

ABON Low Speed Sizers



ABON Low Speed Sizers

Features of the ABON Low Speed Sizers:

- ROM feed size up to 2,000 mm
- Capabilities in excess of 10,000 mtph
- Minimal fines creation
- Insensitive to clay and sticky materials
- Pre-scalping of undersize not required
- Exceptionally low headroom requirements
- Simple infrastructure requirements due to minimal dynamic loads placed on the supports and structure
- Long wear life of consumable components due to positive bite and minimal feed slip

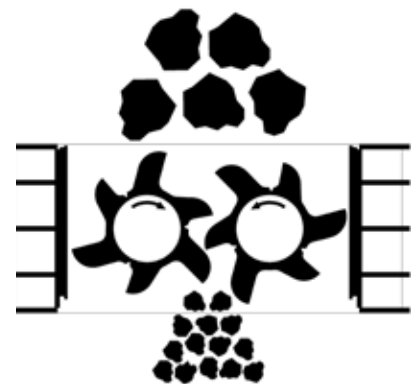
FLSmidth ABON designs and manufactures Feeding, Sizing, Crushing and Screening equipment for an ever expanding range of industries in the broad sphere of minerals handling and minerals processing by-product activities.

FLSmidth ABON commenced operations in the mid 1960's. Our sustained and continued growth has stemmed from recognition and acceptance of our products by major resource companies such as Alcan, Alcoa, Anglo, BHP Billiton, BMA, Inco, MIM, Peabody, RAG, Rio Tinto, Shell, Thiess, Titan, Wesfarmers, Vale and Xstrata.

Description of the Equipment

The ABON Sizer is designed to accept feed through the top of the unit, pass it through the rolls, crushing or sizing it to a specified end product size.

Throughout the world, ABON Sizers have been commissioned in Primary, Secondary, Tertiary and Quaternary high tonnage crushing duties.



ABON Centre Sizing



ABON Side Sizing



ABON 13/300CCTD Primary Sizer and 8/350CCTD Secondary Sizer installed in Iron Ore application

FLSmidth ABON Sizing Principle

ABON Sizing Principle

Low Speed Sizing is one of the more unique crushing technologies in the world today. A combination of high torque and low roll speeds with a unique tooth profile in the ABON equipment leads to a specified product with a minimum of fines creation.

In essence the interaction of tooth, spacer and roll set up a "Sized Void" which in turn "Sizes" oversize material when feed through the machines rolls. Undersize material basically "free falls" through the unit with little or no further size reduction.

The actual rotating tip speed of the tooth or sizing element in an ABON Sizer can be as low as 0.8 m per sec (primary applications) and no higher than 1.8 m per sec (tertiary & quaternary applications).

ABON Sizers have several unique features to exploit extending from this low roll speed principle:

Environmental features of low noise, low dust and minimal fines creation.

Simple Infrastructure requirements due to minimal dynamic loads placed on surrounding supports and structure. Units also have the ability to process full ROM envelopes and are not reliant on prescalping of undersize material.

Long wear lives of consumable elements due to positive bite and minimal feed slip.



Environmental Features:

- **Generate A Minimum Of Fines.**
- **Create A Minimum Of Dust.**
- **Achieve Low Noise Levels.**
- **Impart Low Dynamic Forces On Surrounding Supports and Structures.**



Features

ABON Sizers are suitably protected against high levels of intrusion.

(i.e. flight bars, bolts etc.)

and will not suffer catastrophic damage due to:

- **Inherent low roll speeds**
- **Heavy duty teeth and roll construction**
- **Underspeed sensors**
- **Fluid coupling / trip switches**

These protection features are proven on commissioned Sizers operating in high intrusion colliery and mine applications.

Operational Features Duty Availability

ABON Sizers have been developed from Colliery and Power Station duty requirements where duty availability must be maximised. ABON Sizers are constructed with the highest respect for unit durability and ease of maintenance.

Performance Features End Production Control

ABON Sizers can be formatted with the ability to control end product size via varying tooth and spacer formats, or hydraulically adjustable breaker plate assemblies. Adjustment is external to the crushing chamber and is carried out in-situ (Side Sizers only).

Based upon performance of existing ABON Sizers in the field, top size control is reliable to 95-100 per cent of total product. As ABON Sizers do not employ "Tramp Relief" mechanisms, contamination of product on the output side of the crusher via oversize product is not an occurrence.

Low Roll Speed

Inherent low roll speed provides the added advantage of minimising fines generation and is in itself an added protection device to tramp material. Low roll speed operation also maximises teeth and breaker wear lives.

Maintenance Features

Daily service is limited to visual inspection only of sight glasses fitted to oil baths. Breaking elements are to be adjusted to control end product size as required (Side Sizers only).

When replacement of breaking elements (teeth and breaker plates) is required, this can be carried out in-situ with top feed chute removed or with Sizer withdrawn to the maintenance position. Teeth and breaker replacement does not involve removal of shafts from the machine.

Based upon existing field units, complete teeth and breaker plate changes can be carried out and completed inside of 1 to 2 operating shifts. If and when required, motor, coupling and gearbox removal is done in a minimum of time due to modular construction.



Construction Features

Main Frame

Fabricated from AS 1204 GR 250 carbon steel. End frames are machined from solid plate. Side frame members are fully welded, ribbed construction and machined finish to size. Side members are spigotted and bolted to end plates forming a very robust assembly capable of containing any dynamic forces created by the sizer while in operation.

Shaft Assemblies

The shafts and drive gears are fully machined from a solid one piece forging of AS GR4340 high carbon steel. The shafts are slotted to accept sizing segments. Shaft bearings are spherical roller C3 fit up. Oil seals are duo cone in chamber, lipped and "o" ring elsewhere. All rotating cat seal carriers, bearings and cartridges are held on each end of the shaft by large locking nuts so that all thrust on teeth & shafts is contained inside the shaft and not thrown onto bearings thus avoiding shaft float within the body.

Wear Plates

Abon sizers are fitted with wear plates completely covering the inside of the body and sizing chamber. These plates are made from 500 BHN plate and are doweled and bolted to units allowing easy removal when required and positive secure long term location.

Drive Details

A fitted, four-pole motor drives through a fluid coupling. The fluid coupling has a splined bore on the output side to accommodate the input shaft of the gearbox. The fluid coupling is covered by a cowl, which has an inspection opening for filling the fluid coupling. This cowl also acts as an enclosure and protects the fluid coupling. The reduction gearbox is bolted to the frame drumbox. The final drive, through the spur gear housed in the frame drumbox, rotates the shafts

Modular Reduction Gear Box and Drive

Pinions and gears are machined, carburised and ground from a range of high tensile steel. Input and output shafts are splined for connection to fluid coupling and sizer. All bearings are spherical roller C3. There are no keys or keyways to be fitted or driven during assembly or disassembly for maintenance purposes due to the splined construction. Gear box selection is made with respect to a high overall safety factor.

Gate to Reject System

ABON Sizers have the optional ability to remove tramp or intrusion from the ore stream. Hydraulically operated doors discharge to bypass chutes in the event of an underspeed activation without manual intervention.



Shaft Assemblies



Wear Plates



Gate to Reject System



Modular Reduction Gear Box & Drive



Motor Drives

Construction Features



Gear Box



Drive End



Non Drive End

Lubrication

All bearings and gears in the ABON Sizer are lubricated via "oil bath". Each bearing and gear is lubricated via their own oil bath reservoir. Each reservoir is fitted with oil level sight glass, magnetic drain plug and oil sampling point, (to assist with condition monitoring). These areas are easily accessible for maintenance and monitoring.

Sizing Teeth

ABON Sizing teeth are designed to slide into machined slots in the shaft, without the need to remove the shafts from the main frame. Teeth are held firmly in the shaft by clamp plates. Each row is individually tightened by tensioning bolts. These tensioning bolts are outside the feed stream and don't come into contact with the feed, thus avoiding wear and corrosion.

Changing Teeth Sections

Below are the 3 simple steps in changing out teeth segments on ABON Sizers.



Step 1 - Remove End Wear Plate



Step 2 - Remove Clamp Ring



Step 3 - Teeth Slide On and Off in Rows

Construction Features

Wheel Assemblies

Abon sizers are fitted with fully retractable hydraulically operated wheel assemblies. These wheel assemblies allow units to easily be removed for servicing. When units are in operating position with wheels retracted, they can be set on rubber sealing strips and require little or minimal anchoring.

Surface Protection

The machine is sandblasted to a class 2.5 finish and then two pack epoxy under coat, followed by a two pack polysiloxane top coat. All rotating and stationary duo cone seal housings are protected by a baked molybond coating to the exposed surfaces.

Protective Devices

Low Speed Sensing Probe

A proximity probe is fitted to protect motor and gearbox against jam up by uncrushable materials. The probe is fitted on top of the drumbox and strobes for targets on the driven gears.

Fluid Coupling - Mechanical Thermal Switch

The Sizer is fitted with a MTS, which is activated by a temperature dependant flag on the fluid coupling. When excessive temperature is detected in the fluid coupling oil (140oC), a pin extends to flag & trip the limit switch.

This device is to be constantly monitored and immediate full system shutdown and alarm should occur if tripped. Should the thermal pin fail to trip the (MTS) a fusible plug will activate at 160oC and the coupling oil will be released which will disengage the drive.



Wheel Assemblies



Fluid Coupling - Mechanical Thermal Switch

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