

# Inner Flex Nitrile Rubber

**INNER FLEX**<sup>®</sup>  
NITRILE RUBBER



## DESCRIPTION OF MATERIAL :

- **INNER FLEX®** is closed cell flexible elastomeric foam made from Nitrile rubber. Flexible, durable and easy to handle. Class 1 fire safety as per BS 476 part 7. It is applicable in various fields such as HVAC, automobile, construction industry, pharma industry, hotels, hospital and cold storage industry.

<b>BRIEF DESCRIPTION</b>	It is a closed cell thermal insulation material with class 1 fire classification. It ensures the energy saving in eco - friendly manner as it is free from CFC/HCFC.
<b>MATERIAL TYPE</b>	Elastomeric foam based on synthetic rubber (NBR)
<b>COLOR</b>	Black
<b>PRODUCT RANGE</b>	Available in rolls (sheet) in 6mm, 9mm, 13mm, 16mm, 19mm, 25mm & 32 mm thickness. Available in tubes from 6mm to 19mm & 25mm to 32mm thickness.
<b>APPLICATIONS</b>	HVAC, VRF and Plumbing application, Solar industry, Automobile sector, construction industry, pharma industry, hotels, hospital and cold storage industry to reduce heat loss or gain.

## TECHNICAL DATA

<b>DENSITY</b>	40- 60Kg/m <sup>3</sup>		
<b>TEMPERATURE RANGE</b>	Max. service temperature +105° C Min. service temperature -40° C		
<b>THERMAL CONDUCTIVITY (W/M K)</b>	Ø (°C)	20° C	30° C
	λ in (W/m K)	≤ 0.0346	≤ 0.037
<b>WATER VAPOUR DIFFUSION RESISTANCE FACTOR</b>	≥ 7000(PLAIN) As per ASTM E 96		
<b>ECOLOGICAL DATA</b>	No asbestos, No CFC-HCFC, No formaldehyde etc.		

**TECHNICAL DATA**

<b>SURFACE SPREAD OF FLAME</b>	Class 1	As per BS 476 Part 7
<b>RATE OF BURNING</b>	Class V-0	As per UL94-1997
<b>PRACTICAL FIRE BEHAVIOUR</b>	Self-extinguishing, does not drip, does not spread flame. As per ASTM D 635 -06	

\*Sheet- Available in factory lamination with Aluminium Foil, self - adhesive.

**INNER FLEX™ Class 1 Features:**

- ▶ Class 1 fire performance
- ▶ Low thermal conductivity
- ▶ High water vapour diffusion resistance
- ▶ CFC/HCFC free.
- ▶ Easy to install

INNER FLEX® Tubing (Class 1 Insulation Tube packing List)

Size ID		6mm Thk		9mm Thk		13mm Thk		19mm Thk		25mm Thk		32mm Thk	
Mm	inch	Pcs./ Crtn	Mtr./ Crtn	Pcs./ Crtn	Mtr./ Crtn	Pcs./ Crtn	Mtr./ Crtn	Pcs./ Crtn	Mtr./ Crtn	Pcs./ Crtn	Mtr./ Crtn	Pcs./ Crtn	Mtr./ Crtn
6	1/4	250	457.5	156	285.48	10	01.3	54	98.82				
10	3/8	200	366	120	219.6	80	146.4	40	73.2	25	45.75		
13	1/2	150	274.5	100	183.00	72	131.76	36	65.88	20	36.6		
16	5/8	120	219.6	90	164.70	63	115.29	35	64.05	20	36.6	20	36.6
19	3/4	100	183	72	131.76	56	102.48	30	54.9	20	36.6	20	36.6
22	7/8	90	164.7	64	117.12	48	87.84	30	54.9	18	32.94	18	32.94
25	1	80	146.4	56	102.48	42	76.86	25	45.75	16	29.28	16	29.28
28	1 1/8	70	128.1		89.76	36	65.88	25	45.75	16	29.28	12	21.96
32	1 1/4	60	109.8	42	76.86	30	54.9	20	36.6	15	27.45	12	21.96
35	1 3/8			40	73.20	30	54.9	18	32.94	12	21.96	12	21.96
38	1 1/2			36	65.88	25	45.75	16	29.28				
42	1 5/8			30	54.90	25	45.75	16	29.28	12	21.96	10	18.3
45	1 3/4			30	54.90	20	36.6						
48	1 7/8			28	51.24	20	36.6	15	27.45	10	18.3	10	18.3
51	2			24	43.92	20	36.6	12	21.96	9	16.47	8	14.64
54	2 1/8			21	38.43	20	36.6	12	21.96	9	16.47	6	10.98
57	2 1/4			20	36.60								
60	2 3/8			20	36.60	18	32.94	10	18.3	9	16.47	6	10.98
63	2 1/2			20	36.60	15	27.45	10	18.3				
67	2 5/8			18	32.94	15	27.45	9	16.47	8	14.64	6	10.98
73	2 7/8			18	32.94	13	23.79	9	16.47	8	14.64	6	10.98
76	3			18	32.94	12	21.96	8	14.64	8	14.64	5	9.15
79	3 1/8			16	29.28	12	21.96	8	14.64	8	14.64	5	9.15
84	3 1/3									6	10.98		
89	3 1/2			16	29.28	12	21.96	6	10.98	6	10.98	5	9.15
102	4							4	7.32	5	9.15	4	7.32
108	4 1/4					8	14.64	4	7.32	4	7.32	4	7.32
114	4 1/2											2	3.66

**INNER FLEX™ Continuous Sheet (Class 1 Nitrile Insulation sheet packing List)**

Sheet Thickness (mm)	Dimensions	Roll content sq. mtr.
6	1 X 15m	15
9	1 X 15m	15
13	1 X 15m	15
16	1 X 15m	15
19	1 X 15m	15
25	1 X 10m	10
32	1 X 8m	8

**INNER FLEX® Class 1 Tube/Sheet APPLICATION AREA**

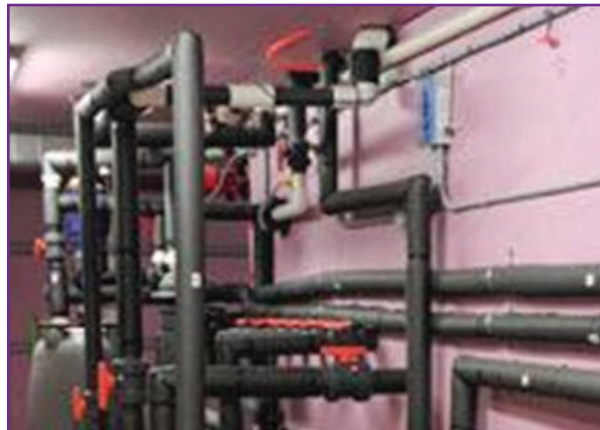
**SOLAR SYSTEM PIPEWORK**

- ▶ Due to high demand & cost of energy and its effect on environment, community & businesses are converting into solar heating system.
- ▶ Large amount of heat is lost from pipes that connects the solar panel to hot water tanks and heat pumps. Which reduces overall efficiency of system i.e. less energy is harnessed.
- ▶ To reduce that heat loss, the pipe carrying hot water needs to be properly insulated.
- ▶ The solar system pipework is long and carrying water at temperature of 60-75°C or more in some commercial applications, as well as it is located outside so insulation material used shall be resistant to moisture, and damage by birds etc.
- ▶ **INNER FLEX®** tube or sheet with tough, UV resistant outer covering is ideal solution for solar hot water system pipework.



## PLUMBING APPLICATION: HEATING & COOLING

- ▶ Plumbing covers the hot and cold water supply lines in case of residential & commercial applications like hotels, hospitals etc.
- ▶ The plumbing lines pass through both indoor and outdoor locations.
- ▶ Insulating these lines will save large amount of energy and ultimately decreases load on heating/cooling system energy consumption drastically.
- ▶ The insulation in case of cold water line prevent it from freezing at sub-zero temperature, also helps in condensation control which avoids corrosion of pipe surface.
- ▶ Insulating hot water pipe prevent heat loss to surrounding air which help in reduction of carbon emission.
- ▶ **INNER FLEX®** tubing is working well for cold as well as for hot water lines due to its good service temperature range.



## VRV/VRF piping in Split Air conditioning System

- ▶ A new kind of HVAC system uses VRV/VRF technology which increases effectiveness and efficiency.
- ▶ Due to this it has become good option for certain commercial & residential construction projects that requires high levels of flexibility when it comes to occupants comfort or for retrofit projects.
- ▶ The term VRF/VRV refers to ability of system to control the amount of refrigerant flowing to each of the evaporators with different capacities & configuration in simultaneous heating and cooling in different zones and heat recovery from one zone to another.

- ▶ Most of the VRV/VRF system consist of 3 –pipe system which are made up of copper or Aluminium, all of which requires to be insulated.
- ▶ These 3 pipe system (liquid line, hot gas line & suction line) branched off with solenoid valve that also needs to be insulated. These set of pipes requires insulating, usually place within a small space or in an exposed area. So insulation material shall be clean free from dust & fibres and formaldehydes.
- ▶ In normal operating condition, the temperature of VRV/VRF pipe system ranges from -16<sup>o</sup> C to 70<sup>o</sup> C, so here closed cell elastomeric insulation is applicable.
- ▶ **INNER FLEX<sup>®</sup>** tubing service temperature ranges from -40<sup>o</sup>C to 105<sup>o</sup>C, which provides best option for VRF piping insulation.



## Ductwork Application

- ▶ Ductwork refers to the system of ducts and pipes that circulate heated or cooled air throughout the serving area.
- ▶ Ducts are made up of thin material, usually sheet metal, which causes air to leak. So proper insulation will help to maintain temperature and avoid leakage. The ductwork in unconditioned area such as basement, ceilings and floors is where ductwork insulation is most important.
- ▶ In case of cooled air passing through warm areas can cause condensation in the ductwork. This condensation leads to development of moisture formation on the surface of duct causing mould growth, corrosion.
- ▶ To address these issues and maintain temperature of heated or cooled air the different shapes duct needs to be insulated.
- ▶ To address these issues and maintain temperature of heated or cooled air the different shapes duct needs to be insulated.
- ▶ Inner Engineering provides closed celled elastomeric insulation **INNER FLEX<sup>™</sup>** sheet which is dust and fibre free, free from CFC/HCFC having high water diffusion resistance factor helps to prevent wastage of energy, leaks, temperature drop and mould growth without harming environment.

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- ▶ **INSEAL**® Alu tapes can be used to seal the joints of insulation sheet, which gives proper covering to prevent heat loss through gaps.



Ductwork Class 1 insulation with aluminium foil.

### Valves, Fittings and Supports:

- ▶ Pipework is coming with different types of Valves & fittings which also contribute to heat loss or heat gain in the overall process.
- ▶ But, due to complicated cutting & installation requirement people avoid applying insulation.
- ▶ This leads to almost 20-30% loss of heat. So insulation of valves & fittings is also most important parameter to save energy in process
- ▶ In HVAC application pipe support becomes a weak part while insulating pipe surface, as it creates a thermal bridge which causes unnecessary heat loss in hot application.
- ▶ In cold application uninsulated pipe support will leads to condensation problem.
- ▶ So applying **INNER FLEX**® sheets by proper cutting and installation will help to reduce above problems, as it's a good water vapour resistant.





## AUXILIARY MATERIALS

### Protective covering/Vapour Barrier: For exposed insulation work

#### INFIX GC® GLASS CLOTH

For UV protection and with high emissivity. It is available in different colors.

- ▶ **Aluminium foil- INNER FLEX®** sheets comes with Al foil laminations also as per requirement



#### INFIX® PROTECK

- ▶ It secure and protect insulation of pipe, duct or any surface. It is used for exposed piping, shafts, critical areas and clean room application for insulation protection against ultraviolet radiations and water vapour.



#### ADHESIVE

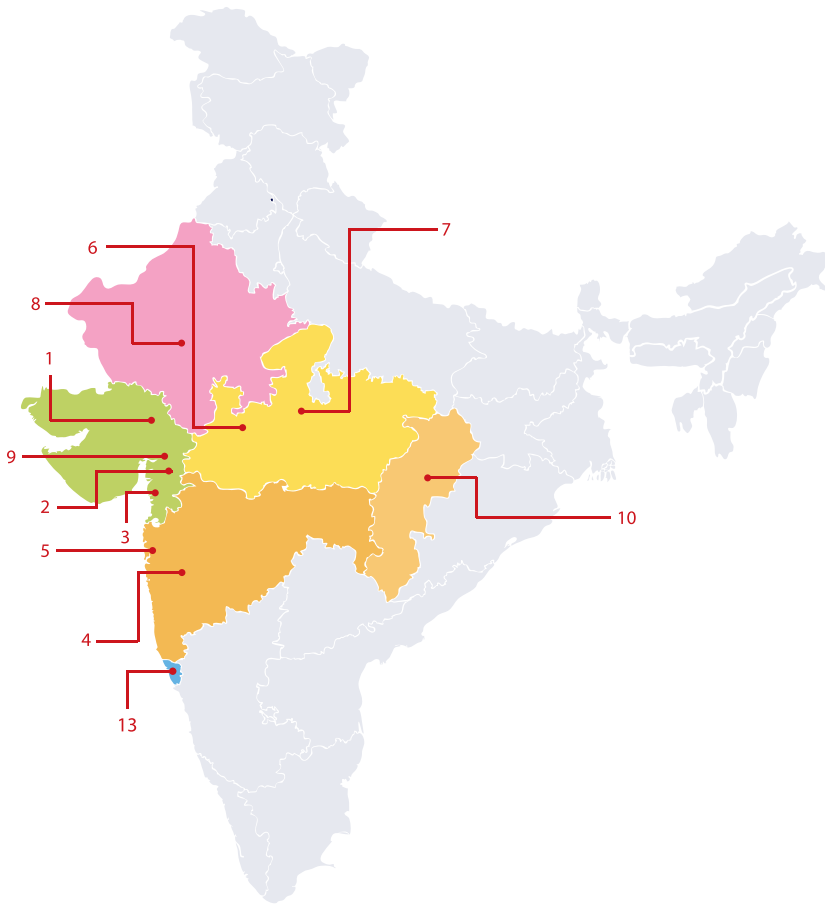
#### INBOND®

- ▶ For installing insulation material properly over surface Inner Engineering provides with one of its best adhesive solution

#### TAPES

#### INSEAL® SELF ADHESIVE TAPE

- ▶ **ALU TAPE, GC TAPES** are used to seal the insulation joints for proper installation.






-  **AHMEDABAD**  
ie.csd@innerengineering.co.in
-  **BARODA**  
ie.contacts@innereng.com
-  **SURAT**  
ie.tejas@innerengineering.co.in
-  **PUNE**  
ie.pune@innerengineering.co.in
-  **MUMBAI**  
ie.mumbai@innereng.com
-  **INDORE**  
ie.mp@innerengineering.co.in
-  **BHOPAL**  
ie.bhopal@innereng.com
-  **RAJASTHAN**  
ie.rajasthan@innereng.com
-  **ANAND**  
ie.anand@innereng.com
-  **CHHATTISGARH**  
ie.chattisgarh@innereng.com
-  **RETAIL SALES**  
ie.retailsales@innerengineering.co.in
-  **KUTCH**  
ie.rajkot@innereng.com
-  **GOA**  
ie.goa@innereng.com

innerengineering.co.in



**INNER ENGINEERING PRODUCTS & SYSTEMS PVT LTD**

-  Registered Office (Ahmedabad)  
Ground Floor, Showroom No. 3, Brooklyn Tower, Next to YMCA Club, S.G Highway, Ahmedabad - 380015, Gujarat, India.
-  Branch Office (Pune)  
Office No 501, Fifth Floor, Archway, Plot No 5, Sopan Baug Society, Survey No 2/1, Balewadi, Pune- 421045, Maharashtra, India.
-  Branch Office (Vadodara)  
713/A, Atlantis Heights, Opp. Swagat Petrol Pump, Nr. Genda Circle, Vadodara - 390021, Gujarat, India.

 1800 572 7963

 [ie.inquiry@innerengineering.co.in](mailto:ie.inquiry@innerengineering.co.in)

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