

**WESTECH**DWN: **RCS** DATE:



Pressure filters operate under the same principle as gravity filters, with a few distinct advantages. They require no repumping after filtration, high head losses, and allow for longer periods between backwashes. WesTech's **Deep Bed Filters** offer these advantages in addition to allowing the units to process water with even higher suspended solids. The deep bed filters also remove oil from process water. With more than 40 years' experience in pressure filtration, WesTech takes a holistic approach to filtration by offering complete systems.

Continuous Caster – Water Recycle

Since the 1960s, continuous casting has become increasingly important in modern steel production. Today more than 80% of the worldwide production uses this process. Liquid steel flows out of the ladle into the tundish, and then into a water-cooled copper mold. Solidification begins in the mold and continues through the caster and the strand, as it is now called, is straightened, torch-cut, and then discharged for intermediate storage or hot charged for finished rolling.

During the continuous casting process, water and oil are used as coolants. As the steel cools and solidifies, a scale forms on the exterior. This scale, as well as the oil used to cool the steel, combines with the water used in continuous casting to form a wastewater stream. In addition, the caster mold sections are held in place by a high pressure (2,000 psi) hydraulic system. It is not uncommon for a hydraulic line to break, sending hundreds of gallons of hydraulic fluid into the wastewater collection system. Because the wastewater contains these high amounts of scale, particulate, oil, and other possible contaminants, it must be treated before being reused.

Scale Pit

Initially the wastewater is sent to a scale pit with an oil skimmer and solids scraper. The scale pit is used to remove the larger scale and particulate, as well as to skim the oil from the water and is normally sized for 30–45 minutes of retention time. In some mills, this pit also receives wastewater from the hot roll and other miscellaneous processes throughout the mill. This can contribute organics, heavy metals, and other contaminants to the scale pit which must be accounted for in any treatment process.

Deep Bed Filter

The pretreated wastewater is then sent to deep bed filters. These filters normally have a single media consisting of a coarse media bed. The deep bed filters are used to remove the fine particulates suspended in the water and to coalesce the remaining oil. The treated water from the deep bed filter is sent to a cooling tower prior to being reused in the continuous caster process.

Thickener and Filter Press

In order to reuse as much water as possible, the deep bed filter's backwash water is further treated. This water stream is treated by a thickener which is followed by a filter press. The underflow from the thickener enters the filter press. The effluent from the thickener and the pressate from the filter press are both recycled to the scale pit.

The EPA is currently revising the water effluent guidelines for the iron and steelmaking industries. These revisions may result in a reduction in the allowable limits for discharges from the continuous caster water treatment facilities. It is expected that these changes will reduce the discharge limits of metals such as nickel, chromium, lead, and zinc, and could well require additional water treatment equipment for continuous casting operations.