TAKUMA Group

NTEC

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SO 9001 certified

JQA-QMA14830
Nippon Thermoener Co., Ltd.
Headquarters
Kyoto Plant
Kanto Plant

ISO 14001 certified

Nippon Thermoener Co., Ltd.
Kyoto Plant
JQA-EM0253
Kanto Plant
JQA-EM0253A

AFFILIATES

NIPPON THERMOENER (THAILAND) CO.,LTD.

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2016.03 R

NTEC

THERMO HEATER

NH-10A　NH-20A　NH-20B　NH-30A　NH-30B　NH-40A　NH-60A　NH-80A
NH-100A　NH-125A　NH-150A　NH-200C　NH-250C　NH-300C

NH-60A

TAKUMA Group

NIPPON THERMOENER CO., LTD.

01 | THERMO HEATER

NTEC THERMO HEATER is a product developed based on the NIPPON THERMOENER's wide experience and modern technology.This is a packaged type heater developed to meet today's demands for a high performance heater.NTEC THERMO HEATERS are widely used not only in the Japanese factories, but at factories in Middle-East and East European countries not to mention the factories in South East Asia. We are confident in saying that your problem with regard to the thermal engineering could now be solved by employing NTEC THERMO HEATER.

02 | Great deal of advantages offered by Thermal Fiuid Heating System.

■ Pressure problems can be avoided.

Thermal fluid is employed as heating media instead of water. Water vapourises at approxi mately 100°C and developes the pressure, 250°C co rresponds to 4Mpa pressure, 280°C = 64MPa, 340°C = 15MPa respectively. The above mentioned temperatures can be attained with thermal oil through employing a simple inexpensive heat-exchanger. Therefore pressurization will not be required at all.

■ Operation at low cost.

With this system, the thermal fluid is first heated in a heater which is then fed to the heating element. The thermal fluid returns to the heater having given its heat away. Thus the cycle is closed and the indirect heating circuit is completed. This results in elimination of blow down heat loss, flush system loss and draining loss which means that the economical operation is possible. Scale, corrosion or frost problem can be avoided. Unlike with water, no scale or corrosion is caused by thermal fluid therefore it is free of frost problem. Furthermore, no expensive water treatment is required. Simple operation & maintenance is enabled.

■ Accurate temperature control.

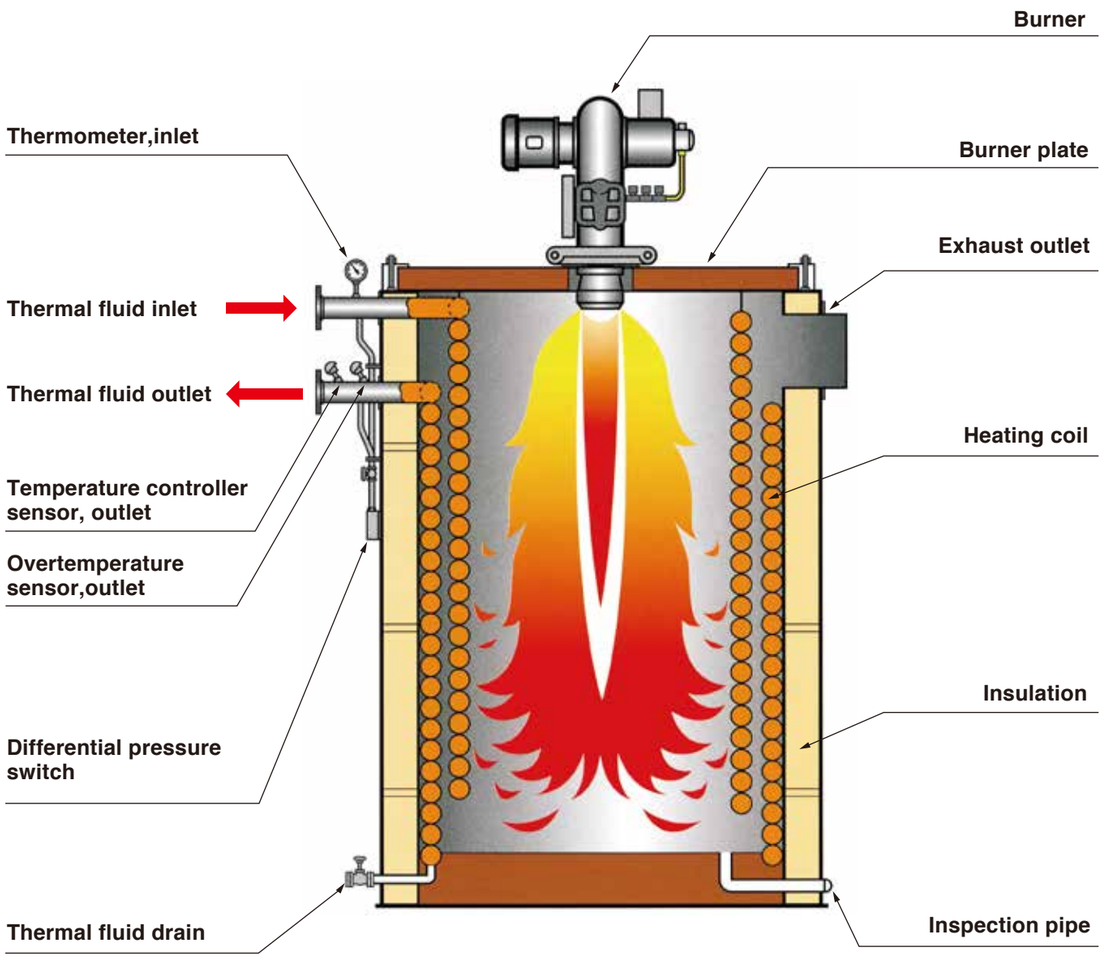
Accurate temperature control is easily available by simply modulating temperature control valves in the heating system.

■ For numerous consumers.

Various types of heat consumers at different tempe ratures are heated by single thermal heater.
Each consumer can be controlled separately.

03 | DESIGN

The combustion chamber is consisted of spirally wound tubes and refactory material at the bottom of the chamber. The radiation and convectional heating surfaces are composed of the concentric tube coil.
The combustion chamber of the NTEC THERMO HEATER is sufficiently large, thus the efficient combustion using heavy oil can be guaranteed under the most unfavorable conditions. Diameter and height are designed to absolutely prevent any direct contact to the flame.
This is also a very important point for the avoiding the local overheating to occur in the tubes.



04 | SPECIALITIES

Plentiful Merits are obtainable by NTEC Thermo Heater

1. Arrangement of heating surface is rational.

Heating tubes are so arranged that proper flow speed is secured according to receiving heat, so that local overheating does not happen. Sufficient size of h eating surface is effective for preventing the film temperature from overheating.

2. High temperature oxidation does not happen.

High temperature oxidation of thermal fluid does not happen by availing attached expansion tank and oil sump because the thermal fluid does not contact with ambient air during running.
According to reasons described in 1 to 4 items, the overheat cracking and high t emperature oxidation of thermal fluid can be avoided by skilful layout, which are so far regarded as deficiencies of thermal fluid, therefore, the thermal fluid can be used for considerably long period without renewing.

3. Cooling water of circulation pump is not necessary.

Cooling water of circulation pump is not necessary because air-cooled pump is employed.

4. Automatic control safety equipment is completely furnished.

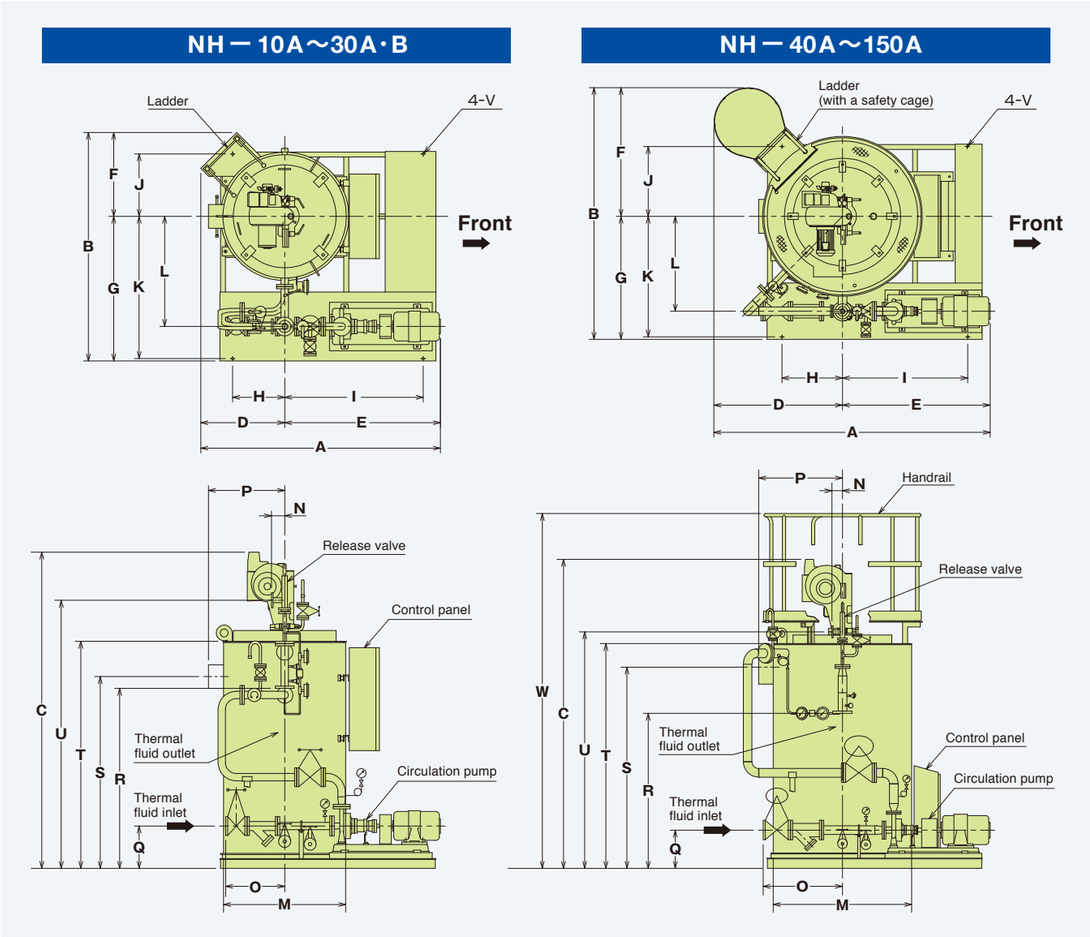
Operation is carried out automatically without manual handling. In case of emergency due to abnormal conditions, safety equipment works automatically.

5. Compact construction and easy installation.

Heater, circulation pump and control panel are mounted compactly on a common base except very big model and the transportation and installation are easy.

CIRCULATION PUMP

05 | DIMENSION



unit : mm

Type \ Simbol	A	B	C	D	E	F	G	H	I	J	K	L
NH－ 10A	1704	1448	1818	525	1179	438	1010	290	1050	375	990	732
NH－ 20A	1909(1930)	1783	2218	663	1246(1267)	663	1120	395	1125	485	1100	842
NH－ 30A	1959(1980)	1888	2613	693	1266(1287)	693	1195	430	1145	515	1175	912
NH－ 30B	1955(1976)	1884	2483	689	1266(1287)	689	1195	430	1145	515	1175	912
NH－ 40A	2165(2186)	1875	2777	889	1276(1297)	740	1135	510	1105	605	1110	850
NH－ 60A	2855	2599	3199	1329	1526	1329	1270	625	1290	720	1245	980
NH－ 80A	2904	2718	3539	1378	1526	1378	1340	695	1290	790	1315	1050
NH－100A	3007	2831	3775	1421	1586	1421	1410	755	1345	850	1385	1105
NH－125A	3181	2971	4200	1481	1700	1481	1490	785	1450	930	1465	1180
NH－150A	3420(3331)	3214	4550	1559	1861(1772)	1559	1655	900	1640	1045	1630	1300

Type \ Simbol	M	N	O	P	Q	R	S	T	U	V	W	Approx Weight
NH－ 10A	Φ 726	110	505	490	361(341)	1016	1055	1346	1691	Φ 19	—	0.56
NH－ 20A	Φ 942	110	505(484)	600	371(351)	1182	1225	1516	1857	Φ 19	—	0.83
NH－ 30A	Φ 1009	110	510(489)	630	371(351)	1488	1585	1876	2220	Φ 19	—	1.2
NH－ 30B	Φ 987	110	510(489)	620	371(351)	1301	1394	1746	2033	Φ 19	—	1.1
NH－ 40A	Φ 1195	110	780(739)	750	396(376)	1334	1789	1981	2170	Φ 19	—	1.6
NH－ 60A	Φ 1430	110	820	865	396	1602	2079	2321	2448	Φ 19	3666	2.4
NH－ 80A	Φ 1568	110	820	935	396	1909	2419	2661	2755	Φ 19	4006	2.9
NH－100A	Φ 1684	110	1061	1000	416(396)	1961	2686	2941	2992	Φ 19	4286	3.9
NH－125A	Φ 1859	110	1201	1080	426	2313	3076	3369	3344	Φ 19	4701	5.5
NH－150A	Φ 2082	110	1226	1190	461(426)	2580	3317	3606	3611	Φ 19	4941	6.7

※1 These tables show dimensions of the push-in packaged type heaters (Fuel oil A fired) and values in parentheses are dimensions of products for 60Hz.
2 Not that NH-10A is not provided with a ladder, and NH-40A is not provided with a handrail and a safety cage of the ladder.
3 For dimensions of NH-20B and NH-200C or higher versions, please contact a sales office.
4 Dimensions shown above may be changed for improvement without prior notice.

06 | PREVENTING OF OXIDATION

Thermal fluid expands approximately 10% Vol. per 100°C temperature increase. Thermal oil heater unit therefore requires an expansion tank. In order to ensure that no over-pressures are encountered in the plant, it is necessary for the expansion tank to have a connection to atomosphere. Nevertheless the thermal fluid must not come into contact with air, as it causes oxidation of the thermal fluid.

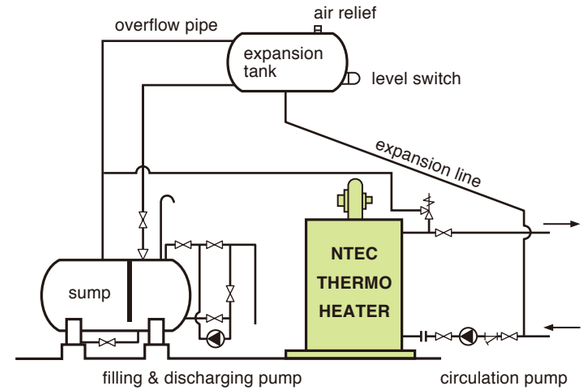


Fig.1

Fig.1; Diagram of NTEC thermal fluid heating system.

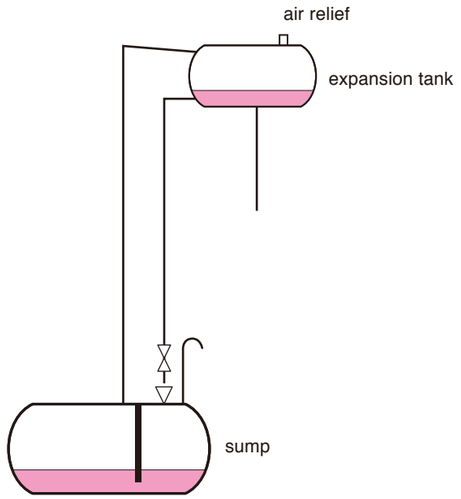


Fig.2

Fig.2; The sketch shows the sump and expansion tank filled to the minimum level. For the first few hours of operation the air relief plug on theexpansion tank is kept opened to release the gas.

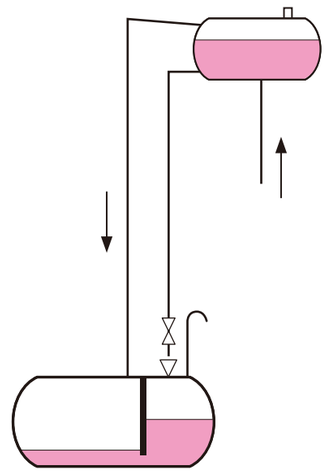
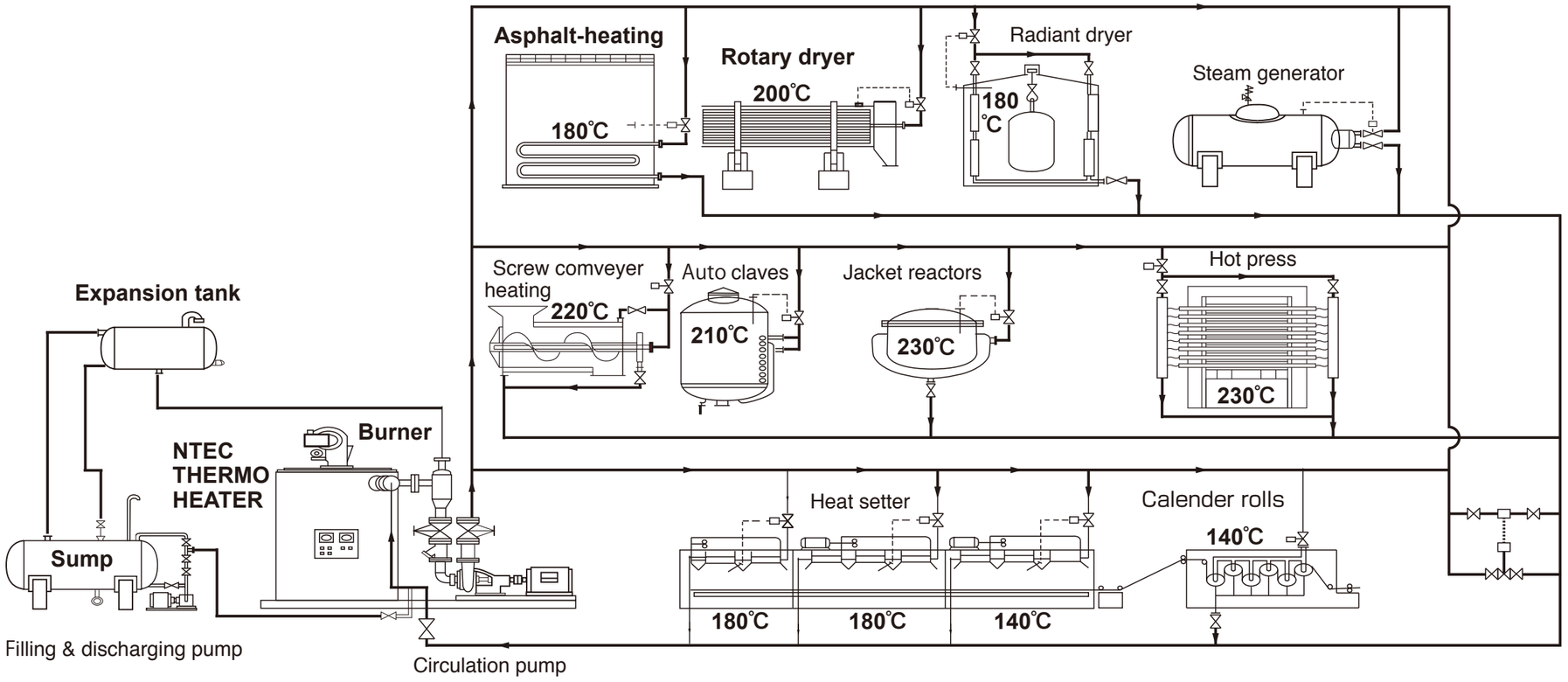


Fig. 3

Fig. 3; The air relief plug will be closed when the system is cooled. The thermal fluid expands and thepressure rises when it is heated. The level of thethermal fluid in the small compartment rises until air escapes through the vent. This continues until the pressure reaches equilibrium. The hot thermal fluid absorbs oxygen from the closed-in air, but there is no serious consequence as the quantity is small.

07 | DIAGRAM OF THERMAL FLUID HEATING SYSTEM



We manufacture and supply thermal fluid heating systems to suit every kind of industry.

1 **Textile industry**

For the heating of stenters, printing machinery, dyeing equipment, coating and plastic irnpregna-tion to fabrics.

2 **Chemical industry**

For heating of autoclaves, boilers for lubricating grease, and agitators.
For heating of reactors, drying plant etc.

3 **Wood industry**

For heating of wood presses, wood drying plants, and particleboard presses, also with cooling.

4 **Caoutchouc and plastic industry**

For heating of calender rolls, melting boilers etc.For heating of plastic presses, and for with cooling.

5 **Asphalt and coal tar industry**

For tank yard, facilities for handling cargo and mixing of the materials.

6 **Paper and cardboard industry**

For heating of drying cylinders, calender rolls and drying chambers.

7 **Shipboard services**

For hea tin g of asphalt tankers, chemical tankers etc. and F.O.,L.O. of the main engines.

8 **Metal processing industry**

For coating plants, phosphate-wash -bath-he ating.

9 **Soap and detergent industry**

For heating of autoclaves, vats spray drier for washing powder.

10 **Construction industry**

For hea tin g of heat tunnels in precast concrete units factories, mixing towers.

11 **Laundry**

For heating of sheets-rolls and ironing.

12 **Paint industry**

For heating of reactor, also with cooling.

08 | GENERAL SPECIFICATION

TYPE OF UNIT	Model NH-10A to NH-150A	Packaged or Field erected
	Model NH-200A to NH-300A	Field erected
DESIGN PRESSURE	0.98MPa・1.2MPa	
DESIGN TEMPERATURE	350℃	
STANDARD OPERATING TEMPERATURE*1	300℃ , other temperature is available	
FUEL*2	Type NH-10A to NH-30A	Kerosene , Light Oil , Natural Gas , Towns Gas , Liquid Gas
	Type NH-40A to NH-300A	Kerosene , Light Oil , Heavy Oil , Natural Gas , Towns Gas , Liquid Gas
ELECTRIC POWER	200/220 V 50/60Hz 3 phase , Other voltage is available on special order.	
EFFICIENCY*3	80% (Depending on the thermal fluid temperature)	

*1: Maximum safe operating temperature of specific installation is dependent on the thermal fluid used.

*2: Supply record of special fuel:OFFGAS,WASTE OIL
Supply record of special burner:Dual fuel burner(Natural GAS or Oil etc)
Mix combustion burner

*3: Supply record:85～92%(attacted Air Heater ,Natural Gas or LPG only)

09 | DIMENSION

Item \ Type	NH-10A	NH-20A	NH-20B	NH-30B	NH-30A	NH-40A	NH-60A	NH-80A	NH-100A	NH-125A	NH-150A	NH-200C	NH-250C	NH-300C
Max. Temp. of Use ℃	300			280	300									
Thermal output ※1 kW	116	233	233	349	349	465	698	930	1,163	1,453	1,744	2,326	2,907	3,488
Inlet/outlet pipe diameter A	40	40	65	50	50	65	80	80	100	125	125	150	150	200
Exhaust opening pipe diameter mm	ø195	ø195	ø195	ø195	ø195	ø250	ø350	ø350	ø375	ø425	ø425	350×550□	500×500□	500×720□
Thermal oil holding capacity ℓ	45	100	100	130	180	320	620	900	950	1,300	1,850	2,100	2,750	3,850
Fuel consumption ※2 ℓ/h	15.0	30.2	30.2	45.2	45.2	60.2	90.3	120.3	150.4	187.9	225.6	300.8	376.0	451.1
Flow rate m³/h	7	10	20	15	15	30	45	55	75	100	125	150	175	210

※1 The values of the thermal output show output values when the maximum temperature of use is 300°C.
Note that the thermal output is different when the temperature exceeds 300°C.
Please contact us for details (280°C for NH-30B).

※2 The values are for Kerosine fired types. The fuel consumption is calculated based on the fuel lower calorific value of 43,500kJ/kg and the specific weight of 0.8.

(Note) Specifications shown above may be changed for improvement without prior notice.

10 | GENERAL SPECIFICATION

Type of thermal oil	Name of manufacturer	Product name	Min. Temp. of Use ℃	Max. Temp. of Use Bulk ℃	Max. Temp. of Use Permissible Film ℃	Pour point ℃	Boiling point ℃	Flash point ℃
Synthetic type	MATSUMURA OIL	Barrel Therm 200	−10	290	320	-20 or less	382	206
Synthetic type	MATSUMURA OIL	Barrel Therm 400	−10	340	370	-20 or less	390	210
Synthetic type	MATSUMURA OIL	Barrel Silicone Fluid ST	−40	–	427	−65	354	178
Synthetic type	Idemitsu Kosan	Daphne Alpha Thermo 32B	10	280		−57.5	402	214
Synthetic type	Idemitsu Kosan	Daphne Alpha Thermo 66	0	345		−26	363	186
Synthetic type	Showa Shell Sekiyu	Shell Thermia Oil X-Z (designated flammable goods)	−30	270	290	−50	404	266
Petroleum type	MATSUMURA OIL	Therm Oil 20	−10	280	300	−12.5	350	204
Petroleum type	MATSUMURA OIL	Therm Oil 34AH (designated flammable goods)	−5	250	270	−20	360	256
Petroleum type	Idemitsu Kosan	Daphne Thermic Oil 68	−5	300	330	−15		240
Petroleum type	Exxon Mobil	Esso Therm 500	−10	315	350	−10		220
Petroleum type	Showa Shell Sekiyu	Thermia Oil B	−10	320	340	−17.5	355	216
Petroleum type	Cosmo Oil	Cosmo Thermo 32	−5	300	320	−15	340	230
Petroleum type	JX Nippon Oil & Energy	High Therm 68	−2.5	300		−12.5	370	268

Specific heat × specific weight (KJ/ℓk) by Temperature ℃

Product name	0	20	40	60	100	150	200	250	280	300	320	340
Barrel Therm 200	1.62	1.63	1.68	1.74	1.80	1.89	1.97	2.02	2.07	2.07	–	–
Barrel Therm 400	1.58	1.63	1.68	1.73	1.82	1.93	2.00	2.08	2.12	2.15	2.17	2.18
Barrel Silicone Fluid ST	1.47	1.51	1.51	1.51	1.51	1.50	1.49	1.45	1.42	1.40	1.37	1.34
Daphne Alpha Thermo 32B	16.1	1.65	1.69	1.72	1.79	1.87	1.93	1.98	2.01	2.02	–	–
Daphne Alpha Thermo 66	1.52	1.58	1.63	1.75	1.77	1.88	1.97	2.05	2.09	2.12	2.14	2.16
Shell Thermia Oil X-Z	1.73	1.76	1.79	1.81	1.87	1.90	1.96	2.00	2.01	2.02	–	–
Therm Oil 20	1.56	1.60	1.64	1.68	1.75	1.83	1.89	1.95	1.98	1.99	–	–
Therm Oil 34AH	1.55	1.60	1.63	1.67	1.73	1.80	1.87	1.92	1.95	1.96	–	–
Daphne Thermic Oil 68	1.62	1.66	1.70	1.71	1.80	1.88	1.95	2.01	2.04	2.08	–	–
Esso Therm 500	1.58	1.63	1.66	1.69	1.76	1.83	1.89	1.94	1.96	1.97	1.98	–
Thermia Oil B	1.59	1.63	1.67	1.71	1.77	1.85	1.91	1.97	1.99	2.01	2.02	–
Cosmo Thermo 32	1.57	1.62	1.67	1.72	1.80	1.90	1.96	2.01	2.03	2.05	–	–
High Therm 68	1.61	1.65	1.69	1.73	1.81	1.89	1.96	2.02	2.06	2.08	–	–

Kinematic Viscosity (mm²/S) by Temperature ℃

Product name	0	20	40	60	100	150	200	250	280	300	320	340
Barrel Therm 200	360	88.0	31.0	15.0	5.00	2.10	1.20	0.82	0.68	0.61	–	–
Barrel Therm 400	192	47.0	18.0	8.40	3.10	1.40	0.82	0.58	0.48	0.44	0.40	0.37
Barrel Silicone Fluid ST	16.1	10.7	7.63	5.69	3.46	2.09	1.36	0.95	0.78	0.70	0.63	0.57
Daphne Alpha Thermo 32B	396	88.0	30.0	14.0	4.70	2.00	1.20	0.83	0.71	0.64	–	–
Daphne Alpha Thermo 66	307	62.0	20.0	9.20	3.20	1.40	0.88	0.63	0.55	0.51	0.47	0.45
Shell Thermia Oil X-Z	307	88.0	34.8	17.2	6.32	2.82	1.65	1.13	0.92	0.82	–	–
Therm Oil 20	180	51.0	20.0	10.0	4.10	1.50	1.10	0.78	0.64	0.58	–	–
Therm Oil 34AH	276	83.3	34.0	17.1	6.42	2.95	1.71	1.16	0.96	0.85	–	–
Daphne Thermic Oil 68	999	175	68.0	26.0	9.40	3.90	1.80	0.92	0.65	0.50	–	–
Esso Therm 500	270	75.0	28.9	14.0	5.21	2.35	1.38	0.94	0.78	0.68	0.61	–
Thermia Oil B	229	64.2	26.0	12.5	4.64	2.17	1.18	0.70	0.50	0.40	0.30	–
Cosmo Thermo 32	330	87.0	32.9	15.5	5.60	2.50	1.40	1.00	0.80	0.70	0.60	–
High Therm 68	1,000	206	65.2	27.5	8.36	3.32	1.82	1.20	0.98	0.88	–	–

(Note) ※1 There are various other usable products that are not included in the table. All thermal oils produced by world-renowned companies, such as JX Nippon Oil & Energy, BP, and The Dow Chemical Company, can be used.
It is important to select a thermal oil product that is most appropriate for your application. If you have any questions, feel free to contact us.

※2 The values of the maximum temperature of use are nominal values disclosed by manufacturers of the thermal oils. In the long term, we recommend setting the value for regular use to a temperature slightly lower than the bulk temperature to leave a margin.