

ATTRITION SCRUBBER



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Introduction

Metso Minerals Attrition Scrubbing machines are simple, yet highly efficient units for scrubbing particles at densities of 70 - 80% solids.

Two opposed Helix type propellers on each shaft force particles against each other, resulting in intense scrubbing, polishing and disintegration. Efficiencies generally increase with an increase of the density of the pulp, as particles have more frequent grain to grain contact.

The twin propellers, mounted on a shaft inside a tank, are supported by a heavy-duty steel structure. Shafts are coupled to either gearbox or spindle bearing drives. Feed and outlet boxes are integral or flanged with the tank in to the cells as shown in the photo to the right. An opening in each cell partition allows pulp to flow through the machine. Machines are usually supplied with two, four or six cells, with each cell ranging in volume from 4 to 9900 liter's. (1 cubic foot to 359 cubic foot). Odd cell arrangements are also available as custom supply.



Applications

Attrition Scrubbers are often used to:

Remove iron surface from sand particles

Delimitate clay, graphite or other plalet, tabular structures

Washing Polyethylene Tetra

Phthalate (PET) plastic chips for recycling.

Mixing cement and mine detainings for back filling underground minded areas.

Soil washing to scrub contaminants from soil surfaces.

Slaking lime

Repulping filter cake

Propellers

The Helix propeller is very effective in providing the vertical and radical forces for maximum scrubbing.

Two six-bladed propellers are mounted on each shaft to provide opposed pumping forces. One propeller has slightly greater blade pitch than the other, which causes the pulp to be pumped from cell to cell. Flow alternates introduction to the cells by way of over

Way of over and under openings in the baffles between the successive cells eliminating short circuiting

The propeller design eliminates destructive cavitating action, which provides extended war life. Nonetheless, in many applications the degree of wear expected makes it necessary to use special materials. While cast iron propellers are often specified, and for highly



Abrasive or corrosive duties, coverings, such as rubber and neoprene are specified for props and shafts.

Drives

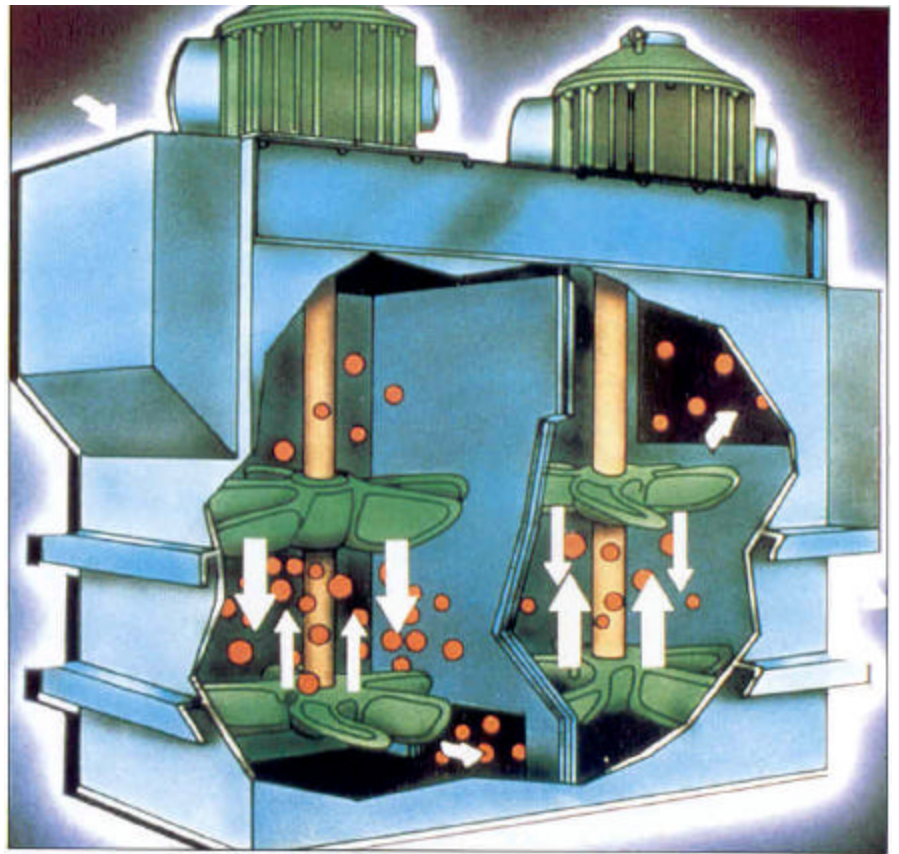
Spindle bearing drives are used on cell size from 11" x 11" (279x279mm) through 40" x 40" (1016x1016mm). On larger units, speed-reducer gearbox drives are offered, giving a more compact arrangement for transmitting the higher horsepower required.

Tanks

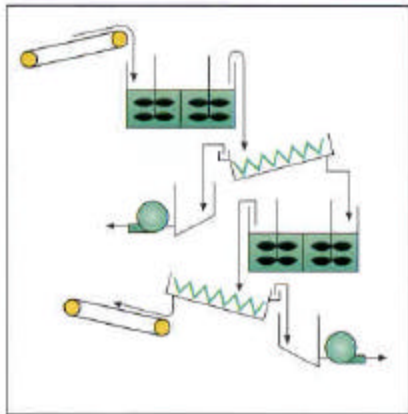
Tanks are of fabricated steel construction with abrasion-resistant steel plate liners. Cover plates are fitted, and partition baffles are located between cells to help direct pulp flows. Rubber or other elastomer linings can be supplied for abrasive or corrosive duties.

Support Structures

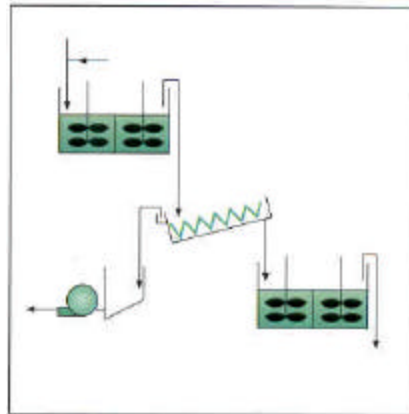
The Mechanism support is a rigidly braced formed steel plate. The motor mount is adjustable.



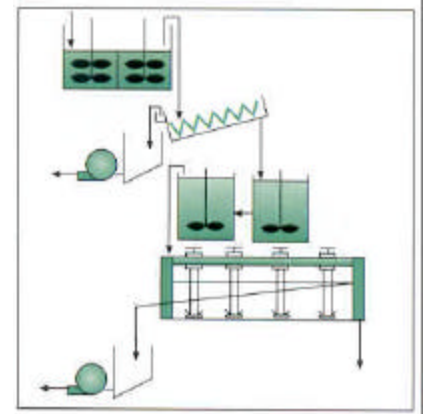
Attrition Scrubber cut-away drawing illustrating the Helix propeller; high-intensity scrubbing.



Two-stage scrubbing as practiced in sand-plants, to liberate bituminous or carbonaceous matter and clays in the production of specification sand.



Potash crystals where clay must be disintegrated prior to washing, and where removal of slime coatings greatly improves or is essential to flotation recovery.



Polishing sand grain surfaces to remove iron stains and disintegrate clay fractions, prior to flotation