



# Impact Crushers

Horizontal Impact Crushers | Vertical Impact Crushers | Multipactor

**SBM**  
MINERAL PROCESSING

**SBM impact crushers**  
yesterday – today – tomorrow

SBM's history started more than 50 years ago with the development of the legendary **swing beam mill**, which also gave **SBM** its name. Today about 5000 impact crushers worldwide demonstrate the efficiency, reliability and thus the success of this proven crusher concept.

Experience gained with several generations of crushers, the continuous further development and optimisation of crushing chamber design and geometry have made SBM impact crushers a universal machine applicable, in many industries.

The clearly defined, unique and high levels of quality, and the goal of continuous improvement of our engineering performance, products and services drive us to higher levels of achievement in the future under the banner: "Made in Austria". Our commitment is documented in numerous certificates, including ISO9001:2000.

Put your trust in the engineering and high levels of quality "Made in Austria" by SBM Mineral Processing.



## SBM impact crushers

Versatile and economical

Impact crushing – an ideal way of comminution

Impact crushing offers some general advantages compared with other crushing techniques:

- high degree of comminution
- selective grinding
- better product quality
- better grain shape / higher cubicity
- better / lower impact crushing value acc. to Los Angeles
- perfect loosening of concrete reinforcements in recycling processes

Impact crushers – the universal crushers

Design benefits of impact crushers compared with cone crushers:

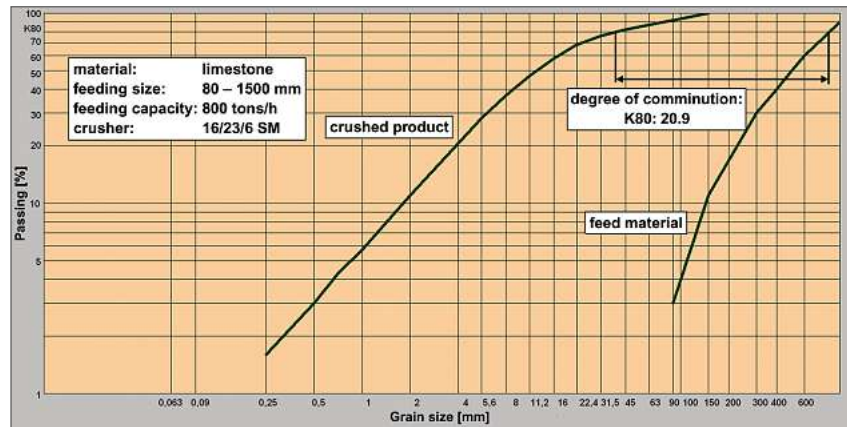
- flexibility for varying performance requirements
- insensitive against larger feed size

Impact crushers – the economical machines

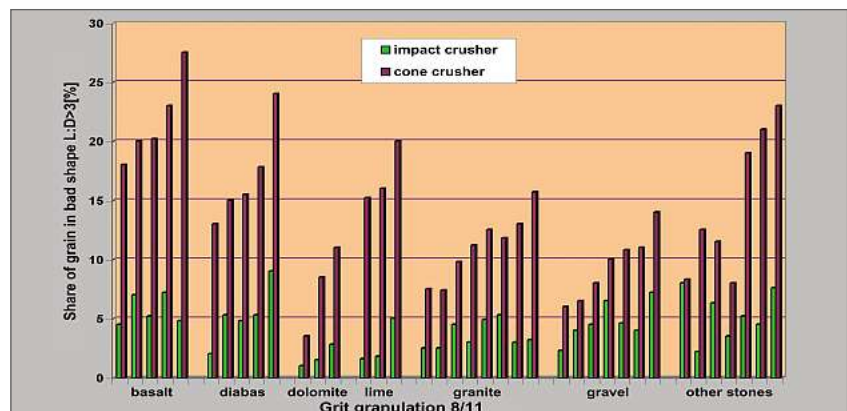
For many applications there are economic reasons in favour of an impact crusher:

- saving up to 2 crushing stages
- little space required
- little energy required
- low investment costs
- easy maintenance due to simple design
- low wear costs due to innovative wear materials – even in case of abrasive materials

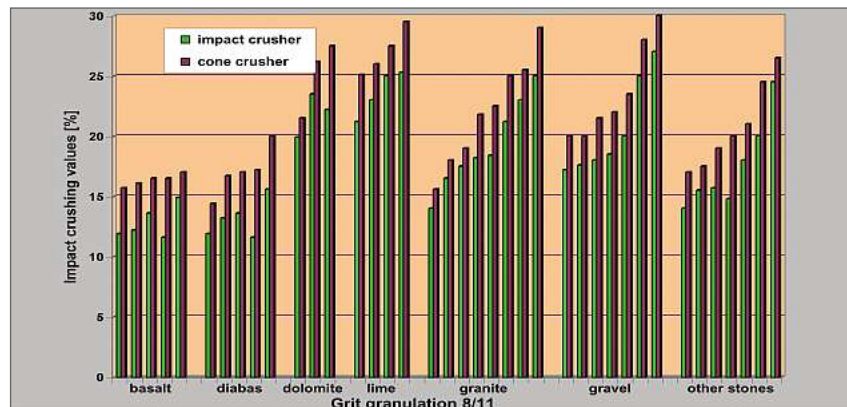
Examples of evaluations of the SBM technical centre with its crushing and analysing systems



Pic. 1 Impact crushing with high degree of grinding



Pic. 2 Comparison impact crusher / cone crusher: share of grain in bad shape



Pic. 3 Comparison impact crusher / cone crusher: impact crushing values

## SBM impact crushers - a good choice

With its comprehensive range of types SBM offers the right machine for every performance requirement. In terms of crusher rating we use a database and the know-how of the SBM technical centre with its crushing and analysing systems. The competence and experience of SBM stands for the best possible combination of the relevant process parameters, a proven design, high-grade components and optimum materials. A high specific throughput, excellent production results and a long service life of the SBM crushers will win you over.

## Horizontal impact crushers

### General

Both as primary or secondary crusher the SBM horizontal impact crushers are used to hard work and major challenges

- primary crushers for feed size up to 1,400 mm.

With excellent design features and functional features they are well equipped for their future work.



Pic. 1 Horizontal impact crusher type RHS



Pic. 2 Rotor shape SF, open



Pic. 3 Impact aprons 1 and 2

### Housing

- heavy-duty design
- lateral walls mainly made of high tensile-strength materials
- modular design
- largely generous equipment of rotors, aprons and armours, two intake structures to choose from (RHSMH / RHSM)
- grinding path for retrofitting

### Crushing chambers / impact zones

- **zone 1:**  
intake / rotor / first apron
- **zone 2:**  
rotor / second apron  
high crushing material acceleration  
utilisation of rebound effect
- **zone 3:**  
rotor / grinding path  
shaping area, grinding zone;  
length of the grinding path affects  
rate of oversized grain and cubicity

### Aprons

- 2 impact aprons as standard
- gap adjustment hydraulic/mechanical or fully hydraulic
- safety spindle for bottom stop

- optimally graded gap widths affect residence time of crushing material as well as throughput

### Options

- sensors at 2<sup>nd</sup> impact apron for automatic reset after response of overload protection
- measuring system for gap width display
- automatic control via discharge curve

### Rotor

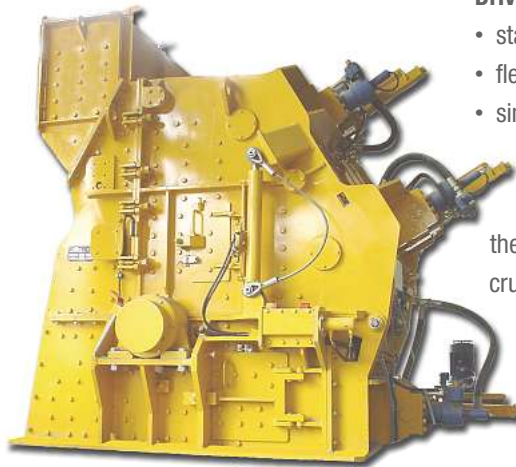
- heavy-duty design
- four rotor variants:  
open / closed / shape SSSL / shape SF

- type, arrangement and combination of blow bars affect the crushed product as well as wear; objective: “much crushing – little grinding”
- ejector for blow bars as an option
- combination of penetration depth into impact circle and circumferential speed provides for good intake and maximum comminution of crushing material
- rotor speed affects throughput, quality as well as grain distribution of the crushed material

### Drive

- standard V-belt drive
- flexible, for damping of shock loads
- simple changing of rotor circumferential speed

Due to the solid design of the rotor, the apron and the housing SBM impact crushers cope with to every challenge.



Pic. 4 Type 13/13/4 RHSMK 5

# SBM horizontal impact crushers – primary crushers

## Models and applications



### Type RHS

No grinding path; selective primary crushing of medium-hard natural stone, asphalt, reinforced concrete and building rubble



### Type RHSM 3

With 3-row grinding path for reduced share of oversized grain; selective primary crushing of medium-hard natural stone, asphalt, concrete and building rubble without reinforcement

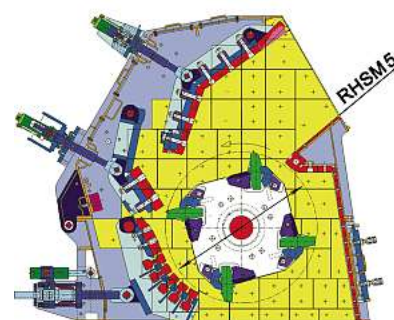
Free configuration with intakes, aprons, grinding path and rotors – adaptation to individual performance requirements due to modular design

## Technical data

Type	Data	Feeding size** up to [mm]	Throughput* from – to [tons/h]	Intake opening H x W [mm]	Number of blow bars	Weight approx. [kg]	Driving power* up to [kW]	Rotor [mm]
11/07/4 RHS	500	80 - 140	725 x 645	3/4	7150	110	1060	
11/07/4 RHSM 3					7600			
11/07/4 RHSM 5					9500			
11/09/4 RHS	600	90 - 160	725 x 835	3/4	9500	132	1060	
11/09/4 RHSM 3					10800			
11/11/4 RHS	700	100 - 180	725 x 1030	3/4	11600	160	1060	
11/11/4 RHSM 3					12300			
11/11/4 RHSM 5					12900			
11/13/4 RHS	700	150 - 220	850 x 1260	3/4	13500	200	1060	
11/13/4 RHSM 3					14200			
11/13/4 RHSM 5					15800			
13/11/4 RHS	900	110 - 220	1030 x 1030	3/4/6	15300	160	1280	
13/11/4 RHSM 3	700		830 x 1030		16800			
13/11/4 RHSM 5	700		830 x 1030		18200			
13/13/4 RHS	1000	180 - 300	1030 x 1260	3/4/6	17500	250	1280	
13/13/4 RHSM 3			700		830 x 1260			18300
13/13/4 RHSM 5	700	220 - 360	1030 x 1540	3/4/6	19800	250	1280	
13/16/4 RHS	1000		830 x 1540		20000			
13/16/4 RHSM 3	1000		830 x 1540		21500			
13/16/4 RHSM 5	700	260 - 410	1030 x 1860	3/4/6	23800	315	1280	
13/19/4 RHS	1000		1030 x 1860		26350			
13/19/4 RHSM 3	1000		1030 x 1860		28250			
13/21/4 RHS	1000	220 - 360	1030 x 2020	3/4/6	28600	400	1280	
13/21/4 RHSM 3			31000					
14/16/6 S	1200	270 - 420	1400 x 1510	4/6	31500	355	1310	
14/16/6 SM				3/4/6	33500			
14/21/6 SH		350 - 540	1400 x 2030	4/6	44500	450		
14/21/6 SMH				3/4/6	46500			
16/19/6 SMH	1400	650 - 800	1650 x 1845	4/6	69000	630	1600	
16/23/6 SMH		800 - 1000	1650 x 2300	4/6	78000	850		

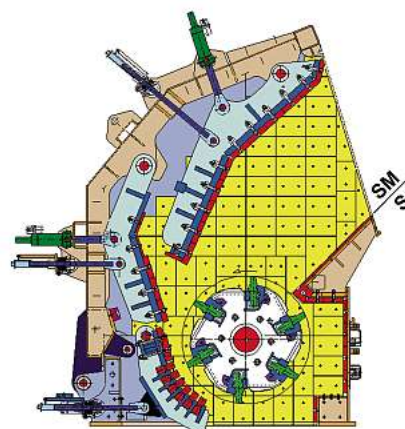
\*) depends on feed material and machine setting

\*\*) data refer to body diagonal



### Type RHSM 5

With 5-row grinding path for reduced share of oversized grain and best cubicity; selective primary crushing of medium-hard natural stone, asphalt, concrete and building rubble without reinforcement



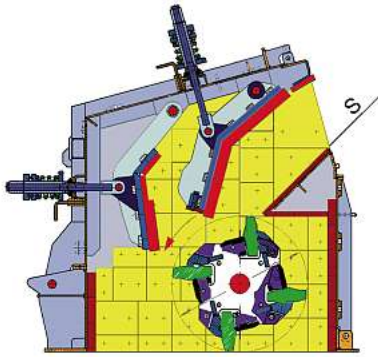
### Type SM

5-6-row grinding path for maximum degree of crushing; selective primary crushing of medium-hard natural stone with large feeding sizes

### Type S – without grinding path

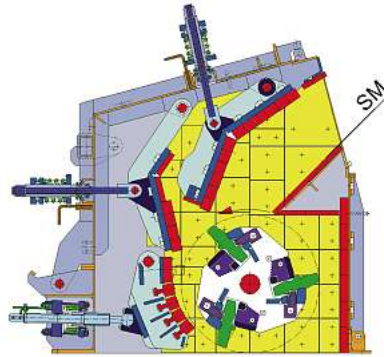
## SBM horizontal impact crushers – secondary crushers

### Models and applications



#### Type S

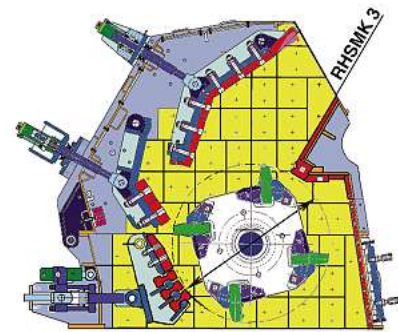
No grinding path; selective secondary crushing of medium-hard to tough-hard natural stone; mechanical apron adjustment; perfectly suitable for minor feeding capacities



#### Type SM

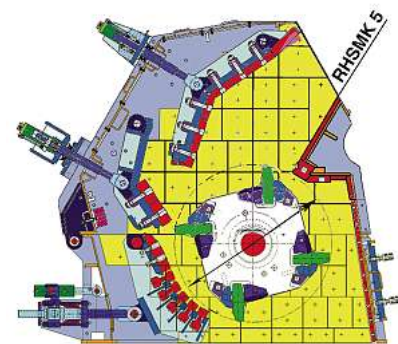
With grinding path for reduced share of oversized grain; selective secondary crushing of medium-hard to tough-hard natural stone; mechanical apron adjustment; perfectly suitable for minor feeding capacities

Free configuration with intakes, aprons, grinding path and rotors – adaptation to individual performance requirements due to modular design



#### Type RHSMK 3

With 3-row grinding path; selective secondary crushing of medium-hard to tough-hard natural stone, asphalt, concrete and/or building rubble without reinforcement; hydraulic/mechanical apron adjustment; steep intake for very good penetration into impact circle



#### Type RHSMK 5

Like type RHSMK 3, but with 5-row grinding path for reduced share of oversized grain and best cubicity

### Technical data

Type	Data	Feeding size** up to [mm]	Throughput* from – to [tons/h]	Intake opening H x W [mm]	Number of blow bars	Weight approx. [kg]	Driving power* up to [kW]	Rotor [mm]
8/5/3 S		200	40 - 70	390 x 465	3/4	3800	75	800
8/5/3 SM						4000		
8/7/3 S		300	60 - 90	390 x 620	3/4	4700	110	800
8/7/3 SM						5200		
11/7/4 RHSMK 3		300	80 - 140	415 x 645	4	7600	132	1060
11/7/4 RHSMK 5						9500		
11/9/4 RHSMK 3		300	90 - 160	415 x 835	4	9300	160	1060
11/9/4 RHSMK 5						11200		
11/11/4 RHSMK 3		300	100 - 180	415 x 1030	4	11300	200	1060
11/11/4 RHSMK 5						13500		
11/13/4 RHSMK 3		300	150 - 220	415 x 1260	4	13300	200	1060
11/13/4 RHSMK 5						14900		
13/11/4 RHSMK 3		300	110 - 200	460 x 1030	4	13960	160	1280
13/11/4 RHSMK 5						16300		
13/13/4 RHSMK 3		300	180 - 300	460 x 1260	4	18400	250	1280
13/13/4 RHSMK 5						19800		
13/16/4 RHSMK 3		300	220 - 360	460 x 1540	4	20200	315	1280
13/16/4 RHSMK 5						22160		
13/19/4 RHSMK 3		300	260 - 410	460 x 1860	4	26500	355	1280
13/19/4 RHSMK 5						27500		
13/21/4 RHSMK 3		300	350 - 460	460 x 2020	4	31200	450	1280
13/21/4 RHSMK 5						32200		

\*) depends on feed material and machine setting

\*\*) data refer to body diagonal

# SBM horizontal impact crushers – secondary crushers

## Secondary impact crushers for hard stone

SBM secondary impact crushers of type HSB are the economical alternative to cone crushers for hard stone up to a feeding size of 350 mm. This is successfully demonstrated day after day by a multitude of crushers of type HSB.

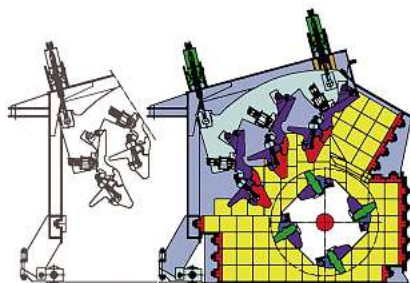
The main differences to the SBM impact crushers of type RHS, S and SM:

- special heavy-duty design of housing, rotor and aprons
- special shape and arrangement of aprons
- no grinding path



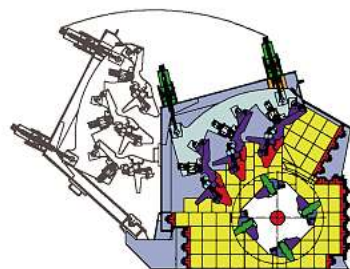
Pic. 1 Horizontal impact crusher type HSB-F

### Models and applications



#### Type HSB-F

With extendable housing for excellent accessibility to wear parts; especially for new planning and sufficient space conditions

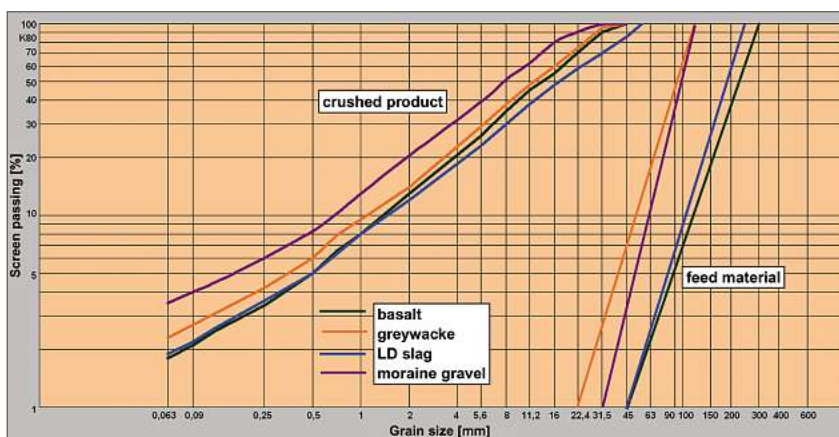


#### Type HSB-K

With folding top for easy maintenance in confined space conditions

## Practical examples

Crushed product curves of various materials



## Technical data

Data	Feeding size** [mm]	Throughput* [tons/h]	Intake opening H x W [mm]	Number of blow bars	Weight approx. [kg]	Driving power* [kW]	Rotor [mm]	
HSB-F 100/075	300	75 - 100	370 x 775	4	11000	110	1060	
HSB-K 100/075			370 x 1150		13000	132		
HSB-F 100/112		100 - 135	370 x 1505		16500	160		
HSB-K 100/112			125 - 165		450 x 1150	17000		200
HSB-F 100/150					450 x 1505	21500		200
HSB-K 100/150	350	175 - 215	450 x 1880	4	24500	250	1250	
HSB-F 125/112			150 - 175		450 x 1150	17000		200
HSB-K 125/112		175 - 215	450 x 1505		21500	200		
HSB-F 125/150			200 - 260		450 x 1880	24500		250
HSB-K 125/150					200 - 260	450 x 1880		24500

\*) depends on feed material and machine setting

\*\*) data refer to body diagonal

## SBM reversible horizontal impact crushers



Pic. 1 Impact crusher type SMR

The reversible SBM impact crushers of type SMR are universal crushers for mineral raw materials. Depending on the operating method a very high share of sand or grit can be produced.

The benefits of the SMR impact crusher in terms of process engineering and economic efficiency are as follows:

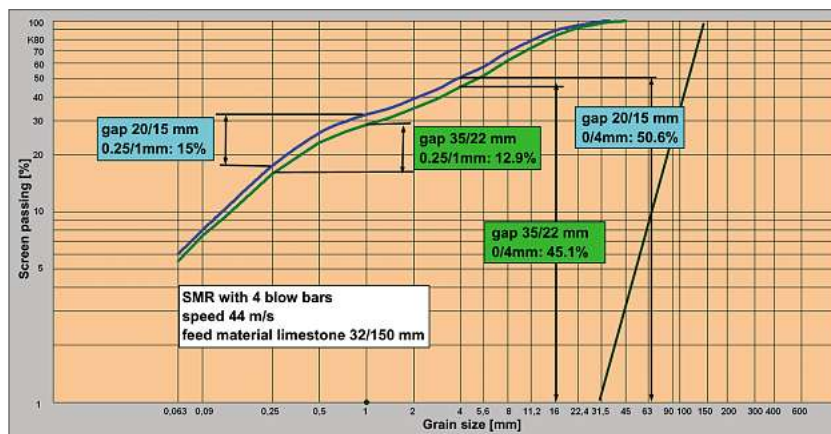
- high share of medium-sized grain in the range of sand or grit possible
- low share of filler
- regular crushed product due to re-sharpening of blow bars owing to the reverse operation
- low wear costs due to maximum degree of efficiency of wear parts

Wear data in actual duty

Feed material	Quartz-porphry	River gravel 97 % SiO <sub>2</sub>	Limestone	LD slag
Feeding size [mm]*	16/45 + 8/30	16/32 (50) in circuit	4/120	32/150
Throughput [tons/h]*	100	100	80	80 - 100
v [m/s]*	44	32	45	53
Service life (approx. h)/ set of blow bars*	400	60	1550	90

\*) depends on feed material and machine setting

### Effect of crushing gap



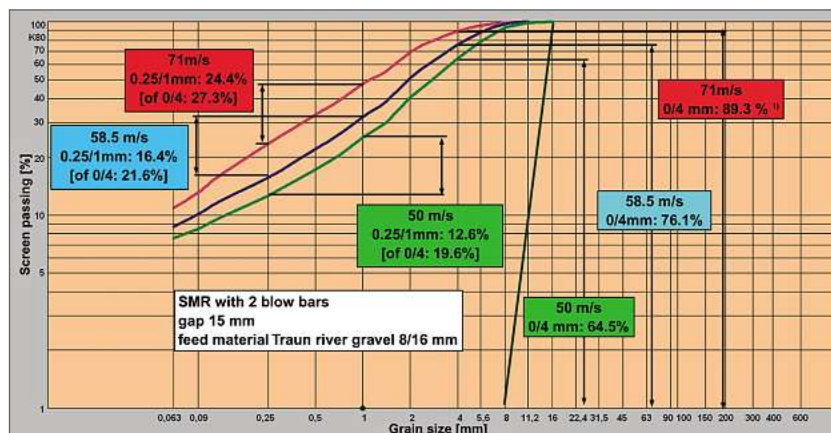
### Systematic control of crushed product via

- adjustment of crushing gap and speed
- design of rotor and aprons
- geometry of crushing chamber

### Compact design for installation

- in confined space conditions
- in mobile or semi-mobile plants

### Effect of rotor circumferential speed



### Serviceability due to

- split and bolted housing to ensure good accessibility
- 4 ultra-large maintenance doors
- pushed in wear parts

## SBM reversible horizontal impact crushers

Design features and variants of SMR impact crushers:

### 2 rotor versions

- rotor with straight blow bars as standard with reinforced web for feeding a coarse lumps with a share of 100-150 mm
- rotor and aprons with X-blow bars increase the share of 0.5-5 mm and lower the share of filler

### Crushing gap adjustment

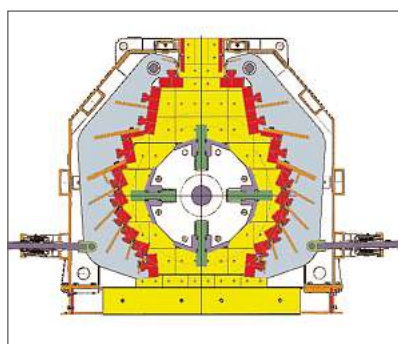
- mechanical via spindle
- automatic by means of hydraulic system and gap display (opt.)



Pic. 1 Crushing chamber of an SMR with wear parts  
Closed rotor with 4 straight blow bars

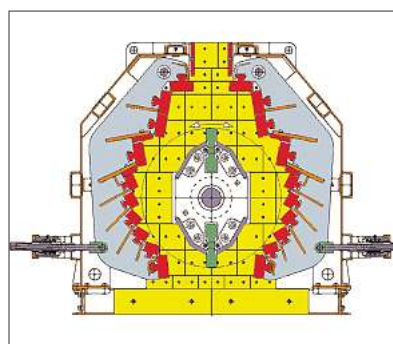
### Technical data

Machine type	Feeding size up to [mm]	For rotor circumferential speed [m/s]	Through-put [tons/h]	Driving power [kW]	Examples of achieved end product over K80 at delivered particle size	Machine weight [kg]
10/05/2 SMR 10/05/2 SMR-X	80	50 - 75	80	75 - 160	v=71m/s; river gravel; K80:0/2.8 mm for feed 8/16 mm	7900 8900
10/05/4 SMR 10/05/4 SMR-X	150	30 - 60	130	75 - 160	v=44m/s; river gravel; K80:0/14 mm for feed 32/80 mm	8100 9100
10/10/2 SMR	80	50 - 75	150	110 - 250	v=50m/s; river gravel; K80:0/5.6 mm for feed 8/16 mm	12000
10/10/4 SMR	150	30 - 60	200	110 - 250	v=37m/s; river gravel; K80:0/11 mm for feed 32/150 mm	12400



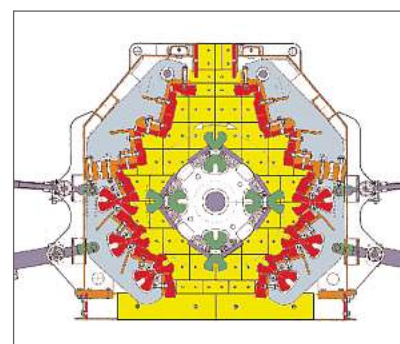
#### Type SMR with 4 blow bars

Secondary and tertiary crushing; selective crushing of soft to medium-hard natural stone and slag up to a feeding size of 150 mm; ideal for shaping and optimising the L.A. value



#### Type SMR with 2 blow bars

Tertiary crushing; selective crushing of soft to tough-hard natural stone; feeding size 2-80 mm; ideal for production of aggregates for ready-made plaster



#### Type SMR X

Special design for particular performance requirements (opt.)

## SBM vertical impact crushers

SBM vertical impact crushers are crushers to produce sand or reshape badly formed stone grain (cubicity). The range of application of type V includes second-

ary crushing of oversized grain up to approx. 45 mm edge length.



Pic. 1 + 2 SBM vertical impact crusher in operation

### Design and process features:

#### Material feeding and intake control

- charging via feeding hopper up to 40 mm feeding size
- intake control is effected via a manual orifice plate or fully automatically; feeding quantity and intake cross section are controlled via a filling level sensor.

#### Comminution in type V

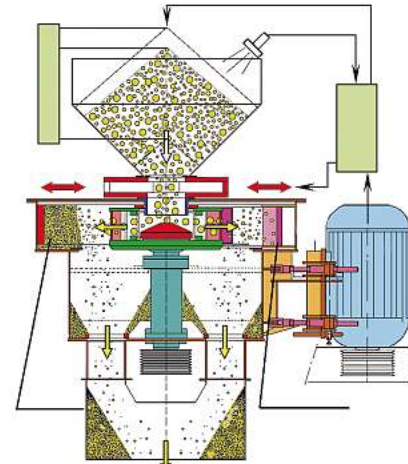
The whole flow of material is accelerated by the rotor and thrown against a wall of crushed material (material bed) or against anvils (higher share of fines).



Pic. 3 Rotor V8 with material bed

### The advantages of this patent pending system

- crusher can always be operated in the full load range
- no air can be sucked in through the intake cross section filled with material, therefore reduced dust emissions caused by the crusher
- low wear costs per ton of crushed material, since wear is approximately equal under part load and full load



Pic. 4 Control system and material flow

Table of vertical impact crusher type V

	V8	V10	V10H
Ø rotor inside	800 mm	1000 mm	1000 mm
Ø rotor outside	-/-	-/-	-/-
V <sub>max</sub> at tear-off edges	83 m/s	86 m/s	
number/height of channels	3/200 mm	3/200 mm	3/250 mm
feeding size	40/-mm	40/-mm	50/-mm
with/without intake control			
max. motor 1475 min <sup>-1</sup>	55 kW	75 kW	90 kW
at 50 m/s 1000 min <sup>-1</sup>	-/-	-/-	-/-
max. motor 1475 min <sup>-1</sup>	132 kW	200 kW	250 kW
at 80 m/s 1000 min <sup>-1</sup>	-/-	-/-	-/-
throughput up to	30 tons/h at 55 kW 85 tons/h at 132 kW	50 tons/h at 75 kW 140 tons/h at 200 kW	50 tons/h at 90 kW 180 tons/h at 250 kW
approx. weight with/ without impact ring (anvils)	5500 kg/-	7800 kg/-	8000 kg/-

## SBM impact crusher – Multipactor

The Multipactor produces very high shares of sand or grit in a very economical way at a max. length of feeding size of 80 mm.

### Crushing in the Multipactor:

The feed material is regularly accelerated through the three chambers. Primary crushing is effected at the impact ring or the material bed. Subsequently the pre-crushed material gets to the multi-crushing zone, where secondary crushing is performed by impact crushing, until the desired final grain size is achieved.

The degree of secondary crushing is adjustable via:

- rotor speed
- the number of anvils at the impact ring and/or crushing at the material bed
- the projection of the blow bars at the rotor



Pic. 2 Rotor with 2 blow bars and impact ring

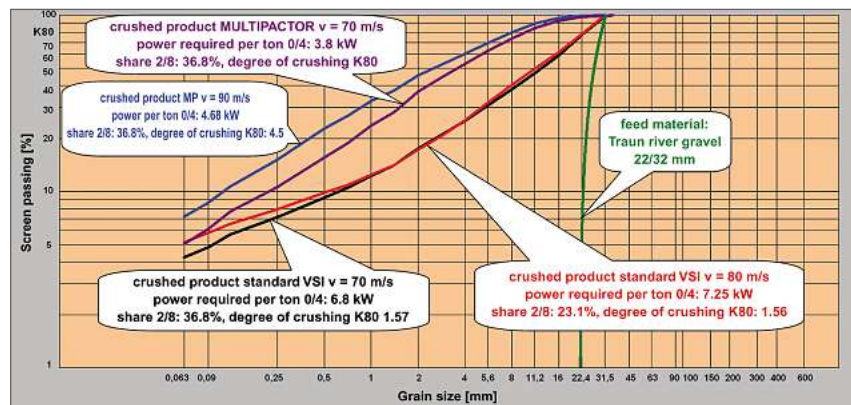
### Very low wear costs

Because of the structural separation of material acceleration and crushing zone very hard and brittle materials can be employed to the friction zones, and tough materials can be employed to the crushing zones. Additionally, speed in the friction zone is considerably reduced at the firing edges.

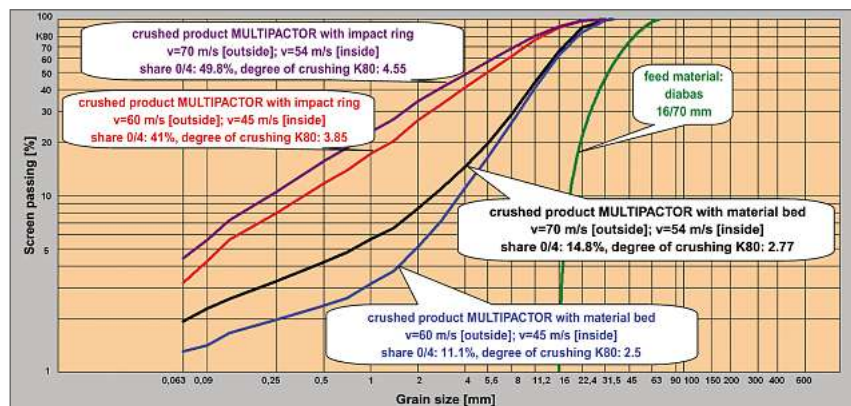


Pic. 1 Multipactor in operation, with vibrating feeder

### Comparison type V and Multipactor

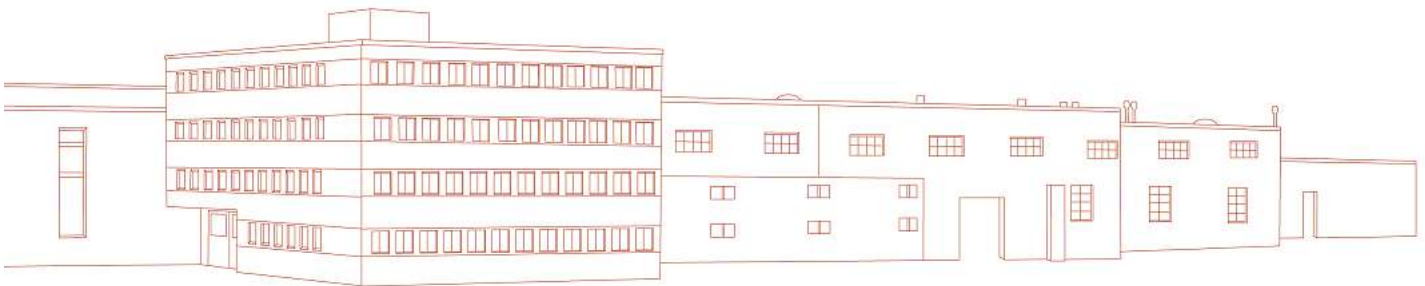


### Comparison Multipactor with/without impact ring



### Table vertical impact crusher Multipactor

	Multipactor V18	Multipactor V20	Multipactor V22
Ø rotor inside	800 mm	800 mm	1000 mm
Ø rotor outside	1100 mm	1100 mm	1300 mm
V <sub>max</sub> at tear-off edges	62 m/s	62 m/s	65 m/s
number/height of channels	3/200 mm	3/200 mm	3/250 mm
feeding size	50 / 80 mm		
with/without intake control			
max. motor	1475 min <sup>-1</sup>	110 kW	132 kW
at 50 m/s	1000 min <sup>-1</sup>	132 kW	250 kW
max. motor	1475 min <sup>-1</sup>	160 kW	250 kW
at 80 m/s	1000 min <sup>-1</sup>	160 kW	250 kW
throughput up to	110 tons/h	180 tons/h	350 tons/h
approx. weight with/without impact ring	6900 kg/9400 kg	7700 kg/10200 kg	13200 kg/16200 kg



**SBM Mineral Processing GmbH**

Arbeiterheimstraße 46

A - 4663 Laakirchen

Tel: +43 (7613) 2771-0

Fax: +43 (7613) 2771-359

[www.sbm-mp.at](http://www.sbm-mp.at)

[office@sbm-mp.at](mailto:office@sbm-mp.at)