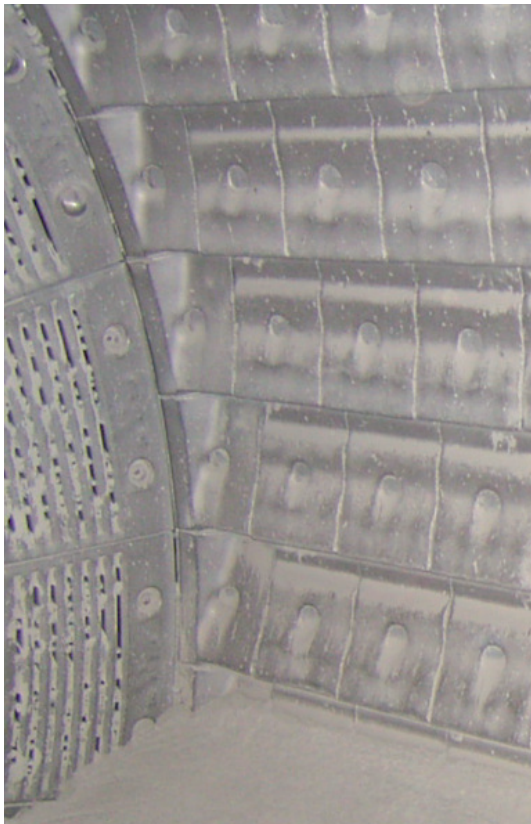


LIFTING LINER MONOSTEP®

WHY A LIFTING LINER ?

The lifting action of a liner is particularly important:

- It needs to transmit enough energy to the grinding balls to crush coarse particles
- It cannot be too aggressive, otherwise the media charge will impact the liners instead of the material, resulting in:
 - a waste of energy
 - a risk of breakage and high wear rates, both for liners and grinding balls.



THE MAGOTTEAUX MONOSTEP® DESIGN

The Monostep® is the most common solution for crushing.

The design features are:

- **Sufficient lifting action** to crush the larger material that cannot be ground in the core of the ball load.
- **Continuous lifting action** to avoid projecting balls onto shell liners.
- Slight **expansion of the material and ball charge**.
- **Reduced dead zone** of the ball charge.

For a given mill, profile and alloy are selected according to:

- customer's specific requirements
- material to be ground
- grinding circuit type
- ball mill type
- mill diameter
- mill rotation speed
- ball charge characteristics
- ball filling degree
- mill drilling pattern

The information and data in this data sheet are accurate to the best of our knowledge. They are intended for general information only. Applications as suggested are described only to help readers make their own assessment. They are neither guarantees nor to be construed as express or implied warranties of suitability for these or other applications.



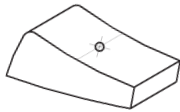
MAGOTTEAUX
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TECHNICAL CHARACTERISTICS

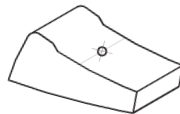
The MONOSTEP® is available in three different profiles:

PROFILE A:



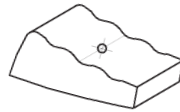
The profile A is the standard solution for all applications, particularly those where the grinding charge already produces fines in the first chamber.

PROFILE B:



The profile B has been designed to compensate for an insufficient lifting action.

PROFILE C:



The profile C has a waved pattern in order to reduce the slipping effect and hence the wear rate of the liners in the presence of highly abrasive material, provided there is no negative effect on grinding efficiency.

The MONOSTEP® liner can be installed in two ways:

- Bolted.
- Semi-boltless (usually with 2, 3 or 4 bolted rows).

The MONOSTEP® lifting liners are manufactured in two specific range of alloys:

- A martensitic steel for applications where more resiliency is required.
- A cast iron with a chromium content between 11 and 27% and hardness between 48 and 62 Rc, to avoid or solve major wear problems.

ADVANTAGES

1. Optimum grinding efficiency due to adequate lifting action and optimum use of energy.
2. Reduced liner and ball wear rates, due to a continuous lifting action.
3. Reduced maintenance costs.

FIELDS OF APPLICATION

The MONOSTEP® is used for grinding the following materials: raw materials, clinker, gypsum, anhydrite, slag, coal, white cement...

