





Thermal Oil Boiler

PACKMAN



Product Description

Thermal Oil Heaters are widely used to supply heat up to 350C at very low pressure, typically just the pressure required to pump the oil through the system. Whereas other heating fluids would require a pressure of 85 bar to achieve this temperature.

In(typical) industrial processes a high temperature fluid is often required, and achieving this steam can be controversial and expensive.

Steam is typically used as a heat medium in heating systems. But at high temperatures, steam requires a corresponding high operating pressure. Steam is typically used as a heat medium in heating systems. But at high temperatures, stea m requires a corresponding high operating pressure. In (typical) industrial processes a high temperature fluid is often required, and achieving this steam can be controversial and expensive.

Thermal oil heaters are widely used to supply heat up to 300°C at very low pressure, typically just the pressure required to pump the oil through the system. Where as other heating fluids would require a pressure of 85 bar to achieve this temperature.

Advantages

Oil Heating Systems, in comparison to other heating systems like the producing steam offer many advantages, which can be listed as follows:

- Low pressure
- High temperature (Consequently smaller heating surface is required)
- No risk of corrosion (Oil is an effective preservative, thus the system's life would be considerably longer) than other heating systems
- No risk of freezing when the plant is shut down
- No scale deposits
- No softener required for pretreatment of the boiler feed
- No chemical dosing system required
- No heat loss due to hot condensate and flash steam
- No steam trap required
- No Blow down system needed
- No risk of compressed gas explosion
- No deaereator or condensation tank required

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- No vaccum Breaker needed
- No supervision required
- Less necessary maintenance
- Higher performance & efficiency
- More safety
- More reliability
- Accurate temperature control is possible
- Quiet operation (no steam stroke & flash steam noise)
- Easy to operate
- Robust construction

- Glue industry
- Food processing industry
- Metal industry
- Tyre industry
- Design & Construction
- Paint & varnish industry
- Packing&packaging industry
- Glass industry
- Industrial laundries

Industrial Applications

Thermal oil heaters are used in the following industries.

- Cement industry
- Chemical / petrochemical industry
- Polymer industry
- Textile industry
- Leather industry
- Oil industry
- Bitumen & Tar processing industry
- Paper mills industry
- Wood industry
- Soap & Detergent industry
- Pharmaceutical industry

The design & construction of Thermal Oil Heaters require special skills. Due to the fact that we have a permanent top level quality control, we can offer Thermal Oil Heaters featuring the best heating surface, efficiency, safety, reliability & durability. The design is based on a forced circulation. The he ater consists of two sets of tubes which are coiled to form 2 coaxial cylinder.

The flue gas is conducted in a three pass counter flow system as described below.

1st Pass - The rediant heat of the burner's flame is transferred to the thermal oil in the main combustion chamber.

2nd Pass - Combustion gases then pass through the space between the



inner and outer coiled tube, where the heat is transferred by convection. 3rdPass - The last convection pass is between the outer coil and the heater's shell, where combustion gases are here after cooled.

This design ensures that maximum heat transfer is achieved before the combustion gases exit the heater, it is warranting high thermal efficiency. Maximum heat transfer is also affected by thermal fluid's velocity and heating surface area. In order to achieve maximum heat transfer and low pressure drop and also to protect oil from degradation, the optimum fluid velocity and heat flux rate must be achieved and maintained which is possible through our optimum design of coil's cross sectional area. The design philosophy ensures that the film temperature in tubes is not exceeded beyond its permissible limits for parts of the tubes exposed to flame impingement. We carry out thorough analysis to determine whether this temperature requirement is met. The maximum film temperature is then used to calculate the service life of thermal oil. It should be noted that for the case of thermal oil, low film temperature, ensures longer life. We provide modest volume of the thermal oil while considering the heater's capacity. Our design also provides the necessary means for safe thermal expansion due to high temperature of the oil. Furthermore, coil's life is extended by optimizing length to diameter ratio and heat flux rate.

Packman supplies a comprehensive set of safety control systems for thermal oil heaters. The logic of control elements comply with the stringent regulations enforced by DIN 4754. There are many safety interlocks, incorporated in the system. All of our heaters provide continuous flow monitoring by means of differential pressure controllers. The flow monitoring is an essential future in oil heating systems, as it measures and monitors the minimum flow rate. If the flow rate drops below a certain minimum value, the firing will be shut down.

Also the thermostats measuring the temperature of flue gases, supply and return oil are connected to the firing system and shall prevent an inadmissible temperature rise in the system. A level switch is also included in the expansion tank which is connected to the feed pump and the burner.

Packman will integrate your desired control requirements from basic relay logic to advanced PLC in order to interface with your plant.





Item No.	Description	Specification		
Designe D	ata			
1	Heater Configuration	Horizontal		
2	Heating Capacity Range	From 250.000 to 4.000.000 Kcal/hr		
3	Max. Operating temp. of Thermal Oil	300 °C		
4	Design Temp. of Thermal Oil	350 °C		
5	Diffrential Temp. Of Thermal Oil	25 °C or 40 °C		
6	Permissible Operating Pressure	8.5 bar g		
7	Design pressure	10 barg		
8	Pneumatic Or Hydrostatic Test Pressure	15 barg		
9	Thermal Efficiency	83-85%		
10	No. Of Circulation Of Flue gasses	3 pass		
11	Coil Material	St 35.8 according to DIN 17175		
12	Shell Material	17 Mn 4 according to DIN 17155 (1.0481)		
13	Return Chamber Material	17 Mn 4 according to DIN 17155 (1.0481)		
14	Heater Standard	According to DIN 4754		
15	Shell Insulation	Rock wool, Thk, 150 mm, Density 120 kg/m3		
16	Shell Cover	Stainless steel SS 304, Thk. 1.5 mm		
17	Test Typ	100% Radiography, Pneumatic, Penetration		







Model	Unit	PTOH- 250	PTOH- 500	PTOH- 600	PTOH- 750	PTOH- 800	PTOH- 1000		
Lengths									
Thermal Capacity	kw	300	600	700	900	950	1,150		
Thermal Capacity	kcal/ hr	250,000	500,000	600,000	750,000	800,000	1,000,000		
Boiler Type	-	Three Pass							
Working Pressure	bar	Up to 16							
Pressure Drop in Combustion Chamber	mbar	2.2	2.5	3.1	3.9	4.2	5.9		
Design Standard	-			DIN	4754				
Max Gas Consumption @Sea Level	m³/hr	30	60	70	90	95	115		
Max Fuel Oil Consumption @Sea Level	litr/hr	25	50	58	75	79	96		
Max Heavy Fuel Oil Consumption@Sea Level	litr/hr	21	43	50	64	68	82		
Connectoins									
Oil Outlet (N2)	in	2	2	2	3	3	4		
Oil Inlet (N1)	in	2	2	2	3	3	4		
Condensate Discharge (N5)	in	1	1	1	1	1	1		
Thermo Meter (N4)	in	1/2	1/2	1/2	1/2	1/2	1/2		
Instrument Manifold (N6)	in	1/2	1/2	1/2	1/2	1/2	1/2		
Venting Valve (N7)	in	1	1	1	1	1	1		
Drainage Valve (N8)	in	1	1	1	11/2	11/2	11/2		
Stack I.D. (N3)	mm	250	250	300	350	400	400		
Boiler Dimensions									
Lengths (L)	mm	1,980	2,400	2,700	3,130	3,200	3,400		
Width (W)	mm	1,460	1,600	1,600	1,600	1,750	1,980		
Height (H)	mm	1,920	2,100	2,100	2,100	2,200	2,500		
Min Front Clearance	mm	1,386	1,680	1,890	2,191	2,240	2,380		
Min Rear Clearance	mm	1,000	1,000	1,000	1,000	1,000	1,000		
Min Side Clearance	mm	1,000	1.000	1.000	1.000	1.000	1.000		







Model	Unit	PTOH- 1250	PTOH- 1500	PTOH- 1750	PTOH- 2000	PTOH- 2250	PTOH- 2500			
Lengths										
Thermal Capacity	kw	1,500	1,750	2,000	2,500	2,750	3,000			
Thermal Capacity	kcal/ hr	1,250,000	1,500,000	1,750,000	2,000,000	2,250,000	2,500,000			
Boiler Type	-	Three Pass								
Working Pressure	bar	Up to 16								
Pressure Drop in Combustion Chamber	mbar	4.1	4.8	4.2	6.7	5.1	5.1			
Design Standard		DIN 4754								
Max Gas Consumption @Sea Level	m³/hr	150	175	200	250	275	300			
Max Fuel Oil Consumption @Sea Level	litr/hr	125	146	167	208	229	250			
Max Heavy Fuel Oil Consumption @Sea Level	litr/hr	107	125	143	179	196	214			
Connectoins										
Oil Outlet (N2)	in	4	4	5	6	6	6			
Oil Inlet (N1)	in	4	4	5	6	6	6			
Condensate Discharge (N5)	in	1	1	1	1	1	1			
Thermo Meter (N4)	in	1/2	1/2	1/2	1/2	1/2	1/2			
Instrument Manifold (N6)	in	1/2	1/2	1/2	1/2	1/2	1/2			
Venting Valve (N7)	in	1	1	1	1	1	1			
Drainage Valve (N8)	in	11/2	11/2	11/2	11/2	11/2	11/2			
Stack I.D. (N3)	mm	450	450	500	600	600	600			
Boiler Dimensions										
Lengths (L)	mm	3,580	3,620	3,620	3,750	4,000	4,400			
Width (W)	mm	2,020	2,020	2,300	2,300	2,300	2,400			
Height (H)	mm	2,600	2,600	2,750	2,870	2,870	3,040			
Min Front Clearance	mm	2,506	2,534	2,534	2,625	2,800	3,080			
Min Rear Clearance	mm	1,000	1,000	1,000	1,000	1,000	1,000			
Min Side Clearance	mm	1.000	1.000	1.000	1.000	1.000	1.000			







Model	Unit	PTOH-2750	PTOH-3000	PTOH-3250	PTOH-3500			
Lengths								
Thermal Capacity	kw	3,200	3,500	3,750	4,000			
Thermal Capacity	kcal/ hr	2,750,000	3,000,000	3,250,000	3,500,000			
Boiler Type	-	Three Pass						
Working Pressure	bar		Upt	to 16				
Pressure Drop in Combustion Chamber	mbar	5.5 6.3		6.0	5.9			
Design Standard	-		DIN	4754				
Max Gas Consumption @Sea Level	m³/hr	320	350	375	400			
Max Fuel Oil Consumption @Sea Level	litr/hr	267	292	313	333			
Max Heavy Fuel Oil Consumption @Sea Level	litr/hr	229	250	268	286			
Connectoins								
Oil Outlet (N2)	in	8	8	8	8			
Oil Inlet (N1)	in	8	8	8	8			
Condensate Discharge (N5)	in	1	1	1	1			
Thermo Meter (N4)	in	1/2	1/2	1/2	1/2			
Instrument Manifold (N6)	in	1/2	1/2	1/2	1/2			
Venting Valve (N7)	in	1	1	1	1			
Drainage Valve (N8)	in	11/2 11/2		11/2	11/2			
Stack I.D. (N3)	mm	750	750	750	750			
Boiler Dimensions								
Lengths (L)	mm	5,140	5,140	5,500	5,730			
Width (W)	mm	2,500	2,500	2,500	2,500			
Height (H)	mm	3,100	3,100	3,100	3,100			
Min Front Clearance	mm	3,598	3,598	3,850	4,011			
Min Rear Clearance	mm	1,500	1,500	1,500	1,500			
Min Sido Cloaranco	mm	1.500	1.500	1.500	1.500			





Model	Unit	PTOH-3750 PTOH-4000		PTOH-5000	PTOH-6000			
Lengths								
Thermal Capacity	kw	4,500	5,000	6,000	7,000			
Thermal Capacity	kcal/ hr	3,750,000	4,000,000	5,000,000	6,000,000			
Boiler Type	-	Three Pass						
Working Pressure	bar	Up to 16						
Pressure Drop in Combustion Chamber	mbar	6.5 6.7		7.2	7.0			
Design Standard	-		DIN	4754				
Max Gas Consumption @Sea Level	m³/hr	450	500	600	700			
Max Fuel Oil Consumption @ Sea Level	litr/hr	375 417		500	583			
Max Heavy Fuel Oil Consumption @Sea Level	litr/hr	321	357	429	500			
Connectoins								
Oil Outlet (N2)	in	8	10	10	10			
Oil Inlet (N1)	in	8	10	10	10			
Condensate Discharge (N5)	in	1	1	1	1			
Thermo Meter (N4)	in	1/2	1/2	1/2	1/2			
Instrument Manifold (N6)	in	1/2	1/2	1/2	1/2			
Venting Valve (N7)	in	1	1	1	1			
Drainage Valve (N8)	in	11/2 11/2		11/2	1 1/2			
Stack I.D. (N3)	mm	800	900	900	900			
Boiler Dimensions								
Lengths (L)	mm	6,500	6,800	7,000	7,500			
Width (W)	mm	2,800	3,000	3,200	3,300			
Height (H)	mm	3,200	3,300	3,300	3,500			
Min Front Clearance	mm	4,550	4,760	4,900	5,250			
Min Rear Clearance	mm	1,500	1,500	1,500	1,500			
Min Side Clearance	mm	1,500	1,500	1,500	1,500			

PACKMAN GROUP **History**

The Packman Company was founded in February 1975, and was soon afterwards registered in companies Registration Office. In early years the Packman construction and service branch focused on building installations. Different mega power plants were built by cooperating with Brown Boveri and Asseck companies in 1976.

The company started its official activities in construction of High-Pressure Vessels such as Hot-Water Boilers, Steam Boilers, Storage Tanks, Softeners and Heat Exchangers from 1984.

Packman Company is one of the first companies which supplied the high quality and standard hot water boilers to the customers.

Packman has exported its products to countries such as Uzbekistan, United Arab Emirates and other countries in the Middle East. It is one of the largest producers of hot-water and steam boilers in the Middle East.

Now we are proud to announce that the Packman industrial group has five major sub-brands that have product titles in all field of HVAC equipment and engineering services, and we do not know this success except with the help and support of our customers.

- 1. Construction Services Industry Association
- 2. Industry Association
- 3. Construction Companies' Syndicate
- 4. Technical Department Association
- 5. Mechanical Engineering Association
- 6. Engineering Standard Association

Departements:

Sales Deps:

∩ Power Plant & Petrochemical
 ∩ Industrial
 ∩ Hospitally Service
 ∩ Commercial & Residential
 ∩ Sport Complex & Pool

Technical Deps:

- Manufacturing R&D
- Innovation Center
- EPC Execute Unit
 Product Develop Unit
- Sales Engineering Dep.
- ≈ Project Control
 ≈ Financial Office
 ≈ Commercial Off

Others:

≈ Commercial Office≈ Marketing Department

≈ After Sales Service





PACKMAN GROUP Brands



Industrial Group

Designer&manufacturer of Condensing, Hot Water, Steam, Hot Oil & Waste Heat Boilers, Heat Exchangers, Autoclave Pressure & Storage Vessels&etc



GREENMAN Green mindset, green future

Engineering& Designing Commercial Greenhouse Plant, CO2 Dosing System, Flue gas Condenser & Special HVAC Systems, Sustainable Agriculture &etc



Water solution

Designer&manufacturer ReverseOsmosisPlant& Package, Water Treatment, Softener& Filters and Chemical DosingSystems&etc



Designer&manufacturer ofIndustrialMono&Dual BlockGas,LPG,Light& HeavyOilBurners, Premixed&Postmixed Burners,Watertube burners, Process burners, Special application burners&Combustion Solutions&etc



Designer&manufacturer ofAir&WaterCooled Chillers, Air Handling Units, Fancoil, HVAČ Equipment,Cold Storage Room & etc

(3)





1. Isfahan Factory

2. Vilashahr Factory

3. Parand Factory

4. Parand (2) Factory

5. Bonyad Factory

SOME OF Certificates are



Knowledge Based













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