One Source

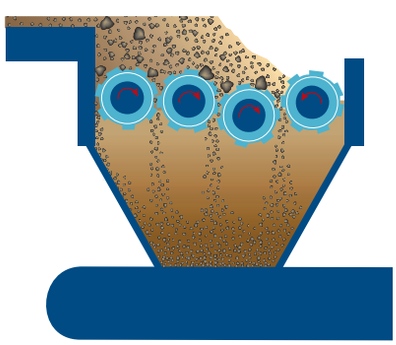
HRB MF clinker breaker

FLSmidth

Keeps crushing, and crushing, and crushing and . . .

Key benefits

- **Extremely reliable operation, regardless of load**
- **Simple, low-cost maintenance**
- **High availability with long wear life**
- **Easy operation**
- **Flexibility for capacity upgrade**



An optimal crusher solution can help keep a kiln and cooler operating at peak efficiency.

The HRB MF (heavy-duty roll breaker modular frame) sets the standard in clinker breakers and is FLSmidth's standard recommendation for the important task of crushing clinker at busy cement plants.

Using a grinding rather than striking movement, the HRB MF significantly minimises the presence of the flying sediment that causes wear. So the crusher itself and the cooler's casing and refractory lining are subjected to the lowest wear.

With its variable speed, low dust generation, quiet operation and superior wear resistance – to name only a few examples – the HRB MF has many distinct advantages. However they all add up to three fundamental results: extremely reliable operation, exceptionally high availability and minimal maintenance.

How it works

The HRB MF consists of a combination of transport and crushing rolls in series.The transport rolls rotate in the direction of the clinker flow and permit clinker fines to pass through predetermined gaps between the shaft assemblies. The voids between the shaft assembly teeth are filled with clinker and, as the shafts rotate, these particles are deposited into the material handling system.

Larger pieces are transported to the crushing rolls, where the remaining oversize material is broken down to the required size by two heavy-duty crushing rolls that rotate in opposite directions, pulling the material into the nip.

The HRB MF is, as per standard, available with electro-mechanical drives, and there is no requirement for either cooling air or water when installed, as standard, at the end of the cooler.

Extremely reliable operation

With the HRB MF, even very large lumps do not disrupt kiln operation. Big loads and pileups are not an issue either.

The HRB MF features a unique, patented shaft arrangement that forms a cavity, enabling the HRB MF to easily grip onto clinker lumps and effectively break them down without stoppage. While the transport rolls are on a common, horizontal plane, the first crushing roll is located below the centre line of the transport rolls and the final crushing roll.

Reversible crushing rolls also contribute to the roll breaker's continuous operation. When the maximum system load is reached, the last of the two crushing rolls reverses automatically to optimally break down lumps to the required size. If jamming continues, both rolls will reverse.

A rugged, high-torque gearbox increases reliability as well, as do motion detectors on all shaft assemblies, which also ensure easy operation.

Exceptionally high availability
Because the robust HRB MF operates automatically at variable speeds – without having to operate at the unnecessarily high speeds that increase wear and tear – it increases availability by minimising wear. Easily replaceable liners on all four sides of the frame and rugged, replaceable shaft wear segments also contribute to maximum uptime.

Additional roll modules can be added in the future if even greater capacity is required.

Minimal maintenance
The HRB MF is designed for minimal and easy maintenance. All shafts share the same basic design of wear segments, but they are arranged in two different ways for the most efficient operation and the least number of spare parts. Transport shafts are optimised for throughput, while crushing shafts are optimised for efficient size reduction. Both deliver long wear and low maintenance.

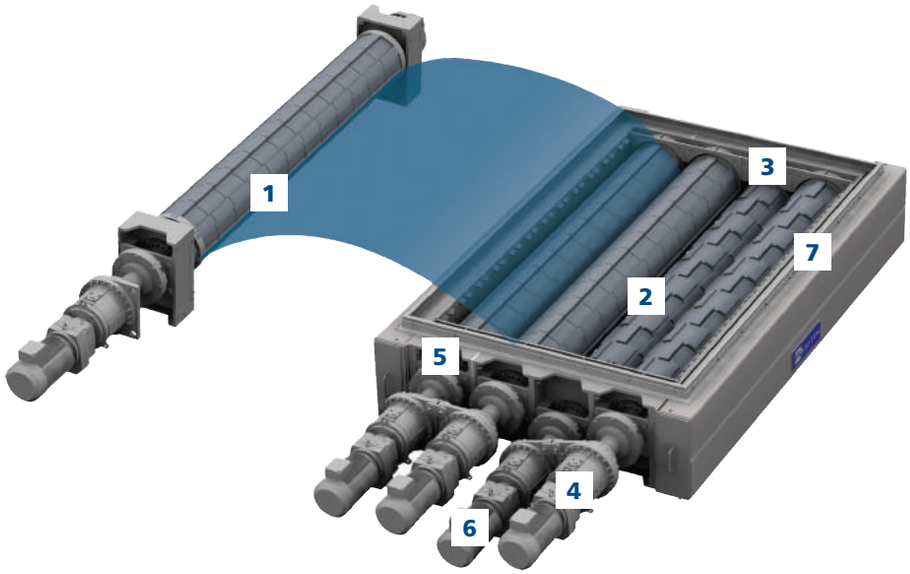
HRB MF installations also feature a "roll-out" design that gives unrestricted access to wear components for removal and replacement.

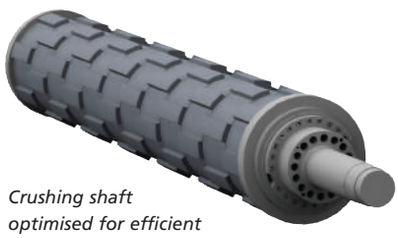
A modular, bolted frame construction enables fast and simple assembly of the HRB MF onsite.

Optional mid-cooler application
If desired, it is also possible to mount the HRB MF in the middle of the cooler, rather than the standard application at the end of the cooler. This may improve heat transfer and subsequent clinker cooling as well as control of clinker discharge temperatures. In some cases, it also enhances handling of kiln upsets.

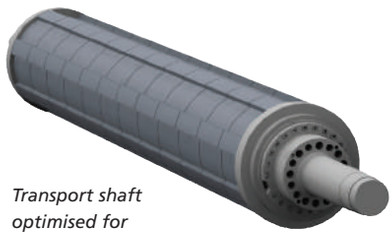
Mid-cooler application requires air cooling of the frame and shafts.

1 **Modular shaft assembly**
2 **Replaceable shaft wear segments**
3 **Replaceable frame liners**
4 **Gearbox**
5 **Spherical roller bearings**
6 **Electro-mechanical drives**
7 **Adjustable top seal**





Crushing shaft optimised for efficient size reduction



Transport shaft optimised for throughput

Standard dimensions and capacity

For end installation

HRB MF	L out mm	W out mm	Rated Capacity MTPD
306	2350	4870	2200
308	2350	5470	3000
310	2350	6170	3700
312	2350	6770	4400
314	2350	7470	5200
316	2350	8070	5900
412	2910	6770	6000
414	2910	7470	7000
416	2910	8070	8000
418	2910	8670	9000
518	3470	8670	11000
618	4030	8670	13500

Crusher height, H = 900 mm

Mid-cooler installation

HRB MF	L out mm	W out mm	Rated Capacity MTPD
306	2650	5290	2200
308	2650	5890	3000
310	2650	6590	3700
312	2650	7190	4400
314	2650	7890	5200
316	2650	8490	5900
412	3210	7190	6000
414	3210	7890	7000
416	3210	8490	8000
418	3210	9090	9000
518	3770	9090	11000
618	4330	9090	13500

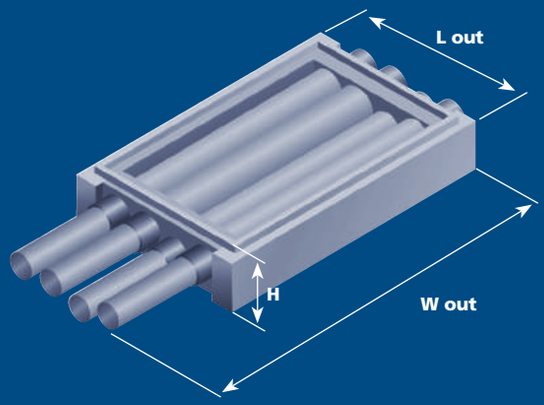
Crusher height, H = 1075 mm

Model number code definition

HRB MF xyy

HRB	Heavy-duty roll breaker
MF	Modular frame construction
x	Number of shaft assemblies
yy	HRB width in segments (300 mm each)

Example: HRB MF 412
HRB with modular frame construction,
4 shaft assemblies, 12 segments wide (3600 mm nominal),
end-cooler location, electro-mechanical drive



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