulation pair coil with excellent insulating and water permeability properties to prevent condensation on the air-conditioning piping system.



Insulation Properties

Thermal Conductivity ('K' Value)	0.038 W/mK @20°C	ASTM C 158
Water Permeability Perm-In-max	0.09	ASTM E 96
Water Vapour Resistance μ Factor	> 5000	DIN 52615
Water Absorption (% by weight)	< 3%	ASTM D1056
Thermal Shrinkage @200° F	4.5% max	ASTM C 548
Flammability Test	V-0	UL 94
Fire Propagation	Class 0	BS 476 PART 6
Surface Spread of Flame	Class 1	BS 476 PART 7 AS 1530

Copper Composition (%)

Standard	Copper (Cu)	Phosphorus (P)
JIS H3300 Alloy No. C1220	99.90 min.	0.015 - 0.040
AS/NZS 1471: 1995 (UNS Alloy C12200)	99.90 min	0.015 - 0.040

Copper Tube Tensile Strength

Temper Grade	Designation	Tensile Test		Hardness Test			GRAIN SIZE (mm)
		Tensile Test Strength (N/mm ²)	Elongation (%)	Rockwell Hardness			
				HR30T	HR15T	HRF	
OL	C1220 T-OL C1220 TS-OL	205 min.	30 min.	-	65 max.	55 max.	0.040 max.

