APPLICATION ON
BIOTECH

- **CHILLED WATER**
  CHD - 6^{0}C - NBR / EPDM Tubes
- **BRINE**
  -5 to - 15^{0}C - Brine - NBR / EPDM Tubes
- **REACTOR (Dual Temperature)**
  -30 to - 130^{0}C - Brine - Steam - EPDM Tubes

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

1. EPS
2. PUF
3. NBR
4. EPDM

EPDM / NBR ARE MOST SUITABLE OUT OF THE ABOVE OPTIONS. A FEW REASONS ARE DETAILED ON THE NEXT PAGE

NBR

1. **THERMAL CONDUCTIVITY:**
   - Off Gassing: Filled with N_2 Gas. Stable thermal conductivity.
   - At low temperature the conductivity is very low

2. **'μ ' VALUE**
   - High 'μ' Value (7,000). very high inbuilt resistance to water vapour ingress.
   - No need of external vapour barrier (easy & faster installation)
   - Increase in thermal conductivity over a period of time is negligible.

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.

4. **CORROSION**
   NBR systems are non-metallic, resilient & have very 'μ' value like NBR
   - No risk of UIC (Under Insulation Corrosion)
   - No risk of galvanic corrosion

5. **SAVINGS**
   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.

6. **SPACE**
   Required insulation thickness is less. So, the gap required between the pipes is less. Space Saving.

7. **INSTALLATION**
   No special tools & machinery is required.

PUF/ PIR

1. **THERMAL CONDUCTIVITY:**
   - Blown with CFC/ HCFC high molecular gases.
   - Increase in conductivity even before installation.
   - At low temperature PUF conductivity is poor

2. **'μ ' VALUE**
   - Low 'μ' Value (34-100). Very poor resistance to water vapour ingress.
   - Need of external vapour barrier (difficult & takes longer time for installation)
   - Increase in Thermal Conductivity over a period of time is very high.

3. Being rigid, even with best installation practices the joints are always prone for water vapour ingress.

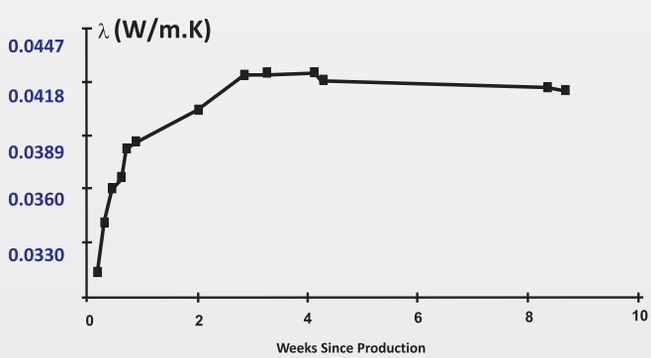
4. **CORROSION:**
   Metallic Coating
   - Risk of UIC (Under Insulation Corrosion)
   - Risk of galvanic corrosion

5. **SAVINGS:**
   - In the long run they work out to be costly.

6. **SPACE:**
   - Required insulation thickness is more. So, the gap required between the pipes is more.

7. **INSTALLATION:**
   - Needs special tools and machinery.

HCFC Exchanged with Air in 4-8 weeks



Manufactured and Marketed by:

ALP AEROFLEX INDIA PVT. LTD.

Corporate Office: Plot No. 32, Sector-18 HUDA, Gurgaon, Haryana - 122015 (INDIA)
Telephone: +91-124-4731500 | **Fax:** +91-124-4731598, 4731599
E-mail: marketing@alpaeroflex.com | **Website:** www.alpaeroflex.com

Plant: Bilaspur Road, Opposite Govt. P.G. College, Rudrapur, Distt. Udham Singh Nagar, Uttarakhand - 244923 (INDIA)
Telephone: +91-5944-247869, 247870 | **Fax:** +91-5944-243813