

M-FLEX FR **Insulation**

TECHNICAL GUIDE

**FIRE RATED
NITRILE RUBBER
THERMAL
INSULATION**



***BY* Marcliff Engineering Co. Pty Ltd**

M-FLEX FR Insulation

Foreword

The evolution of closed cell elastomeric foam, first developed in the early 1900s, has had a dramatic impact on the insulation industry. The most notable reason for this is its high moisture resistance, the result of its cellular structure - millions of tiny barriers that resist the migration of liquid. This characteristic not only minimizes the threats associated with moisture (such as mold), but it also ensures steady, long-term thermal performance. Liquid has a high heat transference capability; hence, wet insulation provides very little insulation at all. Closed cell elastomeric foam has strong water vapor permeability to resist moisture absorption, so neither its performance nor its durability is impaired by the presence of moisture in a heating, ventilating, and air-conditioning (HVAC), plumbing, or refrigeration system.



Thermal Conductivity

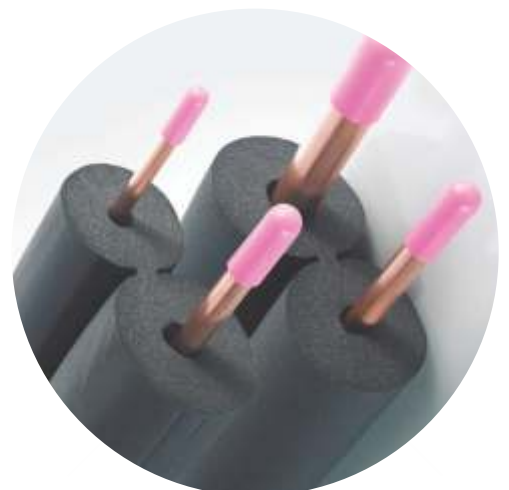
Thermal conductivity value is the most important physical feature of insulation materials, which represents the thermal conductivity ability of materials when heating is stable. Different materials have different values. The lower thermal conductivity value, the better insulation performance. Mflex products can reach the value as low as 0.032W/mk.

Water Vapor Transmission

Water vapor transmission represents the ability of resisting permeation of water vapor. The higher value of water vapor transmission, the less chance for them passing through the material. Thus, it can provide the stability of thermal conductivity value in a long time, prolong the using life of insulation materials. The water vapor transmission of Mflex reaches as high as 10,000.

Closed Cell Structure

The closed-cell foam structure of Mflex prevents moisture from wicking or transferring from the surface of the insulation to the surface of the pipe or duct. This means that water won't be trapped next to the metal, causing corrosion and eventual damage to the system. Because of its non-permeable, closed-cell foam structure, no additional vapor retarder is required to protect Mflex insulation, saving the installer time and cladding material cost. Unlike fibrous insulation, which loses R-value and must be replaced when it becomes wet, Mflex performance stays the same, regardless of surface punctures or exposure to moisture.



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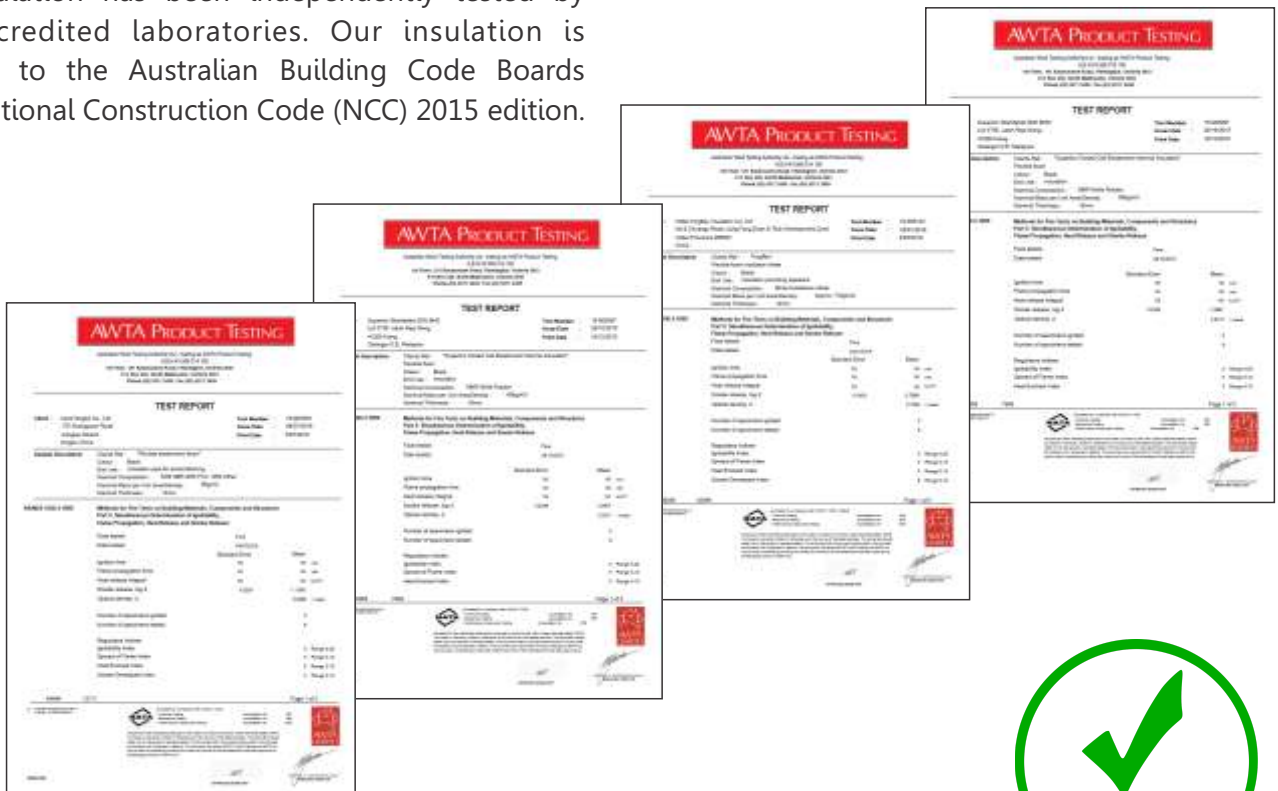
TECHNICAL SPECIFICATIONS

Mflex Insulation conforms to the requirements of the Building Code of Australia (Vol) 1, of the National Construction Code (NCC) 2015. Mflex Insulation is a closed cell extruded nitrile based rubber that exhibits better thermal conductivity as the air inside the closed cells has lower mobility than that produced in open Cells.

TECHNICAL SPECIFICATION FOR MFLEX INSULATION FR		
Construction	Closed Cell	
Density	30% NRB 40%	NC 30% other
Temperature Range	-183° to 105°	
Thermal Conductivity	$\lambda=0.40W/(m.k)$ @ +20° C $\lambda=0.40W/(m.k)$ @ 0° C $\lambda=0.40W/(m.k)$ @ +20° C	AS4859.1 EN12667 ASTMC 177
Water Vapour Diffusion Resistance Factor	$\mu \geq 10,000$	ASTME 96
Fire Performance	Class 1 – Complies with the fire hazard requirements of the Building Code of Australia	AS1530.3
Reaction to Fire	Self Extinguishing	
Environmental	Zero Ozone Depleting Potential (ODP), Low VOC	DIN ISO 16000-6
Fungal / Mold Resistance	Resistant	Anti Microbial JISZ 2801

CERTIFICATION AND TESTING

Mflex Insulation has been independently tested by NATA accredited laboratories. Our insulation is compliant to the Australian Building Code Boards (ABCB) National Construction Code (NCC) 2015 edition.



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MFLEX FR 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 retardant performance of Mflex FR insulation pipe complies with AS1530.3-1999.

PIPE INSULATION								
Nominal ID		Insulation Wall Thickness						
		3/8" 10	1/2" 13	3/4" 19	1" 25	1 1/4" 32	1 1/2" 38	2 " 50
Inches	mm							
1/4"	6	0.53	0.75	1.28	1.89	-	-	-
3/8"	10	0.46	0.64	1.09	1.62	-	-	-
1/2"	13	0.43	0.60	1.03	1.50	-	-	-
5/8"	16	0.41	0.57	0.99	1.41	1.80	2.25	3.29
3/4"	19	0.39	0.54	0.93	1.34	1.71	2.14	3.13
7/8"	22	0.38	0.52	0.88	1.28	1.64	2.04	2.99
1"	25	0.37	0.51	0.86	1.24	1.58	1.97	2.88
1 1/8"	28	0.36	0.50	0.83	1.20	1.53	1.91	2.79
1 1/4"	32	0.35	0.48	0.82	1.16	1.47	1.83	2.68
1 3/8"	35	0.35	0.47	0.80	1.13	1.44	1.79	2.61
1 1/2"	38	0.34	0.47	0.76	1.08	1.41	1.75	2.55
1 5/8"	42	0.34	0.46	0.75	1.08	1.37	1.70	2.48
1 7/8"	47	0.33	0.45	0.73	0.98	1.33	1.65	2.40
2"	51	0.33	0.44	0.72	1.05	1.31	1.62	2.35
2 1/8"	54	0.33	0.44	0.71	1.02	1.29	1.60	2.31
2 3/8"	60	0.32	0.43	0.70	1.00	1.26	1.55	2.25
2 5/8"	67	0.32	0.43	0.69	0.98	1.23	1.51	2.18
2 7/8"	73	0.31	0.42	0.68	0.90	1.20	1.48	-
3"	76	0.31	0.42	0.68	0.96	1.19	1.47	-
3 1/8"	80	0.31	0.42	0.66	0.95	1.18	1.46	-
3 1/2"	89	0.31	0.41	0.65	0.93	1.16	1.42	-
4"	101	0.31	0.41	0.64	0.93	-	-	-

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

Insulation

9MM WALL		Mflex FR	
Product Code	WALL (mm)	ID (mm)	LENGTHS (per carton)
TINS14	9	6	168
TINS38	9	10	130
TINS12	9	13	115
TINS58	9	15	90
TINS34	9	19	76
TINS78	9	22	70
TINS1	9	25	55
TINS118	9	28	55
TINS114	9	32	40
TINS138	9	35	36
TINS112	9	38	32
TINS158	9	42	30
	9	45	26
	9	48	25
TINS218	9	54	25
TINS238	9	60	
TINS258	9	67	

19MM WALL		Mflex FR	
Product Code	WALL (mm)	ID (mm)	LENGTHS (per carton)
TFRINS14	19	6	50
TFRINS38	19	10	40
TFRINS12	19	13	40
TFRINS58	19	15	35
TFRINS34	19	19	30
TFRINS78	19	22	30
TFRINS1	19	25	25
TFRINS118	19	28	24
TFRINS114	19	32	20
TFRINS138	19	35	20
TFRINS112	19	38	17
TFRINS158	19	42	17
	19	45	16
TFRINS178	19	48	15
TFRINS218	19	54	15
	19	57	12
TFRINS238	19	60	12
TFRINS258	19	67	12
TFRINS3	19	76	10
TFRINS318	19	80	10
	19	89	10
	19	80	10
	19	89	10

13MM WALL		Mflex FR	
Product Code	WALL (mm)	ID (mm)	LENGTHS (per carton)
TFR13INS14	13	6	90
TFR13INS38	13	10	80
TFR13INS12	13	13	65
TFR13INS58	13	15	60
TFR13INS34	13	19	45
TFR13INS78	13	22	40
TFR13INS1	13	25	40
TFR13INS118	13	28	36
TFR13INS114	13	32	30
TFR13INS138	13	35	30
TFR13INS112	13	38	24
TFR13INS158	13	42	25
	13	45	20
TFR13INS178	13	48	20
TFR13INS218	13	54	20
	13	57	20
TFR13INS238	13	60	18
TFR13INS258	13	67	15
TFR13INS3	13	76	12
	13	80	12
	13	89	10

M-FLEX FR

Insulation

25MM WALL		Mflex FR	
Product Code	WALL (mm)	ID (mm)	LENGTHS (per carton)
TFR25INS14	25	6	35
TFR25INS38	25	10	25
TFR25INS12	25	13	25
TFR25INS58	25	15	20
TFR25INS34	25	19	20
TFR25INS78	25	22	20
TFR25INS1	25	25	20
TFR25INS118	25	28	18
TFR25INS114	25	32	15
TFR25INS138	25	35	15
TFR25INS112	25	38	12
TFR25INS158	25	42	12
	25	45	10
TFR25INS178	25	48	13
TFR25INS218	25	54	9
	25	57	9
TFR25INS238	25	60	9
TFR25INS258	25	67	8
TFR25INS3	25	76	6
	25	80	6
	25	89	6
	25	108	6
	25	114	