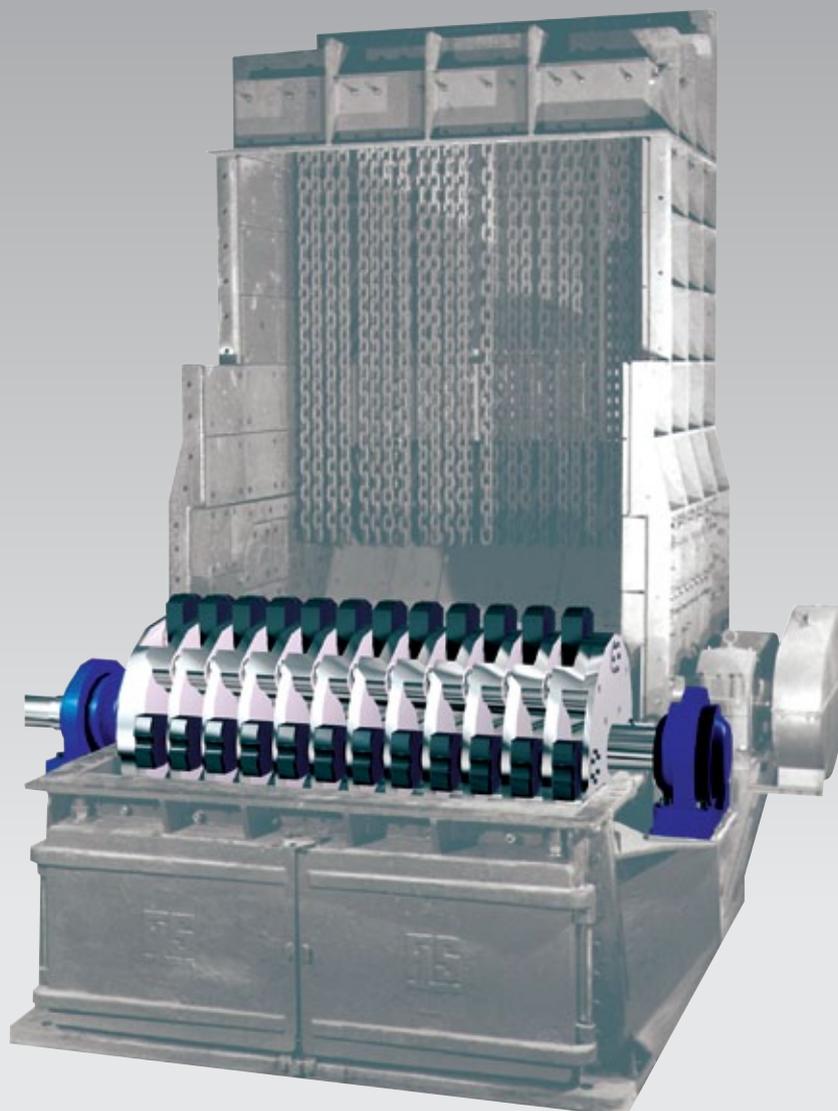


EV crusher retrofit



Introduction

Main features

- **New crusher in a week**
- **Capacity increased by 5-10%**
- **Specific wear rate (g/t) reduced**
- **Specific power consumption (kWh/t) reduced**
- **Wear parts last longer**
- **Less downtime**
- **Less maintenance required**
- **Maintenance facilitated**

Since FLSmidth first launched the EV hammer impact crusher in the mid fifties, design improvements have continuously been introduced while its basic concept has remained the same.

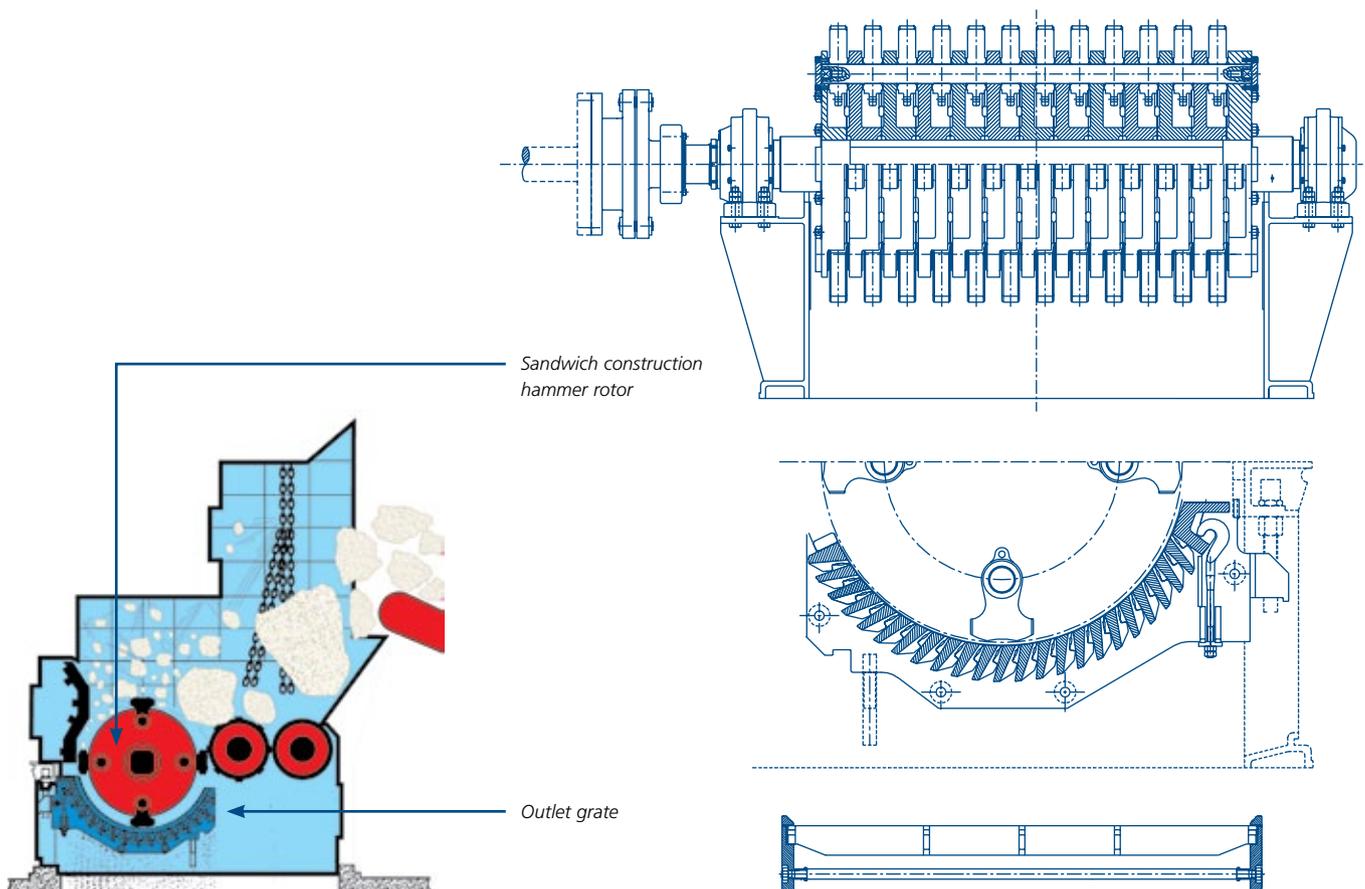
Many of the improvements have been based on the day-to-day experience of operators. The improvements can also be implemented on existing crushers to upgrade their operation and facilitate daily maintenance.

It will normally be practical to implement such an EV Crusher retrofit, including new hammer rotor and outlet grate, in connection with a scheduled major

overhaul of rotor and grate. The new parts can be fitted during the scheduled stoppage while rotor and grate are dismantled.

With hammer rotors and outlet grates of the traditional design, the wear on the outlet grate assembly is often found to resemble the pattern as indicated on this page. Such a wear pattern will eventually make it difficult to attain the required product specifications.

There will also be an increase in wear rate as well as specific power consumption due to less efficient crushing in the outlet grate area.



The new design of hammer rotor and outlet grate assembly overcomes these disadvantages to a large extent and increases operational time between scheduled maintenance stoppages.

The introduction of the hammer bolt handling hydraulic tool and the hammer handling rack makes hammer rotor maintenance safer and much more efficient.

The new hammer rotor design does not include a flywheel. The safety mechanism is incorporated in the coupling assembly. The mass of the now superfluous flywheel is mostly placed in the hammer rotor itself where it is applied more directly to the crushing process.

When installing the new parts during the crusher retrofit, no changes need to be made in the existing components. The new rotor assembly incorporating the coupling assembly with the shear pin safety mechanism matches the position of the existing rotor coupling flange. The new outlet grate assembly resembles the old design as far as the interface to the crusher is concerned.

A complete hammer crusher retrofit is estimated to take less than a week.

Hammer rotor

The new hammer rotor consists of a heavy, forged, square cross-section shaft fitted with cast steel rotor discs. The special "sandwich" assembly of the discs is a robust construction that prevents distortion and crack formation. The closed surface of the sandwich rotor

assembly eliminates the risk of rocks getting stuck and causing operational disturbances. The hammer rows are displaced in relation to each other. In that way they cover the entire width and area of the outlet grate, increasing the overall efficiency of the crusher.

Similar to the old rotor design, the new hammers are pivotally suspended from the through-going bolts and are symmetrically shaped. They can be turned to reverse the leading and trailing edges for maximum durability. Typically, 30% of the original hammer weight is considered wear material. This allows a reduction of hammer weight down to 70% of its original level.

For maintenance and reliability reasons the new rotor bearings are lubricated with grease, and a centralised lubrication system is possible.

Outlet grate

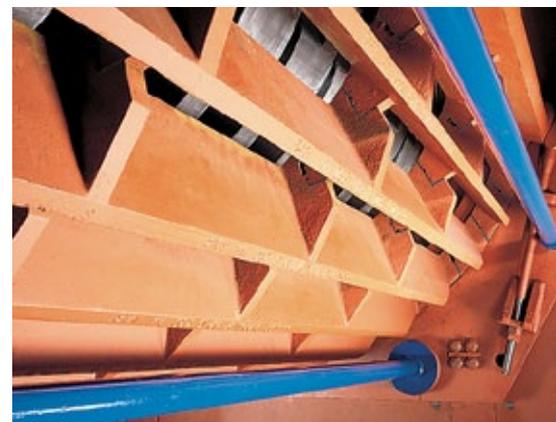
The end product is controlled by the outlet grate assembly. This has sturdy, replaceable grate bars carried by heavy steel plate cheeks. The grate bars of the new type are designed to make the slot openings more tangential in relation to the hammer tip rotation, which makes it easier for sufficiently crushed material to pass. The grate bars mesh, which makes the construction much sturdier and, in turn, causes the comminution to be highly effective. Due to the hammers being displaced in relation to each other, as mentioned above, the grate bars will wear in a uniform pattern – which increases the life of the bars, while helping to maintain product specifications.



Wave-shaped wear pattern in outlet grate, caused by old rotor.



Sandwich construction hammer rotor and part of inlet roller.



Tangential grate bars engaging each other.

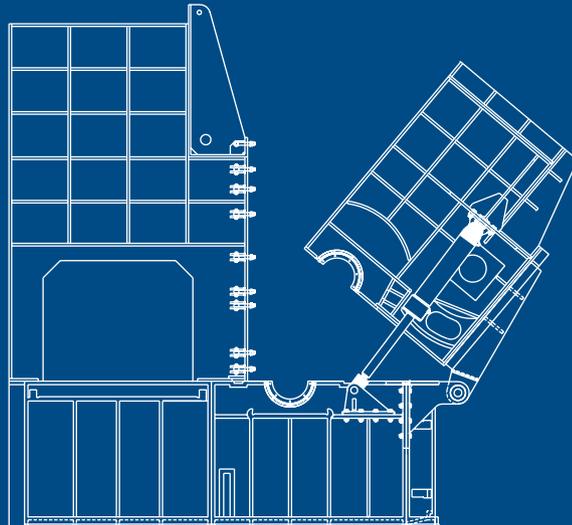
Hydraulic opening of crusher housing

Another feature that reduces downtime and makes servicing of the crusher safer is the hydraulic opening of the crusher housing. Installing two hydraulic cylinders, appertaining brackets and a set of hinges enables the crusher to be opened within 5 - 10 minutes.

When the hinged upper part has been closed it is kept securely in place by a set of eyebolts. The eyebolts are simply swung into grooves in the upper part and the nuts are then tightened.



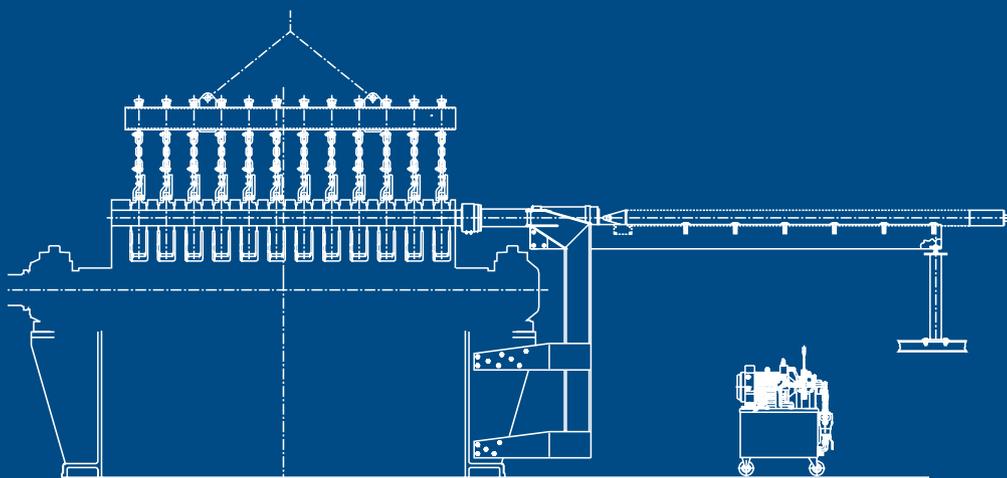
Mobile hydraulic power unit.



Hydraulic opening.

Hydraulic tool for changing of hammers

A hollow hydraulic cylinder placed in a rigid frame is provided to handle the hammer bolts when turning or changing hammers. A mobile hydraulic power unit supplies the hydraulic pressure to operate the cylinder. The power unit has a pressure/flow control system that optimises control of the hydraulic cylinder. The unit is supplied ready to be plugged in. A hammer handling rack greatly facilitates the turning or changing of hammers. The entire new hammer handling arrangement considerably reduces downtime. Free space beside the crusher must be equal to rotor width.



Hydraulic hammer bolt extractor.

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www.flsmidth.com

Project Centre Denmark

FLSmidth A/S
Vigerslev Allé 77
DK-2500 Valby
Copenhagen
Tel: +45 3618 1000
Fax: +45 3630 1820
E-mail: info@flsmidth.com

Project Centre USA

FLSmidth Inc.
2040 Avenue C
Bethlehem, PA 18017-2188
Tel: +1 610-264-6011
Fax: +1 610-264-6170
E-mail: info-us@flsmidth.com

Project Centre India

FLSmidth Private Limited
FLSmidth House
34, Egatoor, Kelambakkam
(Rajiv Gandhi Salai, Chennai)
Tamil Nadu – 603 103
Tel: +91-44-4748 1000
Fax: +91-44-2747 0301
E-mail: indiainfo@flsmidth.com

