ALP

AEROFLEX®

# Application on Biotech

- Chilled Water
  CHD - 6°C - NBR/ EPDM Tubes

- Brine
  -5 to -15°C - Brine - NBR/EPDM Tubes

Reactor (Dual Temperature)
-30 to +130°C - Brine / Steam - EPDM Sheets

**Key Requirements for Biotech Plants**

1. Technical Suitability
2. Commercial Viability
3. Ease of Installation

**Major Technical Properties Considered During the technical evaluation**

1. Thermal Conductivity
2. Water Vapour permeability / Aging Characteristics
3. Flame Retardant Properties

**Major application factors considered while evaluating insulation**

1. Time taken for installation
2. Over all life of the system
3. Ease of installation
4. Maintenance / repair convenience
5. Aesthetics
6. Others

**Materials in this temperature range are**

- EPS
- PUF
- NBR
- EPDM

**EPDM/NBR are most suitable out of the above options. A few reasons are detailed on the next page (over leaf ).**

| NBR | PUF/ PIR |
|---|---|
| 1. Thermal Conductivity:<br>• Off gassing: Filled with $N_2$ gas. Stable thermal conductivity.<br>• At low temperature the conductivity is very low | 1. Thermal Conductivity:<br>• Blown with CFC/ HCFC high molecular gases. Increase in conductivity even before installation.<br>• At low temperature PUF conductivity is poor |
| 2. 'μ' Value<br>High 'μ' Value (7,000). Inbuilt very high resistance to water vapour ingress.<br>• No need of external vapour barrier (easy & faster installation)<br>• Increase in Thermal Conductivity λ' over a period of time is negligible. | 2. 'μ' Value<br>Low 'μ' Value (34-100). Very poor resistance to water vapour ingress.<br>• Need of external vapour barrier (difficult & takes longer time for installation)<br>• Increase in Thermal Conductivity λ' over a period of time is very high. |
| 3. Being flexible. Tubes & Sheets can take difficult shapes easily. Joints made with adhesive provide cold weld. It leaves no scope for water vapour ingress. | 3. Being rigid, even with best installation practices the joints are always prone for water vapour ingress. |
| 4. Corrosion:<br>NBR systems are non-metallic, resilient & have very 'μ' value like NBR<br>• No risk of UIC (Under insulation corrosion)<br>• No risk of galvanic corrosion | 4. Corrosion:<br>Metallic Coating<br>• Risk of UIC (Under insulation corrosion)<br>• Risk of galvanic corrosion |
| 5. Savings:<br>The installed cost of NBR is comparable with PUF/ PIR insulation. In long run it gives huge saving on account energy saving and almost no maintenance cost. | 5. Savings:<br>The long run they work out to be costly. |
| 6. Space;<br>Required Insulation Thickness is less. So, the gap required between the pipes is less. Space Saving. | 6. Space;<br>Required Insulation Thickness is more. So, the gap required between the pipes is more. |
| 7. Installation:<br>No special tools & machinery is required | 7. Installation:<br>Needs special tools and machinery |


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**HCFC Exchanged with Air in 4-8 Weeks**