Metso SUPERIOR® gyratory crushers

metso
Expect results

Metso SUPERIOR® primary gyratory – the first step in high-capacity crushing

Years of experience and thousands of primary gyratory installations combine to create the best gyratory the industry has to offer.

Metso SUPERIOR gyratory crushers are built to help you meet the challenges of high-capacity primary crushing. With thousands of units operating in mines and quarries around the world, Metso has the experience and capabilities to provide the top performance, throughput and efficiency.

Low cost per ton

In today's competitive market, environmental concerns and energy costs are on the rise. To meet these conditions, Metso offers a primary gyratory that provides a low cost per ton through energy efficiency, durability and optimized crusher performance.

A history of quality

SUPERIOR gyratory crushers embody Metso's 100+ years of experience and commitment to first-class crusher design and product development. Our gyratory crushers offer outstanding features that deliver high output and low operating costs. More than 1,500 SUPERIOR gyratories have been installed in mines and quarries worldwide.

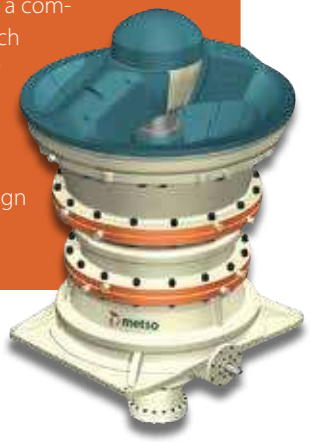
SUPERIOR gyratories are manufactured with high-quality cast steel components to ensure the highest possible functionality and reliability in primary crushing applications.

Crusher range

Metso offers a comprehensive range of SUPERIOR primary gyratories. Crushers are available in models with capacities ranging from 2010 to 8890 mtph (2200–9800 stph) and feed openings up to 1575 mm (62"), so there is one to match your feed material and throughput requirements.

Metso

Metso is the leading global supplier of equipment, solutions, and services to the mining and construction industries. We maintain our core expertise in crushing, screening, grinding, conveying, separation, enrichment, and demolition waste recycling through a comprehensive research and development program that incorporates true life cycle thinking from product design onwards.



SUPERIOR 60-89

The perfect blend of experience and innovation

The SUPERIOR gyratory crushers combine Metso's trusted technology with the latest advancements in metallurgy to achieve peak efficiency and high output by offering:

- A steep crushing chamber and long crushing surfaces for exceptionally high capacity and maximum liner life
- An extra heavy-duty frame, large diameter integral mainshaft assembly, and a high-performance bearing arrangement provide long life and reliable operation
- The correct crushing chamber design resulting in optimized production for your application
- Crusher capacity can be matched to plant requirements by a simple change of the eccentric bushing

Easy maintenance and service

Designed for low service requirements and ease of operation, the SUPERIOR primary gyratory will readily fit into any existing or proposed crushing plant.

- Automatic spider lubrication
- Modular lubrication system
- Mainshaft position indicator system
- Ease of external adjustment of backlash
- Available hydraulic spider separation for removal during maintenance

The right choice for your application

Whatever your crushing needs, you'll find the optimum solution with SUPERIOR gyratory crushers. They tackle the most demanding crushing applications, whether stationary or semi-mobile, surface or underground, and can easily crush the hardest and most abrasive rock and ore.

Project expertise

Primary gyratory crushers form a critical part of new and upgrade projects. Metso project engineers have the expertise to give you the right solution, tailored to your needs. They analyze, imagine, develop and build the complete process surrounding a crusher, overcome the hurdles and meet your objectives.

Metso Services

Make the most of your investment

Achieve your goals with a partner who will be there wherever and whenever you need them.

Metso offers a host of value-added services that can enhance your bottom line and help you make the most of your SUPERIOR primary gyratory. Whether you're installing an entire customized system, a complete circuit, or simply replacing or updating a single piece of equipment, you can count on us to help you make sure your crusher is running at peak efficiency.

Life cycle thinking

Using our long-term experience in crushing equipment and processes, Metso has developed an expert service offering aimed at ensuring maximum reliability and productivity at each step of your operation. Our life cycle services cover all areas of the crushing, size reduction and classifying process, and are aimed at improving the value of your end products.

Metso parts ensure optimal performance

Metso OEM parts are the most reliable replacement parts for your SUPERIOR gyratory crusher. They're designed in-house and manufactured according to strict specifications, so they fit perfectly every time. Metso uses only the highest quality material for parts that last — minimizing expensive downtime.

Working wear parts

Metso certified wear parts will protect your gyratory and prolong its service life. We have a strong research and development program, particularly in areas of metallurgy and part design. Metso wear parts are produced at our own foundries and manufacturing facilities. As a result, we have complete control over quality at every step of the process, from the selection of raw materials right on through to final production.

Global logistics

Metso offers comprehensive global spare and wear parts services, providing you with the right part, in the right place, at the right time and for the right price. Our service hubs are responsive with fast and easy access to crusher parts delivery, to help minimize your inventory costs and downtime.

Inspection services

Experience has shown that regular crusher inspections are key to meeting production goals. Regular inspections help prevent the mechanical and electrical failures that directly impact availability and productivity.

Field services

Metso is your single source for emergency or scheduled field services. We are ready to provide the industry's highest quality service teams to investigate, plan, recommend and execute the solutions you need to satisfy your crusher's operating requirements.

Metso Performance Solutions

Through our Metso Performance Solutions (MPS) program, we offer modular service packages that best fit your needs. We can provide either ready-made packages or tailored service agreements, which may include inspections, preventive maintenance and service and cost per ton agreements.

By jointly setting targets with you and monitoring your operations, Metso Performance Solutions can meet your needs. Our systematic field audits, data collection and analysis help to identify areas of improvement for your gyratory and the entire plant process.

Plant diagnostics and upgrade

Engineering analysis of your crushing circuit can substantially increase production. Metso experts can determine the correct set up of your primary and downstream crushers for optimum equipment application and plant productivity.

Training

Metso training can ensure that your operators are familiar with all the features of the crusher they are using. Properly trained operators gain knowledge of proper procedures, all feature functions, productivity tips, and important safety measures.

We offer a broad range of training courses coached by experienced professionals and available both online and at Metso locations worldwide. Specially tailored and in-house sessions are also available to meet your unique requirements.

Health, safety and environment

Health, safety and environment are key concerns for Metso and they are addressed with the same sense of responsibility as quality, productivity and cost efficiency issues. We also have the responsibility to conduct our operations in a way that is environmentally sound and to offer you services that in turn help you to live up to your environmental responsibilities.

Why Metso parts and service for your SUPERIOR primary gyratory?

- Proper form, fit and function of certified wear and spare parts
- Better process performance
- Improved productivity
- Reduced downtime and maximum plant availability
- Reliable equipment performance throughout the entire life cycle
- Effective preventative maintenance
- Increased production
- Better end product quality
- Overall cost reduction
- Improved safety

Advanced features

Metso has optimized the SUPERIOR design with one thing in mind — to be the most productive, reliable and efficient primary gyratory crushers on the market. The SUPERIOR range provides innovative, exclusive features with the power and performance to operate in the most demanding conditions.

Mainshaft position control

The mainshaft position system — successfully used for decades — is a hydraulic method of vertical adjustment to compensate for wear. It consists of a pump, controlled by a push-button, and a heavy-duty hydraulic cylinder that supports and adjusts the mainshaft assembly.

The SUPERIOR primary crusher is equipped with a balance cylinder that protects the step bearing and piston by keeping them in contact with the mainshaft assembly when any occasional upward movement of the mainshaft is encountered.

SUPERIOR primary gyratory crushers are fitted with a mainshaft position sensor probe. This gives a direct indication of the mainshaft position, enabling the operator to maintain the crusher setting, provide a consistent product, and monitor liner wear.

Spider design

The patented U-shaped spider arms (currently available on the 60-110E) reduce twisting during crushing. The simplistic shape of the spider arm creates a reliable, consistent product. Arched spider arms create clearance in the chamber and reduce material bridging.

Features for better crushing economy

- Exceptionally high capacity and maximum liner life provided by the steep crushing chamber and long crushing surfaces
- Long life and reliable operation provided by an extra heavy-duty frame, large diameter integral mainshaft assembly, and high-performance bearing arrangement
- Optimized production for your application provided by a computer-designed crushing chamber
- Versatility of changing the eccentric throw — crusher capacity can be matched to plant requirements simply by changing the eccentric bushing

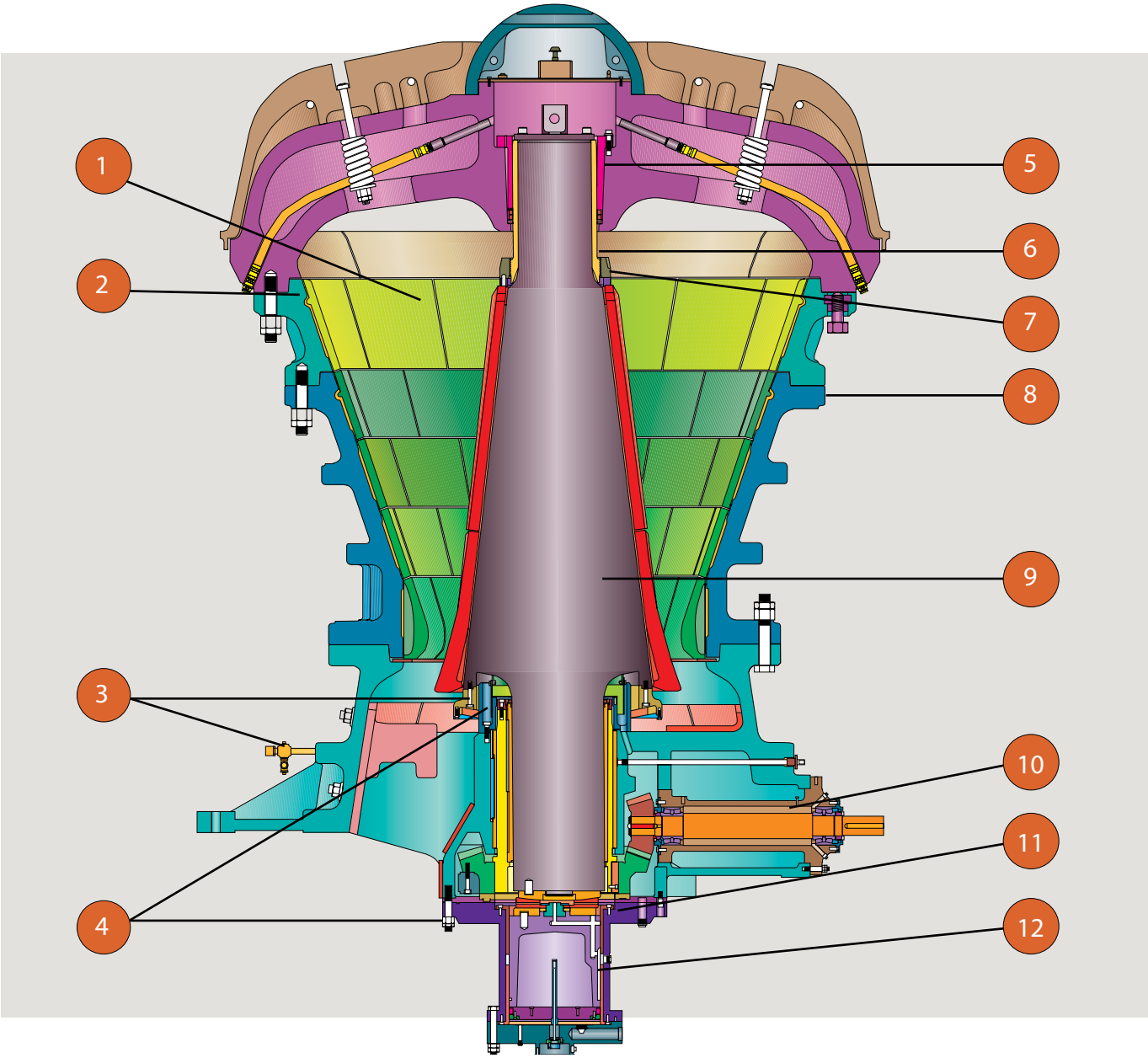
Crushing chambers provide even wear

Many years of design experience and accumulated operating data have led to the new SUPERIOR crusher design. We have developed a unique crushing chamber concept providing:

- Greater product uniformity
- Better distribution of wear throughout entire chamber, resulting in fewer service problems and lower operating cost
- Fewer liner changes — less wear cost per ton of product
- Improved energy efficiency

Heavy-duty mainshaft design

- The mainshaft is forged in one piece, meaning there's no risk of loosening head centers, reducing down-time
- Head nut threads are on the replaceable alloy steel mainshaft sleeve — no threads to damage on the shaft. The large, highly polished radius between the shaft upper journal diameter and the taper strengthens the mainshaft, providing long life
- Self-tightening head nut tightens mantle automatically
- Increased upper journal diameter provides extra strength for severe crushing applications



SUPERIOR gyratory crusher features

1 **Crushing chambers** are matched to each individual application, optimizing crushing performance

2 **Manganese wearing parts** are standard — chrome alloy option is available for concaves and bottomshell liners

3 **Effective dust seal** is equipped with an over pressure air blower to keep dust out of the eccentric and drive, increasing crusher bearing life

4 **Counterbalanced design**, ideal for all applications, mobile or stationary, minimizes forces transmitted to the supporting structure

5 **The spider bushing and seal** can be replaced without removing the spider — reducing manpower, time, equipment and lost production due to down-time

6 **Heavy-duty integral mainshaft** with alloy steel threaded sleeve reduces stress on the mainshaft

7 **Patented headnut with burning ring** allows for simple removal of the mantle

8 **High-strength shell design**, proven in the toughest applications, provides trouble-free operation and long life

9 **Mainshaft and head center** are forged in one integral piece, eliminating the possibility of the head center separating during operation

10 **External gear and pinion backlash adjustment**

11 **Patented step bearing wear indicator** releases harmless silver powder into the oil at worn bearing thickness

12 **The mainshaft position system** provides easy adjustment of the mainshaft to compensate for liner wear and to control product size

Proper installation is key

Feed and discharge arrangements can greatly affect crusher reliability and performance. Basic recommendations are:

- Position spider arm in line with truck discharge. The arm will split material flow into the crushing chamber for more even feed distribution
- Construct a stone box around the spider so material discharge from truck dumping falls on dead stone bed before entering the crushing chamber
- Avoid direct impact of dumped material on the spider cap or mainshaft assembly
- Scale-up in truck size and capacity can significantly alter the material discharge angle and impact point of heavy pieces — and may require modification of truck dump platforms
- Make surge pocket large enough to contain a minimum live storage of two truckloads (biggest truck size) and preferably more
- A high level device (optional) in the surge pocket can be used to signal operators when a full condition exists
- Significant increases in crusher throughput may require enlargement of the surge pocket and increase in product discharge flow

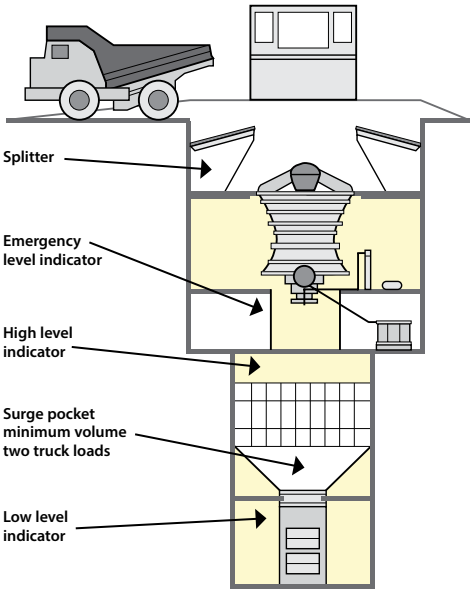
Proper feeding will result in the following:

- Increased life of crusher structural components
- Increased crushing chamber wear life
- Increased bearing life

Metso can provide additional installation and operation recommendations based on years of experience obtained from hundreds of SUPERIOR gyratory crusher installations worldwide.

Mobility

Use of mobile primary crushers as extraction progresses is considered by many companies to be the most economic alternative to heavy-duty truck haulage. The SUPERIOR crusher with maximum counter balance design provides the ideal crusher for these applications. Metso can offer innovative technical solutions for mobile gyratory crushing systems.



Total crusher and process control

Metso's TC1000-C automation system contributes to a higher return on your investment by improving overall crusher control, maximizing availability, and minimizing maintenance and energy costs.

The TC1000-C automation system (available as an option) simplifies operation and provides real-time information about the condition of the crusher:

- Ability to monitor, control, record, and communicate
- PLC based system
- Highly adaptable
- Easy to use

Benefits of TC1000-C automation:

1. Total machine protection minimizes downtime
2. Complete control of the crusher from the control room simplifies operation and reduces costly staff time

Total crusher control

Every aspect of the crusher is controlled by the TC System. The entire lubrication system is controlled, including the air blower, immersion heaters, lube pump, and oil coolers.

Asset protection

On-screen diagnostics help to better predict problems and schedule maintenance. The TC1000-C provides total machine protection for the crusher and auxiliary devices — reducing costly downtime while boosting the bottom line.

Automated diagnostics limit downtime

On-screen diagnostics help troubleshoot problems by showing possible causes involving shutdowns. This helps protect your gyratory and eliminates costly downtime.

The TC1000-C also records production information and crusher performance. It gives graphic trending of up to 24 hours of operation, which improves reporting capabilities.

Automation makes it possible to perform analyses and corrective actions based on process variations.

Capacities

Open side settings of discharge opening

Machine Size	Feed Opening mm (in)	Pinion RPM	Maximum kW (HP)	125 mm (5.0")	140 mm (5.5")	150 mm (6.0")	165 mm (6.5")	175 mm (7.0")	190 mm (7.5")	200 mm (8.0")	215 mm (8.5")	230 mm (9.0")	240 mm (9.5")	250 mm (10.0")
42-65	1065 (42)	600	375 (500)	—	2010 (2220)	2335 (2575)	2515 (2775)	2870 (3165)	—	—	—	—	—	—
50-65	1270 (50)	600	375 (500)	—	—	2395 (2645)	2780 (3065)	2935 (3240)	—	—	—	—	—	—
54-75	1370 (54)	600	450 (600)	—	—	2885 (3185)	2985 (3295)	3145 (3470)	3335 (3680)	3485 (3845)	—	—	—	—
62-75	1575 (62)	600	450 (600)	—	—	2890 (3190)	3615 (3985)	3815 (4210)	4205 (4640)	4330 (4775)	—	—	—	—
60-89	1525 (60)	600	600 (800)	—	—	—	4195 (4625)	4540 (5005)	5080 (5600)	5295 (5840)	5530 (6100)	5805 (6400)	—	—
60-110E	1525 (60)	600	1200 (1600)	—	—	—	—	5535 (6100)	6945 (7655)	7335 (8085)	7570 (8345)	8280 (9130)	8595 (9475)	8890 (9800)

The above capacities are based on an assumed feed where 100% of the feed passes 80% of the feed opening. 80% of the feed passes 60% of the feed topsize, and 50% of the feed passes a sieve size that is 10% of the topsize. The capacities are for feed materials with a bulk density of 1.6 metric tons per cubic meter (100 pounds per cubic foot).

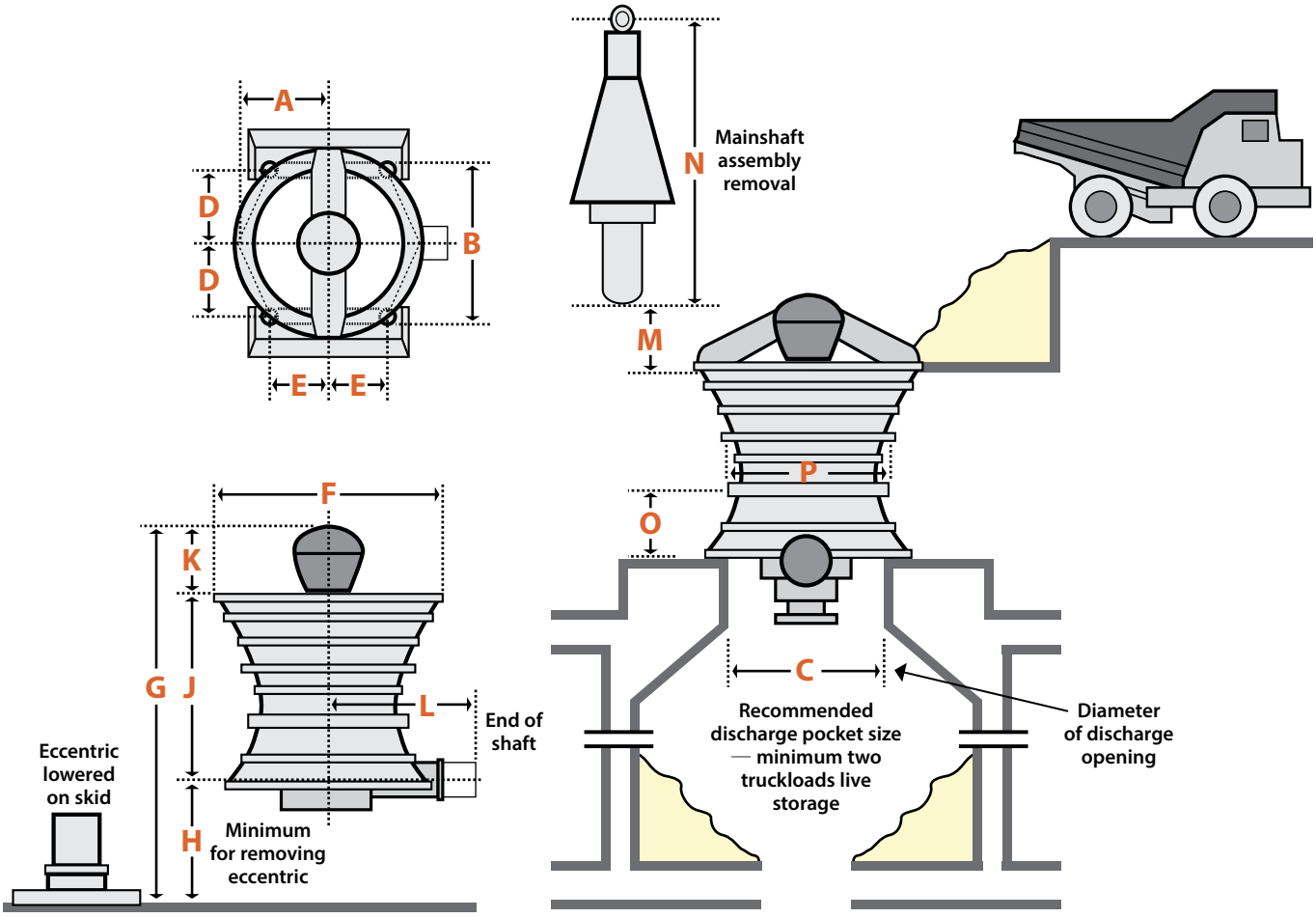
All capacities are calculated at a maximum throw for each respective machine. All capacities are relative to individual application. Material characteristics, feed size, distribution, work index, percent moisture, and feed method are factors when considering total crusher capacity. Please consult Metso to verify your capacity requirements.

Weight

Crusher Size		Total Crusher	Spider Assembly	Top Shell Assembly	Mainshaft Assembly	Bottom Shell Assembly	Mainshaft Position Assembly	Eccentric Assembly
42-65	kg pounds	119,750 264,000	20,500 45,200	36,330 80,100	23,130 51,000	29,570 65,200	4,040 8,900	3,080 6,800
50-65	kg pounds	153,300 338,000	30,840 68,000	54,880 121,000	28,120 62,000	29,570 65,200	4,040 8,900	3,080 6,800
54-75	kg pounds	242,220 534,000	38,100 84,000	85,050 187,500	38,560 85,000	62,140 137,000	5,400 11,900	5,720 12,600
62-75	kg pounds	298,460 658,000	69,850 154,000	109,320 241,000	42,180 93,000	62,240 137,200	5,400 11,900	5,720 12,600
60-89	kg pounds	398,250 878,000	65,320 144,000	154,680 341,000	66,220 146,000	82,780 182,500	10,430 23,000	8,940 19,700
60-110E	kg pounds	553,383 1,220,000	103,964 229,200	169,010 372,600	103,874 229,000	114,986 253,500	21,275 46,900	17,900 39,460

Dimensions

Crusher Size		A	B	C	D	E	F	G	H	J	K	L	M	N	O	P
42-65	cm	167.6	358.1	261.6	166.4	152.4	393.7	689.9	209.2	338.5	142.2	219.4	15.2	457.8	125.1	301.0
	ft. in.	5–5	11–9	8–7	5–5 ½	5–0	12–11	22–7 5/8	6–10 3/8	11–1 ¼	4–8	7–0 3/8	6	15–0 1/8	4–0 ¼	9–10 ½
50-65	cm	167.6	358.1	261.6	166.4	152.4	445.8	760.7	209.2	400.6	150.7	219.4	15.2	520.0	125.1	301.0
	ft. in.	5–5	11–9	8–7	5–5 ½	5–0	14–7 ½	24–11 ½	6–10 3/8	15–1 ¾	4–11 3/16	7–2 ½	0–6	17–0 ¾	4–0 ¼	9–10 ½
54-75	cm	204.4	439.4	322.9	207.0	174.0	492.8	840.5	244.8	435.0	160.7	245.4	15.2	563.5	145.4	358.1
	ft. in.	6–8 ½	14–5	10–7 1/8	6–9 ½	5–8 ½	16–2	27–6 7/8	8–0 3/8	14–3 ¼	5–3 ¼	8–0 ½	6	18–5 7/8	4–9 ¼	11–9
62-75	cm	204.4	439.4	322.9	207.0	174.0	557.4	908.1	244.8	503.7	159.6	245.4	15.2	618.6	145.4	358.1
	ft. in.	6–8 ½	14–5	10–7 1/8	6–9 ½	5–8 ½	18–3 1/8	29–9 ½	8–0 3/8	16–6 3/16	5–2 7/8	8–0 ½	0–6	20–3 ½	4–9 ¼	11–9
60-89	cm	228.6	513.1	374.6	241.3	175.3	558.8	1046.9	299.7	536.6	210.8	264.8	15.2	682.6	175.3	388.6
	ft. in.	7–6	16–10	12–3 ½	7–11	5–9	18–4	34–4 1/8	9–10	17–7 ¼	6–11	8–8 ¼	6	22–4 ¾	5–9	12–9
60-110E	cm	248.9	548.6	442.5	243.8	218.4	619.7	1138.2	386.4	537.2	214.6	283.8	22.9	765.6	185.4	477.5
	ft. in.	8–2	18–0	14–6	8–0	7–2	20–4	37–4 1/8	12–8 1/8	17–7 ½	7–0 ½	9–3 ¾	9	25–1 3/8	6–1	15–8



Expect results

It is our promise
to our customers and
the essence of our strategy.

It is the attitude
we share globally;
our business is to deliver
results to our customers,
to help them reach
their goals.

metso

Metso Minerals Industries, Inc., 20965 Crossroads Circle, Waukesha, WI 53186, USA, tel +1 262 717 2500, fax +1 262 717 2501, www.metso.com

2705-01 -12-ESBL/Pittsburgh