
MIDREX



Supplier Requirements & Qualifications

2020/2021

CATEGORIES OF MIDREX PURCHASED EQUIPMENT AND MATERIALS

Plant Systems & Equipment

1. Process Gas System
 - a. Process Gas Compressors
 - b. Seal/Purge Gas Dryers & Plant and Instrument Air Dryers
 - c. Mist Eliminators
 - d. Pulsation Dampeners
 - e. Piping, Valves, Supports, and Fittings
2. Material Processing System
 - a. Reduction Furnace
 - b. Scrubbers
 - c. Abrasion-resistant Vessels and Piping
 - d. Feeders
3. Centrifugal Fans & Blowers
4. Heat Recovery System
5. Burner Systems
6. Water Treatment Systems & Chemicals
 - a. Horizontal, Centrifugal, Vertical and Abrasion-resistant Pumps (for water and slurry)
 - b. Plate and Frame Heat Exchangers
 - c. Clarifiers
 - d. Classifiers
 - e. Plate type filters for dewatering
7. Hydraulic Power Systems & Cylinders
8. Conveyor Systems
 - a. Vertical Rubber-belted
 - b. Metal Apron-type (for Hot Briquette cooling)

Instrumentation & Controls

1. Distributed Process Control (DPC) Systems
2. Field Instrumentation
3. Automatic Valves

Proprietary Equipment & Materials

1. Reformer Tubes and Accessories
2. Proprietary Process Machinery
3. Proprietary Fabrications
 - a. Heavy Fabrications (typically low multiples)
 - b. Light Fabrications (typically high multiples)

Power Distribution

1. Motors (HV and LV)
2. Switchgear
3. Motor Control Centers (MCC)
4. Transformers
5. Emergency Diesel Generators

Evaluation & Testing

1. Gas Conditioners and Mass Spectrometers, Chromatographs, and Analyzers
2. Laboratory Equipment

Miscellaneous Equipment & Materials (Purchased to Specifications)

1. Structural Steel
 2. Refractory-lined Ductwork
 3. Metal Expansion Joints, Bellows, and Flexible Hoses
 4. Refractory
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TYPICAL MIDREX EQUIPMENT DESCRIPTIONS

High Multiples			
Midrex Equipment Package Designation	Primary Materials of Construction	Major Shop Machinery Required/Suggested	Estimated Total Weight and Comments
Reformer Tube Accessories	SS310 Piping and Plate, A-36 Plate, miscellaneous Carbon Steel rods and springs	CNC boring and milling machines and alloy and carbon steel welding apparatus	Approximately 500 units totaling 110MT
Main Burners and Doglegs	A-106 piping, A-36 Plate, miscellaneous stainless plate and formed cones	CNC boring and milling machines and alloy and carbon steel welding apparatus	Approximately 800 units totaling 120MT
Miscellaneous Alloy/Carbon Steel Components	330SS and 310SS Piping and Plate, A-36 Plate	Forming rolls, horizontal and vertical boring and milling machines and carbon and alloy steel welding apparatus	Approximately 30MT

TYPICAL MIDREX EQUIPMENT DESCRIPTIONS

Low Multiples			
Midrex Equipment Package Designation	Primary Materials of Construction	Major Shop Machinery Required	Estimated Total Weight and Comments
Material Handling	A-36 Plate, A-106 Pipe, Abrasion-Resistant Steel and Abrasion-Resistant Weld Overlay	Forming rolls and press breaks capable of handling ~1" thick X 8' wide carbon steel plates, horizontal and vertical boring and milling machines and carbon steel welding and abrasion-resistant welding overlay apparatus	Approximately 30MT
Material Processing Units	Single piece Centrifugally Cast Tubes >28" OD, 2-1/2" or 2" Wall Thickness, Variety of Alloy and Carbon Static Castings ~10 - 25 KG. Variety of Machined Carbon Steel Rings and Weldments and Machined Bronze Bushings	Forming rolls, press breaks capable of handling 1" thick X 4' wide carbon steel plates, horizontal and vertical boring and milling machines and carbon and alloy steel welding apparatus and a lathe capable of a 35' center distance and 11 MT load capacity.	Approximately 40MT.
Fabricated Alloy Processing Equipment	25mm thick alloy plate and 20mm thick alloy plate	Forming rolls and a dishing ram capable of handling up to 1" thick X 8' wide alloy plate, horizontal and vertical boring and milling machines and carbon and alloy steel welding apparatus. All welds are RT quality.	Approximately 30MT

TYPICAL MIDREX EQUIPMENT DESCRIPTIONS (CONTINUED)

Low Multiples			
Midrex Equipment Package Designation	Primary Materials of Construction	Major Shop Machinery Required	Estimated Total Weight and Comments
Fabricated Processing Equipment	Single piece Alloy Centrifugally Cast Tube, 28" Diameter, 2" Wall Thickness and ~34' Long, Machined Carbon Steel Weldments	Forming rolls, press breaks capable of handling 1" thick X 4' wide carbon steel plates, horizontal and vertical boring and milling machines and carbon and alloy steel welding apparatus and a lathe capable of a 35' center distance and 11 MT load capacity.	Approximately 14MT
Fabricated Material Handling Equipment	Mixture of heavy wall (~25mm) and light wall carbon and alloy plate, single piece centrifugally cast tubes, ~16" OD, ~ 10' long and carbon steel and alloy piping.	Forming rolls capable of handling 1" thick X 5' wide alloy and carbon steel plate, horizontal and vertical boring and milling machines and carbon and alloy steel welding apparatus. Hydraulic and water piping disciplines also required.	Approximately 100MT

COMPRESSOR DUTIES

RECOMMENDED TYPE OF COMPRESSOR	QUANTITY PER PROJECT	MEDIA	NORMAL VOLUME	NORMAL PRESSURE RISE	TYPICAL POWER REQUIRED	ACCESSORIES
CENTRIFUGAL TWO STAGES IN SERIES	2	Mixture of H ₂ , CO, H ₂ O, CO ₂ and CH ₄ .	200,000 - 350,000 M ³ /HR (WET)	PRESSURE RISE OF 1.5 – 4 BARG CONSIDERING BOTH STAGES AS ONE SYSTEM	6.5 - 8 MW	IN ACCORDANCE WITH API 617, SKID MOUNTED, GEAR BOX, FORCED LUBE, ANTI- SURGE VALVES AND CONTROLS
					6.5 - 8MW	
ROTARY LOBE OR CENTRIFUGAL	1	Mixture of H ₂ ; CH ₄ ; C ₂ H ₆ ; N; CO and H ₂ O.	100,000 - 350,000 M ³ /HR (WET)	PRESSURE RISE OF .5 – 1.5 BARG	3 - 6 MW	PEDESTAL OR SKID MOUNTED, GEAR BOX, FORCED LUBE, PULSATION DAMPENER FOR ROTARY LOBE
ROTARY LOBE	2	Mixture of N, CO ₂ , H ₂ O (vapor), and O ₂ .	10,000 - 25,000 M ³ /HR (WET)	PRESSURE RISE OF .5 – 1.5 BARG	1 - 2 MW	SKID MOUNTED, GEAR BOX, FORCED LUBE, PULSATION DAMPENER

COMPRESSOR DUTIES (CONTINUED)

RECOMMENDED TYPE OF COMPRESSOR	QUANTITY PER PROJECT	MEDIA	NORMAL VOLUME	NORMAL PRESSURE RISE	TYPICAL POWER REQUIRED	ACCESSORIES
OIL-FREE SCREW	1	Mixture of N, CO ₂ , O ₂ .	5,000-15,000 M ³ /HR (DRY)	2 - 4 BARG PRESSURE RISE	400 - 600 KW	SKID MOUNTED, PRE AND AFTER COALESCING FILTER
OIL-FREE SCREW	2	Air	600 – 1,000 NM ³ /HR	6 - 8 BAR G DISCHARGE	80 - 130 KW	SKID MOUNTED, PRE AND AFTER COALESCING FILTER
OIL-FREE PISTON TYPE	2	Mixture of N, CO ₂ , O ₂ .	300- 500 NM ³ /HR	10 - 20 BAR G PRESSURE RISE	50 - 100 KW	SKID MOUNTED, FILTERS, SEPARATORS, TRAPS, INTER-STAGE COOLER
OIL FLOODED SCREW	1	Mixture of H ₂ , CO, H ₂ O and CO ₂	20,000 - 30,000 NM ³ /HR	12 BAR G PRESSURE RISE	2 - 4 MW	SKID MOUNTED WITH INLET FILTER, DISCHARGE PULSATION DAMPENER/SILENCER, BULK OIL SEPARATOR AND COALESCING FILTER

TYPICAL CARBON STEEL FABRICATIONS FOR MIDREX MEGA-MOD

Equipment Description	Estimated Total Weight (MT)	Estimated Largest Single Shipping Piece (M X M X M)	Estimated Weight of Largest Single Shipping Piece (MT)	Nature of Fabrication	Predominant Materials of Construction
Top Gas Scrubber	125	11M Dia. X 7M H	95	Unstamped vessel fabricated in accordance with ASME Section VIII, Div. 1 Quality Standards	45mm thick A-36 Support Ring, 30mm thick A-516 Head and 20mm - 25mm thick A-516 Shell Plate
Reduction Furnace	280	11M Dia. X 6 M H	100	Unstamped vessel fabricated in accordance with ASME Section VIII, Div. 1 Quality Standards	45mm thick A-36 Support Ring, 30mm thick A-516 Head and 20mm - 25mm thick A-516 Shell Plate
Cooling Gas Scrubber	95	9 M Dia. X 6 L	45	Unstamped vessel fabricated in accordance with ASME Section VIII, Div. 1 Quality Standards	25mm thick A-36 Support Ring, 30mm thick A-516 Head and 20mm - 25mm thick A-516 Shell Plate

TYPICAL CARBON STEEL FABRICATIONS FOR MIDREX MEGA-MOD (CONTINUED)

Equipment Description	Estimated Total Weight (MT)	Estimated Largest Single Shipping Piece (M X M X M)	Estimated Weight of Largest Single Shipping Piece (MT)	Nature of Fabrication	Predominant Materials of Construction
Mist Eliminators (4 ea.)	80	3.5 M Dia. X 9 M L	20	ASME Section VIII, Div. 1 stamped pressure vessel	25mm thick A-36 Support Ring, 25mm thick A-516 Head and 20mm thick A-516 Shell Plate
Reformer Casing	328	3 M X 5M X 1 M	5	Platwork fabricated in accordance with ASME Section VIII Div. 1 Quality Standards	6mm thick A-36 panels reinforced with various channels, angles or wide flanges and many installed or loose A-106/A-53 flanged nozzles
Heat Recovery Casing	200	3 M X 5M X 1 M	5	Platwork fabricated in accordance with ASME Section VIII Div. 1 Quality Standards	6mm thick A-36 panels reinforced with various channels, angles or wide flanges



If you have any questions about these requirements, please contact the Midrex Procurement Department at procurement@midrex.com
