



Material Selection



Piping for Utility

Utility	Material
Boiler Blow Down	A106 Gr.B/A672 Gr.B60
Boiler Feed Water	A106 Gr.B/A672 Gr.B60
Cooling Water	A106 Gr.B/A672 Gr.B60
LPS/LPC	A106 Gr.B/A672 Gr.B60
MPS/MPC	A106 Gr.B/A672 Gr.B60
Nitrogen	A106 Gr.B/A672 Gr.B60
Plant Air	A106 Gr.B/A672 Gr.B60
Service Water	A106 Gr.B/A672 Gr.B60
Fire Foam	A106 Gr.B/A672 Gr.B60
Fire Water (AG)	A106 Gr.B/A672 Gr.B60
Demineralized Water	A312 TP304
Instrument Air	A312 TP304
Fire Water (after filter)	A53 Gr. B/GALV



Piping for Chemicals

Chemicals	Material
Oxygen Scavenger	A312 TP304L
NaOH Solution	A312 TP304L
Phosphate Solution	A312 TP304L
Crossion Inhibitor (AG)	A312 TP316L
H ₂ SO ₄	A312 TP316L
HCL Solution (2~40%) (AG)	CPVC
NaClO Solution (10%) (AG)	CPVC
Lube Oil	A312 TP304



Piping for Process Units

Process Fluids	Material
Fuel Gas	A106 Gr. B/A672 Gr.B60
Natural Gas	A106 Gr.B/A672 Gr.B60
Methanol Mixtures	A106 Gr.B/A672 Gr.B60
Process Oxygen	B165 N04400 /A312 TP304L
Process Condensate	A312 TP304L
Ammonia Water	A312 TP304L
Turbine Condensate	A312 TP304
Hydrogen Gas	A106 Gr.B/A672 Gr.B60/ A312 TP304
Syngas (H ₂ +CO+CO ₂)	A312 TP304
Reformed Gas (H ₂ +CO+CO ₂)	A312 TP321H/ A312 TP304L



Separators and Tanks

Fluids	Material
NG	CS
Rich Methanol / Methanol Water	CS
BD	CS
LPC/MPC/HPC/MPS	CS
BFW+Steam	CS
Reformed Gas/ Syngas ($H_2+CO+CO_2$)	SS
Saturated Natural Gas	SS
DMW	CS+Internal Painting
Ammonia	SS



Turbine and Compressor

Fluid	Material
HPS/LPS	CS
HHPS/LPS	CS
Nitrogen	CS
Syngas (H ₂ +CO+CO ₂)	CS / If T>150 use SS



Heat Exchanger

Suitable Fluid	Natural Gas Cooling Water Methanol	Demineralized Water Reformed Gas Process Condensate
Component of Channel Side	CS	SS
Head	SA-516 70N	SA-240 304L
Shell	SA-516 70N	SA-240 304L
Channel Flange	SA-266 2N	SA-965 F304L/SA-182 F304
Pass Partition	SA-516 70N	
Nozzle	SA-105N	SA-182 F304L
Flange	SA-105N	SA-312 TP304L
Component of Heat Transfer	CS	SS
Tie Rod	SA-36	SA-479 304
Spacer	SA-179	SA-213 TP304/SA-789/SA-312
Baffle	SA-516 70N	SA-240 304
Support Plate	SA-516 70N	SA-240 304L
Partition Plate	SA-516 70N	SA-240 304L
Impingement Plate	SA-516 70N	SA-240 304
Tubesheet	SA-266 2N	SA-182 F304/SA-965
Hex Bolt	SA-193 B7	SA-193 B7/A2-70
Hex Nut	SA-194 Gr 2H	SA-194 Gr 2H/A2-70
Body Flange	SA-266 2N	SA-965 F304/F304L
Shell Side Shell	SA-516 70N	SA-240 304/ SA-387
Tubes/U-Tubes	SA-179	SA-213 TP304/SA-789
Sealing Strip	SA-516 70N	SA-240 304L



Valve

Fluid	Material
NG	SA216 WCB
Purge Gas	SA216 WCB
Syngas	SA216 WCB/A351 CF8
Process Condensate	A351 CF8
LPS	SA216 WCB
MPS	SA216 WCB
HPS	SA216 WCB /SA217 WC6
HHPS	SA217 WC6
LPC	SA217 WC6/WC9
MPC	SA216 WCB
HPC	SA217 WC9
BFW	SA216 WCB/ SA217 WC6
WMW	A351 CF8
Nitrogen	SA216 WCB
Crude Methanol	SA216 WCB
Flashed Methanol	A351 CF8
Refined Methanol	SA216 WCB
Process Gas	SA216 WCB/ A351 CF8
Oxygen	Monel