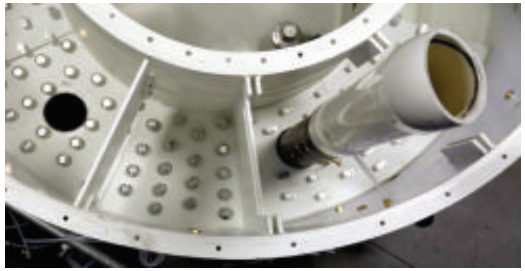
Bins, Apron Feeders and Conveyors: Many mining operations depend on bins, hoppers, apron feeders and conveyors, to manage and transport raw ore. Coanda has performed many experimental and computational studies to characterize the behaviour of ore materials in conventional bins and hoppers, and on apron feeders and conveyors.

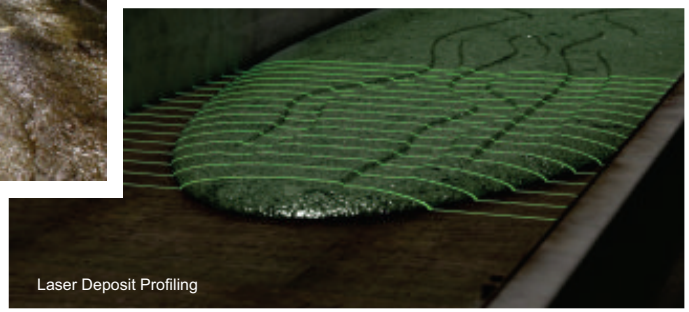
Fluidized Beds: Coanda has a broad range of experience with fluidized beds, spanning all Geldart particle types, at conditions from minimum fluidization to fast fluidized and pneumatic transport. We have applied scaled laboratory models and mathematical models, including CFD to a variety of geometries, from conventional beds and toroidal designs, to circulating beds.



Toroidal Circulating Fluidized Bed

Tailings Flocculation and Deposition: Coanda has extensive experience in the areas of tailing management related to flocculation, coagulation and deposition. We have performed many laboratory and pilot scales studies related to optimizating dewatering and long term geotechnical consolidation using passive inline mixing systems and tank dynamic mixers. Sub-aerial and sub-aqueous depositions strategies have been studied and optimized leading to the development of predictive models of thin-lift deposition slurry flow as well as new optical measurement technologies to monitor thin-lift flow in laboratory flumes as well as in large scale commercial applications.

Laboratory Tailings Deposit Flume



Laser Deposit Profiling

Contact

Vancouver, BC
Canada
(604)420-0367

Calgary, AB
Canada
(403)351-0115

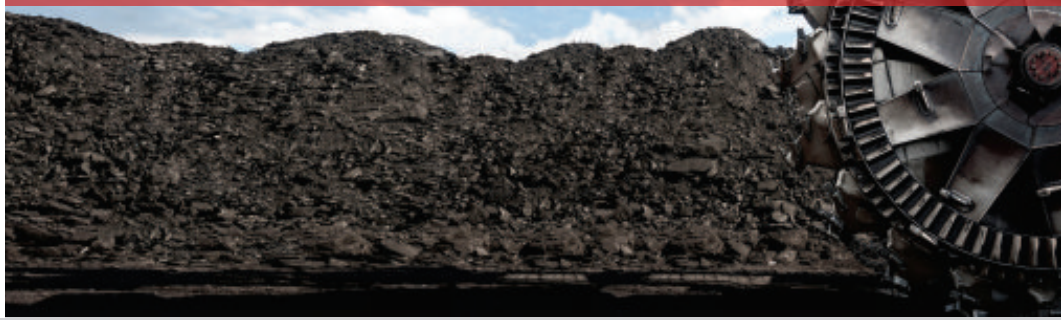
Edmonton, AB
Canada
(780)485-0366

info@coanda.ca

www.coanda.ca

Coanda
Research & Development Corporation

MINING



Supporting industry for over 20 years

The industrial scientists and engineers at Coanda help clients in the mining sector overcome some of the most difficult problems facing the industry.

Our knowledge and expertise in multi-phase and non-Newtonian flows, physical and computational modelling, and geotechnical engineering, allow Coanda to tackle complex challenges leading to effective, lasting solutions.

With over two decades of experience, and a team of over 60 scientists, engineers and technical staff, Coanda delivers tangible results in many technical areas of concern including:

- Material Wear
- Slurry Stream Management
- Gravity Separation
- Flotation
- Thickeners
- Cyclones/Hydro-Cyclones
- Particle Size Reduction
- Screens
- Mixing Boxes
- Bins, Apron Feeders and Conveyors
- Fluidized Beds
- Tailings Flocculation and Deposition

Characterizing Ore Slurry Sample

MINING

Material Wear: We have studied wear related problems and developed appropriate remedial plans to reduce or eliminate wear. Computational fluid dynamics (CFD) can be used to simulate slurry flows in both simple and complex geometries, allowing high wear areas to be accurately identified. Laboratory simulations using wear sensitive surface tracers can provide insights into wear rates.

Slurry Stream Management: We have extensive experience in the design and operation of many different slurry handling systems, as well as the ability to account for complex non-Newtonian behaviours such as yield strength, shear sensitivity and thixotropy.

Gravity Separation: We have worked with many different gravity separation technologies, designs and applications, from vertical and horizontal separators to inclined plate and cyclone separators. We can help design and evaluate components such as feed distributors as well as perform optimization of complete vessel geometries and operating conditions.

Multiphase Separation Flow-Loop

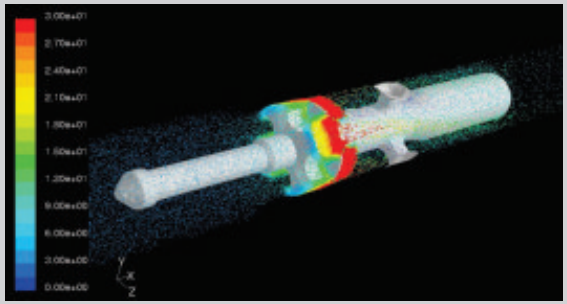
Flotation: Coanda has performed analytical and experimental studies to improve the effectiveness of flotation columns. The influence of feed distributors, vessel geometry, bubble-size distribution and gas hold-up on separation efficiency, has been assessed for a number of commercial processes.

Thickeners: Coanda has supported a variety of projects involving thickener technology-from mathematical modelling of thickener units to laboratory programs to determine optimal throughput rates and thickener sizing. We have worked with different material types and have extensive experience with the design and optimization of various thickener components or aspects of the process (e.g. flocculant mixing in the feed well).

Cyclones/Hydro-Cyclones: These can be effective tools in mining operations for the removal of fine particles suspended in either a continuous gas phase media (cyclones) or a continuous liquid phase media (hydro-cyclones). We have used computational and physical modelling techniques to optimize various conventional and unconventional designs.

Malvern Particle Sizer

Particle Size Reduction: Coanda has studied tumblers, autogenous mills, semi-autogenous mills, and ball mills using physical laboratory modelling and computational simulations. Our focus has included feed system design, outlet design, residence time optimization, capacity and size optimization, efficiency of the milling process, wear minimization, power / torque requirements and scale-up.



CFD Simulation of Down-Hole Tool

Screens: Coanda has worked with both rotary and flat screening systems (with or without vibration) using physical modelling and computational simulations. Improvements include optimal screen sizing for a given flow rate, design of internals to adjust residence times and minimize carry-over, and screen feed designs to minimize and evenly distribute wear.

Mixing Boxes: The design of mixing boxes for ore slurrification requires effective mixing between the dry ore and water, plus aggressive solid-solid impact to induce lump breakup and ablation. Gravity is used as the primary source of energy input in most mixing boxes, and the ore and added water are repeatedly impacted as they cascade through the internal mixing elements. Using laboratory simulations techniques Coanda has developed proprietary designs which dramatically increase the mixing effectiveness, reducing the overall mix box height and size.

Laboratory Model of a Mix Box Screen

Coanda
Research & Development Corporation