

XPS Builds a New Large Scale Pilot Roaster

XPS has built and commissioned a new 300mm (12") internal diameter, 3-m-high pilot scale fluid bed roasting circuit. The roaster can be configured for various processes with the current configuration for sulphide roasting. The flow sheet includes oxygen enrichment, dry or slurry feed, fluid bed roasting and sulphur dioxide gas capture via two-stage SO₂ scrubbing.

The roaster was designed and built for Royal Nickel Corporation (RNC) to conduct a roasting pilot plant on nickel sulphide concentrate from their Dumont Ni Project. The roaster is capable of operating from ~50 to 200 kg/hour with a maximum operating temperature of 1200°C. A modern process control system has been installed to safely control and operate the roaster with a HMI located at a nearby operator's station. The process control system continuously measures and records operating parameters such as, feed rate, temperature at various locations, off-gas concentration including oxygen and SO₂, and pH in the scrubbing system.

The off gas passes through a cyclone at the top of the roaster, the underflow is fed back to the roaster (in this configuration) and the overflow gas is cleaned in the scrubber. Feed is fed into the bottom of the roaster using a venture eductor. The bed is manually discharged at the bottom into sealed stainless steel drums. Isolation valves are in place to allow safe and secure emptying while the roaster is operating. Although designed for nickel sulphide testing the roaster is capable of handling various sulphide feeds such as copper concentrate, pyrite, or nickel sulphide matte.

XPS also operates and performs roasting evaluations using 50 mm and 100 mm diameter continuous roasters where sample quantities are limited. The roasters along with extensive operations and



XPS 300 mm Diameter Pilot Scale Roaster

academic experience, Thermal Gravimetric Analysis (TGA) and FactSage modeling can result in efficient, stream-lined roasting studies for most materials. XPS and its partners are the premiere facility to perform roasting studies, process design and techno-economic analysis in the world.

For further information on roasting capability, contact Mika Muinonen at mika.muinonen@xps.ca.