



ThermoWise

INTELLIGENT ENERGY SAVING SOLUTIONS

HOT AND COLD WATER

PRESSURE AND NON-PRESSURE

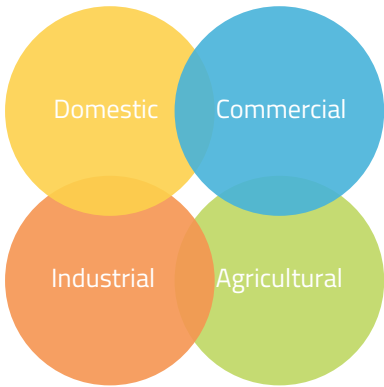
STORAGE VESSELS

SPECIFICATION SHEET



INDEX

Manufacturing	3
Treating Method	3
Specification	5
Vessel Design	6
Call out Detail	7 / 8
Heating Method	9
Lagging and Cladding	10



SPECIALISTS IN AIR TO WATER HEAT PUMPS

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MANUFACTURING

We fabricate and distribute vessels as a standard, ranging from 500 liters to 10 000 liters, as well as fabricate vessels according to customer specification, with stock available on request. The vessels are designed and manufactured according to ASME VIII DIV1 and SANS 347:2012. We are also capable of certification of the vessels by an independent inspection authority, if it is specified and required.

We only use the highest grade of metal for the manufacturing of our vessels. The shell thickness of our standard vessels range from 4mm to 10mm, using S355JR (300 WA) mild steel in the manufacturing process. The dish ends of our vessels range from 4mm to 10mm thickness to suit the vessel shell and consist of a 6% ellipsoidal dish manufactured from S355JR (300 WA) mild steel.

All connection points on our standard vessels are manufactured out of ASTM106 seamless pipe, with a flange configuration welded internally and externally to the shell of the vessel, and can be sized from 15mm to 100mm or high-grade steam sockets can be used. The connection points are specifically laid out for connection to a ThermoWise heat pump to gain maximum efficiency from the heat pumps, but can be custom designed according to your needs and specifications.

TREATING METHOD

BLASTRITE

Before coating takes place, grit blasting is done, and the vessels are certified to confirm that the steel work has been blasted in accordance with clause 4.3 of SABS 064/ISO8501/1 grade SA2.5, and has obtained an angular blast profile as set out in the standards, to ensure that the coatings applied, have the highest possible adhesion to the steel.

OUTER VESSEL PRIMER

After the outer vessel has conformed with the grit blasting process, the vessel is coated with a primer called OptiGuard Universal EP, which is a solvent based, self - priming, polyamide-cured epoxy coating, which performs as a durable high build primer or intermediate coat.

OUTER VESSEL TOP COAT

The vessel is then coated with OptiThane 421, a two component, acrylic polyurethane based, protective topcoat. It forms a high gloss, re-coatable, colourfast abrasion and weather resistant topcoat for metal and concrete. It has a high performance finish for both maintenance and new construction.

INNER VESSEL PRIMER

After the outer vessel has conformed with the grit blasting process, the vessel is coated with a primer called OptiGuard Universal EP, which is a solvent based, self - priming, polyamide-cured epoxy coating, which performs as a durable high build primer or intermediate coat.

INNER VESSEL TOP COAT

The inside of the vessel has two options of top coats. Either of the below will be suitable for the application:

OptiGlassFlake which is a solvent free, zinc phosphate, glass flake epoxy. It is designed to protect steel with the minimum amount of surface preparation and offers excellent corrosion resistance, excellent resistance to salt water, solvents and dilute acids and excellent abrasion resistance.

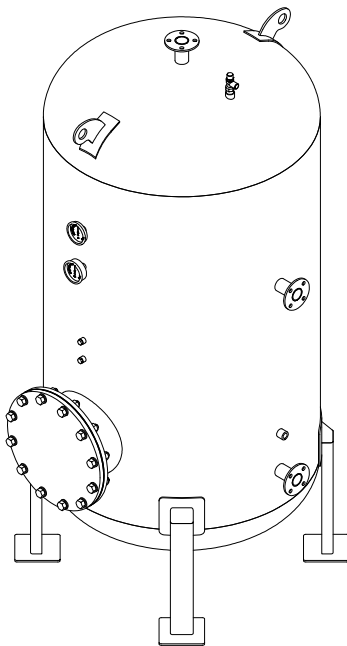
OptiGuard HB SF a high performance, solvent-free, self-priming, epoxy metal coating which can be used in marine and industrial environments. OptiGuard HB SF has excellent resistance to water and barrier properties, it is abrasion resistant and can be applied over mechanically cleaned steel and suitably prepared concrete. OptiGuard HB SF adheres to a variety of substrates such as damp steel, concrete and badly prepared steel and previously coated surfaces.



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STANDARD SPECIFICATION

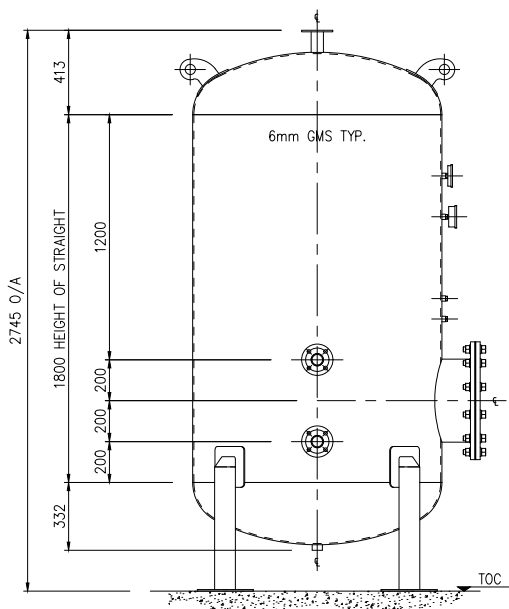
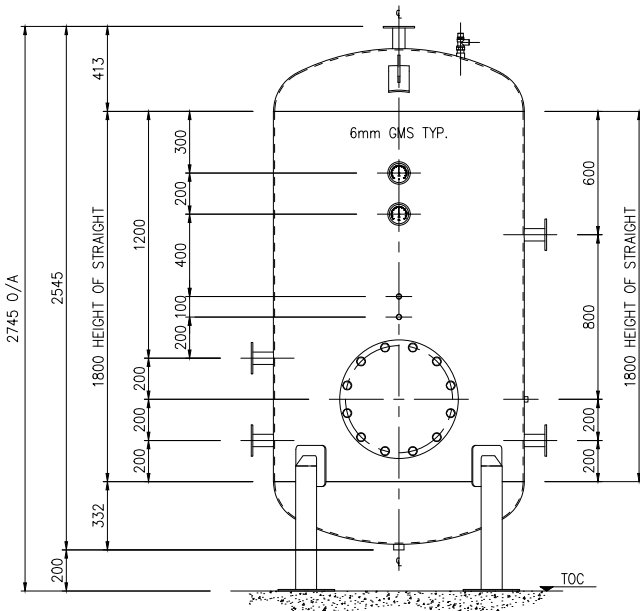
Our vessels are manufactured as either standard vessels or can be custom made to customer requirements. Below is a chart of our standard vessels sizes.



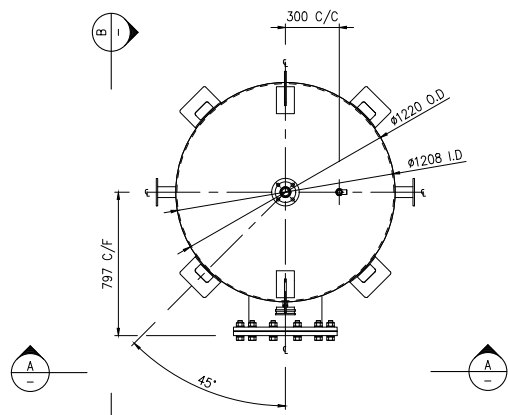
CAPACITY	DIAMETER	WELD TO WELD	OVERALL HEIGHT	DRY WEIGHT	STD LOADING
500	750	1000	1600	180	9kW
1000	920	1400	2000	260	12kW
1500	1070	1500	2200	330	18kW
2000	1070	2100	2750	380	24kW
2500	1220	1800	2500	450	24kW
3000	1220	2100	2700	530	36kW
3500	1370	2400	3100	580	36kW
4000	1450	2200	3000	620	36kW
4500	1500	2300	3100	675	48kW
5000	1600	2200	3000	740	48kW
6000	1800	2300	3200	1000	60kW
7000	1900	2300	3200	1075	72kW
8000	2050	2200	3200	1150	84kW
9000	2100	2300	3500	1250	84kW
10000	2100	2600	3800	1400	96kW

STANDARD VESSEL DESIGN

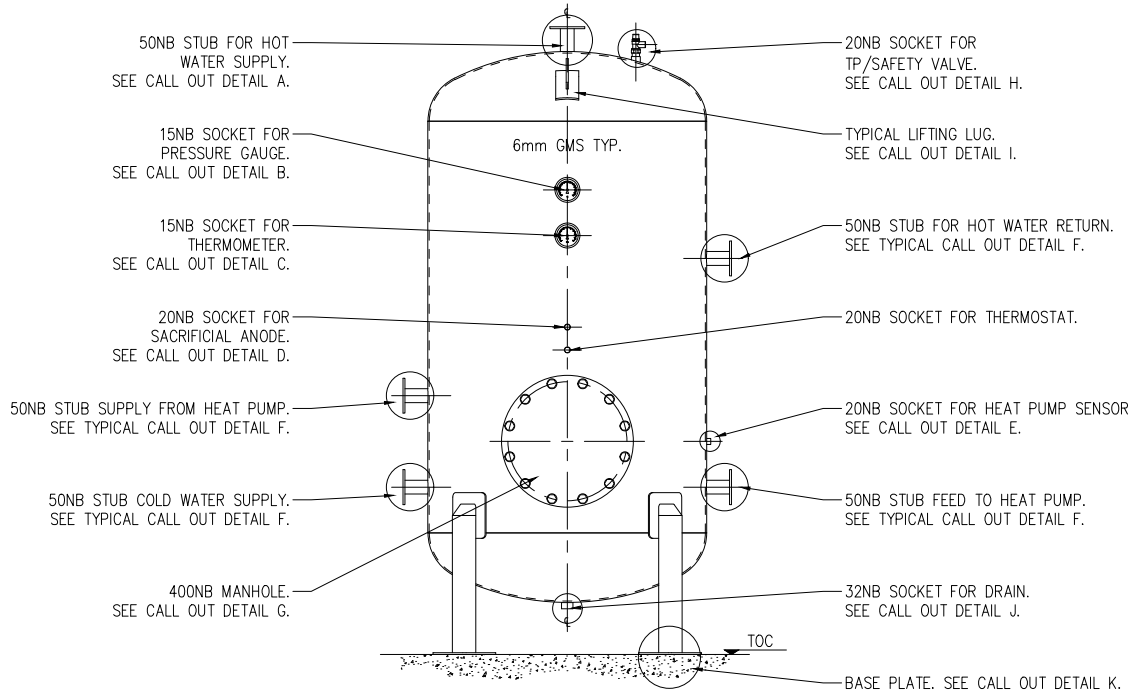
TYPICAL 2500LT VESSEL DESIGN WITH INDICATED SPECIFICATION



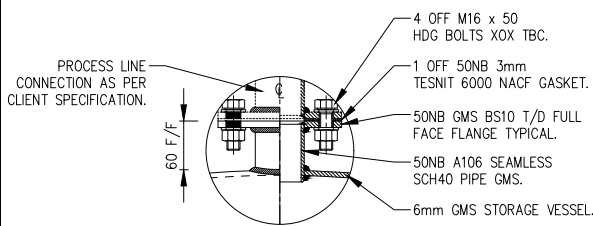
2500L VERTICAL WATER STORAGE VESSEL VESSEL SPECIFICATION:	
SHELL MATERIAL	6MM SJR MILD STEEL
DRY MASS	622KG
WET MASS	3122KG
WELDING SPECIFICATION	
ROOT	TIG
FILTER	MIG
CAP	MIG
NTD	DYE PENETRATION 2 PART SPRAY
PRESSURE TESTING	
CORROSION PROTECTION	
SAND BLASTING	ISO 8501 - SA3
HOT DIP GALVANIZING	SANS 1461
PRIMER	OPTIGUARD PRIMER @100µ DFT
INTERNAL TOP COAT	OPTI GLASS FLAKE @ 250µ DFT
EXTERNAL TOP COAT OPTION A	OPTITHANE 420 @ 66½ DFT
EXTERNAL TOP COAT OPTION B	OPTIGUARD HBSF @ 200µ DFT
INSULATION	
INSULATION FILLER	ISOVER GLASS WOOL 80kg/m³
CLADDING	0.5mm - 0.8mm PLATE TO SPEC
HEATING CAPACITY	
24KW (2X12KW)	380V/3É/50Hz
FITTINGS & INSTRUMENTATION	
TP/SAFETY VALVE	3/4" KWIKOT 600kPa
PRESSURE GUAGE	Ø100mm WIKA, 0 - 1000kPa
THERMOMETER	Å~100mm WIKA, 0 - 120 Å°C
SACRIFICIAL ANODE	KWIKOT MAGNESIUM SEAL ROD
HP SENSOR	



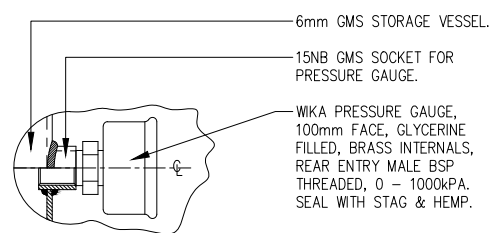
CALL OUT DETAIL



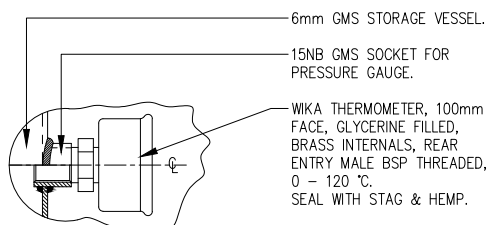
CALL OUT DETAIL A
50NB VERTICAL CONNECTION



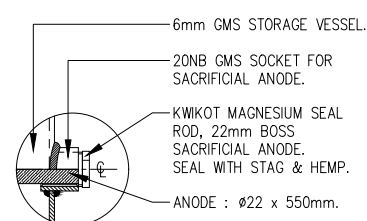
CALL OUT DETAIL B
15NB PRESSURE GAUGE SOCKET

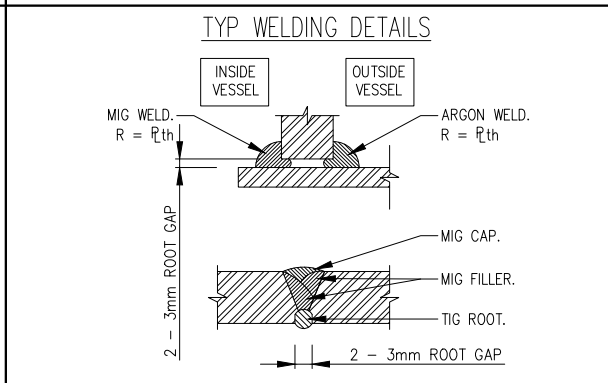
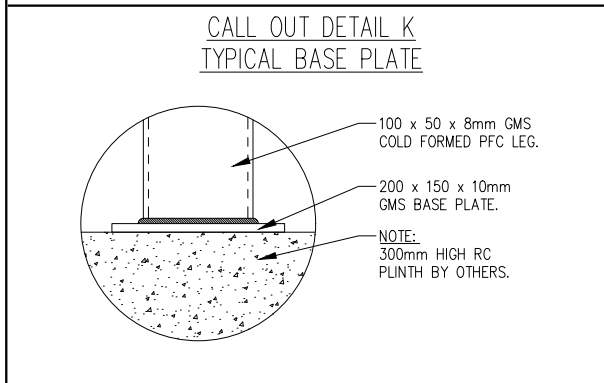
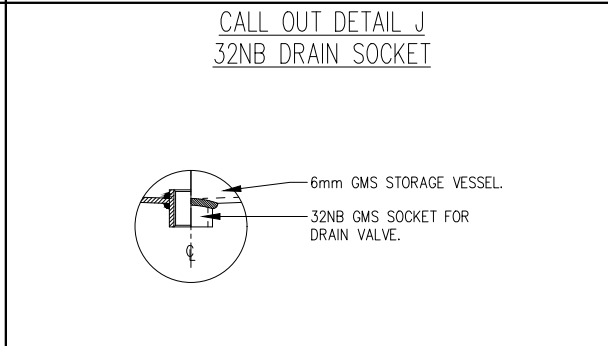
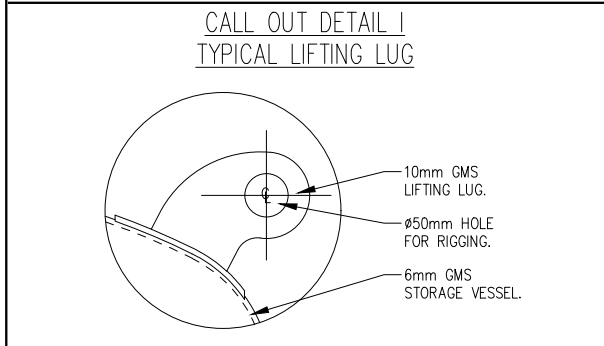
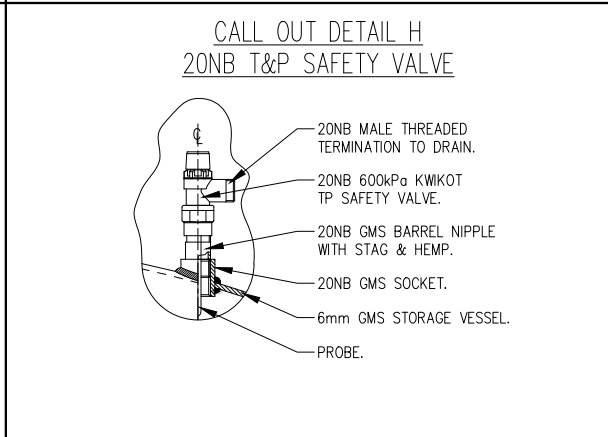
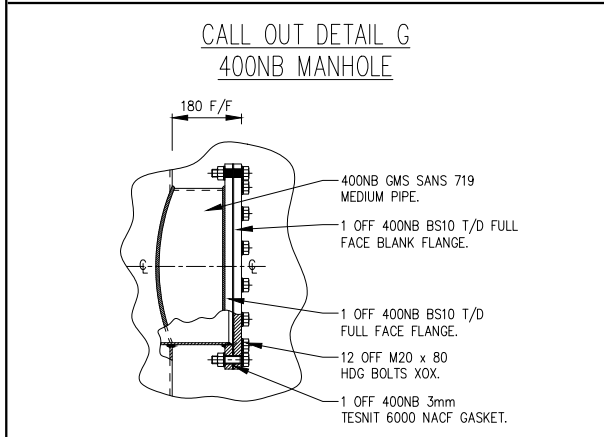
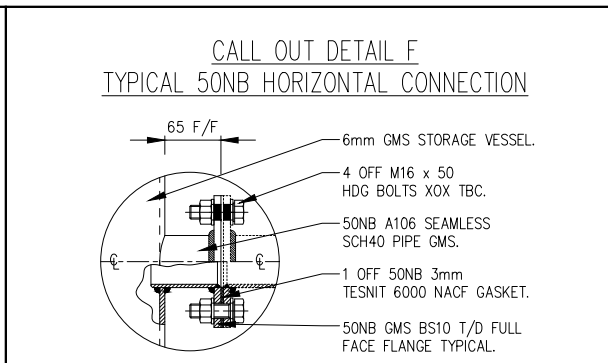
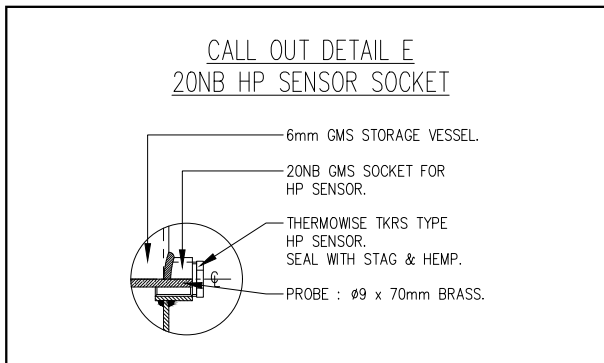


CALL OUT DETAIL C
15NB THERMOMETER SOCKET



CALL OUT DETAIL D
20NB SACRIFICIAL ANODE SOCKET





HEATING METHOD

HEAT PUMPS

At the heart of a modern heat pump, is a refrigeration system. Paradoxically, the refrigeration cycle is an efficient provider of heat, as well as cooling, and the basics of its operation are quite easily understood. The heat released during the process of condensing the refrigerant to a liquid, is rejected via the heat exchanger directly into air, or transferred, to heat the water. The air or water temperature at this point could be 43°C to 60°C, depending on the design of the system.

ELECTRICAL ELEMENTS

The vessel's heater box or the vessel itself, depending on the heating method, shall be fitted with a 3 phase bank of electrical elements rated as described in sections 2.2 and 2.3. Each element shall be connected phase to neutral, and not phase to phase, and be suitable for operating at 230 volts \pm 10% without any deterioration in anticipated life. The outlet from the heater box shall be adequately insulated and will feed the tank on the upper side or top of the tank, to ensure adequate stratification and ensure that the outlet water temperature is maintained at 60°C.

The elements may be either directly immersed in the heater box (Direct Immersion, DI), or be mounted in pockets (MIP) as selected in the data sheet, and shall be wired in groups, so that they can be remotely controlled (and a local manual bypass switch provided) in various groups, to avoid creating power spikes when all clusters are switched on.

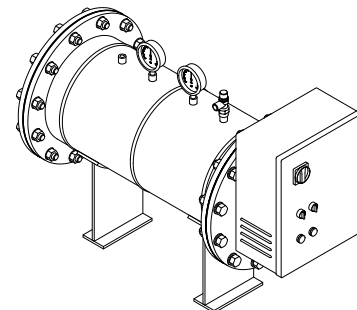
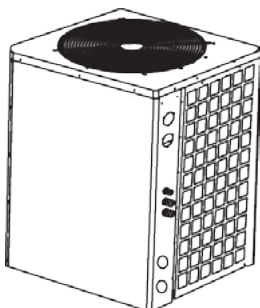
INLINE WATER HEATERS

The units are manufactured from mild steel and coated with Sigmarite Sealer (Glass Flake Epoxy on request)

- Units are insulated with 50mm fiber wool and 0,6mm galvanised cladding (Aluminium or Stainless Steel cladding on request).
- Element loading to specification but can be manufactured up to 480 kW.
- Product is supplied with electrical control, thermostat and safety valve.
- Product can be manufactured to customer specification and include high working pressures, specialised material for non standard dimensions and alternative electrical controls.
- Inline heaters can be used in conjunction with a large storage tank or where no storage tank is available.
- This product can be used to heat liquids other than water.
- The product is ideally suited for the conversion from oil and coal fired boilers where existing tanks are available.

PRESSURE RATING

The vessel shall be suitable for operating at a water pressure of 600kPa, but it is a requirement of the water system designer to ensure that the system pressure in normal or mal-operation does not exceed 400kPa, or alternatively ensure that a vessel of the appropriate pressure rating is supplied. Standard pressure testing procedure dictates that pressure testing is done at 1.5 x operating pressure. We, however, prefer to test at 1050kPa.



AIR TO WATER HEAT PUMP • ELECTRICAL ELEMENT • INLINE WATER HEATER

LAGGING AND CLADDING

Lagging and cladding, otherwise known as galvanized sheeting, is a means of insulating the vessel and reticulation system, ensuring reduction in heat loss. The lagging and cladding of the vessel can be completed either in our workshop or on site, as per customer requirement.

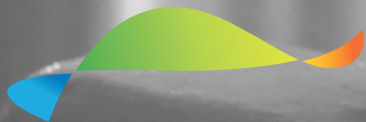
The vessel is covered with a layer of Glasswool, a product produced from a combination of up to 80% recycled glass, naturally occurring silica and fluxing agents, resulting in a product that has Zero Ozone Depleting Potential (ODP) and no CFC's or HCFC's are produced in the process. Alternatively a layer of K-Flex, an elastomeric foam insulation perfect for high temperatures, free of CFCs, HFCs, HCFCs, PBDEs, formaldehyde and fibers, can be used.

A galvanized sheet of 0.8mm is placed over this layer. Alternatively we do offer another option of 0.7mm mirror finish stainless steel sheeting to protect and finish off the vessel and reticulation system.

FEATURES AND BENEFITS

- Life long energy savings
- Lightweight & easy to handle
- DIY friendly
- Maintenance free
- Long product life that will not readily age
- Suitable for high humidity applications
- Zero ozone depleting potential(ODP)





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