

Steam-Heat Exchanger

Raise the temperature of well effluents

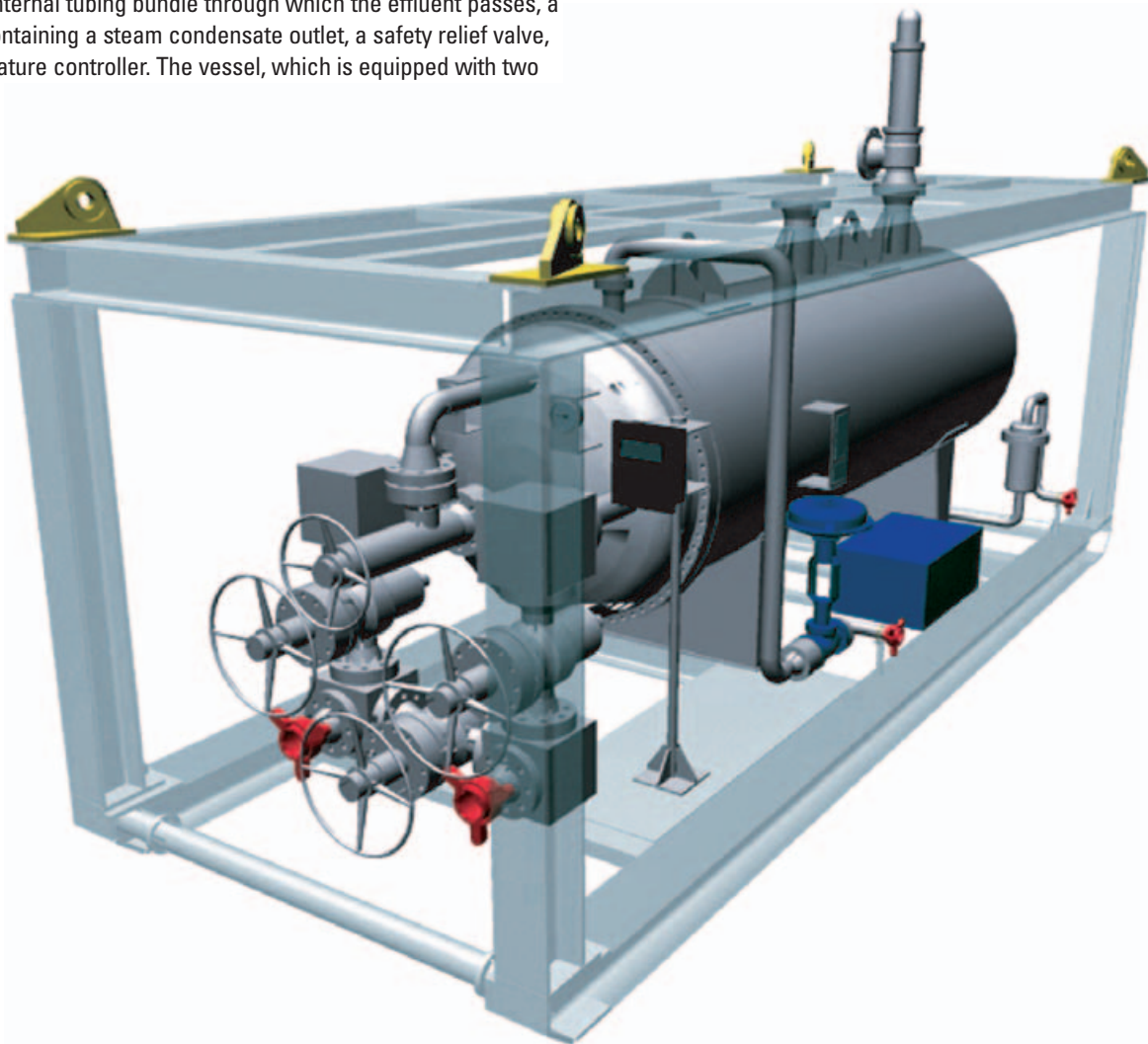
Steam-heat exchangers are used to raise the temperature of well effluents to prevent hydrate formation, reduce viscosity, and break down emulsions for efficient separation of oil and water. Because the steam-heat exchangers virtually eliminate fire risk, they are used on offshore platforms and in other work conditions where safety regulations do not permit the use of indirect-fired heaters.

The steam-heat exchanger requires an adequate steam supply for operation. Some rigs have a sufficient steam supply, but usually a steam generator is required.

Steam enters the vessel through an automatic control valve. The vessel contains an internal tubing bundle through which the effluent passes, a steam trap containing a steam condensate outlet, a safety relief valve, and a temperature controller. The vessel, which is equipped with two

152-mm [6-in] safety valves and a split coil, 106 mm by 106 mm [4 in by 4 in], is insulated with glass wool and an aluminum jacket. Heat from the steam is transferred to the tubing bundle and, in turn, to the effluent. A choke—with a 2-in seat, and a 3-in manifold equipped with three $3\frac{1}{16}$ -in gate valves—is located between the effluent inlet and outlet. It allows the effluent to be preheated before and after the pressure is reduced at the choke.

All steam-heat exchanger models offered by Schlumberger are skid-mounted units.



Steam-heat exchanger.

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Specifications

Model	STX-CCN	STX-CCR	STX-FA, STX-FB	STX-GA, STX-GB	STX-HA, STX-HB
Service	H ₂ S	H ₂ S	H ₂ S	H ₂ S	H ₂ S
Fluid class	DD	DD	DD	DD	DD
Vessel size, cm × m [in × ft]	106 × 4.57 [42 × 15]	130 × 3.96 [51 × 13]	130 × 3.96 [51 × 13]	130 × 3.96 [51 × 13]	130 × 3.96 [51 × 13]
Working pressure, MPa [psi]					
Coil	69 [10,000]	103 [15,000]	34 [5,000]	69 [10,000]	103 [15,000]
Vessel	1.6 [235]	1.6 [235]	1.6 [235]	1.6 [235]	1.6 [235]
Working temperature, degC [degF]	-20 to 160 [-4 to 320]	-20 to 160 [-4 to 320]	-20 to 177 [-4 to 350]	-20 to 177 [-4 to 350]	-20 to 177 [-4 to 350]
Max. design temperature (vessel), degC [degF]	177 [350]	177 [350]	177 [350]	177 [350]	177 [350]
Heating capacity, J/h [MMBtu/h]	4,600 [4.3]	4,600 [4.3]	4,600 [4.3]	4,600 [4.3]	4,600 [4.3]
Steam consumption, kg/h [lbm/h]	2,268 [5,000]	2,268 [5,000]	2,268 [5,000]	2,268 [5,000]	2,268 [5,000]
Effluent inlet	3-in Fig 1502 Female	3-in Fig 2202 Female	3-in Fig 1002 Female	3-in Fig 1502 Female	3-in Grayloc®
Effluent outlet	3-in Fig 1502 Male	3-in Fig 2202 Male	3-in Fig 1002 Male	3-in Fig 1502 Male	3-in Grayloc
Steam inlet	3-in Fig 206 Female	3-in Fig 206 Female	2-in Fig 206 Female	2-in Fig 206 Female	2-in Fig 206 Female
Steam outlet	3-in Fig 206 Male	3-in Fig 206 Male	2-in Fig 206 Male	2-in Fig 206 Male	2-in Fig 206 Male
Footprint, m [ft]	6.50 × 2.34 [21.3 × 7.7]	6.50 × 2.34 [21.3 × 7.7]	6.50 × 2.46 [21.3 × 8.07]	6.50 × 2.46 [21.3 × 8.07]	6.50 × 2.46 [21.3 × 8.07]
Height, m [ft]					
Unit only	2.60 [8.5]	2.60 [8.5]	2.70 [8.86]	2.70 [8.86]	2.70 [8.86]
With safety valves	3.50 [11.5]	3.50 [11.5]	na [†]	na	na
Weight, kg [lbm]	12,200 [26,896]	15,500 [34,172]	12,000 [26,455]	14,000 [30,865]	15,500 [34,172]
Certifications					
Design	Type Approval/Design Verification Review	Type Approval/Design Verification Review	Type Approval/Design Verification Review	Type Approval/Design Verification Review	Type Approval/Design Verification Review
Manufacturing	Certificate of Conformity	Certificate of Conformity	Certificate of Conformity	Certificate of Conformity	Certificate of Conformity
Documentation	Quality File	Quality File	Quality File	Quality File	Quality File
Applicable codes	ASME [‡] VIII Div. 1, ANSI B31.3, API-6A (PSL-3), DNV [§] 2.7-1 skid and frame, H ₂ S (NACE ^{††} MR0175), DNV NPD ^{††} , CE ^{§§}	ASME VIII Div. 1, API-6A (PSL-3), ANSI B31.3, DNV 2.7-1 skid and frame, H ₂ S (NACE MR0175), DNV NPD	ASME VIII Div. 1, ANSI B31.3, API-6A (PSL-2), DNV 2.7-1 skid and frame, H ₂ S (NACE MR0175), CE ^{†††}	ASME VII Div. 1, ANSI B31.3, API-6A (PSL-2), DNV 2.7-1 skid and frame, H ₂ S (NACE MR0175), CE ^{†††}	ASME VII Div. 1, ANSI B31.3, API-6A (PSL-2), DNV 2.7-1 skid and frame, H ₂ S (NACE MR0175), CE ^{†††}
Optional accessories	Set of D72 choke beans; part number P582656 Fixed choke conversion kit adjustable, 3-in, 69 MPa [10,000 psi]; part number P494689	Set of choke beans; part number P785056	na	na	na

[†] not applicable

[‡] American Society of Mechanical Engineers

[§] Det Norske Veritas

^{††} NACE International (formerly National Association of Corrosion Engineers—NACE)

^{†††} Norwegian Petroleum Directorate

^{§§} Conformité Européene

^{†††} CE applicable code for models STX-FB, STX-GB, and STX-HB

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