

Master Training Program on Water (Water Supply, In-house Processing, End-of-Pipe) in Textile and Garment factories

Promotion of Sustainability in the Textile and Garment Industry in Asia - FABRIC

Day 5 Presentation 4

Water Conservation - Utility

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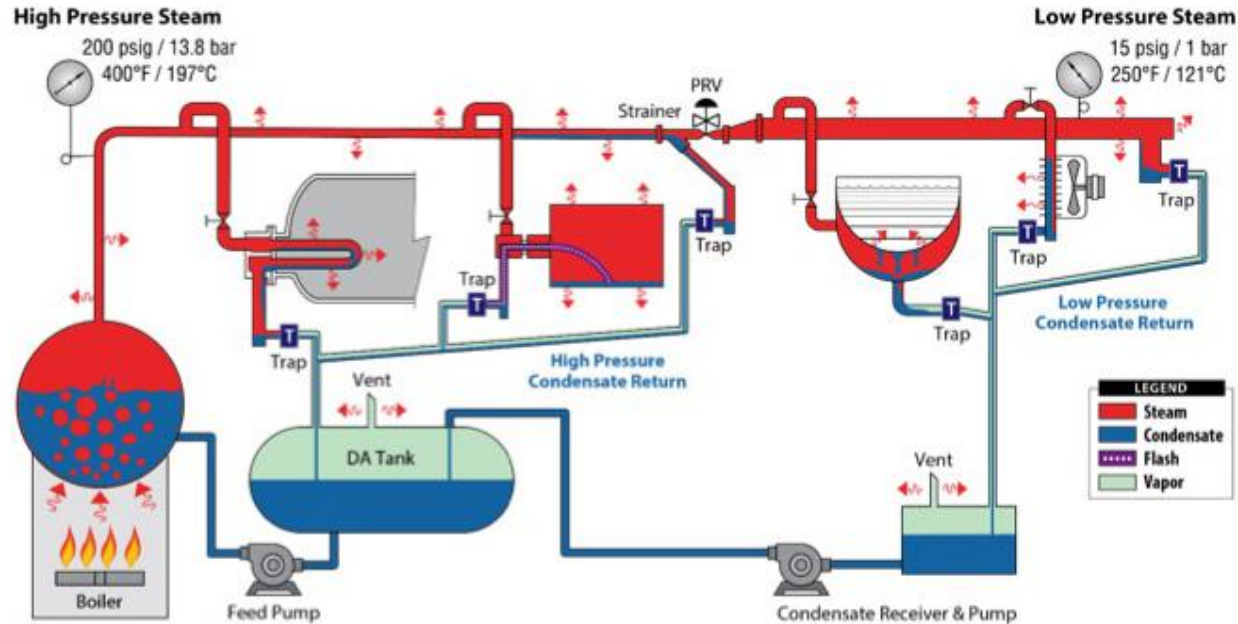
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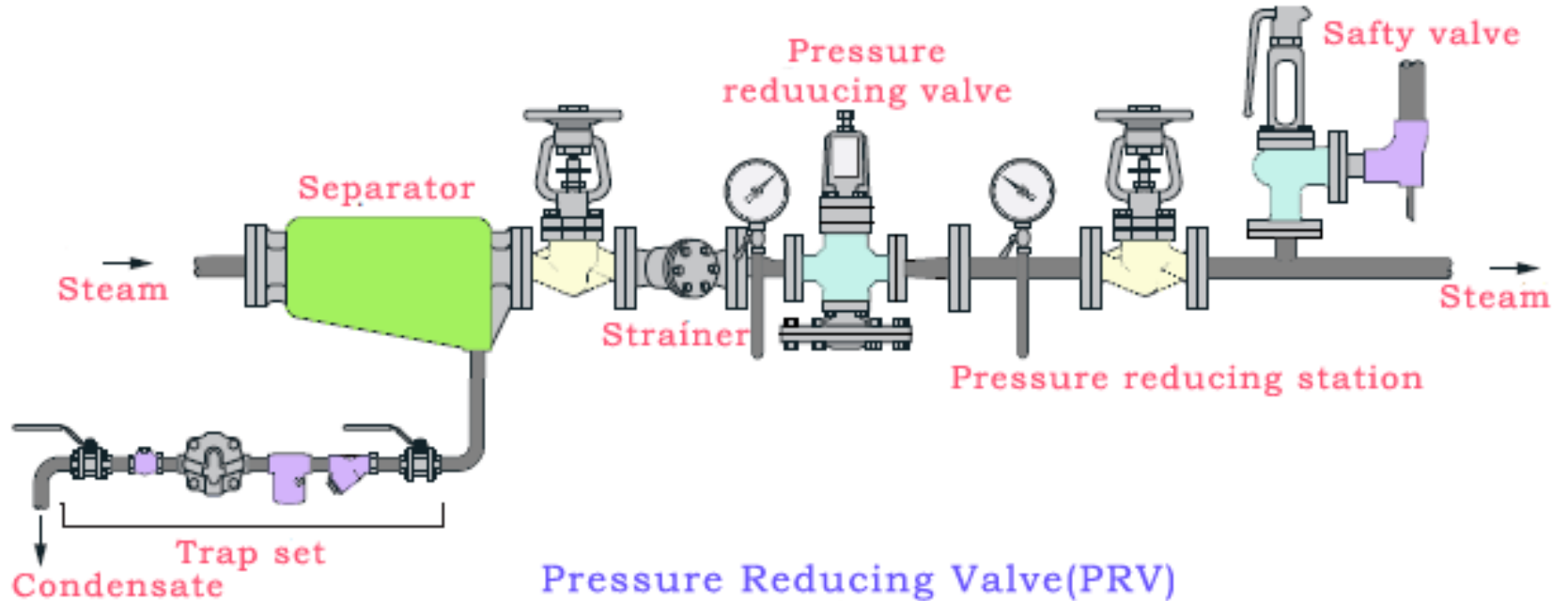
- Steam Distribution System
- Condensate recovery
- Cooling Tower Management
- Rainwater Harvesting Systems

Steam Distribution



<https://www.campbell-sevey.com/steam-conservation-guidelines-for-condensate-drainage/>

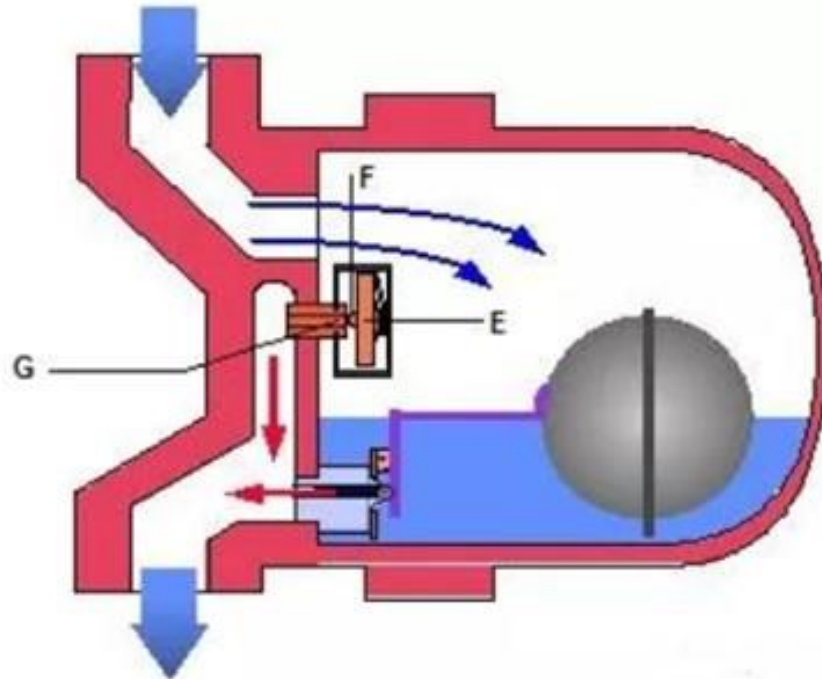
Steam Distribution



<https://www.electrical4u.com/effective-steam-distribution-system/>

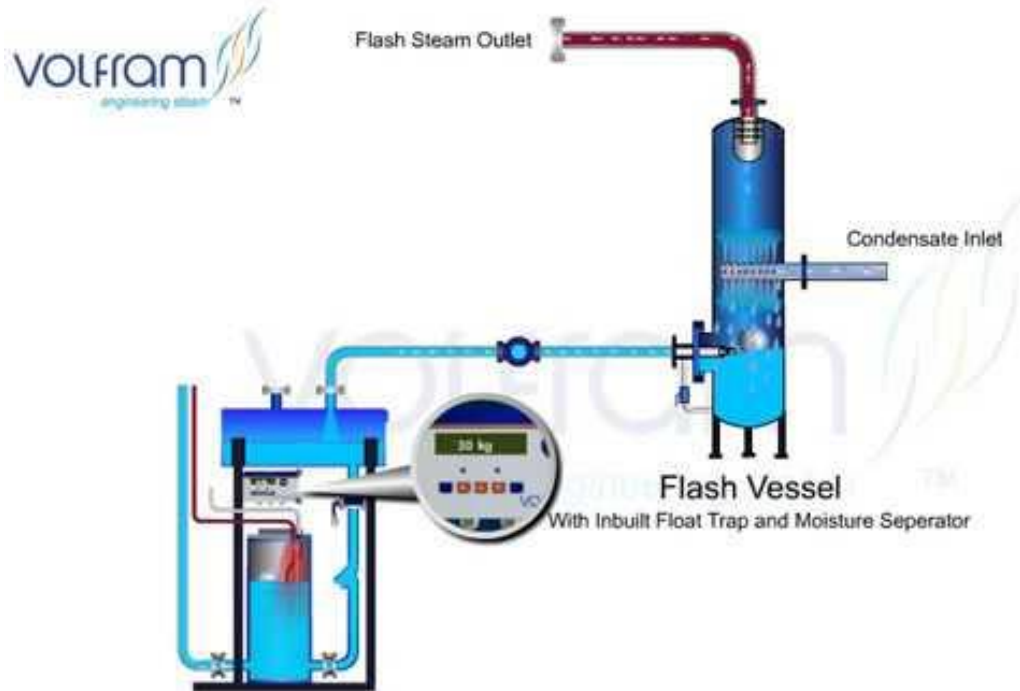
Steam trap

<https://www.youtube.com/watch?v=8cwsvKPVnS4>



Condensate recovery

<https://www.youtube.com/watch?v=doqeyXtEqnA>



Mechanically Operated Condensate Recovery Pump with Flash Vessel | www.volfram.in

Reuse of Water

Ammonia Chiller Condenser Water

- Cold caustic soda solution is used at some of the mercerization processes in the textile finishing industries
- The caustic soda solution is cooled through ammonia chiller. Cooling water is used at ammonia chiller's condenser to condense ammonia gas. This cooling water is a clean water stream which is usually wasted
- The quantity of this water is about 400 m³/d. This water can be collected and reused in the process



Reuse of Water

Ammonia Chiller Condenser Water

Economics

Capital cost = Rs. 400,000

Annual saving = Rs. 0.6 million

Annual O&M cost = Rs. 300,000

Simple payback period = 1.3 year



Reuse of Water

Cooling water from Dyeing machines

- After completion of the dyeing process of the knitted polyester fabric, the temperature of the dye bath is reduced from 130°C to about 80°C by circulating the hot bath through heat exchanger
- Fresh water is circulated in the heat exchanger to cool down the hot bath. The hot dye bath transfers its heat to the fresh water which gets warm
- This continuous warm cooling water stream (50 - 60°C) from the heat exchanger is wasted in the drain
- The quantity of this water is in the range of 57 to 179 m³/d which can be collected and reused in the process



Reuse of Water

Cooling water from Dyeing machines

Economics

Capital cost = Rs. 0.8 - 1.2 million

Annual saving = Rs. 1.4 to 5.96 million

Annual O&M cost = Rs. 400,000 – 600,000

Simple payback period = 3 to 10 months



Reuse of Water

Heat recovery from hot wastewater

- Extensive hot washes are carried out in the textile finishing industries to wash impurities, undesired chemicals and unfixed dyes and pigments
- Hot wastewater from below mentioned washes (60-95°C) contains substantial amount of thermal energy which costs millions of rupees per year
 - ✓ Desizing/scouring/bleaching washing water
 - ✓ Mercerization hot washing water
 - ✓ Dyeing hot washing water discharge
 - ✓ Continuous post dyeing hot washing
 - ✓ Hot washing water discharge from exhaust dyeing
 - ✓ Washing water from soapers
- Thermal energy from the wastewater streams can be recovered by installing heat exchangers.



Reuse of Water

Economics

Capital cost = Rs. 1.5 million

Annual saving = Rs. 9 million

Annual O&M cost = Rs. 600,000

Simple payback period = 2 month



Rain water harvesting



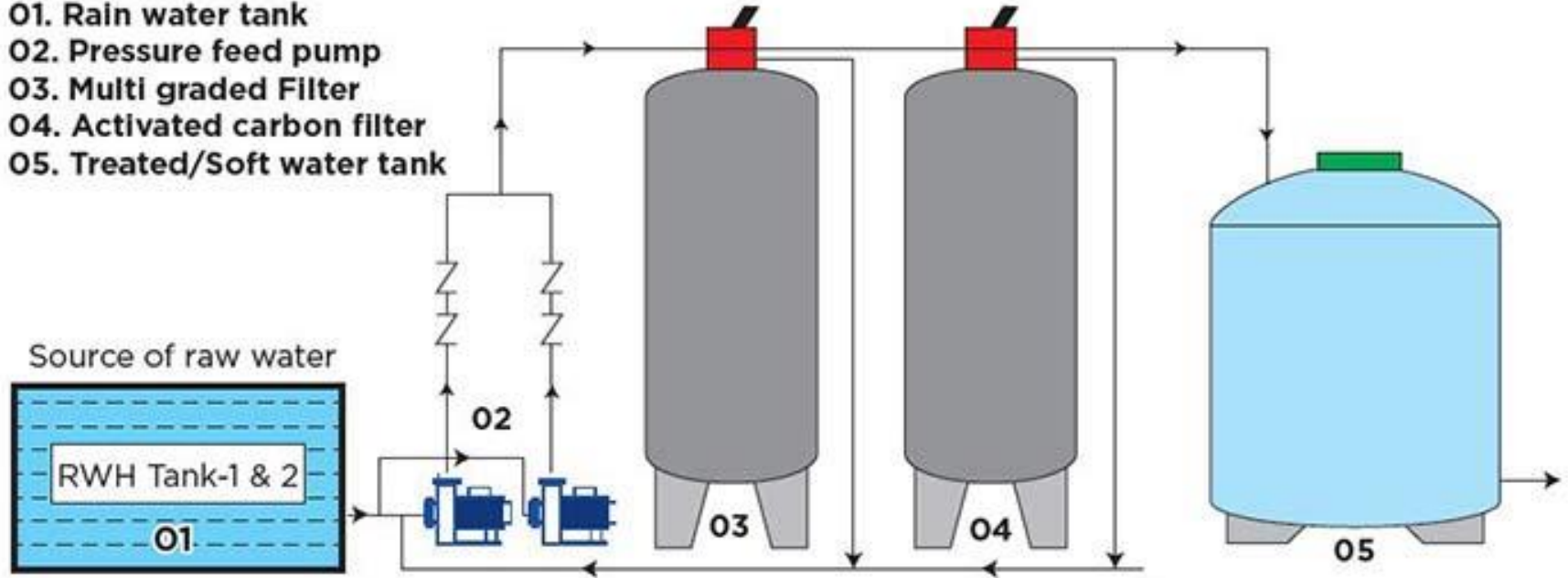
Rain water harvesting



https://www.chaitanyaproducts.com/blog/industrial_rainwater_harvesting_need_process/

Rain water harvesting

- 01. Rain water tank
- 02. Pressure feed pump
- 03. Multi graded Filter
- 04. Activated carbon filter
- 05. Treated/Soft water tank



<https://www.textiletoday.com.bd/robintex-group-shows-commitment-to-environment-by-harvesting-and-using-rainwater/>

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