

EV hammer impact crusher



Introduction

Main features

- **Reduces limestone boulders to mill feed in one operation**
- **Achieves size reduction ratios up to 1:100**
- **The crusher requires little floor space and installation height**
- **The EV crusher is designed to simplify plant layout and reduce civil cost**
- **Inlet roller(s) smoothe(s) the feed to the hammer rotor**
- **Outlet grate effectively controls the top size of the crushed product and maintains a consistent flow to the conveyor**
- **Hydraulic opening of the top part provides easy access to the interior of the crusher**
- **The hammers remain serviceable down to 70% of their initial weight**
- **The hydraulically adjustable outlet grate allows compensating for hammer wear**
- **Using a gear unit instead of a V-belt drive facilitates maintenance**

The crushing process

Most cement plants these days extract limestone by blasting. This produces many oversize boulders which often contain a lot of clay and sand.

The crusher therefore has to handle feed containing fairly large blocks as well as some sticky materials.

The proven and reliable FLSmidth EV hammer impact crusher is a cost-effective solution for processing abrasive and moderately sticky raw materials in one stage.

Horizontal feed system

In a traditional hammer mill with a top inlet, large blocks in the feed may impede the action of the hammers and

block the crusher. In the EV crusher, however, the horizontal feed system accepts coarse feed blocks because it incorporates one or two shock absorbing inlet rollers. The inlet rollers accurately control the feed to the crusher and ensure a smooth and even flow of material.

Whether one or two inlet rollers are used depends on the method of feeding the crusher. The AF apron feeder, which is normally used, maintains a consistent feed rate and requires only one inlet roller. A vibration feeder, on the other hand, includes grizzly sections for by-passing undersize material, and the somewhat uneven feed rate can be smoothed by installing two inlet rollers.



Design features

Effective size reduction

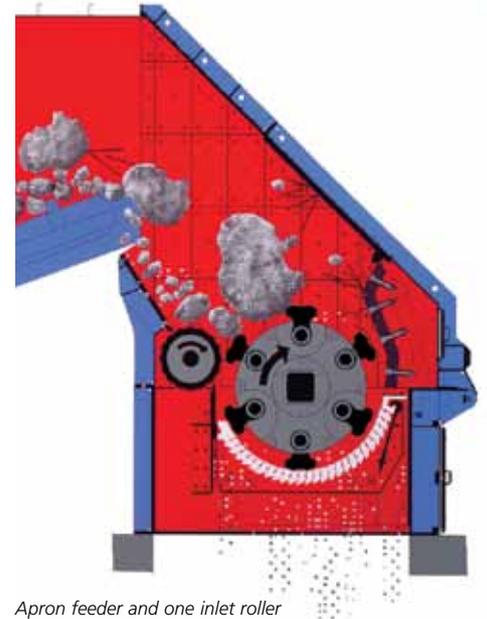
The EV crusher reduces quarry size limestone boulders (measuring up to 2.5m and weighing up to 5 tonnes) to mill feed (25mm) in only one operation. This means a reduction ratio of 1:100. Throughput capacities range up to 2200 tonnes per hour with an outlet grate and 2500 tonnes per hour without an outlet grate. Motor sizes are typically in the range 500 - 2500 kW.

Primary crushing is effected by impacting while secondary crushing takes place by shearing and compression between the hammers and the breaker plate and between the hammers and the outlet grate. This ensures that even the small particles absorb energy and that no oversize particles leave the crusher.

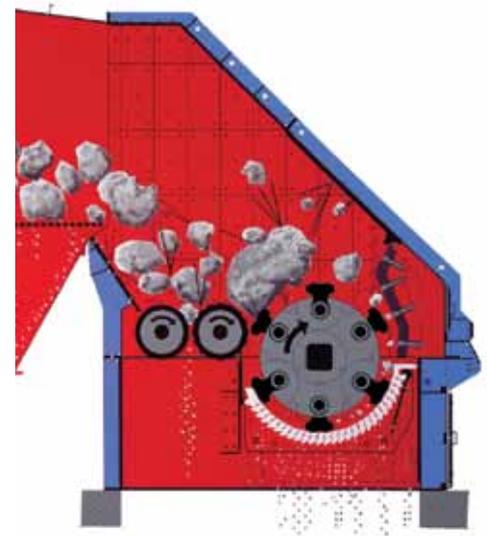
Adjustable outlet grate

The adjustable outlet grate gives the EV crusher unique control of the top size of the product. The grate ensures a consistent flow to the conveyor and protects it against any sudden impact of material leaving the crusher at high speed. Besides, the grate effectively protects subsequent machinery such as reclaimers, sluices and mills against operational upsets and mechanical damage.

The hold-up mechanism of the outlet grate generates a crushed product with a relatively high proportion of fines. In this way more of the comminution work is moved from the less energy efficient raw mill to the more energy-efficient crusher.



Apron feeder and one inlet roller

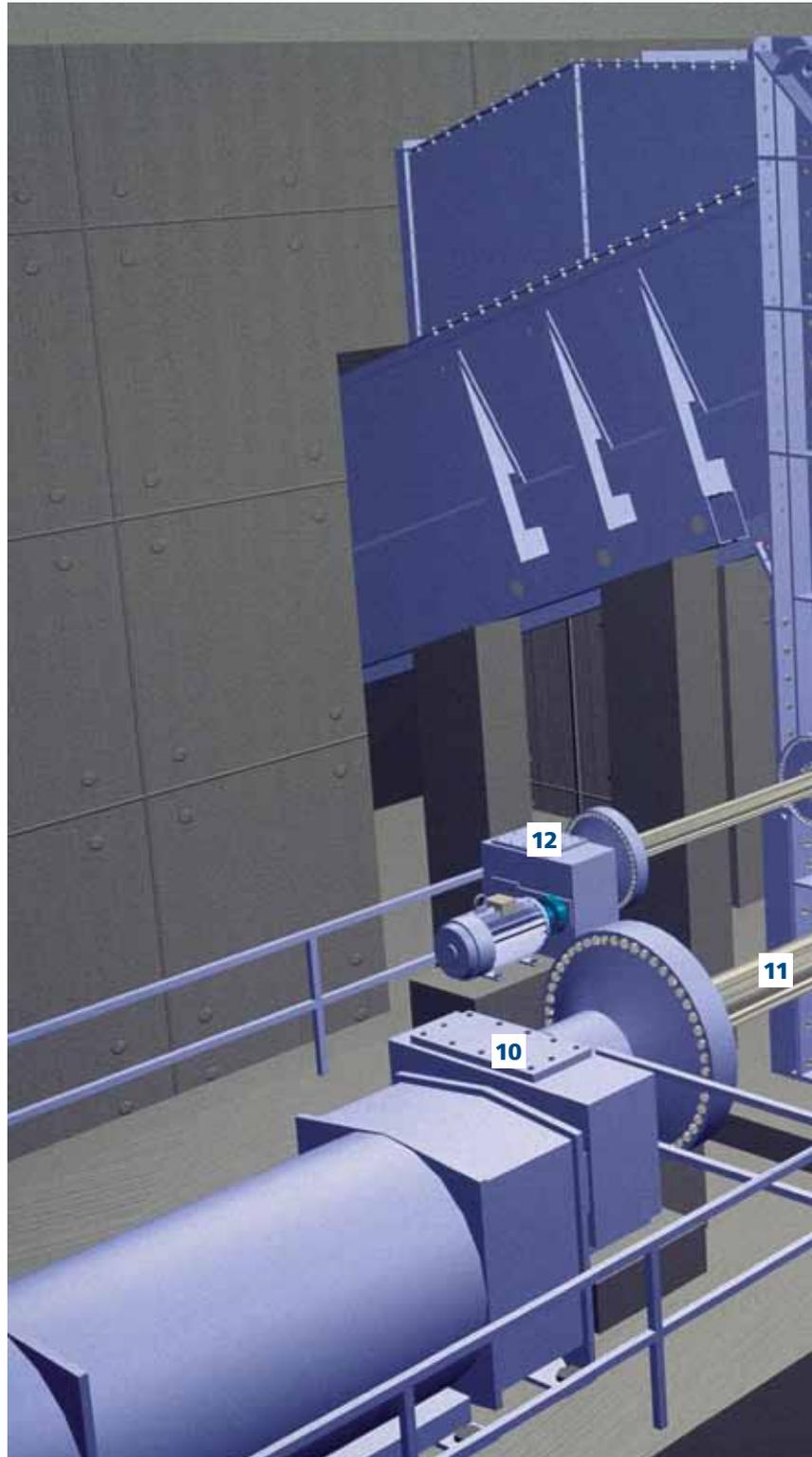


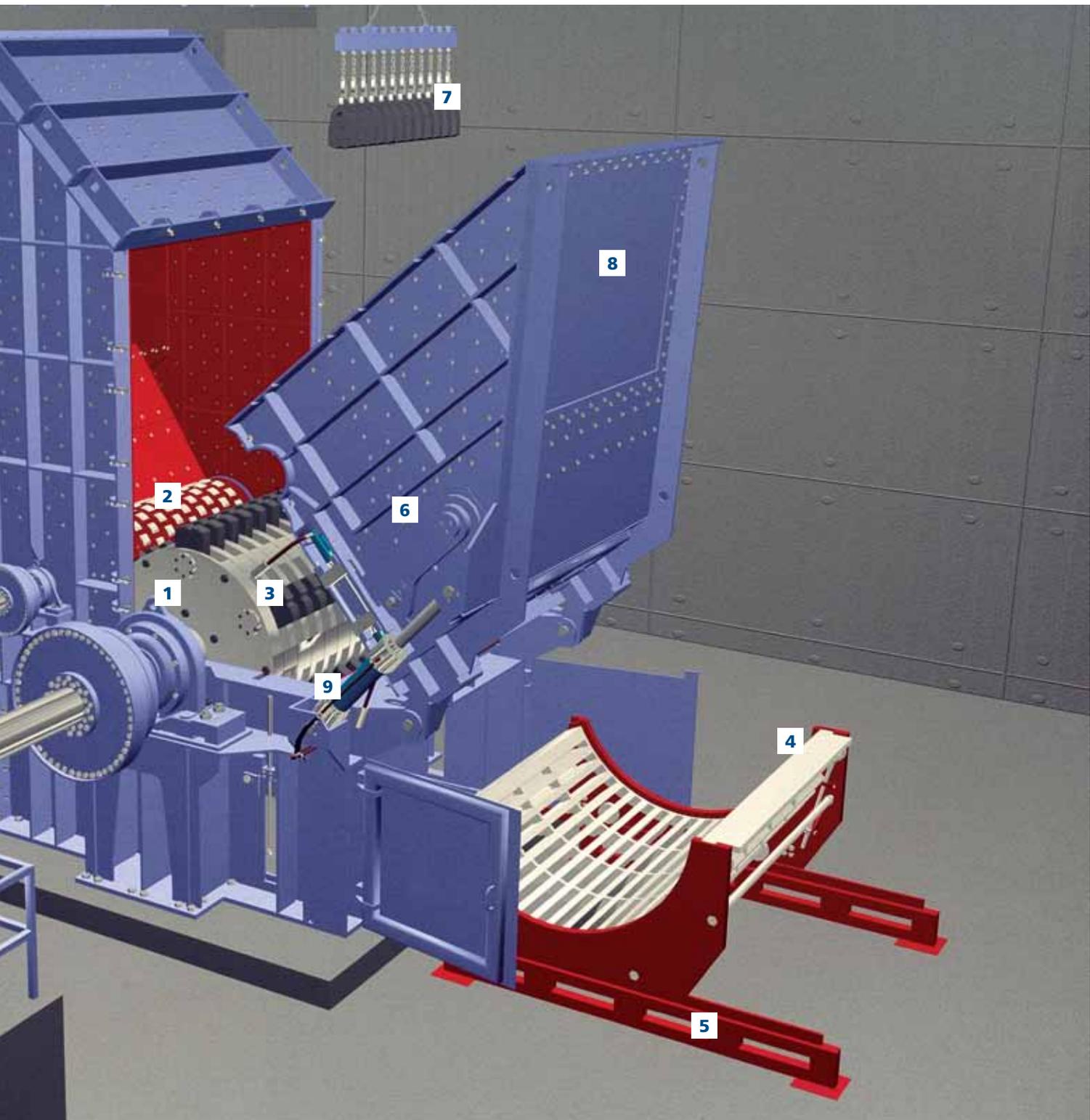
Vibration feeder with grizzly sections and two inlet rollers

EV hammer impact crusher



- 1 Hammer rotor
- 2 Inlet roller
- 3 Hammers
- 4 Outlet grate
- 5 Rails for sliding grate in and out
- 6 Breaker plate adjustment
- 7 Spare hammers
- 8 Top part
- 9 Hydraulic cylinder for opening top part
- 10 Main drive station
- 11 Membrane coupling
- 12 Drive station, inlet roller





Beneficial technical features



Opening for dismantling breaker plates and outlet grate adjustment

Durable and reliable

All exposed surfaces in the crusher including the adjustable breaker plates are lined with bolted-on wear-resistant plates.

The inlet rollers consist of a cylinder and a concentric shaft which is driven by a separate motor. Rubber pads inserted between the shaft and the cylinder make the rollers shock absorbent.

The hammer rotor assembly consists of a heavy-duty, forged shaft with a square cross-section and fitted with rotor discs. The special 'sandwich' assembly of the

discs is a robust construction which prevents distortion and crack formation.

Effective and efficient

The hammer rows are fitted in a staggered arrangement to give complete coverage across the outlet grate. The hammer assembly provides several points of attack on the raw materials, depending on the number of hammer rows. This increases the overall efficiency of the crusher.

The hammers are pivotally suspended from through-going bolts and are symmetrically shaped. They can easily

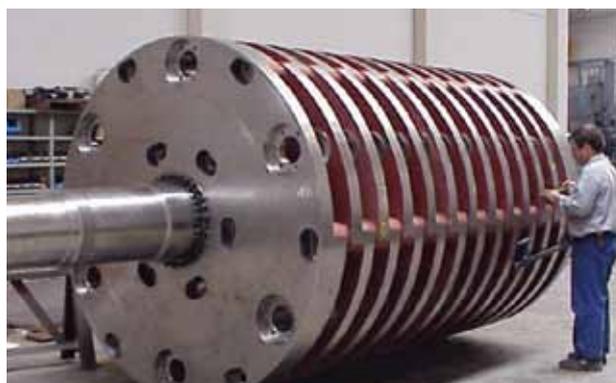


Hammers and rotor



Outlet grate

Hydraulic cylinder to open top part of crusher



be turned to reverse the leading and tracing edges for maximum service life. The fact that the hammers are all free to pivot around the bolts reduces the full blow from the contact between material and hammers, thereby protecting the rotor and crusher housing.

The spacing between the hammers and the breaker plate and the spacing between the hammers and the outlet grate can be adjusted to compensate for hammer wear. This allows the hammers to lose up to 30 percent of their original weight without this affecting the required product size curve.

Controlling the final product

The outlet grate assembly is equipped with sturdy, replaceable grate bars supported by heavy cheeks. The position of the outlet grate assembly can be adjusted in order to control the crushed product. This takes place hydraulically from outside the crusher casing.

Easy to service and maintain

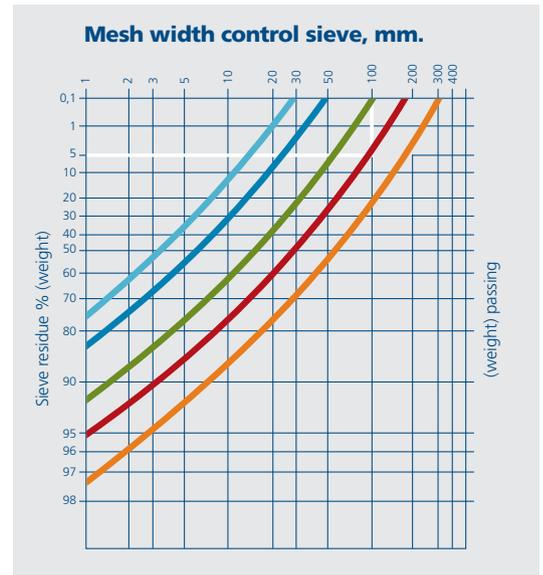
The top part of the crusher can be opened by means of hydraulic cylinders to facilitate access to the crusher interior.

The supply package includes hydraulically operated tools for dismantling and fitting of the heavy hammer bolts.

The hydraulic cylinders and the hydraulic tools are served by a mobile hydraulic power unit which is stored in a separate room when not in use.

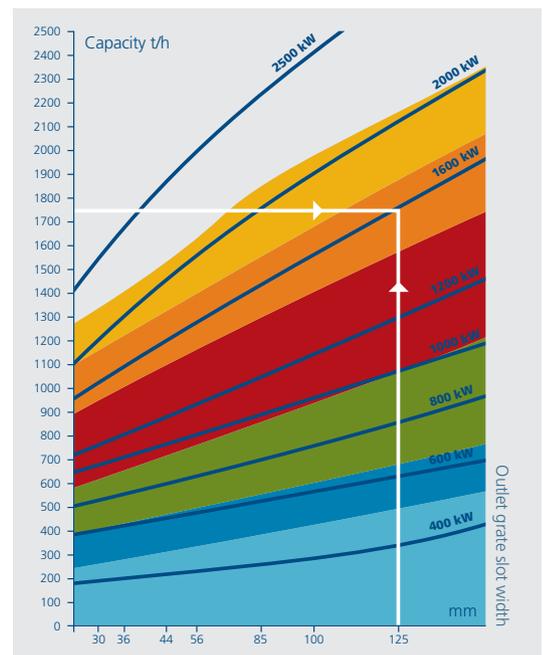
A lifting yoke facilitates handling of the hammer rows when changing hammers. It also holds them in position when dismantling and fitting hammer bolts.

- ▶ 30 mm slots
- ▶ 44 mm slots
- ▶ 85 mm slots
- ▶ 125 mm slots
- ▶ Without outlet grate



Example: To attain a product size distribution with a sieve residue of approximately 5% in a 100 mm control sieve an outlet grate with 125 mm slots is needed.

- ▶ EV 250 x 300
- ▶ EV 250 x 250
- ▶ EV 200 x 300
- ▶ EV 200 x 200
- ▶ EV 150 x 200
- ▶ EV 150 x 150
- ▶ Approximate motor size



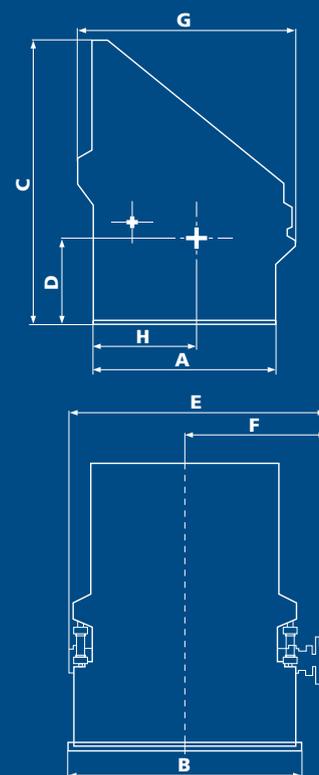
Example: An outlet grate with 125 mm slots and a desired capacity of 1750 t/h will result in an EV 250 x 250 with an approximately 1600 kW motor.

Charateristics

Hammer crushers	Inlet roller			Hammer rotor		Max. feed soze		Weight
	Type	Nos.	Peripheral speed m/s	Speed rpm	Peripheral speed m/s	Speed rpm	Max. size mm	Max. weight kg
EV 150*150-1	1	1	24	30-39	380-495	900	1,500	71
EV 150*200-1	1	1	24	30-39	380-495	1,200	1,800	79
EV 200*200-1	1	1	19	30-39	290-375	1,400	2,000	95
EV 200*200-2	2	0.67/1	13/19	30-39	290-375	1,400	2,000	107
EV 200*300-1	1	1	19	30-39	290-375	2,000	3,000	131
EV 200*300-2	2	0.67/1	13/19	30-39	290-375	2,000	3,000	146
EV 250*250-1	1	1	19	30-39	230-300	1,900	3,500	157
EV 250*250-2	2	0.67/1	13/19	30-39	230-300	1,900	3,500	170
EV 250*300-1	1	1	19	30-39	230-300	2,400	5,000	174
EV 250*300-2	2	0.67/1	13/19	30-39	230-300	2,400	5,000	190

Dimensions

In mm	A	B	C	D	E	F	G	H
EV 150*150-1	3,634	2,800	6,688	1,800	3,498	1,920	4,420	1,981
EV 150*200-1	3,634	3,300	6,688	1,800	3,998	2,170	4,420	1,981
EV 200*200-1	4,000	3,000	6,900	2,000	4,300	2,500	4,400	2,250
EV 200*200-2	5,000	4,000	6,900	2,000	4,300	2,500	5,400	3,250
EV 200*300-1	4,000	3,000	6,900	2,000	5,300	3,000	4,400	2,250
EV 200*300-2	5,000	4,000	6,900	2,000	5,300	3,000	5,400	3,250
EV 250*250-1	4,700	4,270	8,090	2,250	5,000	2,600	5,300	2,600
EV 250*250-2	5,700	4,270	8,090	2,250	5,000	2,600	6,300	3,600
EV 250*300-1	4,700	4,770	8,090	2,250	5,500	3,100	5,300	2,600
EV 250*300-2	5,700	4,770	8,090	2,250	5,500	3,100	6,300	3,600



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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

