

WEAR PARTS
CONE CRUSHERS
LIPPMANN



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AFTERMARKET



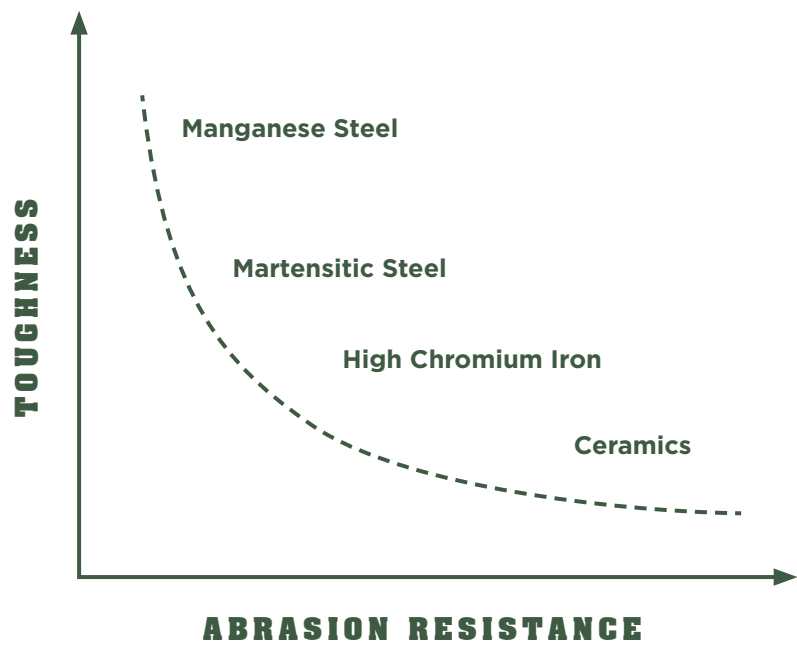
At MPP Aftermarket, we understand that every second of downtime impacts your bottom line. That is why we deliver premium wear parts for cone crushers with precision, reliability and speed. Our global parts inventory, supported by factory-trained technical and on-call support teams, means you get the right component exactly when you need it.

Whether you are replacing mantle and bowl liners or complete wear-kits, choosing the correct material grade and geometry is critical to maximize production and minimize unplanned maintenance. Industry leaders highlight that well-engineered wear parts help avoid costly stoppages, extend service life and stabilize crushing performance.

Partnering with MPP Aftermarket ensures your operations remain productive and profitable. Our promise is simple: uptime delivered.

WEAR PARTS MATERIALS & PROPERTIES

MATERIAL TOUGHNESS vs ABRASION RESISTANCE



WEAR PART MATERIALS

MANGANESE STEEL
Cone Liners (Cone Crushers)
Jaw Dies (Jaw Crushers)
MARTENSITIC STEEL (HARDENED STEEL)
Blow Bars (Impact Crushers)
HIGH CHROMIUM IRON (CHROME)
Blow Bars (Impact Crushers)
COMPOSITES (CERAMIC INSERTS)
Blow Bars (Impact Crushers)

MANGANESE STEEL

Manganese steel is the most common material for crusher wears. The wear resistance of manganese steel is based on a work hardening phenomenon. When the surface of manganese steel is under heavy impact or a compressive load, it hardens from the surface while the base material remains tough. The depth and hardness of the work hardened surface vary depending on the application and manganese steel grade.

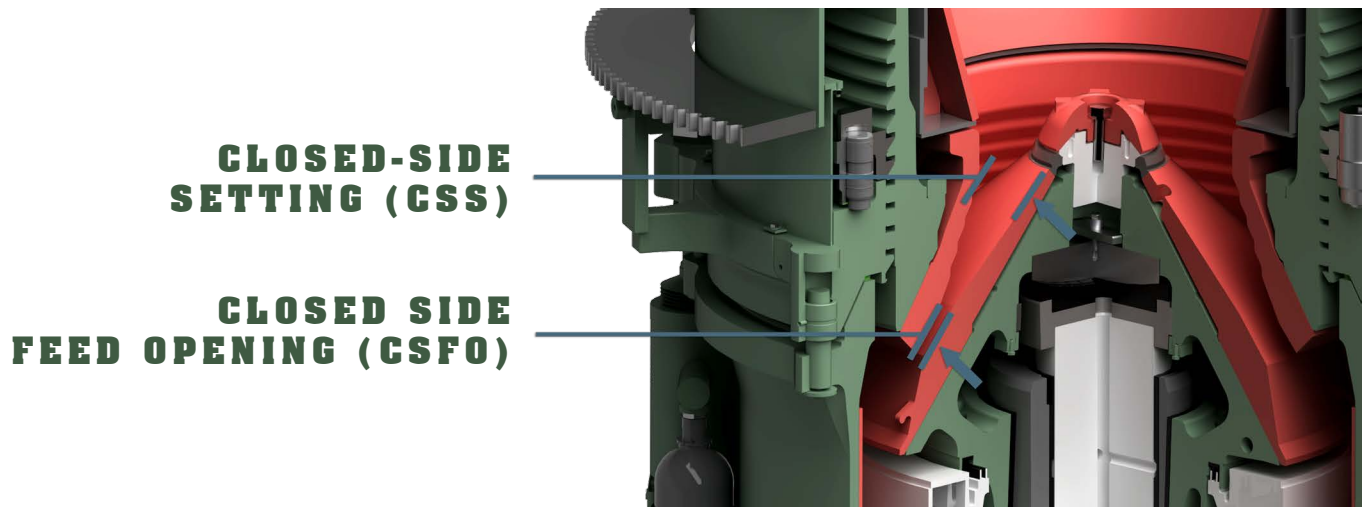
The standard all-round manganese level, and the most common for all jaws and cone liners, is 18%. Low-manganese-grade steel (14%) work hardens more slowly than higher grades but is more impact resistant. Higher levels (22%) are used in very hard and abrasive applications where significant wear resistance is needed.

	DIFFICULT AND ABRASIVE	DIFFICULT AND NON ABRASIVE	MEDIUM AND ABRASIVE	MEDIUM AND NON ABRASIVE	EASY AND ABRASIVE	EASY AND NON ABRASIVE
18% MANGANESE	✓	✓	✓	✓	✓	✓
22% MANGANESE	✓		✓		✓	



BASIC CONCEPTS OF CONE CRUSHING

KEY PARAMETERS AND TERMINOLOGY



CLOSED-SIDE SETTING (CSS)

CSS is the smallest gap between the mantle and bowl liner during the gyrating cycle. CSS directly controls the final product size and defines the reduction ratio of the crusher. It is measured from the bottom of the mantle to the bowl liner at their closest point.

A tighter CSS yields finer product but lower throughput, whereas a larger CSS allows more throughput but coarser output.

CLOSED-SIDE FEED OPENING (CSFO)

Closed-side feed opening refers to the area through which feed material enters the crushing chamber at minimum CSS. The open-side feed opening is the distance between mantle and bowl when they are farthest apart, and the closed-side feed opening is the distance at their closest point. The feed opening governs the maximum size of feed that the cone crusher can accept.

NIP ANGLE

Nip Angle is the angle between the mantle and bowl liner surfaces. A proper nip angle helps grip the rock. If the nip angle is too large, rock may slip upward rather than being crushed, leading to reduced capacity and accelerated wear. An excessive nip angle is observed as “bouncing” or “boiling” of feed in the chamber, indicating the cone crusher is not effectively biting the material.



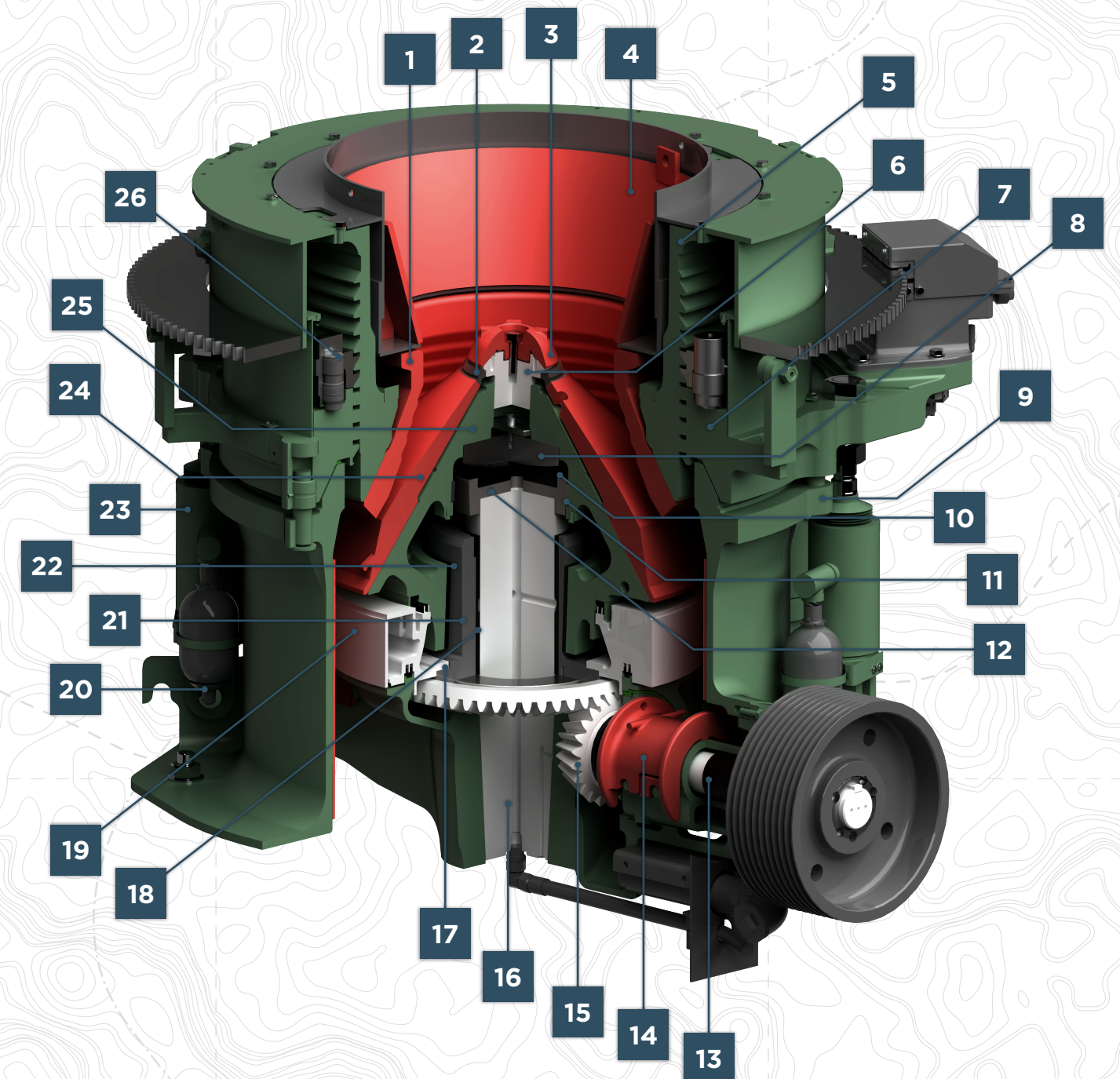
REDUCTION RATIO

Reduction Ratio refers to the ratio of the incoming feed size to the crusher’s output size (often measured at the 80% passing metric or P80). In cone crushers the reduction ratio typically ranges from about 4:1 to 6:1 in one pass. Coarser chamber liners can sometimes achieve a higher reduction in secondary applications, while finer liners operate in the lower end of the range.

Cone Crusher COMPONENT

LIPPMANN

- | | | |
|-------------------|-----------------------------|---------------------------|
| 1 Bowl liner | 10 Socket liner | 19 Counterweight guard |
| 2 Torch ring | 11 Upper head bushing | 20 Accumulator |
| 3 Feed cone | 12 Socket | 21 Eccentric |
| 4 Feed hopper | 13 Countershaft | 22 Lower head bushing |
| 5 Bowl | 14 Countershaft bushings | 23 Tramp release cylinder |
| 6 Head bolt | 15 Gear and pinion | 24 Mantle |
| 7 Adjustment ring | 16 Main shaft | 25 Head |
| 8 Head ball | 17 Eccentric thrust bearing | 26 Clamping cylinders |
| 9 Main frame | 18 Eccentric bushing | |



WEAR FACTORS WHAT AFFECTS WEAR LIFE

SERVICE LIFE FACTORS

The service life of crusher wear parts is influenced by many factors, from the type of wear and operating conditions to the characteristics of the feed material and the properties of the parts themselves.

Of these, the abrasiveness and crushability of the feed material are often the most critical, directly affecting performance, longevity, and overall operating efficiency.

ENVIRONMENTAL FACTORS	TYPE OF WEAR	CRUSHER PARAMETERS	FEED	WEAR MATERIAL
<ul style="list-style-type: none"> Moisture Temperature 	<ul style="list-style-type: none"> Abrasion Fatigue Corrosion Adhesion 	<ul style="list-style-type: none"> CSS Speed Stroke 	<ul style="list-style-type: none"> Distribution Rock types & characteristics Wearing Particles 	<ul style="list-style-type: none"> Wear material type / Chemical composition Wear part Manufacturing quality

FEED MATERIAL CLASSIFICATION & PROPERTIES

CLASSIFICATION	FRENCH ABRASIVENESS (G/TON)
Non-Abrasive *	0 - 100
Slightly Abrasive **	101 - 600
Medium Abrasive ***	601 - 1200
Abrasive ****	1201 - 1700
Very Abrasive *****	1701 +

CLASSIFICATION	CRUSHABILITY (%)
Very Easy *	50 +
Easy **	40 - 49
Medium ***	30 - 39
Difficult ****	20 - 29
Very Difficult *****	0 - 19

APPLICATION	ABRASIVENESS	CRUSHABILITY
Basalt	500 - 2500 ****	20 - 50 ***
Dolomite	0 - 500 **	30 - 60 **
Granite	900 - 1900 **	30 - 90 *
Gravel	300 - 2500 ***	30 - 55 **
Limestone	0 - 500 **	30 - 65 **
Recycled Concrete	600 - 1200 ***	20 - 50 ***
Recycled Asphalt	1500 - 2400 *****	30 - 50 ***

ABRASIVE CLASSIFICATION

Abrasiveness of the feed material can be determined in rock laboratories using a test for abrasiveness. The table (left) indicates the abrasiveness of rock based on this test.

CRUSHABILITY CLASSIFICATION

Crushability indicates how easily the rock material breaks down. Harder rock with a low crushability value requires more crushing energy than softer rock with a higher crushability value.

MATERIAL PROPERTIES

Different materials wear crusher parts differently. Highly abrasive types like basalt need tougher parts, while softer aggregates such as limestone are easier to crush. Understanding abrasiveness and crushability ensures optimal wear part selection.

CHAMBER SELECTION

STANDARD CHAMBER PROFILES

Chamber selection is ultimately determined by the properties of the feed, especially the feed top size. A good place to begin is with the nominal values listed below, as these represent the optimal operating conditions for each crushing chamber.

For Standard chambers, ensure that 100% of the feed is equal to or below 80% of the open-side feed opening. To maximize chamber performance, the ideal feed size should be approximately 80% of the maximum feed size at the nominal setting.

MACHINE	STANDARD PROFILES	MINIMUM CSS ¹	CLOSED SIDE FEED OPENING AT MIN CSS	NOMINAL CSS	MAX FEED SIZE AT NOMINAL SETTING ³
300R	Fine (STD F)	13 mm (0.51 in)	107 mm (4.21 in)	18 mm (0.71 in)	113 mm (4.45 in)
	Medium (STD M)	17 mm (0.67 in)	150 mm (5.91 in)	25 mm (0.98 in)	163 mm (6.42 in)
	Coarse (STD C)	19 mm (0.75 in)	211 mm (8.31 in)	25 mm (0.98 in)	214 mm (8.43 in)
400C	Medium (STD M)	20 mm (0.79 in)	198 mm (7.8 in)	30 mm (1.18 in)	210 mm (8.27 in)
	Coarse (STD C)	25 mm (0.98 in)	252 mm (9.92 in)	35 mm (1.38 in)	259 mm (10.2 in)
	Extra Coarse (STD EC) ²	30 mm (1.18 in)	299 mm (11.77 in)	45 mm (1.77 in)	304 mm (11.97 in)
500C	Fine (STD F)	16 mm (0.62 in)	133 mm (5.18 in)	22 mm (0.85 in)	140 mm (5.46 in)
	Medium (STD M)	20 mm (0.79 in)	204 mm (7.95 in)	30 mm (1.17 in)	216 mm (8.42 in)
	Coarse (STD C)	25 mm (0.98 in)	286 mm (11.15 in)	35 mm (1.36 in)	298 mm (11.62 in)

SHORT HEAD CHAMBER PROFILES

Short Head liners are built for tertiary and quaternary stages, when you need finer product and tighter control of gradation. MPP Aftermarket is proud to offer Short head chamber profiles, delivering our finest crushing capability yet.

For Short Head chambers, 100% of the feed material should be equal to or smaller than the chamber’s closed-side feed opening. This ensures smooth material flow through the chamber even at the higher operating speeds common in short head applications. In gravel pit applications with rounded material, these recommended feed limits should be reduced by 10–20%

MACHINE	SHORT HEAD PROFILES	MINIMUM CSS ¹	CLOSED SIDE FEED OPENING AT MIN CSS	NOMINAL CSS	MAX FEED SIZE AT NOMINAL SETTING ³
300R	Medium (SHM)	6 mm (0.24 in)	53 mm (2.09 in)	12 mm (0.47 in)	60 mm (2.36 in)
400C	Medium (SHM)	8 mm (0.31 in)	52 mm (2.05 in)	14 mm (0.55 in)	59 mm (2.32 in)
500C	Medium (SHM)	10 mm (0.39 in)	57 mm (2.22 in)	14 mm (0.55 in)	59 mm (2.32 in)

1. *Minimum CSS is theoretical and may not be achievable for certain materials or applications.
2. Requires a separate adapter ring to install the bowl liner.
3. To maximize chamber performance, ideal feed size should be 80% of the maximum feed size at the nominal setting.

CONE CRUSHERS

SHORT HEAD LINERS



Example of short head (left) and standard liners (right)

LIPPMANN STANDARD VS SHORT HEAD LINERS

Standard liners are typically used in secondary applications. Secondary applications don't necessarily need to be operated in closed circuit, but preferably choke fed. Short head liners are used in tertiary or quaternary stage applications for fine crushing. Fine crushing requires choke feeding and closed circuit operation with oversize returning to the crusher.



CONE CRUSHERS

STANDARD CHAMBER PROFILES

FINE (F) CHAMBERS

RELATIVELY SMALL FEED OPENING AND STEEP ANGLE

- High reduction ratios and produce finer, more cubical aggregates.
- Often selected for tertiary crushing of prepared feed.
- Works best with moderate feed topsize

Fine chambers are a good choice when you need a smaller product and have controlled feed coming from a preceding screen or crusher.



MEDIUM (M) CHAMBERS

BALANCED FEED OPENING AND ANGLE

- Often selected for secondary aggregate applications
- Provide versatility, good reduction and decent throughput
- Medium chambers accept larger rock than Fine cavity and will still produce a relatively fine output

This profile might be used, for example, when feed size is around 150 mm (5.91 in) or less and a mix of throughput and moderate fines is desired.



COARSE (C) CHAMBERS

RELATIVELY LARGE FEED OPENING AND GRADUAL ANGLE

- Coarse liners are typically used for secondary crushing, especially after a primary jaw crusher.
- Coarse profiles prioritize capacity and can achieve higher reduction per stroke for bigger feed pieces.

Using Coarse chambers is recommended when you need to process larger feed from the pit and aren't aiming for the smallest product on that stage.



EXTRA COARSE (EC) CHAMBERS

LARGEST FEED OPENING AND SHALLOW CRUSHING ZONE

- EC chambers are designed for handling very large feed sizes in secondary or even primary-crushing roles.
- EC liners have the least aggressive profile yield a coarser output, but they maximize throughput

This profile is ideal when the cone crusher is being used in a secondary position with a very large feed coming directly from a primary crusher or blasting, and the emphasis is on handling capacity.



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MPP Aftermarket is the exclusive OEM provider of parts, service, and technical training for Lippmann. Strategically located parts centers in North America and Europe enable rapid delivery, maximizing equipment uptime for customers worldwide.

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