

Application Description	P No	O No	Item Type	Project Company	Industry Type	Customer Benefit	End User	Install Country	Site	Plant	Duty	Tubeside Fluid
Crude Pre-heat Train	1651	2553	Shell / Tube	Shell Int' Chemicals B.V.	Refining	Reduced Fouling	Shell	Brunei	Brunei	Refinery	Heating	Crude Oil
Tar Oil Heater	2094	2844	Shell /Tube	Cabot Carbon Ltd	Carbon Black	Reduced Fouling	Cabot Carbon (USA)	USA	Pampa, Texas	Research Plant	Heating	Tar Oil
Frac' Bottoms cooler	1550	2554	Shell / Tube	Imperial Oil	Oil Refining	Improved Duty	Exxon	Canada	Jarvis Ont'	Nanticoke Refinery	Cooling	HEAVY CYCLE GAS OIL (FCC)
Diesel Product Cooler	1805	2794	Air Cooler	Foster Wheeler (UK)	Oil Refining	Improved Duty	Petronas	Malaysia	Kerteh	Refinery CDU	Cooling	Diesel
FCC Waste Heat Boilers	1893	2796	Shell / Tube	Engen Refinery	Oil Refining	Reduced Fouling	Engen Refinery	South Africa	Durban	FCC	Cooling	Fractionator Bottoms
Atmospheric residue	1939	2798	Air Cooler	GEA Luftkuhler GmbH	Oil Refining	Reduced Foulig	Eurosplitter	Netherlands	Rotterdam	CDU	Cooling	Atmospheric Residue
Stabiliser Reboiler	1470	2977	Shell / Tube	Nerefco	Oil Refining	Improved Duty	Nerefco	Netherlands	Europort	CD3	Cooling	Atmospheric Residue
Flash Preheater	2365	3010	Shell / Tube	DEA	Oil Refining	Reduced Fouling	DEA	Germany	Grassbrook	Solvent Recovery	Boiling	Residues + Solvent
Vacuum ResidueProduct cooler	2465	3115	Air Cooler	Heat Exchangers Int	Oil Refining	Improved Duty	Thai Petrochem	Thailand	Rayong	Lube Base Oil	Cooling	Vacuum Residue
Vacuum ResidueProduct cooler	2465	3116	Air Cooler	Heat Exchangers Int	Oil Refining	Improved Duty	Thai Petrochem	Thailand	Rayong	Lube Base Oil	Cooling	Vacuum Residue
Vacuum ResidueProduct cooler	2465	3117	Air Cooler	Heat Exchangers Int	Oil Refining	Improved Duty	Thai Petrochem	Thailand	Rayong	Lube Base Oil	Cooling	Vacuum Residue
Vacuum ResidueProduct cooler	2465	3118	Air Cooler	Heat Exchangers Int	Oil Refining	Improved Duty	Thai Petrochem	Thailand	Rayong	Lube Base Oil	Cooling	Vacuum Residue
Vacuum ResidueProduct cooler	2465	3119	Air Cooler	Heat Exchangers Int	Oil Refining	Improved Duty	Thai Petrochem	Thailand	Rayong	Lube Base Oil	Cooling	Vacuum Residue
Vacuum Residue / crude oil exchanger	2472	3120	Shell / Tube	ABB Lummus	Oil Refining	Reduced Size	Deutsche BP	Germany	Wintershall	Coker Plant	Cooling	Vacuum Residue
Crude vs Diesel Exchanger	2799	3124	Shell / Tube	Total (Denver)	Oil Refining	Reduced Fouling	Total Oil	USA	Commerce City, CO	Crude Unit	Heating	Crude Oil
Crude vs Diesel Exchanger	2799	3125	Shell / Tube	Total (Denver)	Oil Refining	Reduced Fouling	Total Oil	USA	Commerce City, CO	Crude Unit	Heating	Crude Oil
Crude vs Diesel Exchanger	2799	3126	Shell / Tube	Total (Denver)	Oil Refining	Reduced Fouling	Total Oil	USA	Commerce City, CO	Crude Unit	Heating	Crude Oil
Crude oil heater	2928	3174	Shell / Tube	Nerefco	Oil Refining	Reduced Fouling	Nerefco	Netherlands	Europort	Sidestream Fouling Rig	Heating	Crude Oil
Stabiliser Reboiler	2939	3178	Shell / Tube	BP Amoco	Oil Refining	Improved Duty	BP Oil	UK	Grangemouth	Crude Unit 3	Cooling	Atmospheric Residue
Crude vs Diesel Exchanger	2799	3203	Shell / Tube	Total (Denver)	Oil Refining	Reduced Fouling	Total Oil	USA	Commerce City, CO	Crude Unit	Heating	Crude Oil
Vacuum Distillation Reboiler	2805	3215	Shell / Tube	Mohawk	Oil Refining	Improved Duty	Mohawk Oil Company	Canada	Burnaby, BC	Used Oil Refinery	Boiling	100 Neutral Mineral Oil
Crude/HGVO Exchanger	2997	3277	Shell / Tube	Little America Ref Co	Oil Refining	Reduced Fouling	Little America Ref. Co.	USA	Casper, WY	Crude Distillation	Heating	Crude Oil
Reactor Effluent Heater	2876	3349	Shell / Tube	Mohawk	Oil Refining	Improved Duty	Mohawk Lubricants	Canada	Burnaby, BC	Used Oil Refinery	Heating	Vacuum Distillate
Residue Cooler	3341	3379	Shell / Tube	Nerefco	Oil Refining	Improved Duty	Nerefco	Netherlands	Europort	Crude Unit 3	Cooling	Residue
Residue Cooler	3341	3412	Shell / Tube	Nerefco	Oil Refining	Improved Duty	Nerefco	Netherlands	Europort	Crude Unit 3	Cooling	Residue
Waste Heat Boiler	2829	3514	Shell / Tube	KNPC	Oil Refining	Improved Duty	KNPC	Kuwait	Shuaiba Refinery	Vacuum Distillation	Cooling	Vacuum Residue
Vacuum Residue/Waste Heat Boiler	2829	3568	Shell / Tube	KNPC	Oil Refining	Improved Duty	KNPC	Kuwait	Shuaiba Refinery	Vacuum Distillation	Cooling	Vacuum Residue
Raffinate Product Air Cooler	3324	3570	Air Cooler	Exxon Mobil Res/Eng	Oil Refining	Reduced Fouling	Exxon	USA	Baytown	Paraffinic Lube	Cooling	Raffinate Product
Hot Residue/Crude HE	3273	3573	Shell / Tube	YPF	Oil Refining	Reduced Size	YPF	Argentina	La Plata	Refinery	Heating	Crude Oil
Gas Oil Cooler	3865	3653	Air Cooler	Foster Wheeler (UK)	Oil Refining	Improved Duty	Petronas	Malaysia	Kerteh	Refinery CDU	Cooling	Diesel
Raffinate Air Cooler	3960	3716	Air Cooler	Hammco Air Coolers Inc.	Oil Refining	Reduced Size	Exxon	USA	Baytown	Paraffinic Lube	Cooling	Raffinate Product
Heavy oil exchangers	4004	3736	Shell / Tube	Indian Petrochem Corp Ltd	Oil Refining	Reduced Fouling	Indian Oil	India	Haldia	CDU	Heating	Reduced crude oil
Reactor Effluent Cooler	3938	3743	Air Cooler	Shell Nederland Chemie B.V	Oil Refining	Improved duty	Shell	Netherlands	Pernis	CDU	Cooling	Reactor Effluent
Fluxed Pitch Cooler	3977	3747	Air Cooler	Imperial Oil	Oil Refining	Improved Duty	Exxon	Canada	Strathcona	Refinery	Cooling	Fluxed Pitch
Reactor Effluent Cooler	3938	3876	Air Cooler	Shell Nederland Chemie B.V	Oil Refining	Improved Duty	Shell	Netherlands	Pernis	Refinery	Cooling	Reactor Effluent
Reactor Effluent Cooler	3938	4054	Air Cooler	Shell Nederland Chemie B.V	Oil Refining	Red size/fouling	Shell	Netherlands	Pernis	Refinery	Cooling	Reactor Effluent
LCGO Reflux Cooler	4841	4298	Air Cooler	Colt Engineering Corporation	Oil Refining	Improved Duty	Imperial Oil	Canada	Nanticoke	FCC	Cooling	LCGO
Raffinate & Extract cooler	4941	4353	Shell / Tube	BP Lubes Services GmbH	Oil Refining	Improved Duty	Deutsche BP AG	Germany	Hamburg	Lubes	Cooling	Lubestock
Vertical Exchanger	4966	4397	Shell / Tube	Baker Petrolite	Oil Refining	Improved Duty	Baker Petrolite	UK	Hartlepool	Process	Cooling	TC211
Raffinat & Extract cooler	4941	4399	Shell / Tube	BP Lubes Services GmbH	Oil Refining	Improved Duty	Deutsche BP AG	Germany	Hamburg	Lubes	Cooling	Lubestock
Gasoil / crude cooler	5893	5008	Shell / Tube	Mayr-Wilhelm GmbH & Co	Oil Refining	Reduced Size	Deutsche BP AG	Germany	Lingen	Erdöl-Raffinerie	Cooling	Gas oil
SRAR Air cooler	6159	5238	Air Cooler	Conoco Phillips	Oil Refining	Improved Duty	Co Noco Phillips	Ireland	Cork	Topping Plant	Cooling	Residue
Crude/Crude preheat train	6211	5294	Shell / Tube	Petroleos Mexicanos	Oil Refining	Improved Duty	Pemex	Mexico	S Mexico	Platform	Heating	Crude/water
Gas Oil Rundown Cooler	6254	5335	Air Cooler	Petronas Penapisan	Oil Refining	Reduced Size	Petronas	Malaysia	Penapisan Terenganu	Kerith	Cooling	Diesel Rundown
Texas Tower (Feed / Effluent)	5898	5387	Shell / Tube	BP America Inc.	Oil Refining	Improved Duty	UOP (Licensor)	Germany	Gelsenkirchen	JV Chemical Plant	Boiling	organic compound /crude
Gas Oil Cooler	6699	5800	Air Cooler	Shell Stanlow Refinery	Oil Refining	Reduced Size	Shell Oil	UK	Stanlow Refinery	Run Down Unit	Cooling	Gas Oil
Gas Oil Cooler	6699	5820	Air Cooler	Shell Stanlow Refinery	Oil Refining	Reduced Size	Shell Oil	UK	Stanlow Refinery	Run Down Unit	Cooling	Gas Oil
Residue cooler	6721	5832	Air Cooler	Conoco Phillips	Oil Refining	Reduced Size	Conoco Philips	Ireland	Cork	Whitegate Refinery	Cooling	Residue
Crude / Oil Interchanger	4625	4625	Shell / Tube	ABB Lummus Global Inc	Oil Refining	Reduced Size	Total Angola	Angola	Dalia FPSO	Topsides	Cooling	Crude/Water Emulsion