# EROF

EPDM closed cell elastomeric thermal insulation





















# I'm saving your energy.

AEROFLEX closed cell tube and sheet insulation is a flexible and lightweight EPDM based elastomeric material designed for insulating liquid cooling and heating pipelines. The closed cell structure of Aeroflex provides many advantages over most rigid insulations such as:

- Moisture and vapor resistance without using additional vapor barriers.
- Stable thermal conductivity (K. value / λ value) throughout service life, due to its dense surface skin and closed cell characteristics.
- Flexibility which makes installation work easy and neat. Outstanding ultraviolet and weather resistance.

**AEROFLEX** is an ideal insulation for frost control on sub-zero piping. It prevents heat gain and condensation problems on chilled water and refrigerant pipelines, and it also prevents heat loss from hot water plumbing, liquid and dual temperature piping.





#### **FIBERGLASS** (open-cell structure insulation)

Fiberglass thermal insulation is made from compacted small glass fibers. Air occupies the spaces between the fibers which allow spheric moisture to penetrate into the insulation, resulting in very high water vapor





# **POLYURETHANE FOAM**

PU Foam is made of polyols and polyisocyanates mixed with HCFCs or similar gases. The cell wall is very thin and brittle, making it semi-opend cell easily. This allows much moisture penetration, which resulting in high water vapor permeability.





# AEROFLEX

Aeroflex is made from synthetic elastomers based material. The elastomeric material makes Aeroflex flexible with closed cell structure (mainly nitrogen gas inside), resulting in very low water vapor permeability.

# **MAIN ADVANTAGES**

# **TEMPERATURE RANGE**

Aeroflex standard enhances enegy-saving and prevents condensation when used in operating temperatures down to -57°C and prevents heat loss up to 125°C. However, for higher temperature up to 150°C, Aeroflex-HT is recommended which is suitable for low pressured steam application, but not suitable for electric heater and radiator system. Within these recommended operating temperatures, it will not affect the thermal efficiency of Aeroflex.

# **WATER ABSORPTION & MOISTURE PERMEABILITY**

The closed cell structure protects against moisture and assure very low water absorption which can eliminate the need for a water vapor barrier in the most applications. However, under severe condition of high humidity (90% RH up), high temperature (40°C up), low ventilation area like tunnel or gutter and also direct to sun light, metal or polymeric jacketing is recommended to use as additional water vapor barrier and greater protection against severe condition.

## **FLAME AND SMOKE PROOF**

Aeroflex standard products have been specially formulated to meet and exceed the international fire standards such as ASTM E84, UL94. JIS K 6911, EMPA, IMO A653 and other standards. For other specific international fire standard, Aeroflex also offer Aeroflex-EP for FM approved insulation product. The products have low smoke density while burning and unlike other thermoplastic materials, Aeroflex will not melt nor drip flaming balls, therefore, it will not cause flame transfer.

# **NON-POLAR MATERIAL**

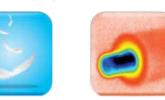
Aeroflex is made from EPDM Synthetic rubber. EPDM rubber is classified as Non-Polar material which is highly water resistant while NBR/PVC is classified as Polar, which slowly dissolves in water and causes surface deterioration. Meanwhile water is also polar material, so continuous contact with condensate water as water vapor damages NBR/PVC insulation much faster than EPDM based insulation.

#### **AEROFLEX** Outstanding physical properties





Self-extinguish ASTM D 635, Flame proof ASTM E 84 and pipe even after long period of service.





CFC's, HFC's, HCFC's free product - Ozone friendly product.



Wide temperature continuous



3mm (1/8") ID to 204mm m [1/8"] to 75mm [3"].



Low water absorption ASTM D 1056, Low V



has long-lasting service life.



Excellent ozone and weati ce ASTM D 1171. D 1149.



Accredited with ISO standards worldwide



# **PRODUCTS & APPLICATIONS**

#### **AEROFLEX TUBE INSULATION**

Aeroflex Tube Insulation Standard Product is available from 6mm ID upto 273mm ID with thickness from 6mm upto 100mm. Other sizes are also available upon request. Aeroflex Closed Cell Tube Insulation, made of EPDM (Ethylene Propylene Diene Monomer Synthetic Rubber) as its main raw material, is easily installed to pipe or tubing. The factory-applied coating of talcum powder on the thick and smooth inner skin helps facilitate and speed up preassembly line. When applied to existing lines, tubing should be slit lengthwise and snapped into place. Slitting can be done on the job easily with razors, blades, knives or shears. Cut edges and joints can be sealed with Aeroseal Adhesive (neoprene based contact cement).

## **AEROFLEX STANDARD SHEET (MS1 & MS2)**

The standard sheet is available in  $0.5 \text{m} \times 2.0 \text{m}$  (MS1) and  $1.0 \text{m} \times 2.0 \text{m}$  (MS2) with the wall thickness from 3 mm up to 50 mm. It prevents heat loss and condensation on large pipeline, tanks, chillers, air ducts and other irregular shaped vessels.

# **AEROFLEX SHEET ROLL (MSR)**

Aeroflex sheet insulations are also available in continuous roll form. Aeroflex continuous sheet rolls are available from 3mm to 50mm thickness, with the width of 1,000mm, 1,220mm, 1,400mm or above also available upon request. All insulation sheets are made from the same materials as Aeroflex tubing.

#### **AEROFLEX SA/PT**

Aeroflex insulation with self-adhesive tape and Protape cover, providing fast and easy installation, time and cost-saving, volatile chemical free without the use of adhesive, and extra protection with Protape cover.

# AEROFLEX SHEET WITH ADHESIVE AND ALUMINUM FOIL LAMINATION

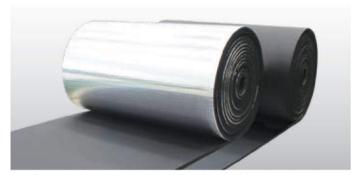
Aeroflex sheet with adhesive and aluminum foil lamination is a lightweight insulation installed on air ducts to prevent condensation, save energy and reduce noise. It helps to minimize mold growth and provides better air quality.

# **ACCESSORIES**

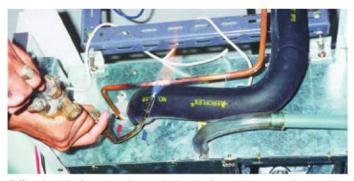
Aeroflex offers the widest range of thickness and sizes both tube and sheet forms. To complement its customer needs, other products including Aeroseal glue, Aerotape foam tape, Everseal corktape, Aerocoat acrylic emulsion paint, Aerofix rigid foam hanger, etc., are also available at the distribution network of Aeroflex.



Aeroflex is available in continuous sheet roll both with and without aluminum foil lamination to suit different needs.



Aeroflex is available in continuous sheet roll both with and without aluminum foil lamination to suit different needs.



Self-extinguished property, low smoke density, less toxic gases and non-melting characteristic when burnt, making Aeroflex widely used in air-conditioning systems.



Many advantages described above making Aeroflex suitable for insulating chilled water piping.









**AEROSEAL** 





AEROTAPE PROTAPE

**EVERSEAL** 

AEROFIX

AEROCOAT

# PRODUCTS SPECIFICATIONS

# **AEROFLEX**

# WIDELY USED TO SAVE ENERGY AND PREVENT CONDENSATION

AEROFLEX sstandard is an EPDM based closed cell light weight elastomeric thermal insulation specially formulated to meet 25/50 ASTM E 84, Class V-0 UL 94, Class 5.3 EMPA (Switzerland), IMO (International Marine Organization) and other international fire standards. Aeroflex standard sheet and tube elastomeric thermal insulation are widely used to save energy and prevent condensation problem on chilled water and refrigeration systems. They also efficiently reduce heat loss on hot water plumbing, liquid heating and dual temperature piping.



## AEROFLEX-Standard Specification:

Properties*			Test Method				
Cell Structure			-				
Density lbs/ft³ (Kg/m³)		3	ASTM D 1667				
Thermal Conductivity BTU.in/ft² hr °F	Mean Temp	-4°F (-20°C)	32°F (0°C)	75°F (24°C)	90°F (32°C)	104°F (40°C)	ASTM C 177 ASTM C 518
(W/ m.K)	K-Value	0.215 (0.0310)	0.230 (0.0330)	0.247 (0.0356)	0.256 (0.0365)	0.259 (0.0374)	JIS A 1412 EN ISO 8497
Service Temperature *3			Becomes hard at -57°C but can be used even at -200°C				
Water Absorption			<	10% (by weig	ht)		ASTM D 1056
water Absorption		<(	ASTM C 209				
Water Vapor Permeabilit perm.in (g/Pa.s.m)		< 0.10	ASTM E 96				
Ozone Resistance			ASTM D 1149 ASTM D 1171				
UV Weather Resistance			ASTM G 154				
Heat Stability (%Shrinka @ 220°F (104°C) x 7 days			ASTM C 534				
				ASTM E 84			
				UL 94			
Flammakility 9 Cmala D			S	ASTM D 635			
Flammability & Smoke D	ensity			EMPA (Switzerland)			
				JIS K 6911			
				IMO *4			
Mold Resistance			Meet F	UL 181			
Fungi Resistance				ASTM C1338			
Bacteria Resistance			Meet Red	ASTM E 2180			
Corrosion of Copper/Sta	ainless Steel			DIN 1988			
Nitrosamine Contents *5	i			FDA CPG 7117.11			
RoHS				Not Detected	EN Restriction of the Use of Hazardous Substances Directive (RoHS) 2002/95/EC		
Sound Reduction (AF)				32 dB (20 mm	1)		DIN EN ISO10052, DIN 4109-11
Flexibility				ASTM C 534			

**Note:** \*1. Figures show the average values obtained by world's well-known and recognized testing institutes.

- According to ASTM C 534: The density of this type of insulation material is not a performance property, so density is for reference purpose only.
   Aeroflex has wide range of thickness from 6mm up to 100mm and ID from 6mm up to 273mm, making insulation skin and volume ratio much varied from item to item, in which thicker insulation results in lower density, whereas thinner insulation results in
- higher density. Wall thickness below 32mm, the density is 48-80 kg/m³, while wall thickness above 32mm, the density  $\ge$  40 kg/m³.
- \*3. At temp. under 57 °C, AEROFLEX becomes hard but it does not affect thermal conductivity nor water vapor permeability. For heating applications, AEROFLEX can stand upto +125 °C continuously, and the adhesive up to +100 °C.
- \*4. IMO : International Maritime Organization
- \*5. It is reported that Nitrosamin is harmful to human health even during storage. No Nitrosamin compound was detected in AEROFLEX.



# **CHILLED WATER & REFRIGERATION SYSTEM**

AEROFLEX EPDM closed cell elastomeric thermal insulation is a superior insulation for cooling systems that function at below ambient temperature for energy saving by retarding heat gain and also preventing condensation on chilled water and refrigeration lines. Aeroflex also prevents the water pipes from freezing when ambient temperature is below sub-zero point. In areas with high humidity, condensation problems often occur on chilled water pipelines in central cooling systems. The condensation does not only damage ceiling, carpet and other furniture but also waste energy because of higher heat gain on chilled water pipes.

# Water Vapor Permeability

g/Pa.s.m (x 10<sup>-10</sup>)



**Note:** This average water vapor permeability data is based on products without vapor barrier.

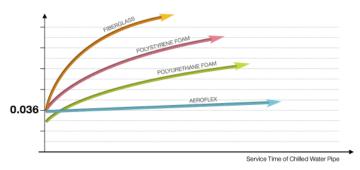


AEROFLEX is EPDM-based material with fine cell structure containing dry air (mainly nitrogen gas) which is high resistant to convection heat transfer, and with thousands of cell walls acting as multi-layer water vapor barrier to retard water and moisture penetration, resulting in low and stable thermal conductivity throughout service time. Aeroflex has been widely used in chilled water and refrigeration systems due to the following superior characteristics:

- Great resistance to water vapor penetration and very low water absorption
- Low and very stable thermal conductivity (K. Value)

# K. Value (Thermal Conductivity)

W/m.K



Note: Service time largely depends on humidity, temperature and installation workmanship. Under high humidity in tropical areas, the low water vapor transmission is important for thermal insulation in chilled water pipeline to maintain stable thermal conductivity (K. value) during service. Condensation problem will occur when the K. value of the insulation increases and the surface temperature of insulation drops below dew point. This happens in insulations with high water vapor transmission and high water absorption. (average K. value of water is approx. 0.60 W/m.K)

# **HOT WATER SYSTEM**

AEROFLEX elastomeric thermal insulation is very effective in reducing heat loss on hot water pipings, liquid heating and dual temperature piping in hospitals, hotels, residential buildings, industrial plants, etc. It's also used on central liquid heating system to heat private houses and public buildings. For higher performance in heat resistance and outdoor application, AEROFLEX-HT provides exceptional ozone, ultraviolet and weather resistance, also used for solar-heating and steam-heating applications with service temperature up to +150 °C. No danger of fibrous material when installed in place where hygiene is vital. Aeroflex is manufactured from synthetic polymers which contain no asbestos or fibrous material. The is one of many reasons why Aeroflex is widely selected as replacement for fibrous material

like fiberglass or rock wool used in hot water and low pressured steam pipeline. The closed cell structure and superior elastomeric properties provide the following advantages:

- Service temperature up to +125 °C for Aeroflex Standard and up to +150 °C for Aeroflex-HT
- Outstanding ultraviolet and weather resistance when used outdoor
- · Very stable thermal conductivity value throughout service life
- · Very low water absorption
- No jacket is necessary even for outdoor piping, unless long term direct contact to sunlight jacketing or protective coating are recommended Flexibility for easy installation



Because of low water absorption and water vapor transmission, Aeroflex is widely used in heating and cooling system.



Stable K value and outstanding weather resistance throughout service life. Aeroflex is widely used in heating system to replace fiberglass.

# STANDARD PACKING (Metric System)

AEROFLEX Insulation Tube : 2 Meters Length/Piece

I.D.	SIZE		Code number (Quantity : Pieces/Carton)															
мм	INCH	I.P.S.	6 m wa		9 m wai		13 m wal		19 m wal		25 m wal		32 n wal		38 m wal		50 m wal	
6	1/4"	-	M06006	(180)	M09006	(132)	M13006	(80)	M19006	(32)	M25006	(24)	-	-	-	-	-	-
10	3/8"	-	M06010	(140)	M09010	(110)	M13010	(70)	M19010	(32)	M25010	(24)	M32010	(14)	-	-	-	-
(12)13	1/2"	1/4"	M06013	(110)	M09013	(84)	M13013	(60)	M19013	(32)	M25013	(20)	M32013	(14)	M38013	(10)	M50013	(4)
(15)16	5/8"	3/8"	M06016	(80)	M09016	(70)	M13016	(50)	M19016	(28)	M25016	(18)	M32016	(14)	M38016	(8)	M50016	(4)
(18)19	3/4"	-	M06019	(70)	M09019	(60)	M13019	(40)	M19019	(24)	M25019	(18)	M32019	(14)	M38019	(8)	M50019	(4)
22	7/8"	1/2"	M06022	(70)	M09022	(54)	M13022	(32)	M19022	(20)	M25022	(16)	M32022	(12)	M38022	(8)	M50022	(4)
25	1"	3/4"	M06025	(60)	M09025	(44)	M13025	(30)	M19025	(18)	M25025	(12)	M32025	(10)	M38025	(8)	M50025	(4)
28	1-1/8"	-	M06028	(50)	M09028	(36)	M13028	(28)	M19028	(18)	M25028	(12)	M32028	(8)	M38028	(8)	M50028	(4)
32	1-1/4"	-	M06032	(40)	M09032	(34)	M13032	(24)	M19032	(18)	M25032	(12)	M32032	(8)	M38032	(8)	M50032	(4)
35	1-3/8"	1"	M06035	(40)	M09035	(32)	M13035	(20)	M19035	(16)	M25035	(10)	M32035	(8)	M38035	(6)	M50035	(4)
38	1-1/2"	-	M06038	(32)	M09038	(30)	M13038	(18)	M19038	(12)	M25038	(10)	M32038	(8)	M38038	(6)	M50038	(4)
42	1-5/8"	1-1/4"	M06042	(30)	M09042	(28)	M13042	(18)	M19042	(12)	M25042	(8)	M32042	(8)	M38042	(6)	M50042	(4)
45	1-3/4"	-	M06045	(28)	M09045	(24)	M13045	(18)	M19045	(10)	M25045	(8)	M32045	(8)	M38045	(6)	M50045	(4)
48	1-7/8"	1-1/2"	M06048	(24)	M09048	(20)	M13048	(16)	M19048	(10)	M25048	(8)	M32048	(6)	M38048	(6)	M50048	(3)
51	2"	_	<u>~</u>	_	M09051	(18)	M13051	(14)	M19051	(8)	M25051	(8)	M32051	(6)	M38051	(4)	M50051	(3)
54	2-1/8"	-	<u>-</u>	_	M09054	(18)	M13054	(14)	M19054	(8)	M25054	(8)	M32054	(6)	M38054	(4)	M50054	(3)
57	2-1/4"	-	-	-	M09057	(18)	M13057	(14)	M19057	(8)	M25057	(8)	M32057	(6)	M38057	(4)	M50057	(3)
60	2-3/8"	2"	_	_	M09060	(18)	M13060	(12)	M19060	(8)	M25060	(6)	M32060	(4)	M38060	(4)	M50060	(3)
64	2-1/2"	(=:	~	-	M09064	(16)	M13064	(10)	M19064	(8)	M25064	(6)	M32064	(4)	M38064	(4)	M50064	(3)
67	2-5/8"	-	-	-	M09067	(14)	M13067	(10)	M19067	(8)	M25067	(6)	M32067	(4)	M38067	(4)	M50067	(3)
73	2-7/8"	2-1/2"	-	-	M09073	(10)	M13073	(10)	M19073	(6)	M25073	(6)	M32073	(4)	M38073	(3)	M50073	(2)
76	3"	_	_	_	M09076	(10)	M13076	(8)	M19076	(6)	M25076	(6)	M32076	(4)	M38076	(3)	M50076	(2)
80	3-1/8"	-	-	-	M09080	(10)	M13080	(8)	M19080	(6)	M25080	(6)	M32080	(4)	M38080	(3)	M50080	(2)
83	3-1/4"	_	22	2	M09083	(10)	M13083	(8)	M19083	(6)	M25083	(6)	M32083	(4)	M38083	(3)	M50083	(2)
90	3-1/2"	3"	-	-	M09090	(8)	M13090	(8)	M19090	(6)	M25090	(4)	M32090	(4)	M38090	(3)	M50090	(2)
92	3-5/8"	_	_	_	M09092	(8)	M13092	(8)	M19092	(6)	M25092	(4)	M32092	(4)	M38092	(3)	M50092	(2)
98	3-7/8"	920	_	2	M09098	(8)	M13098	(8)	M19098	(4)	M25098	(4)	M32098	(2)	M38098	(3)	M50098	(2)
102	4"	-	=	_	M09102	(8)	M13102	(8)	M19102	(4)	M25102	(4)	M32102	(2)	M38102	(2)	M50102	(2)
105	4-1/8"	_	-	-	M09105	(6)	M13105	(6)	M19105	(4)	M25105	(4)	M32105	(2)	M38105	(2)	M50105	(2)
115	4-1/2"	4"	_	_	M09115	(6)	M13115	(6)	M19115	(4)	M25115	(4)	M32115	(2)	M38115	(2)	M50115	(2)
130	5-1/8"	-	-	_	M09130	(4)	M13130	(4)	M19130	(4)	M25130	(2)	M32130	(2)	M38130	(2)	M50130	(2)
140	5-1/2"	5"	_	_	M09140	(4)	M13140	(4)	M19140	(4)	M25140	(2)	M32140	(2)	M38140	(2)	M50140	(2)
165	6-1/2"	6"	_	-	M09165	(4)	M13165	(4)	M19165	(2)	M25165	(2)	M32165	(2)	M38165	(2)	M50165	(2)

Note: Other ID and wall thickness are available upon request.

# **AEROFLEX Standard Sheet Insulation**

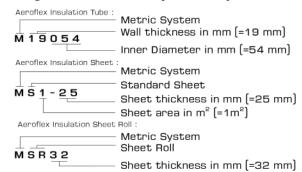
TENOT LEX Standard Shoot modulation											
Sheet Size	Code Number (Quantity : M²/Carton)										
	3mm wall	6mm wall	9mm wall	13mm wall	19mm wall	25mm wall	32mm wall	38mm wall	50mm wall		
0.5mx2.0m	MS1-03 (48)	MS1-06 (24)	MS1-09 (16)	MS1-13 (12)	MS1-19 (8)	MS1-25 (6)	MS1-32 (5)	MS1-38 (4)	MS1-50 (3)		
(1m²/sheet)	MS1-03 (48)				MS1-19 (6)	MS1-25 (6)			MS1-50 (3)		
1.0mx2.0m	MS2-03 (96)	MS2-03 (96) MS2-06 (48)	MS2-09 (32)	MS2-13 (24)	MS2 10 (16)	MS2-25 (12)	MS2-32 (10)	MS2-38 (8)	MS2-50 (6)		
(2m²/sheet)		10152-06 (46)			MS2-19 (16)	10152-25 (12)			10132-50 (6)		

# **AEROFLEX Continuous Sheet Roll (1 Meter Width Roll)**

_	Size								
Code	Thickness (mm)	Width (m)	Length (m)	Area/Roll (m²)					
MSR 03*	3	1.0	45	45					
MSR 06*	6	1.0	22	22					
MSR 09*	9	1.0	15	15					
MSR 13*	13	1.0	11	11					
MSR 16	16	1.0	10	10					
MSR 19	19	1.0	7	7					
MSR 25	25	1.0	5	5					
MSR 32	32	1.0	4	4					
MSR 38	38	1.0	3	3					
MSR 50	50	1.0	2	2					

Note: \*3, 6, 9mm thick sheet have one side skin.

# Decoding of Aeroflex Insulation (Metric Unit):



# **AEROFLEX Average Nominal Wall Thickness Insulation Tube**

AEHOFLEX Average Nominal Wall Thickness Insulation Tube											
I.D. SIZE	nominal wall 1/4" (6mm)	nominal wall 3/8 (9mm)	nominal wall 1/2" (13mm)	nominal wall 3/4" (19mm)	nominal wall 1" (25mm)	nominal wall 1-1/4"(32mm)	nominal wall 1-1/2"(38mm)	nominal wall 2" (50mm)			
9mm. to 28mm.	6 ± 1 mm.	9 ± 1	12.5 ± 1	19 ± 1	25 ± 1	32 ± 2	38 ± 2	50 ± 2			
32mm. to 80mm.	$7 \pm 1$ mm.	9.5 ± 1	13.5 ± 1	20 ± 1	26 ± 1	33 ± 2	39 ± 2	51 ± 2			
90mm. to 140mm.	-	10 ± 1	14.5 ± 1	21 ± 1	27 ± 1	$34 \pm 2$	40 ± 2	52 ± 2			

# **AEROFLEX IN SERVICE WORLDWIDE**

**AEROFLEX** thermal insulation has been widely installed in thousands of high standard buildings including hotels, hospitals, office buildings, universities, shopping centers, international airports, nuclear power stations, and other industrial buildings worldwide.







• Ferrari World, Abu Dhab



Fukushima Nuclear Power Plant, Japan



Super Brand Mall. Shangha



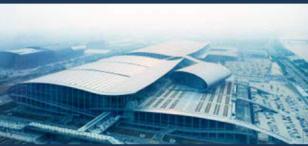
• Burj Khalifa, Dubai



• Suwanaphumi International Airport, Thailand



• Central World Bangkok, Thailand



• Guangzhou International Exhibition Center, China



• Swiss International Airport



Crown Regency Hot
 Philippines



• Royal Cliff Resort, Pattaya



Atlantis Palm Jumeirah, Dubai



 Swiss Federal Institute of Technology Zurich (ETH), Switzerland



Skypark Marina Bay Sands Resort, Singapore





... and many other high standard projects.

# **AEROFLEX INTERNATIONAL DISTRIBUTION**



#### ASIA:

China, Japan, South Korea,
Taiwan, Hong Kong, Philippines,
Thailand, Malaysia, Indonesia,
Brunei, Singapore, Vietnam, Laos,
Myanmar, India, Pakistan, Srilanka,
Bangladesh, Maldives, Nepal

#### MIDDLE EAST:

Saudi Arabia, Egypt, Kuwait, U.A.E., Qatar, Oman, Bahrain, Jordan Iran, Syria, Lebanon, Israel.

## AUSTRALIA & OCEANIA:

Australia, New Zealand, Fiji, Papua New Guinea, Noumea.

#### AFRICA:

South Africa, Ghana Mauritius, Tanzania, Kenya, Nigeria.

#### EUROPE:

Germany, Sweden, Norway, Denmark, Benelux, Poland, Switzerland, Bulgaria, Portugal, Hungary, Turkey, Cyprus, Slovakia, Croatia, Slovenia, Romania, Estonia, Lituania, Latvia, Russia, Spain, Czech Republic, U.K., Malta,

#### NORTH AMERICA:

U.S.A., Canada, Mexico

# CENTRAL AND SOUTH AMERICA:

Chile, Cuba, Dominican Republic, Panama, Venezuela, Colombia.





















AEROFLEX CO.,LTD (Total area 100,000 m²)



# บริษัท 3ที อินซูเลชั่น จำกัด

ที่อยู่ 20/8 หมู่ 10 ถ.กาญจนาภิเษก ต.คลองข่อย อ.ปากเกร็ด จ.นนทบุรี 11120 โทรศัพท์ 02-159-6402, 02-159-0601-2 Email sales@3t-insulation.com Website www.3t-insulation.com

