Sludge Dewatering

Plate and Frame Filter Press

[Figures showing the components of a Plate and Frame Filter Press, including fixed and traveling ends, sludge in, filter cloths, sludge cake, filtrate drain holes, and operating handle.]

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Belt Filter Press

Principles of Operation
1. Sludge is pre-conditioned with polymer
2. Sludge is delivered to belt where water gravity drains
3. Sludge is pressed between two belts which forces water out
4. Solids are scraped from belt
5. Belts are sprayed and continue the cycle

Factors Affecting Belt Press Operation
1. Sludge type (secondary sludge can cause problems)
2. Sludge conditioning
3. Belt tension or pressure
4. Belt speed
5. Hydraulic loading
6. Belt type

Typical Performance
- Digested Primary Sludge = 25%-35% TS
- Digested Primary + WAS = 18%-24% TS
- Extended Aeration Sludge = 14%-18% TS
Operational Controls

1. **Belt speed**
   - 2 – 10 ft/min.
   - Depends on sludge feed rate solids concentration
   - Slow speed allows more time in pressure zone for water removal
   - Too slow will cause solids to build up and not drain properly
   - Ideal speed is the slowest speed without causing washout.

2. **Sludge Conditioning With Polymer**
   - Polymer is used to aid in solids/water separation
   - Bench tests are performed to determine ideal dose

3. **Hydraulic Loading**
   - 20-50 gpm/meter of belt width or 7-16 gpm/ft of belt width
   - Washout is more likely when operating at the upper end of loading band

4. **Belt Tension**
   - More tension on belts increases pressure and increased water removal
   - Too much tension will cause sludge to be squeezed from between the belts
   - Too much tension will cause sludge to be forced through the belt
   - Ideal tension is highest level that keeps sludge between the belts

5. **Belt Porosity**
   - Too porous results in poor filtrate quality
   - Not porous enough could result in belt blowing (plugging) and cause washout

### Belt Press Troubleshooting Guide

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<th>Check</th>
<th>Solution</th>
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<td>Polymer overdose</td>
<td>Secure and clean</td>
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<table>
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<tr>
<th>Poor filtrate quality</th>
<th>Washout</th>
<th>See Washout above</th>
<th>See Washout above</th>
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<tbody>
<tr>
<td></td>
<td>Sludge squeezed from belt</td>
<td>Belt tension and washing equipment</td>
<td>Reduce tension or wash belt</td>
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<table>
<thead>
<tr>
<th>Cake solids too wet</th>
<th>Belt speed high</th>
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<td>Belt tension low</td>
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<td>Adjust upstream process Adjust chemical dose Control industry dumps</td>
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