

## Student Handout- Module Number Eight (8) - Steam, Batch, Still Retorts

# Steam, Batch, Still Retorts

### Characteristics of these retorts:

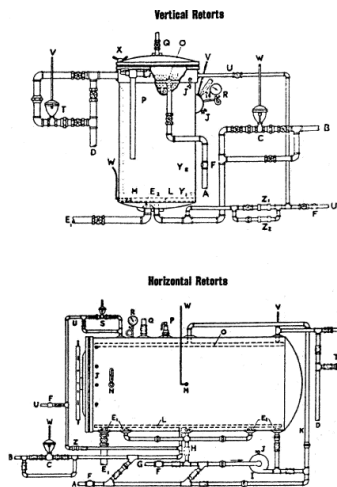
- Pressure Vessel
- Batch-type
- Non-agitating
- Vertical or horizontal
- With or without crates

### Advantages of using Steam:

- Excellent Medium for Heat Transfer
- Temperature Easily Regulated
- Pressure Can Counter- balance Internal Can Pressure
- Easy to Produce and Stored for Instant Use

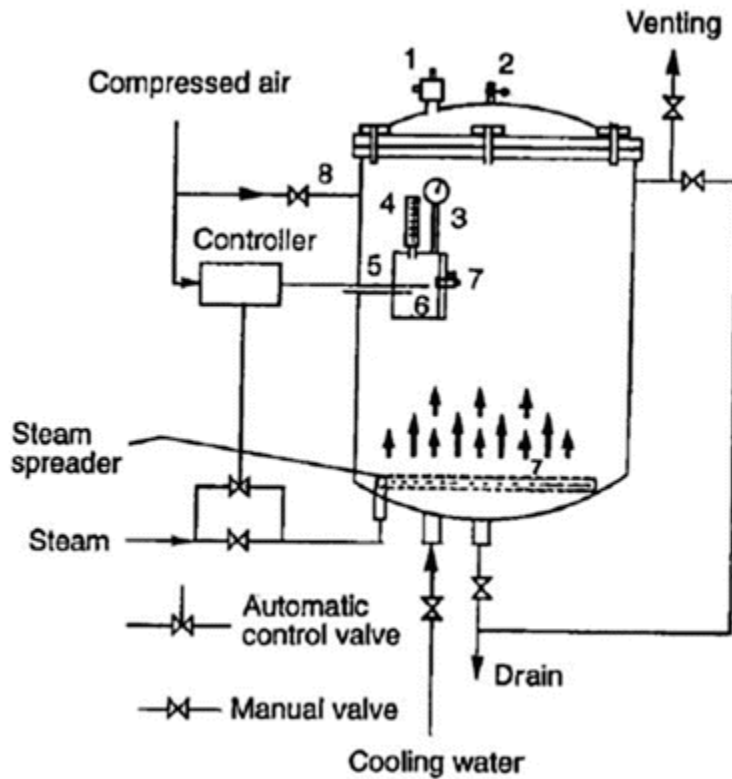
### Three different models:

- **Vertical** – Equipment sits vertically, loaded from the top in baskets or similar
- **Horizontal** – Equipment sits horizontally, loaded from the end in crates or similar
- **Craterless** – Equipment sits vertically but is loaded from the top using gravity with containers dropping inside the retort in no definite order (jumbled or mixed up)



**Instrumentation needed:**

- Temperature indicating device (Mercury-in-Glass - MIG) or equivalent device (e.g., Resistance Temperature Device – RTD or Digital Temperature Gauge-DTG) Item #4
- Temperature/time recording device - Item # 6



**Requirements:**

**External well:**

- Must be connected through at least a 3/4" opening
- Must have at least a 1/16" bleeder opening

Page 1

**Steam Inlet:** Must be large enough for proper operation; Must facilitate air removal; Must be located opposite the vent.

Page 2

**Steam Spreaders – Vertical Retorts:** Not required for vertical retorts. If used, usually in form of a cross and perforations along the top or side. **All others:** Total cross-sectional area should be equal to 1.5 to 2 times the cross-sectional area of the smallest part of the steam inlet line.

**Vents:** Large valve-controlled openings to remove air from the retort; Located opposite steam inlet; Controlled by a full flow valve or equivalent; Atmospheric break between vent and closed drain required.

**Construction of Crates, Carts and Divider Plates:** Constructed of suitable materials; Perforations shall be 1" holes on 2" centers or equivalent (27% open area).

**Bleeders:** Small openings, normally 1/16 to 1/8 inch in diameter used to remove air from steam retorts and circulate the steam while they are in operation; Open during come up and processing; Bleeders must be within 1 foot of outermost containers and no more than 8 feet apart along the top of the horizontal retort.

**Mufflers:** Used on bleeders and vents to decrease noise; Must not impede normal operation.