

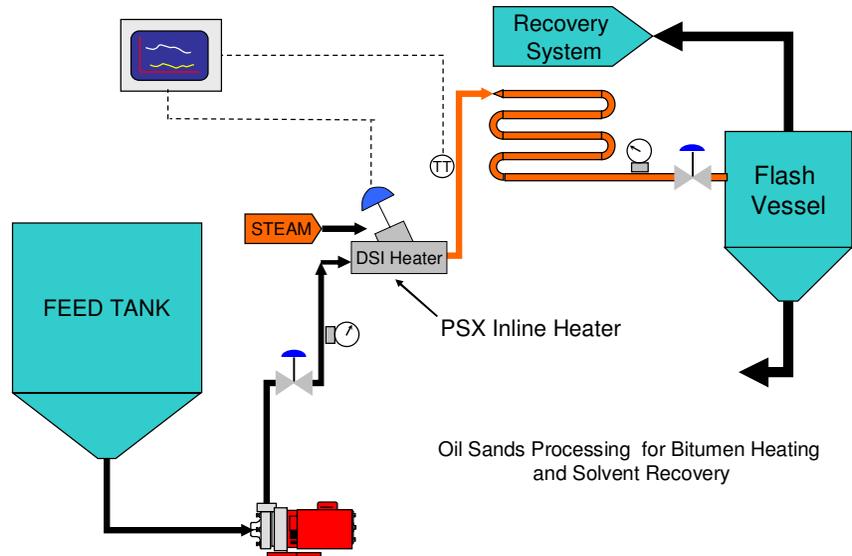
**Application: Oil Sands Solvent Recovery - Evaporative Flashing**

Oil Sands processing in Northern Canada utilizes a variety of solvents and naphtha to assist in the separation of the Bitumen from the water and sand. These fluids can help promote chemical reactions, accelerate processing time, and reduce processing costs. Many of these must be recovered due to their high costs, importance of water recovery, or issues associated with release of the chemicals to the environment.

**Issues Associated with Oil Sands Processing**

- The sand that is separated is very abrasive and can cause excessive wear. Devices that accelerate flow or cause impingement will wear very rapidly.
- Bitumen and froth are not well suited for heating in traditional heating devices due to issues with pressure drop, abrasion, and plugging/fouling.
- Solvents sometimes require high temperatures for processing yet can be very unstable and flash in the pipe if temperatures are not controlled properly.

**Evaporative Flashing Process**



**PSX Heater Solution**

The PSX heater can be installed to heat up the process fluid prior to the flash vessel or recovery tank, and has a high heating capacity and can achieve up to a 250 °F temperature rise in a single pass. For difficult to pump slurries or unstable solvents, the PSX heater can be arranged in a Multi-stage configuration to stage the heating to optimize the process. The key to efficient, safe, and predictable steam injection is to inject steam at sonic velocity to achieve choked flow. By achieving choked flow, sonic velocity conditions can be achieved for steam injection. All steam injectors need to operate in a choked flow manner for good, non-violent mixing. The PSX heater is an internally modulated heater that varies the mass flow rate of steam by changing the area in which the steam may pass. This type of modulation allows the full steam pressure to always be present at the point of injection regardless of plug position. Flow rates can range from 1 – 10,000 gpm.

**Key PSX Heater Direct Steam Injection Benefits**

- **Eliminate Process Upsets** as the internal steam control design of the PSX heater controls the steam mass flow and not the steam pressure thus eliminating steam hammer and vibration issues.
- **Lower maintenance** due to the PSX heater's self cleaning design (no scaling or plugging/fouling)
- **Low pressure drop** (typically 1-2 psig) reduce pump integration issues and flow disruptions, and provides energy savings by lowering slurry pump demand
- **Improved temperature control** (typically +/- 1 °F ) allows for a more reliable heating process
- **Improved Reliability** as a variety of alloys and wear coatings are available to address wear issues

For additional information, please visit ... [www.pro-sonix.com](http://www.pro-sonix.com)

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