DD-Washer
On Site Service Solutions

The Drum Displacer Washer
AHLSTROM DRUM DISPLACER  Developed by Enso Engineering in the early 1980s.

- The first commercial unit started up in 1984 at the Enso Gutzeit mill in Kotka, Finland. Ahlstrom took over Enso Engineering and continued the development and marketing of the washer. The DD Washer is presently marketed by Andritz.

- The DD Washer is a multistage rotary pressurized drum washer which can accommodate up to four washing stages in a single unit.

- The surface area of the drum is separated into sections (or pockets) by longitudinal dividers. Pulp enters the forming zone of the washer at approximately 4-6% consistency, forming a fiber mat at approximately 10-12% consistency.

- As the drum rotates, it passes stationary sealing bars which contact the dividers. These sealing bars are attached to a specially designed enclosure in such a way that a separate stationary wash pond is created for each washing stage; the wash zones remain stationary as the pulp mat in the drum pockets rotates through them. The sealing bar of the wash zone serves the second function of wiping off the pulp cake so the compartments are uniformly filled as they enter the wash zone (Stage 1 inspection).

- Fully flooded displacement washing occurs as wash water flows counter-currently from one washing compartment to the next. During the displacement washing, liquid from unwashed pulp is replaced with wash liquor (Press plate, pussauslevy).
Pulp rotating past the final wash zone enters a vacuum zone where mat consistency is raised to approximately 15% with a vacuum pump. Filtrate removed from the pulp is collected in a vacuum receiver and returned to the next to last stage washing zone.

Fresh wash water is added to the final washing stage and circulated counter-currently through the wash zones using small, low-head booster pumps between stages. The mat is removed by a blast of compressed air from inside the drum and falls into a re-pulper located directly below the washer.

**Variations:**

**Low-consistency (LCDD) washer:**
- **Consistency:** Inlet 3-6%
- **Position:** Brown stock washing after screening or knot separating

**Medium-consistency (MCDD) washer:**
- **Consistency:** Inlet 8.5-10.5%
- **Position:** Brown stock, oxygen delignification, bleach plants.

**Stages:**
1, 1.1, 1.2, 1.5, 2, 3, 4

**Type:** (points to measures: drum diam and length)
3020 (diam 3, length 2), 3030, 3040, 4040, 3060, 3070, 4060, 4070, 4570
• Example of the kraft pulp process: Capacity 1 000 000 air dry tons (ADT 10%) per year
Stage 1

- Inspection
  - Service history
  - Manufacturer and manufacturing year
  - Washing efficiency and consistency.
  - Leakages and general condition of the seals.
  - Seal water flow and pneumatic seal pressures (see picture slide 8)
  - Release of cake
  - Element gears
  - Filtration tubes
  - Notice, observe and record factors essential to the service stage 2 and 3: such as location and availability of electricity, air pressure, water, bridge crane.
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Stage 1 Inspection

DD washer inside
perforated plates
reikälevyt
Drum rips
rimat
Massakakun irroitus-suikut
Cake releasing showers
Stage 1 Inspection (below DD washer)

- TS side outer casing
  - Pneumatic seals
- TS side inner casing
  - Pneumatic seals

- TS side inner casing
  - Seal water in
- TS side outer casing
  - Seal water in
- TS side outer casing
  - Seal water out
- TS side inner casing
  - Seal water out
Stage 2 Basic service and changing the seals

- **Basic service**
  - Drum; perforated plates, ribs, support plates
  - Seal water and pneumatic seal pressure values
  - Centricity control measurement and adjustment of the (TS and DS)end rings.
  - Pressure plates: Function and condition check, shank seals, plates, adjustment.
  - Screw conveyor: gear check, belt check, wear sleeve check. Parts changed and adjusted when needed.
  - Filtration tubes: Seal of filtration pump, condition check of flexible tubes, etc.
  - Showers: Condition and adjustment of nozzles
  - High pressure washing condition check and adjustment
  - **Seal change:**
    - T-Profiles and pneumatic seals
    - O-rings
    - Element seals
    - Nose lists if needed
    - Water rings cleaning and change if needed.
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Sealing comparison 2014

www.prrolls.com
Press plates reconditioned

During the displacement washing, liquid from unwashed pulp is replaced with wash liquor (Press plate, pussauslevy).
Perforated plates

The pressurized pulp is thickened on the surface of the perforated plate of the drum and fills the pockets separated by the ribs.
Stage 3 Machining and thermal coating service

- Machining and coating
  - If found wear of the sealing surfaces.
  - Twin Wire arc coating with new more durable wire.
On Site Machining flanges: Pulp tower
Face surface contaminated and oxidized
PR ROLLS DD-Washer Repair Method

- Replacement bars with hard stellite tips will last 1.5 times as long as the original new ones.
- Base material is according to the original.
- Heat-tension problems are reduced.
- The worn sealing bars are machined to tolerance and the replacement bars assembled by welding.
- Shutdown of only half of the traditional method.
- Remarkable savings in costs.
- At the same time, outer and inner surfaces of the end sealing can be repaired with the original manufacturing methods.
Plasma cutting the bars
Grinding of plasma cutted surface
Mounting and welding ribs
New ribs with stellite steel surface welded
Measuring oversize before grinding
Grinding to final shape and tolerance
Sealing bars (ribs) reconditioned back to original shape and tolerances
DD-Washer
The Drum Displacer Washer Repair

Repair of The Inner and Outer sealing surface Sealing Bar (rib) repair. Face surface repair

All repair works will be tailored to fit the specific project.

- On Site machining of flanges, additional coating, general overhaul and modifications.
## DD-Washer

**On Site Service Solutions**

### References

<table>
<thead>
<tr>
<th>Customer</th>
<th>place</th>
<th>pcs</th>
<th>DD workscope</th>
<th>Target</th>
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