

Valves-Customer's Expectations

Thermax Ltd. : Requirement of Valves & Quality Problems

Thermax Today



- Rs. 3,500 Crore Group with subsidiaries and sales & service network in Asia, Middle East, Africa, Europe and the Americas.
- Manufacturing facilities in India and China.
- Supports customers in over 75 countries with solutions to conserve energy and preserve the environment.



- A partner in the global initiative for sustainable development.

Our Core Business



Boilers & Heaters



(30 - 400 tons/hr)

- Package boilers
- Large capacity Power boilers
- Thermal oil / Water heaters
- Energy recovery systems

Cooling & Heating

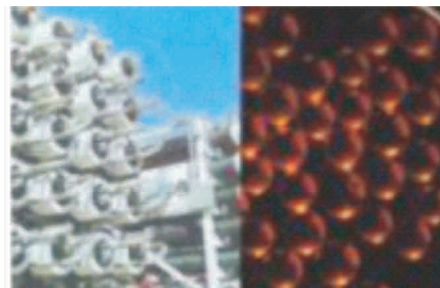
Cooling (10 - 3150 TR)

- Steam fired chillers
- Hot water fired chillers
- Direct fired chillers

Heating (1 - 30 tons/hr)

- Packaged shell and coil boilers

Power Generation



Captive Power (upto 300 MW)

- Small power plants
- Medium power plants
- Large power plants

Chemicals & Water

Chemicals

- Ion exchange resins
- Cooling water chemicals
- Fireside chemicals

- Polyelectrolyte

Water and wastewater

- Wastewater & Effluent water treatment systems
- Water recycling
- Waste management

Air Pollution Control

- ESP (upto 300 MW)
- Bag filters
- Scrubbers
- Dust collectors
- Gas coolers

Valves (incl. control valves) and actuators

- Spend base - INR750 Million

Valves (Non IBR) for Water applications

Applications	Valve Type	MOC	Sizes	Operation	Actuator Type
Waste/Raw water line,	Diaphragm Valve	CI, CIEL	1/2" To 8"	Manual & Auto	Pneumatic Actuator
Dosing Tanks,	Butterfly valves	CI, WCB,CF8M,D2 Ni	1/2" To 16"	Manual & Auto	Pne./Elect. Actuator
Clarifier Water Supply	Gate, Globe, Check	WCB,CF8M	1/2" To 18"	Manual	
Self Cleaning Filter Lines	Ball Valve	WCB,CF8M	1/2" To 18"	Manual & Auto	Electrical actuators
UF Flash Pumps	Needle Valve	SS316	1/2"	Manual	
Sludge Trans.pumps	Pr. Relif Valve	CF8M, WCB, Alloy 20	1" to 4"	Manual	
Cartridge Filter line	Knife Gate Valves	WCB , CF8M , CF3M	1.1/2" to 8"	Manual & Auto	Pneumatic Actuator
RO and HP Pumps	Dual plate Chk Valves	WCB , CF8M , D2Ni	2" to 8"	Manual	

Valves (IBR) for Boilers' application

Applications	Types of Valves	MOC	Size and Range	Operations
Steam line, Process line & Hi. Pr. line	Gate Valve	WCB,A105, WC6,WC9,WCC, F11,F12 ,F91 & C12 A	1/2" to 28" up to 4500#	Manual & Motorized
Steam line, Process line & Hi. Pr. line	Globe Valve	WCB,A105, WC6,WC9,WCC, F11,F12 ,F91 & C12 A	1/2" to 12" up to 4500#	Manual & Motorized
Steam line, Process line & Hi.Pr. line	Check valve	WCB,A105, WC6,WC9,WCC, F11,F12 ,F91 & C12 A	1/2" to 28" up to 4500#	Manual & Motorized
Steam line, Process line & Hi. Pr. line	Ball Valve	WCB,A105, WC6,WC9,WCC, F11,F12 ,F91 & C12 A	1/2" to 28" up to 600#	Manual & Motorized
Steam Line	Blow down valve	WCB,WCC,WC6,WC9	1" to 2"	Manual & Motorized
Steam line,	Safety Valve/ Relif Valve	WCB,WC6,WC9 & C12A	1" to 6"	Manual

Applications	Types of Valves	MOC	Size and Range	Operations
Steam line, Process line & Hi. Pr. line	Stop Check NRV	WCB,WC6,WC9 & C12A	Up to 12" #1500	Manual & Motorized
Steam & Water applications for Pr. Reduction and, Flow control	Control Valves	WCB, WCB,WC6,WC9 & C12A	Up to 12" #1500	SCADA requirements, Smart positioner
Steam line, Process line & Hi. Pr. line	Quick Check NRV	WCB,	Up to 12" #1500	Manual

(~ 17MUSD).

- 66% [INR 500 Million ~ 11MUSD] - Water application, Steam applications, BOP & packages
- 14% [INR 105 Million ~ 2.3MUSD] - Imported

Customers' expectations

Quality

- Breakages, especially handles during transit
- Gland packing bleeding
- Trim mismatch: Specifications Vs actual
- MOC selection w.r.t temperature, pressure rating requirements
- Mismatch of Flow direction in welded valves
- Incomplete or short supply
- Improper or incomplete documentation

Design/Application engineering

- Availability of Y type valves – for

Valves (IBR, non IBR) for BOP applications

Applications	Types of Valves	MOC	Size and Range	Operations
Steam line, Process line & Hi. Pr. line	Gate Valve	WCB,A105, WC6,WC9,WCC, F11,F12 ,F91 & C12 A	1/2" to 120" up to 2500#	Manual & Motorized
Steam line, Process line & Hi. Pr. line	Globe Valve	WCB,A105, WC6,WC9,WCC, F11,F12 ,F91 & C12 A	1/2" to 12" up to 2500#	Manual & Motorized
Steam line, Process line & Hi. Pr. line	Check valve	WCB,A105, WC6,WC9,WCC, F11,F12 ,F91 & C12 A	1/2" to 28" up to 2500#	Manual & Motorized
Cooling water , Low Pr. line	Batter Fly valves	CI,WCB,WC6, WC9,WCC,	6" to 120" Pr. rating PN2, PN6 & PN10	Manual & Motorized.
Steam Applications	Safety Valve/ Relief Valve	WCB,WC6,WC9 & C12A	1" to 8"	Manual & Motorized
Steam & Water applications Pr. Reduction and Flow Control	Control Valves	WCB, WCB,WC6, WC9 & C12A	Upto 12" #2500	SCADA requirements, Smart positioner

Valves for super-critical boilers

Types of Valves	MOC	Size and Range	Operations
Globe	F91	1" #1500	Manual
Gate	A105	1" # 1500 SPL	Manual
Gate	WCB	4" # 1500 SPL	Manual
Globe, Gate & Stop check	WCB	3" - 22" # 2500	Manual, Pneumatic, Motorized & GOV
Angle	WC6 / F12	5" - 12" # 2500	Pneumatic
Check	A105	2" # 2500	-
Ball	F11	2" # 2500	Motorized
Gate	WCB	6" - 12" #2500 SPL	Pneumatic
Gate	WC9	5" - 16" #2500 SPL3	Motorized
Globe	A105 / F11 / F12 / F91	1 & 1/2" - 2" #2500 SPL	Pneumatic
Gate	C12A	22" #3500	Motorized with IBP
Globe	F22 / F91	1" # 4500	Manual

CBD (continues blow down) application

- Adherence to AWWA standard (American water work std) – Utility Boiler Valves
- Large size valves - Requirement of integral bypass

- Requirements of smart actuators
- Increased steam parameters - Higher temperatures & pressures due to increasing capacity of boilers.
- Change in MOC, pressure rating & sizes

- Casting material WC9 to C12A
- Forgings of F91 grade
- Pressure Range 1500# to 2500# & 4500#
- Sizes up to 24"
- Actuators – Need for local manufacturing of IQ / Intelligent actuators.
- Adherence to International Safety Norms.
- QMS, EMS, OSHAS certification, in addition to statutory compliances (IBR, codes)
- **Project consultants' and 3rd party approvals** are becoming mandatory.
- TCO needs & spares availability.
- Load tests (on steam) especially for safety valves & control valves.
- Lead time reduction to meet ever shortening project schedules and international competition (660MW plants are commissioned in 18months!)

Conclusion

- **The average consumer of electricity expects (demands!)** uninterrupted supply of power.
- Valves need to support the requirement of uninterrupted & quality power!
- The valve industry should gear up to meet the demanding challenges on design & performance to make available high pressure valves of excellent quality conforming to total cost & total quality requirements.

(Mr. A. Bhargava of Thermax Limited, Pune Presented this paper in Valves' Conference Mumbai in December 2010.)