

Belt Cleaning



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Gravity Belt Thickener

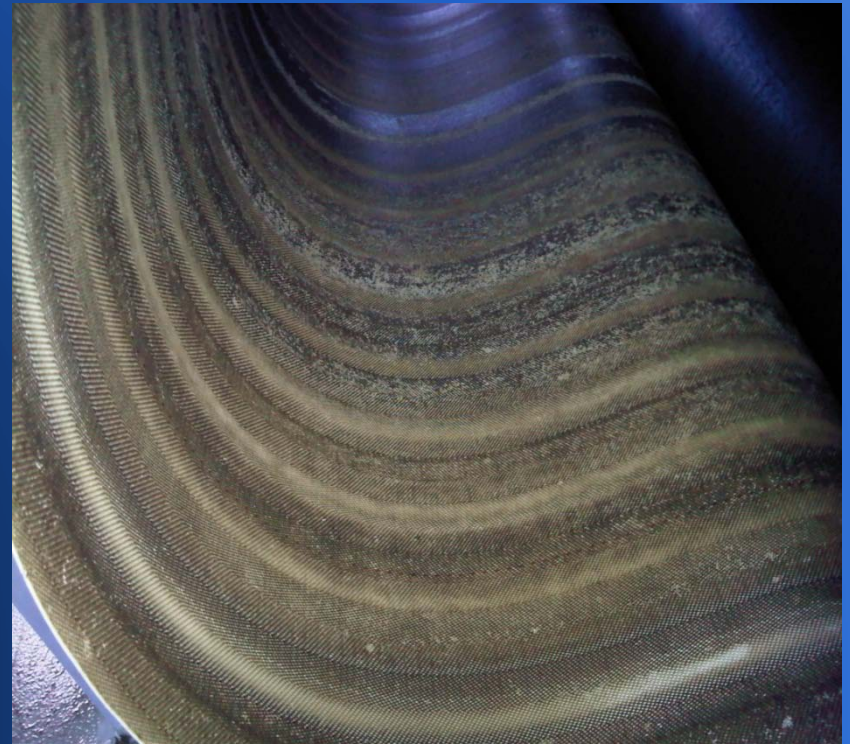
Problem: Cowlitz County:
2m Belt

- Frequent Cleaning
- Removal and reinstall
- 2 year life
- Feed Rate not at design
- Speed not at design



Visual inspection

- Fabric back covered with hardened product



Existing Fan spray

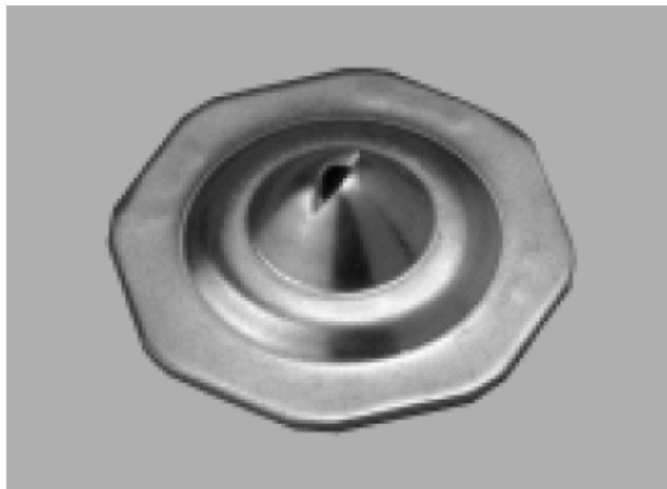


Existing Wash Spray Approach

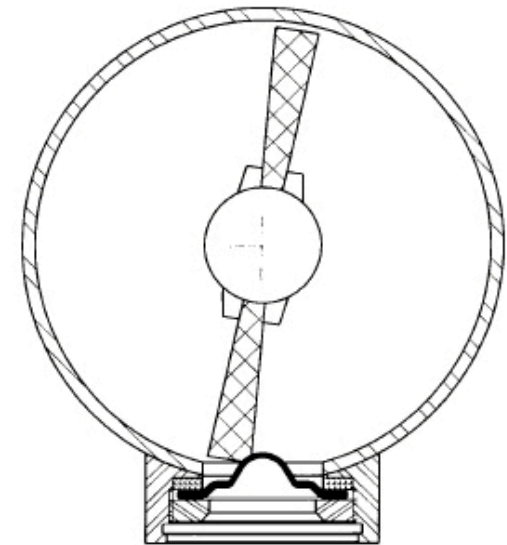
- Nozzles recessed in pipe--difficult to clean
- Brushes only temporarily loosen clogged material to nozzles
- Maintenance requires removal of full spray header to clean



Strip brush spray cleaner

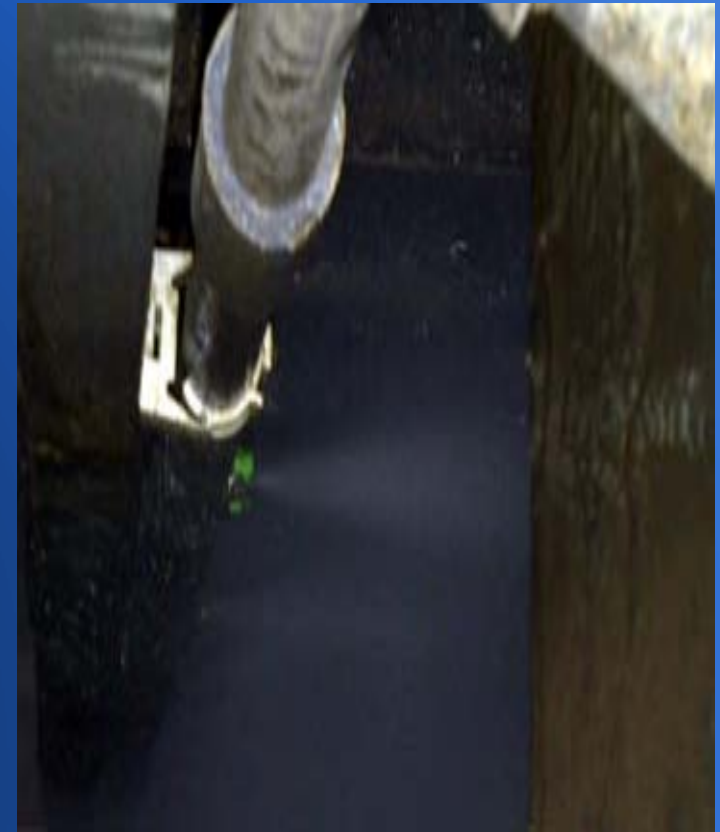


VIEW OF THE INTERNAL BRUSH



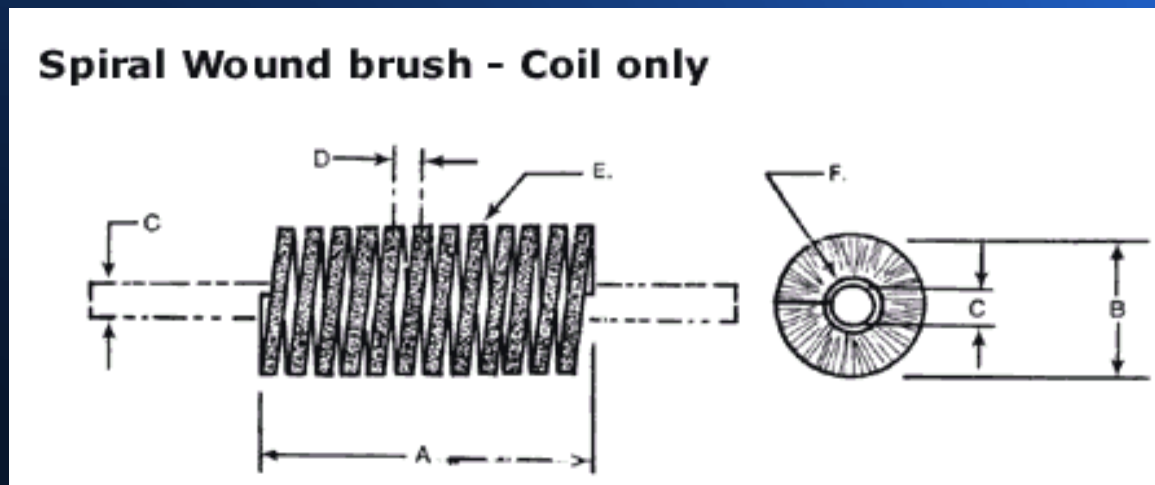
Washbox design

- Current belt cleaning is static
- Small nozzle openings
- Clogged nozzles difficult to clean
- Washing action vs. cleaning
- Near zero penetration
- Nozzles clogged frequently



Brushes

- Brush “pipe cleaner” design
- Fouls with particulate
- Requires regular dis-assembly to clean



Spray Width vs. cleaning force

- Existing fan sprays
- Wash belt vs. clean
- Little penetration
- Usually washes only one side
- Hi-pressure pump
- Hi-spray distance



Belt/Fabric design parameters

FABRIC SPECIFICATION

Thickness - ?? mm

Tensile Strength – ????? N/cm

Opening – 0-470u???

Air Permeability – ????? l/m²/s ??? Pa

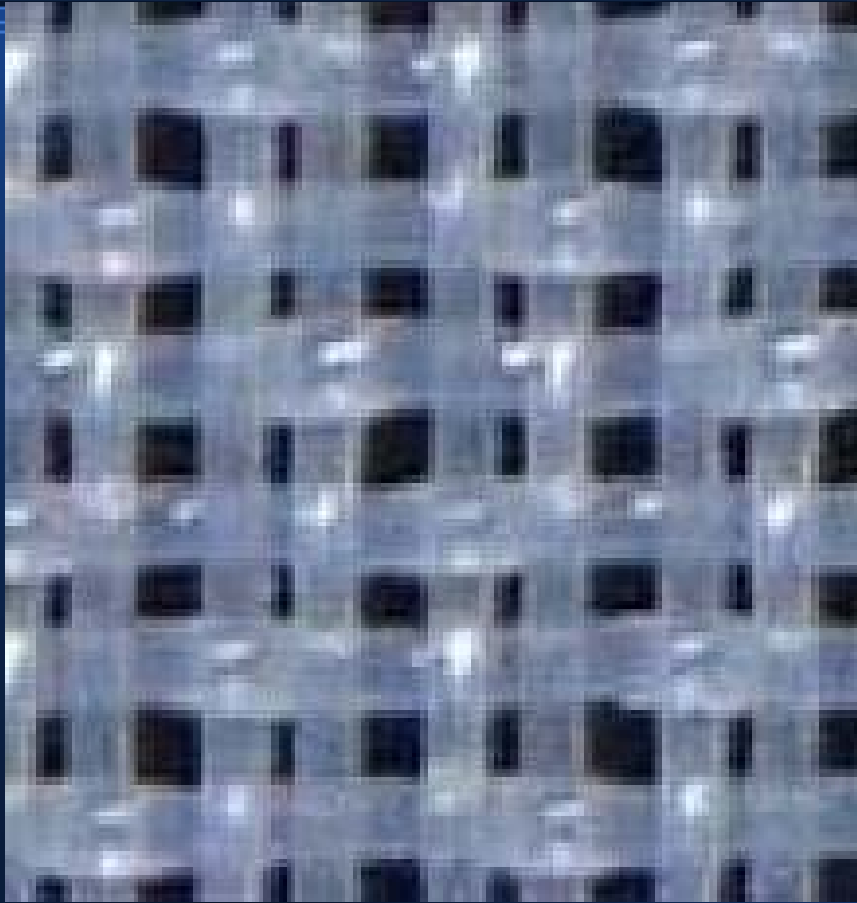
CFM – ???

Safety Factor of Belt – ?? @ ??? pli

Safety Factor of Seam (standard, L) – ?? @ ??? pli

Tensile Strength of Seam (standard, L) – 502.8 pli

Fabric design parameters



Belt/Fabric design parameters

MONOFILAMENT POLYESTER

Process design:

Pattern – 6/2, ????

Surface - Ultra Smooth, ????

Low Modulus-of-Elasticity

Warp material – pes, ????

Weft material – pes, ????

MODIFIED SATIN WEAVE, ????

Process design:

Mesh/Count/Weave – Optimized, ????

CDM – Cross Machine Direction – Large (Diameter), ????

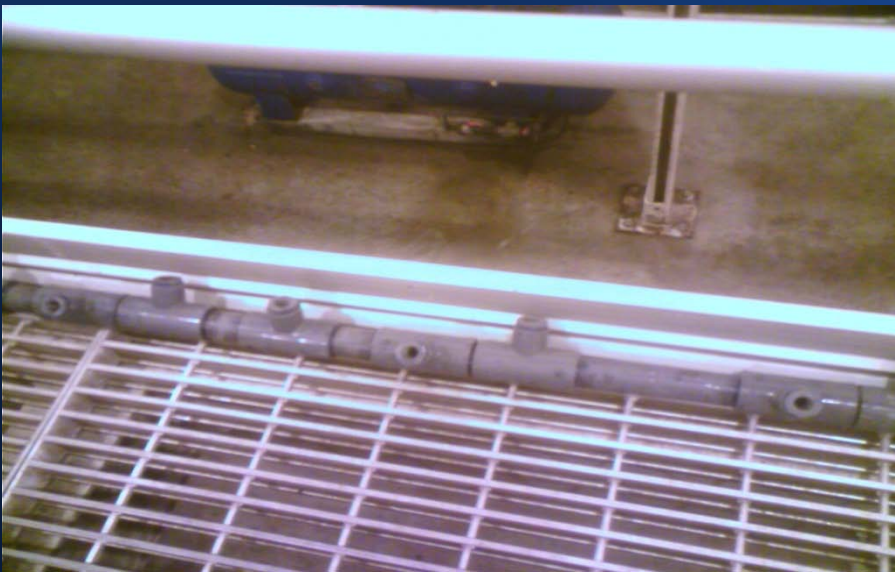
Fabric accelerated deterioration

- Fabric fiber delamination
- Fibers create additional surface area for polymers and material to precipitate
- Fibers accumulate material and lay flat in feed/mixing zone



Home-made spray

- Existing washbox theory insufficient
- Operators forced to design own systems

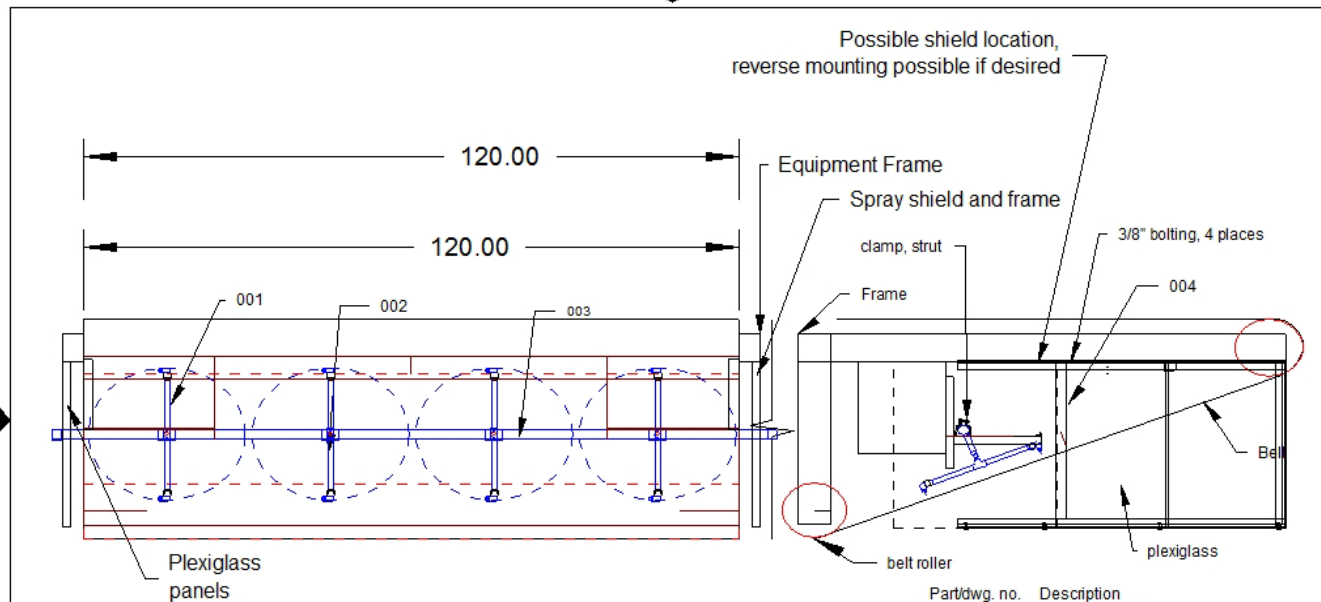


Gravity Belt Pilot Test

- 2 meter GBT
- 40 existing nozzles
- 80 gpm @ 70psi
- 1/8" of Material on back of fabric
- Belt Blaster pilot 8 gpm @ 70 psi



Belt Blaster- GBT



Notes:

1. rotating spray bars with solid stream nozzles deep clean the belt from the backside
2. 0.5 to 1.5 gpm nozzles depending upon field test performance
3. spray system can be set to operate on a periodic basis or continuous

Part/dwg. no.	Description
EBPRS-001	Spray bar, rotating
EBPRS-002	Bearing, rotary
EBPRS-003	Piping, supply
EBPRS-004	Shield, spray deflector

ECO-BLASTER, BCS

GillTrading.Com, Inc		Description: Belt blaster	
DRAWN Name	B. Gill	11/12/08	SIZE
REVIEWED Name	P. ANDREWS	11/12/08	DWS NUMBER
SCALE	REV	-	WWR-0376
			SHEET 1 OF 1

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Rotating Spray Advantages

- High impingement forces
- Reduced water volume
- Reduced pressure
- Roll tracking control due to reduced material on rolls
- Higher consistent belt cleanliness actually removes material compressed on rolls

Belt Blaster System

- Optimize washbox system efficiency
- Reduce water volume used with improved weave penetration
- Drive materials out of weave openings
- Reduce nozzle clogging issues
- Consistent weave opening, therefore improved dewatering abilities
- Consistent scfm=improved speed

Belt Filter Press pilot test

- Pilot test available for extreme cases
- Adaptable to most machine configuration
- Bolt in test model
- 2" strip between Rotating spray bars = belt normal state



Strainer filtration

- 60-300 mesh strainer
- Larger diameter due to larger nozzle openings
- Automated cleaning strainer available



Secondary cleaning

- Rolls stay clean due to the belt being cleaner
- Machine tracking /control systems reliability improved



Belt Filter Press Cleaning Field Pilot Test

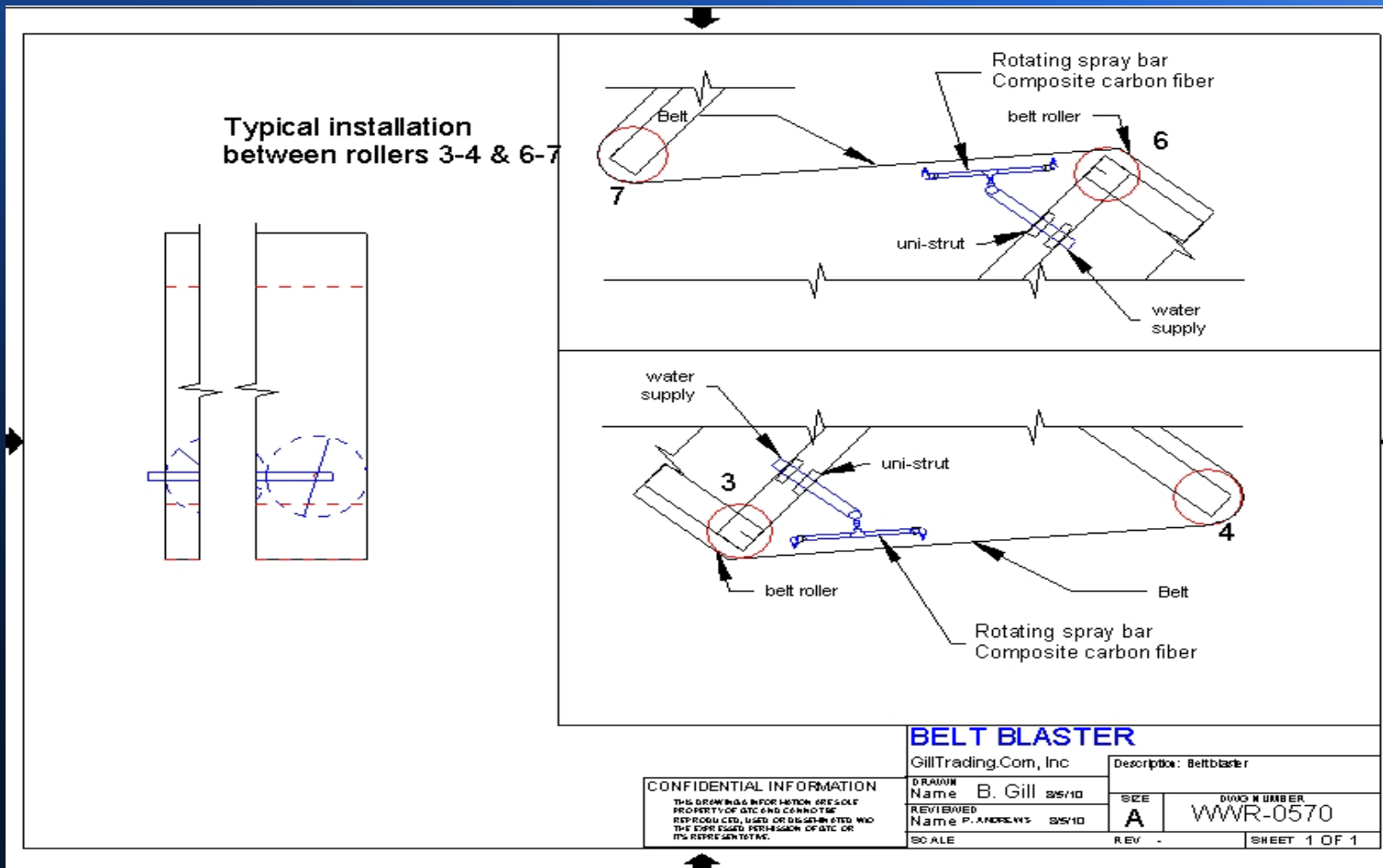


Spray cleaning ability

Cleaning ability is dependent upon many factors:

- >belt travel rate
- >water pressure
- >water volume
material
- >angle of spray impact
- >Surface finish
surface
- >Rotating solid stream spray over a moving fabric/media allows
to cleaning with solid steam spray
- >temperature of the liquid
- >thickness of material
- >density/adhesion of
- >spray dispersion area
- >distance to cleaning

Belt Blaster- Belt Filter Press



Testing Questionnaire

Operational visual inspection photograph

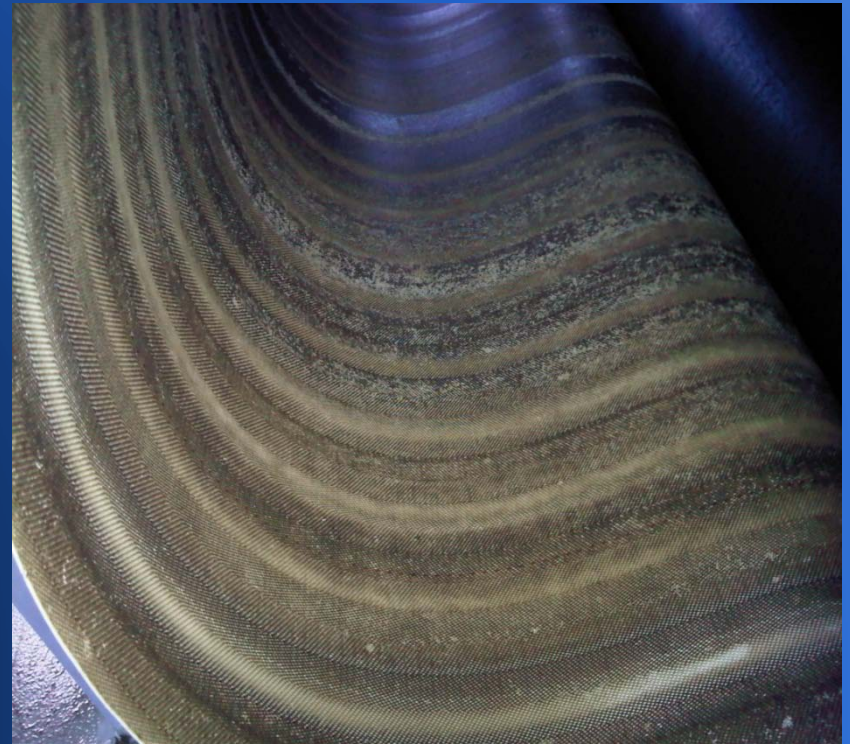
Please provide the following additional data:

1. Manufacturer & Model #:
2. Machine type: (ie. Gravity belt, Gravity zone plus pressure section, etc..)
3. Product being thickened (please be specific, include concentration, material and grease/polymer content)
4. Width and number of Belts/Fabric:
5. Fabric/belt data:

SCFM	Thickness
Opening size	Air Permeability

Visual inspection

- Fabric back covered w/ hardened product



Testing Questionare

6. Fabric/belt average operational life:
7. Wash box water pressure and flow:
8. Number of nozzles per wash box:
9. Nozzle opening size (can be found by trying various size drill bits to test hole size by inserting bits to match size)
10. Cleaning procedure (Daily/weekly/quarterly) for fabric/belt including chemical/anti-polymer cleaning solutions used and periodicity
11. Primary problem(s) with belt/fabric:

Spray penetration

- Rotating water lance
- Full Penetration
- Spray from fabric back
- Lower pressure
- Concentrated force
- Extreme water reduction

