

A. TURBINE

1 Components for Gas Turbine

1) Combustion Chamber Parts

- EV Burner
- Shielding Cone
- Support Cylinder
- Lower Combustion Chamber Insert
- Hot Gas Casting

2) Turbine Parts

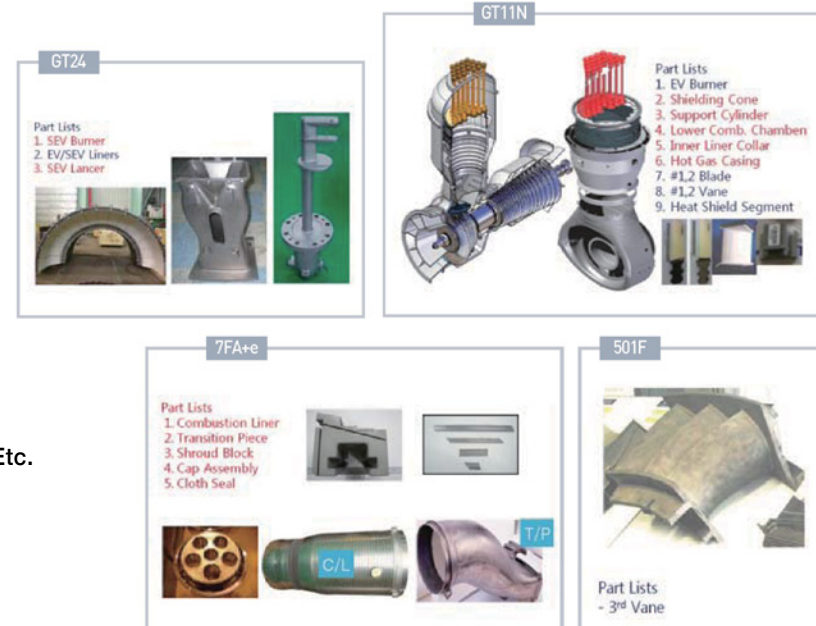
- Blades
- Vanes
- Heat Shield Segment

3) Manufacture & Repair

- Parts & Components of Gas Turbine

4) 100% Compatible with GE, ABB, Siemens & Etc.

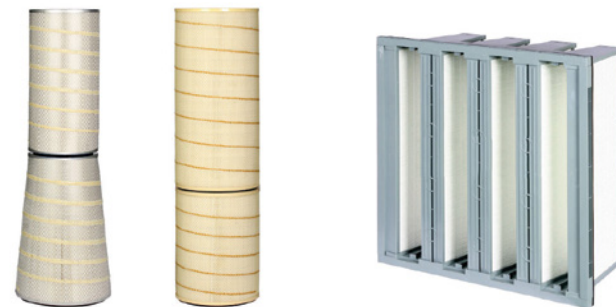
- GT11N, GT24, 7FA+e, 501F



2 Inlet Filter

1) Cylindrical and Cylindrical + Conical Type

- Description
 - Cylindrical : 22", 26", 28", 34"
 - Cylindrical + Conical : 26"
- Frame : Plastic, Galvanized Steel
- Media : 100% Cellulose, 80/20 Blend Melt Blown, 100% Synthetic



2) V Bank and Header Type

- Description
 - V Bank : 24"*24"*12"
 - Header : 24"*24"*12", 12"*24"*12"
- Air Flow : 2,000CFM
- Class : F7, F8, F9



3) HEPA Filter

- Description : 24"*24"*12"
- Air Flow : 2,000CFM, 2120CFM
- Class : E10~H14

4) Gas Turbine Pre Filter

- Description : 12"*24"*4", 24"*24"*4"
- Air Flow : 2,000CFM, 2,500CFM
- Media : 90% Arrestance

B. PIPES

1 Piping Fabrication

1) Piping Spool

- Carbon, Stainless, Super Duplex/Alloy, Titanium, Copper/Nickel, Clad, GRE/FRP, Inconel, Nimonic
- Projects for Thermal/Combine Cycle/Nuclear Power Plant, Chemical Plant, On/Offshore Plant
- Capacity : Carbon(6000 Ton/Year), Stainless(3,000 Ton/Year), Super Delux/Alloy(4500 Ton/Year)

2) Small Radius Bend

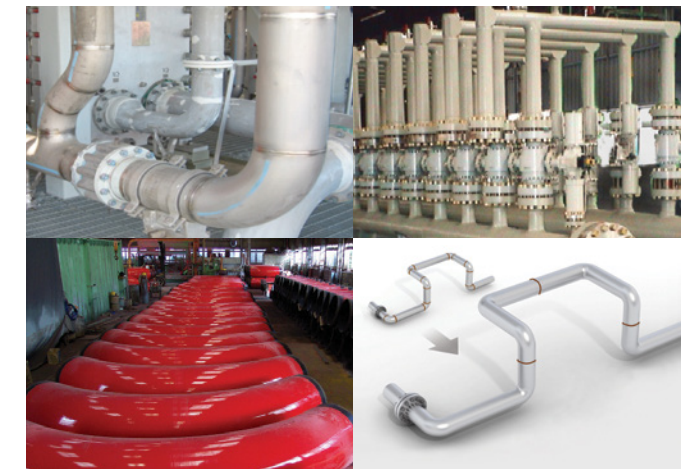
- Weld-less Piping(1.5/2.0 DR)
- Excellent Mech. Property(Fatigue, Tensile, Elongation)
- Cost Saving & Less-QC/QA
- Flexible Design

3) Induction Bend

- Advanced Technique & Certified Quality
- One-Stop Service
- Max. 1550mm*120mmThk

4) Vacuum Casting

- Vacuum Furnace Heating
- Coating by Robot



2 Piping Accessories

1) Hanger

- 23kg to 22,476kg
- Simple Structure & Low Price
- Near-zero change
- Application for extreme-low temperatures
- Specially Designed Machinery Mechanism



2) Cold Support

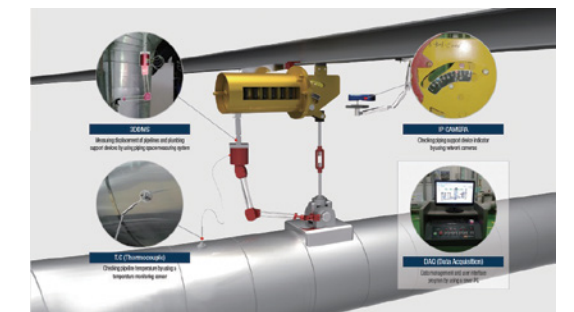
- Density : 500kg/m³
- Compressive strength : higher than 170kg/m²
- Bending strength : higher than 200kg/cm²
- Thermal conductivity : less than 0.084kcal/Mhr°C
- Flame spread : less than 25
- Closed cell content by volume : more than 90%
- Water absorption : less than 1g/100cm²
- Working Temp. range : -190 ~ 80°C



3 Piping Management System

PLUMBER

- Total Management System for Piping & Hanger
- 3D Displacement Data/Pipe Temperature Graph
- Supporting Pipe Temperature Graph
- Database/Storing Data Report & Managing History
- Viewer to check Design Drawing directly



C. PUMP

1 Heavy Duty Vertical Process Pump(VM)

- Capacity : up to 450m³/min
- Head : up to 50m
- Size : up to 1500mm
- Application : General Industry / Factory drainage
/ Rainwater drainage / Agriculture

2 ISO Process Pump(ISB)

- Capacity : up to 12m³/min
- Head : up to 140m
- Temperature : up to 177°C
- Size : up to 250mm
- Application : Chemical Industry / Petroleum refinery
/ Petrochemical industry / Other Industries

3 Co-Generation Feed Water Pump(ST)

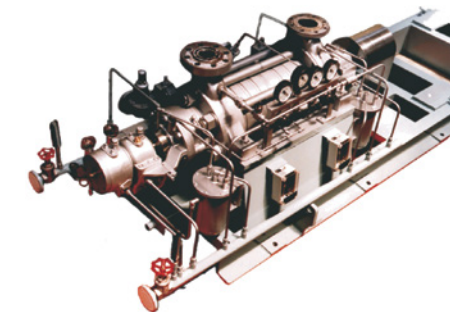
- Capacity : up to 12m³/min
- Head : up to 2100m
- Size : up to 150mm
- Application : Boiler feed / Mine drainage
/ Chemical Process
/ Other High Pressure Services

4 Double Suction Pump(DSN)

- Capacity : up to 6m³/min
- Head : up to 50m
- Temperature : up to 177°C
- Size : up to 150mm
- Application : Process / Pulp & Paper / Primary metals
/ Utilities Cooling / Marine

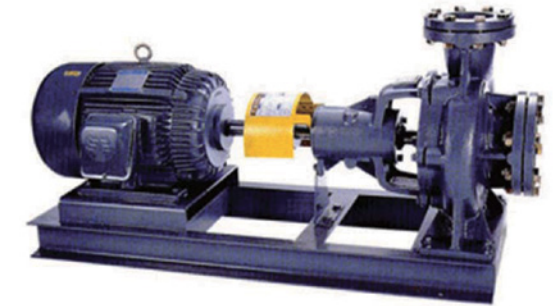
5 Vacuum Self-priming Pump

- For water-pumping with air(for removal of such floats as bubble and oil)
- No remaining fluids during suction and delivery
- All liquids including high viscosity & low gravity(thinner or benzol)
- For Tank & Pipe cleaning(nothing remnants in suction and discharge pipes)
- Feeding of high temperature water(hot oil up to 350°C)
- Water supply of salt water for general purpose
- Sludge cleaning of below-ground tanks



6 Centrifugal pump

- Wide Standardization
- Unification of dimension
- The standardization of parts
: keeping the highest compatibility
- Top Discharge diameter : stability & balance
- Back pull out structure : without dismantling of equipment piping
- Applied standard
 - ISO 2858(International standardization norm)
 - KS b7501(Korea standard norm)
 - JIS b8313(Japan standard industry norm)



D. VALVES & ACTUATORS

1 Butterfly Valve

Butterfly valve for Cargo Line



Butterfly valve with MOV



T/C cut off system valve(550°C)
(Automatic Operated)



Butterfly valve with Pneumatic actuator (with De clutch)



Butterfly valve with Hydraulic actuator



• Technical Data

Size range	2"(50A) – 16"(400A)
Pressure Rating	7Bar, 10Bar
Temperature Range	0°C to +80°C
Flange Drilling	ANSI B16.5(CL, 150) DN 2532(PN10), BS 4504(PN10), JIS B2210(10K)
Face to Face dimension	ISO 5752, API609, MSS SP-67
Body Style	WAFER, LUGGED(Two Pieces)
Top flange mounting	ISO 5211
Actuator	Lever handle, Worm gear, Electric actuator, Pneumatic actuator

2 Gate & Globe Valve

Standards Compliance

- The face to face dimension shall be in accordance with ANSI B16.10 JIS F 7310, 7360, in general.
- The Body is designed to API STD. 600, ANSI B16.34 JIS F 7310, 7360, in general.

Production Range

- Size : 50mm(2inch) ~1300mm(52inch)
- Service Pressure : 5bar ~260bar
- Service Temperature : -29°C~ 454°C

Applicable Flange

- ANSI 150LB ~ 1500LB.
- KS/JIS 5K ~ 63K.
- DIN/BS/ISO PN6 ~ PN260



3 Ball Valve

- Design Standard : API 6D
- End Connection : Double Flanged / Butt-weld
- Size : up to DN1500mm (60")
- Pressure : up to Class 2500
- Material : Carbon Steel / Stainless Steel / Ni. Alloy
- Flow : Bi-Direction
- Leakage Class : Class VI, Bubble Tight Shutoff (Zero Leakage)



4 Dual Plate Check Valve

- Type : Wafer, Lug, Double Flanged, Hub, Buttwelding, Jacketed
- Size & Class : 2~80inch / ANSI Class 150~2500LB
- Material : Carbon Steel, Stainless Steel, Ni. Alloy, Ni. Al-bronze, Duplex, Monel, Hastelloy C, Inconel



5 Surge Relief Valve

- Type : Angle type
- Material
 - Body & Actuator : Ductile Iron, Bronze
 - Internals : Stainless Steel, Bronze & Coated Steel
 - Diaphragm : Chloroprene, NBR
 - Spring : Inconel
- Size : 4~12" (100~300mm), other size are available on request



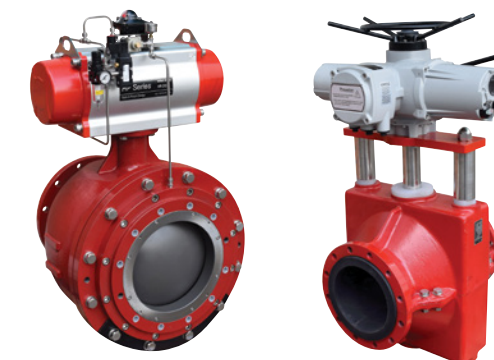
6 Air Release Valve

- Standard Flange Connection : ANSI 150lb, other are available
- Material
 - Body : A216-WCB, B148-C95800, A351-CF3M
 - Float & Disk : HDPE
 - Seat & Gasket : NBR
 - Cover : SS400, B148-C95800, A351-CF3M
 - Ball : A240-316L, Monel-K400
- Size : 2~12", other size are available on request



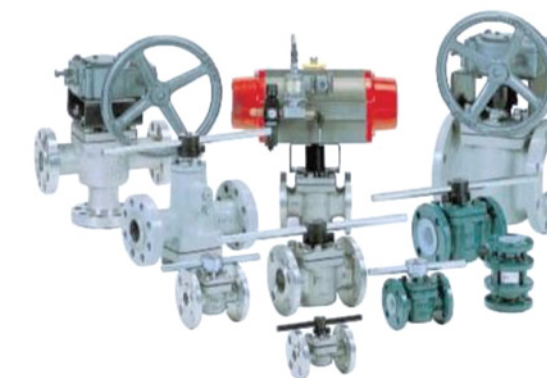
7 Dome Valves

- Easy installation and replacement on silo
- 100% air-tight
- No additional bracket & coupling
- Stable and reliable sealing effect



8 Plug Valves

- Lubricated Plug Valves (Pressure Balanced type)
- Teflon Sleeved Plug Valves (STD PORT & FULL PORT)
- Teflon Lined Plug Valve (STD PORT)
- Severe Service Plug Valves
- Teflon Lined Ball Check Valves
- Teflon Lined Swing Check Valves
- Metal Seated Plug Valves (STD PORT & FULL PORT)
- ON-OFF Control Valves (PNEUMATIC, HYDRAULIC, ELECTRIC)
- THROTTLING Control Valves (PNEUMATIC, ELECTRIC)
- DBB Valves (DOUBLE BLOCK & BLEED)
- FACILITIES : HIGH ALLOY STEEL CASTING FOUNDRY FACILITY MACHINING, ASS'Y AND TESTING FACILITY



9 Cryogenic Valve

Application

- Gas carrier (liquefied propane gas, butane, acetylene, ethylene liquefied natural gas, etc.)
- Receiving terminal
- Liquefied Oxygen(-160) plants



10 Forged Valves

- Gate, Globe and Check Valves
- Wafer check and Butterfly Valves
- High Pressure Valves
- Full Bore Valves
- Extended Bonnet type
- Sour Service (NACE)
- Cryogenic Valves
- Bellows Seal Valves
- Jacket type Valves
- Mov, Actuated Valves (API, ASME, JIS, BS ANSI etc)

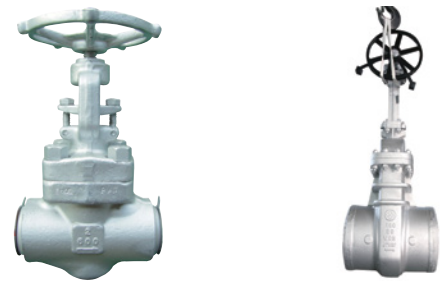


11 Large Sized Forged Valves

- Gate, Globe and Check Valves
- Option : Gear, Electrical Motor Operated, Pneumatic Actuator Operated
- Material : A182-F91/F92/ EN1.4901/EN1.4903
- Full Bore Valves
- Extended Bonnet type



ITEM	SIZE	Class
Gate Valve	3/8"~2-1/21"	150~4500
Globe Valve	3/8"~2-1/21"	150~4500
Check Valve	3/8"~2-1/21"	150~4500
Non-Return Valve	3/8"~2-1/21"	150~4500
Stop-Check Valve	3/8"~2-1/21"	150~4500
Angle Valve	3/8"~2-1/21"	150~4500



12 Ram Piston Valve

Designed for taking fluid sample.
Designed for preventing dead space from being made in the tank and the pipe in order that the valve can work in proper way.

- Application : Almost all the industries including petrochemical, Oil & Gas industries
- Pressure : 150LB ~ 2500LB
- Size : 1/2"~16"



13 Tank Bottom Flush Valve

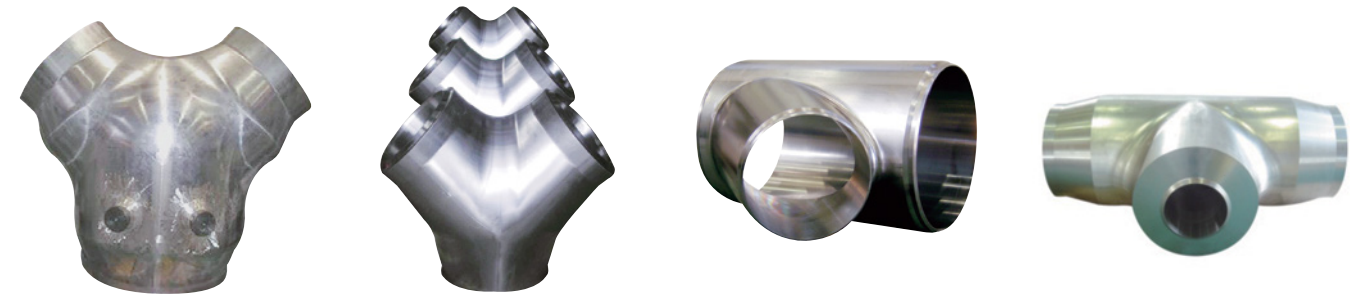
Basically similar function to the Ram piston valve.
Designed for cleaning tank with thinner stem than flow passage, combined with disc which completely seals flow passage.
Quick operating is possible and load on pipe is decreased thanks to shorter size and lighter weight than the Ram piston valve.

- Application : Petrochemical industry, Oil & Gas industries
- Pressure : 150LB ~ 1500LB
- Size : 4"~32"



14 Special Fitting

- WYE-piece, Lateral, Header Tee, Forged Tee, Forged Elbow, Tee Piece, Transition Piece



ITEM	EXP. MAX. SIZE	DESIGN CONDITION	APPLICABLE CODE
Y-PIECE	32"	SIF FACTOR(FEM/FVM)	ASME B31.3, 31.3
LATERAL	36"	SIF FACTOR(FEM/FVM)	ASME B31.3, 31.3
MIXING PIECE	22"	SIF FACTOR(FEM/FVM)	ASME B31.3, 31.3
INJECTION PIECE	22"	FVM	ASME B31.3, 31.3
PIPE BEND	36"	FVM	ANSI B16.9
TUBESHEET(OVERLAY)	OD 6000 th k1000	CUSTOMER DESIGN	CUSTOMER DESIGN
NOZZLE(OVERLAY)	All size	CUSTOMER DESIGN	CUSTOMER DESIGN

15 Multi-Turn Actuator

- Motor : Class F without brake / Standard rating(15mim)
- Terminal : control - 34points(rating AC250V/5A)
power - 3points(rating AC660V/63A)
- Enclosure : IP-68(water depth 8m 72hr), IEC60529(1989)
- Space Heater : Thermistor type, 5W, 100~240V, 0.3~1.8kΩ
- Ambient Temp : -25~70°C
- Standard Coat : Polyester powder coating after anodizing
- Design Life : Min. 10,000cycles



16 Quarter-Turn Actuator

- Terminal : 26points
- Enclosure : IP-68(water depth 8m 72hr)
- Space Heater : Thermistor type, 5W, 110~240V
- Ambient Temp : -25~70°C
- Standard Coat : Polyester powder coating after anodizing
- Design Life : Min. 10,000cycles



17 Electro-Hydraulic Actuators

- Torque : Maximum 32,000Nm ~ 100,000Nm (23,602lbf-ft ~ 73,756lbf-ft)
- Thrust Force : Maximum 700,000N (154,324lbf)
- Stroke : 25 ~ 300mm (Linear Type)
- Enclosure Class : Ex d IIB T4 Gb, IP68
- Fail Action : Fail to Close or Open
- Control Method : Dry Contact, Analog, Digital, Fieldbus
- Electric Power : 1.2kW, 1Φ 110 ~ 220VAC(±10%) 50/60Hz
0.6kW, 1Φ 110 ~ 220VAC(±10%) 50/60Hz
3Φ 380 ~ 460VAC(±10%) 50/60Hz
- Ambient Temperature : -20 ~ +60°C (-4 ~ +140°F)
- Manual : Override Hand Pump



E. SYSTEM & FACILITIES

1 CSU and Stacker & Reclaimer

Continuous Ship Unloader (CSU)

- Capacity : 2,700t/h (Material : Coal)
- No. of Unit : 2
- Delivered : 2015, Shinboryeong Thermal Power Plant
- Slewing Radius : 49.5m
- Type : Chain free type
- Characteristic
 - Environmentally compatible operation
 - Low energy consumption
 - Low dust emission



Stacker & Reclaimer (ST/RE)

- Capacity
 - Stacking : 4,800t/h
 - Reclaiming : 4,800t/h (Material : Coal)
- No. of Unit : 2
- Delivered : 2013, Yeongheung Thermal Power Plant
- Slewing Radius : 46m



Components : Travelling, RTGC Tire Part, Bucket, Etc.

- Proven engineering based on extensive experience

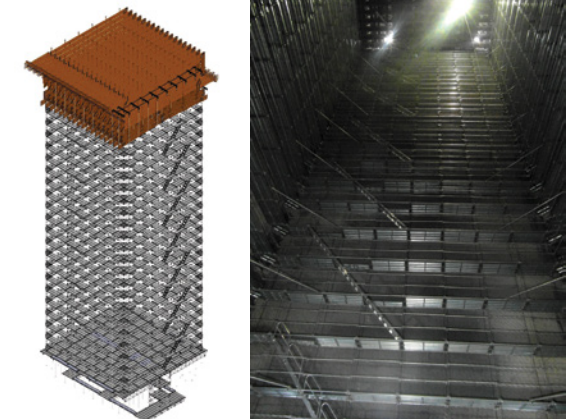
2 Heat Exchanger & Pressure Vessel

- Air Cooled Heat Exchanger
- Shell & Tube Heat Exchanger
- H.R.S.G.
- Pressure Vessel



3 Scaffold System

- Structure : Wire rope-type
- Characteristics
 - Installation of scaffolding support structure in the boiler platen SH and hanger tube bundle
 - Installation of walk plate after construction of wire
- Work ability
 - Simple structure
 - No shaking
 - Easy to move and handle objects
- Load capacity : 4 ton
- Manufacturing Period : 1 months



F. AUX. EQUIPMENTS

1 Water Sprinkling System

Intelligent Water Sprinkling Management System for coal yard (WS-JINSU 650L)

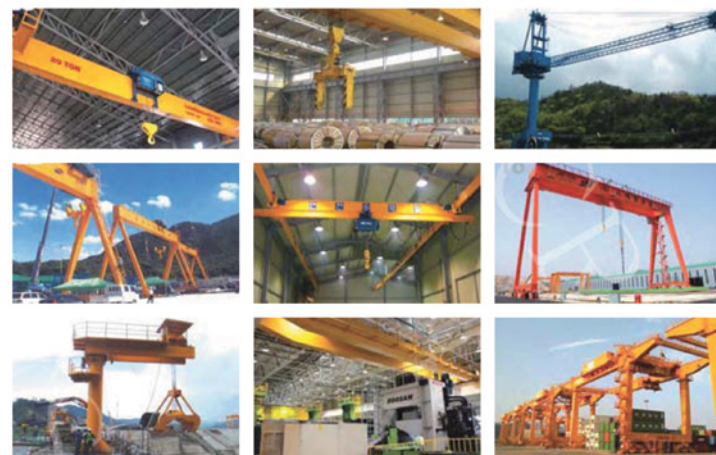
- Monitoring and Analyzing wind direction & speed daily, monthly and seasonal
- The function of Alarm is prepared for a false operation (wind direction/speed) and communication error
- Monitoring for the amount of scattering dust
- Monitoring for Temperature and Humidity
- UI ofr user's convenience
- Outdoor coal yard Specification
 - Max Jet Angle 60°
 - Radius of sprinkling 130m
 - Flow : 450L/min
- Indoor coal yard Specification
 - Max Jet Angle 30°
 - Radius of sprinkling 130m
 - Flow : 595L/min



2 Crane & Hoist

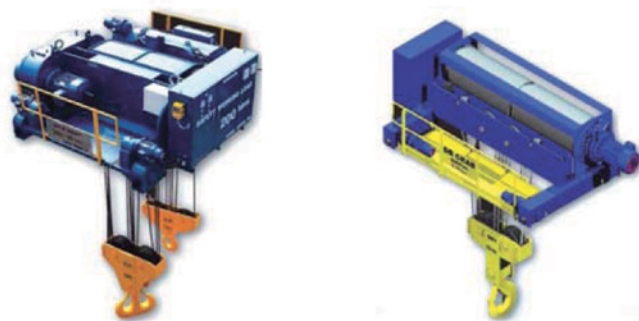
1) Crane

- Goliath Crane For Shipyard(1500 Tons)
- Level Luffing Crane For Shipyard(100 Tons)
- RMQC & Gantry Yard Crane(40 Feet & 30EA / HR)
- Launching Girder For Construction(1500 Tons)
- Doublerrail Gantry Crane(400 Tons)
- Doublerrail Hoist Crane(400 Tons)
- Clean Room Crane(50 Tons)
- Low Space Crane(40 Tons)
- Jib Crane & Gorbelt Crane(10 Tons)
- Overhead Crane for Steel Mill(600 Tons)
- Overhead Crane with Coil Lifter(600 Tons)
- Training Log Crane for DAM(500 Tons)
- Monorail Gantry Crane(300 Tons)
- Mono Girder Hoist Crane(80 Tons)
- Suspension Hoist Crane(50 Tons)



2) Hoist

- GB Crab Hoist
- VLC Chain Hoist



3 Tools & Equipment

Induction Bending Machine

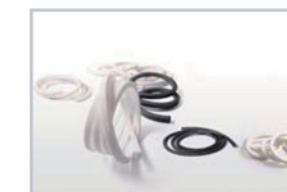
- Size : 1 inch to 80 inch
- Wall Thickness : 5mm to 130mm
- Min. Bending Radius : 1.5DR
- Bending Angle : 0°~180°



4 Accessories

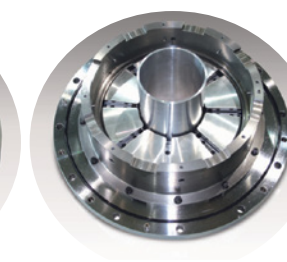
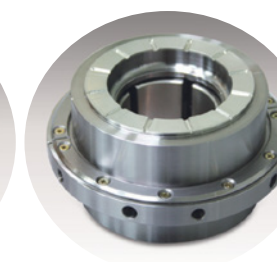
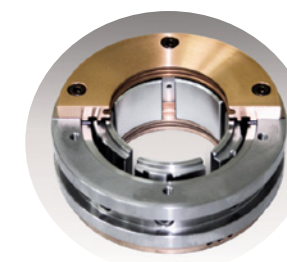
1) Sealing Device

- Mechanical Packing
- Graphite Molding Packing & Gasket
- Spiral Wound Gasket
- Mechanical seal
- Spring Energized Seal
- Metal Sealing
E-Seal / O-Seal / C-Seal
- Specialized Products



2) Bearing

- Tilting Pad Journal
- Tilting Pad Thrust
- Fixed Profile
- Journal & Thrust Combined
- Vertical Guide & Thrust
- Horizontal Motor
- Medium & Thick Wall Journal



5 Industrial Roller

1) Carrying Idler(Trough Idler)

- 3A Unique Carrier Roller
- Belt damage protection (Round-Edge)
- Triple housing (Shock absorbing)
- IP54 Grade (Lip + Labyrinth Seal)



2) Impact Roller

- Exchangeable Rubber Wheel
- Eco friendly + Economic
- Maximize the absorption of impact



3) HDPE Roller

- HDPE(High Density Polyethylene) Roller
- Reducing noise and maintenance costs
- Light weight and non-corrosive
- Anti-vibration cap (optional)



4) Lightweight Return Roller

- Axis-separable Lightweight Roller
- Reducing maintenance costs
- Light weight (30~40%)
- Fire-proofing and anti-static (optional)



5) Pulley

- Drive / Non-Drive Pulleys
- Rubber, Ceramic, etc.
- Max Diameter : Ø1,500
- Max Length : 6,000mm



6 Cylinder & Valve Positioner

1) Hydraulic Cylinder

- Standard tie rod type
- Double acting for 70kgf/cm² or 140kgf/cm² (Bore sizes Ø40 ~ Ø250)
- High performance cushion & Less shock
- Various mounting style (SD, LA, LB, FA, FB, FY, FZ, FC, FD, FE, CA, CB, TC, TA)



2) Positioner Cylinder

- Easy and quick auto-calibration
- Detecting reverse acting or direct acting automatically regardless of wrong air connections
- Error messages against performance failures
- Various Testing Mode with any fixed signal
- Wide operating temperature range -30 ~ +80°C
- Low air consumption



3) Electric/Pneumatic Actuator Valve

- Compact & Light (High grade aluminum alloy housing)
- Actuators with worm gear system
- Intelligent actuator (Digital control or Integral control)
- Rechargeable battery backup actuator (for emergency application)



4) Smart Valve Positioner YT-3300, 3400 Series

- Intrinsic Safety Type (YT-3300), Flame Proof Type (YT-3400)
- Fail Freeze or Fail Safe Function Available
- ATEX, IEC Ex, CSA(Canada & US) Certification
- Auto-Calibration, Bypass Switch, Feedback Signal, HART
- High Reliability against Dust, Humidity & Vibration
- LCD Display, 4 Buttons for Local Control



5) Electro-pneumatic / Pneumatic Positioner

- 4~20mA DC Signal
- Simple Zero and Span Adjustment
- No Resonance between 5~200Hz
- Bypass Switch, RA/DA and 1/2 Split Control Available
- Option : Stainless Steel Case, High & Low Temperature, Feedback Signal, Limit Switch (2XSPDT)



6) Positioner Accessories

- Air Filter Regulator
- Volume Booster
- Lock-up Valve
- Snap Acting Relay
- Smart Position Transmitter
- Limit Switch Box



7 Mobile Fire-Fighting Equipment

1) Mobile-Engine Pump

- Engine : 23HP gasoline engine
- Pressure : 0~20bar
- Application
 - Firefighting equipment for remote areas
 - Supplementary for fire engine
 - High rise building/long distance delivery



2) Cargo-Hold Cleaning Pump

- Pressure : 0~40bar (ordinary 20 bars)
- Self-priming : 9.5 meters(vertical)
- Discharge Range : 30~40 meters



3) Easy-Moving Pump

- Pressure : 0~20bar
- Water tanker : 3.8 ton
- Application : general fire & oil fire

4) Water Cannon System

- Pressure : 0~20bar
- Discharge range : 100m(H)/70m(V)
- Application : general fire & oil fire

8 Pneumatic Control Drive

- Rated Torque : 17~750 kgfm at air supply pressure 5.5 kg/cm²
- Operation Angle : 0~90°

With limit switches, position transmitters, heated enclosures, air failure lock and characterized cams



9 Insulation Material

1) High Temperature Layered Insulation (HITLIN)

- Service Temperature : SHS Steam(370°C)
- Space Saving : Thinner insulation
- Carcinogenic Risk to Humans Group 3
- For Power Plant & District Heating



2) Pipe Cover

- Less turnaround schedule
- Significantly less labor
- Energy efficiency
- 2 pieces / 1.00m

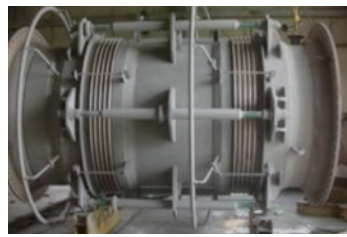

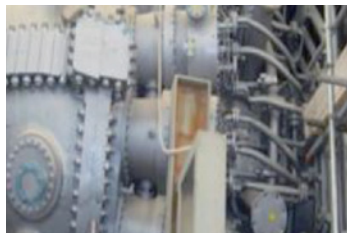

- 3) Elbow Cover**
- Preformed elbow available
 - Significantly less dust
 - Reduced turnaround schedule
 - Less labor and Less heat loss



- 4) Insulation Board**
- Less turnaround schedule
 - Significantly Less labor
 - Energy efficiency



10 Mechanical Expansion Joint

	Product	Description:	Application:
1	Metallic Expansion Joint	 Eliminate the thermal stress, absorb vibrations, contraction & expansion for Piping lines	<ol style="list-style-type: none"> 1. Boilers/Heat Exchangers/HRSGs/ Combustion equipment 2. Gas Turbine Equipment and service 3. Nuclear equipment and services 4. Pipe, hose, tubes and fitting 5. Steam turbine equipment and services
2	Non-Metallic Expansion Joint	 Flexible connectors designed to eliminate the thermal stress, absorb vibrations & contraction & expansion for Piping line	<ol style="list-style-type: none"> 1. Boiler/Heat Exchangers/HRSGs/ Combustion equipment 2. Gas Turbine Equipment and service
3	Flexible Joint	 Flexible joint used in industrial piping systems.	<ol style="list-style-type: none"> 1. Boilers/Heat Exchangers/HRSGs/ Combustion equipment 2. Gas Turbine Equipment and service 3. Nuclear equipment and services 4. Pipe, hose, tubes and fitting 5. Steam turbine equipment and services
4	Rubber Expansion Joint	 Rubber expansion joint for industrial applications.	<ol style="list-style-type: none"> 1. Boilers/Heat Exchangers/HRSGs/ Combustion equipment 2. Steam turbine equipment and services 3. Nuclear equipment and service

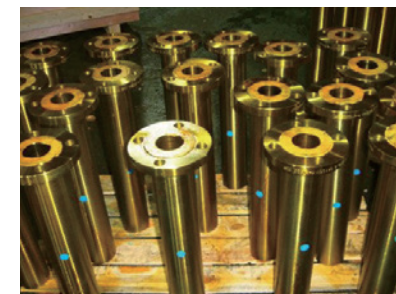
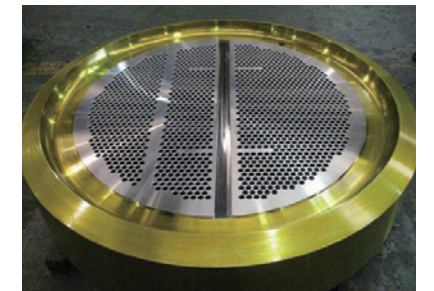
11 Components & Materials

1) Flange / Tube sheet

- Material
 - A105 / A182 F51 / A182 F1+SS304L(Overlay) / A182 F53 / A266 Gr.2 / F304, F304L / F316, F316L / Others "ASME 2011 a Addenda Sec.II" Materials

2) Flow nozzle / Venturi cone

- Material
 - A106 Gr.B / A106 Gr.C / A335 P91 / A312 TP.304L / A312 TP.316 / A312 TP.316L / Others "ASME 2011 a Addenda Sec.II" Materials



3) Instrument Tube / Boiler Tube / Precision Tube

4) Seamless Pipe

- STAINLESS STEEL
 - Austenitic : 304/304L, 304N,304LN, 304H, 316/316L, 316N, 316LN, 316Ti, 310S, 321/321H, 317L, 347/347H
 - Martensitic : 410S, 420J2, 440B
 - Duplex : S31803, S32205, S32750 , S31260
 - Special steel
 - Corrosion-resistant alloys : TITANIUM GR.2, ALLOY 200, ALLOY 201, ALLOY400, ALLOY K-500, 904L, ALLOY C-276, ALLOY20, ALLOYC-4, ALLOY22, UNS 30825, S31002
 - Heat-resistant alloys : ALLOY 600, ALLOY 601, ALLOY 310S
 - High-temperature, High-strength alloys : ALLOY 600H, ALLOY 601H, ALLOY 800H, ALLOY 800HT
 - Nonferrous Metal : C68700, C44300, C26000, C60800, C70600, C71500, Aluminium
 - Carbon Steel : A179/SA179, A106/SA106 Gr.B, A335/SA335 P11, STKM, STPG, T1, T5, T9, T11, T12, T21, T22
- * Standard : ASTM, ASME, AISI, DIN, JIS, KS

