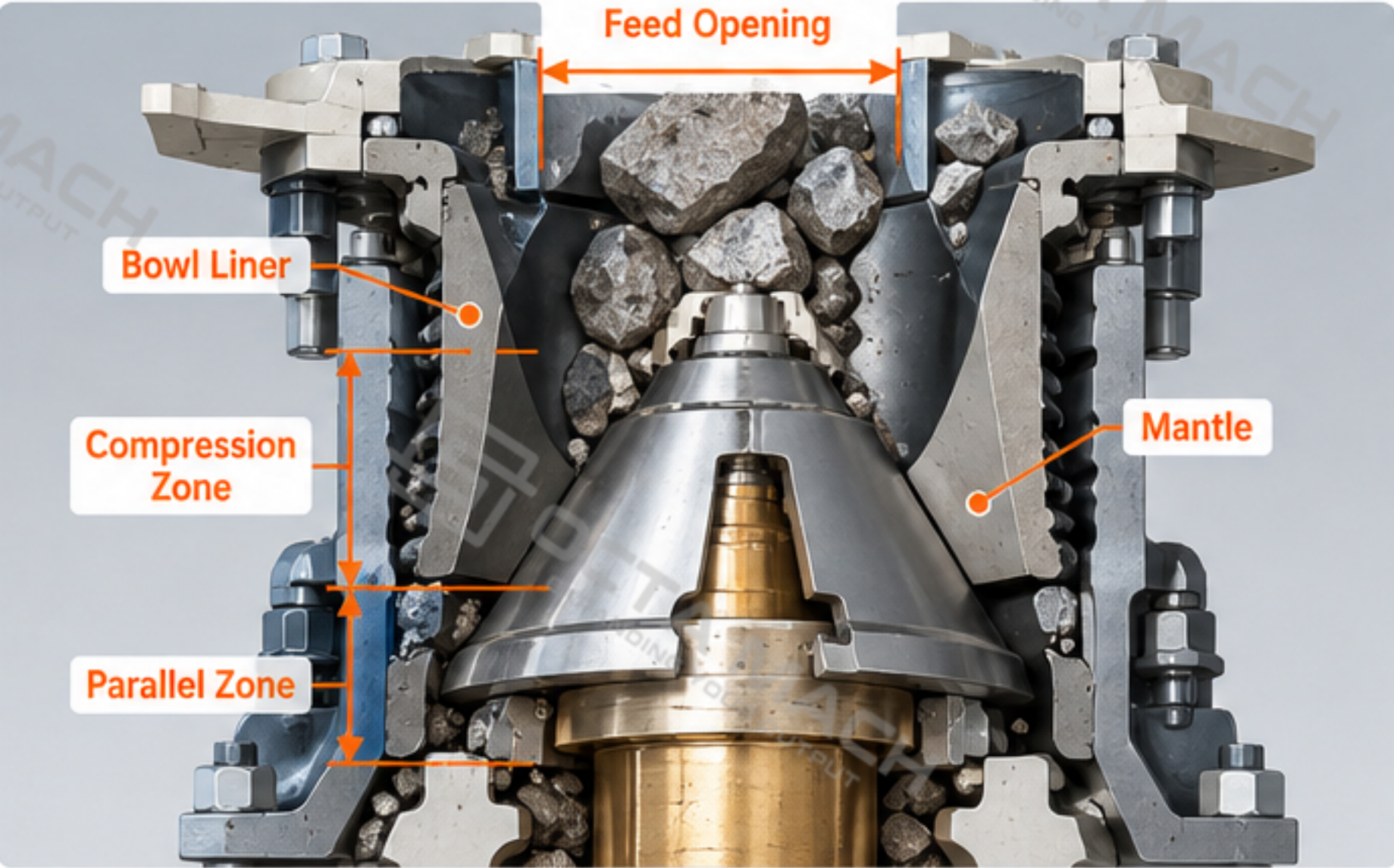


Chamber Geometry and Critical Dimensions

The crushing chamber of a cone crusher is formed by the mantle mounted on the moving head and the bowl liner fitted inside the surrounding bowl assembly. As the head moves eccentrically, the distance between the two crushing surfaces changes continuously, generating the compressive forces required to reduce rock size. Chamber geometry determines how material enters the crushing zone, moves between the liners, and passes toward the discharge opening. The feed opening, liner profile, chamber length, and closed-side setting (CSS) must therefore be considered together. A liner that fits the supporting assembly does not necessarily provide the intended crushing chamber geometry.

Critical Chamber Geometry Parameters

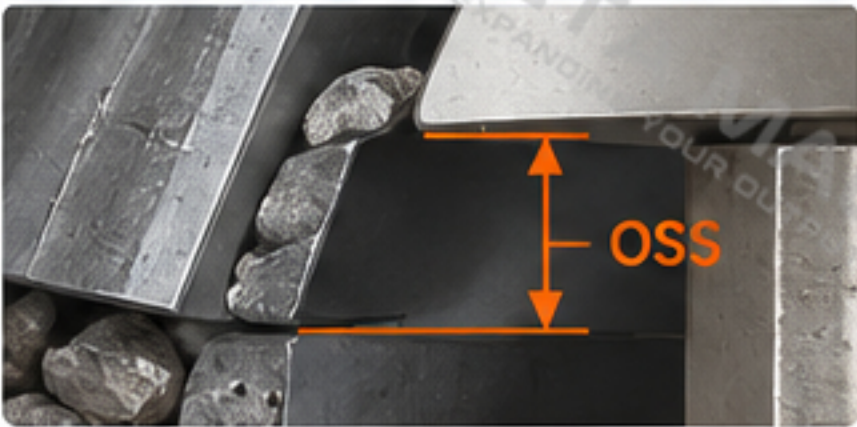
Parameter	Technical Definition	Engineering Significance
Feed Opening	Available entry space between the crushing surfaces at the chamber inlet	Influences the maximum acceptable feed size
Mantle Profile	Contour of the moving inner crushing surface	Influences compression geometry and material movement
Bowl Liner Profile	Inner contour of the stationary outer crushing surface	Defines the outer boundary of the crushing chamber
Compression Zone	Region where particles are compressed between the liners	Influences particle breakage and force distribution
Parallel Zone	Lower chamber region where opposing liner profiles approach a more nearly parallel arrangement, where applicable	Influences final-stage compression and material passage
Closed-Side Setting (CSS)	Minimum crushing gap at the designated setting reference location	Affects discharge conditions and product size distribution
Open-Side Setting (OSS)	Maximum gap at the corresponding reference location during the eccentric cycle	Describes the opening range of the chamber



Closed-Side Setting (CSS)



Open-Side Setting (OSS)



Relationship Between Chamber Profile and CSS

The CSS is an operating adjustment, while the liner profile is a geometric feature of the installed crushing chamber. Reducing CSS narrows the minimum discharge opening, but it does not compensate for an unsuitable liner profile or an incorrectly matched mantle and bowl liner.

Chamber assessment should consider the intended feed size, operating setting range, and material movement through the complete crushing zone. **CSS alone cannot predict the finished product gradation**, which also depends on feed characteristics, chamber loading, machine operation, and screening arrangements.

Coarse, Medium and Fine Chamber Profiles

Cone crusher chambers are configured with different liner profiles to accommodate the required feed size, crushing stage, and discharge conditions. Coarse, medium, and fine chambers differ in their inlet geometry, compression path, and lower crushing-zone configuration.

Chamber designations are not necessarily interchangeable across manufacturers or crusher series. A coarse profile for one crusher model may have different dimensional limits from a similarly named profile for another. Chamber selection must therefore be based on the specific equipment configuration and its approved liner options.

Comparison of Typical Chamber Configurations

Chamber Type	General Profile Characteristics	Feed Considerations	Typical Application
Coarse	Relatively open inlet geometry and chamber configuration intended for larger feed	Larger feed particles within the specified machine limits	Secondary crushing or other large-feed duties
Medium	Intermediate chamber geometry balancing feed acceptance and reduction requirements	Moderately sized, suitably graded feed	Secondary or tertiary crushing, depending on equipment
Fine	Chamber geometry intended for smaller feed and finer reduction duties	Smaller feed within the specified chamber limits	Tertiary or fine crushing applications

These descriptions represent general chamber categories. Actual feed limits, CSS ranges, capacity, and liner availability must be confirmed for the specific crusher model.

Coarse Chamber

Coarse chamber with a relatively open inlet geometry for larger feed particles.

Medium Chamber

Medium chamber with intermediate geometry balancing feed acceptance and reduction requirements.

Fine Chamber

Fine chamber designed for smaller feed and finer reduction duties.

How Chamber Geometry Affects Material Movement

In a coarse chamber, the liner arrangement provides an entry geometry intended to accept relatively larger feed particles. A fine chamber is configured for smaller feed and the compression conditions required for finer reduction. Medium chamber profiles provide an intermediate arrangement, although the actual chamber shape is determined by the crusher series.

An unsuitable chamber profile can restrict feed entry, disrupt material movement, or reduce the usable operating range. A finer chamber should not be selected solely to achieve a smaller product size if the incoming material exceeds its permitted feed dimensions.

Chamber Profile Selection Considerations

Operating Condition	Required Evaluation
Large maximum feed particles	Confirm the feed opening and permitted maximum feed size
Wide feed-size distribution	Review feed gradation and the risk of packing or unstable chamber loading
Fine product requirement	Confirm the achievable CSS range and suitable chamber profile
Abrasive rock	Evaluate expected liner wear without assuming geometry alone determines service life
Existing mantle or bowl liner retained	Confirm that the replacement profile is approved for the remaining liner and bowl/head configuration

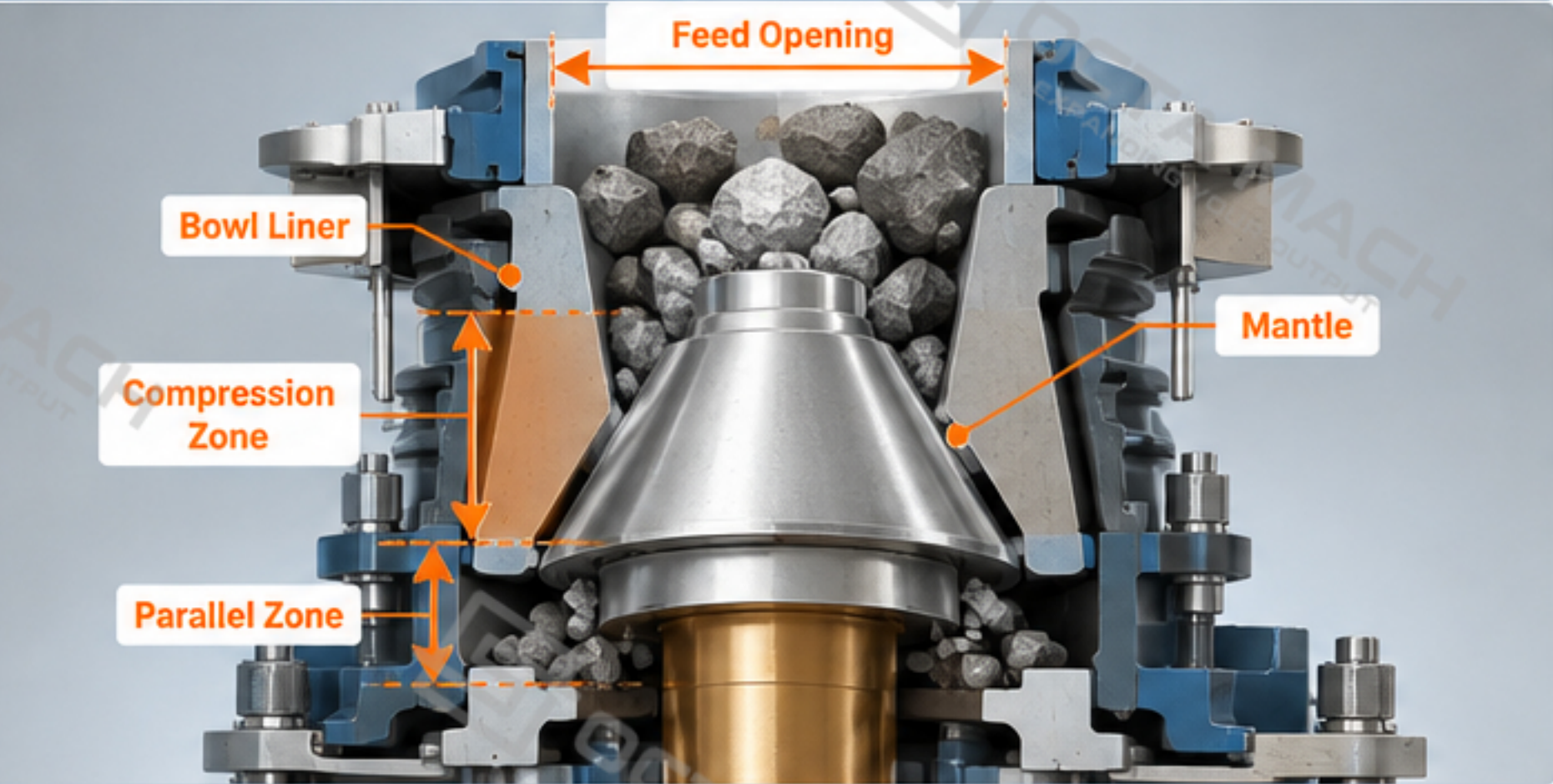
Mantle and Bowl Liner Matching

The mantle and bowl liner form a matched set of crushing surfaces. Their profiles determine the available chamber space throughout the eccentric cycle, while their mounting interfaces determine how each casting fits and is retained within the crusher assembly. Two liners may have compatible overall dimensions yet form an unsuitable chamber when installed together. Differences in profile shape, installation height, seating geometry, or liner configuration can affect feed entry, minimum clearance, and material movement through the crushing zone.

Critical Liner Matching Requirements

Matching Item	Technical Verification	Risk of Incorrect Matching
Crusher Model and Configuration	Confirm the equipment series, exact model and applicable assembly configuration	Selection of an incompatible liner
Mantle and Bowl Liner Profiles	Verify the intended matching profile combination	Unsuitable chamber shape and material flow
Installation Height	Confirm the installed position of each liner relative to its support	Incorrect chamber geometry or setting range
Seating and Contact Interfaces	Check the specified bearing areas and mounting geometry	Incomplete seating or uneven support
Retaining Arrangement	Confirm the required locking and securing components	Inadequate liner retention
Setting and Clearance Range	Verify the permissible operating range with the selected liner combination	Interference or an unsuitable adjustment range

Mantle and Bowl Liner Assembly



Correct Liner Matching



✓ Correct Liner Matching
Mantle and bowl liner are a matched pair for the same equipment configuration, providing the intended chamber geometry and operating range.

Incorrect Liner Matching



✗ Incorrect Liner Matching
Mismatched profiles or installation positions can produce an unintended chamber shape, restrict feed entry, or reduce the available setting range.

Chamber Clearance and Profile Compatibility

A correctly specified liner combination provides the intended chamber geometry throughout the required operating range. The mantle and bowl liner must maintain the clearances prescribed by the crusher design, including allowance for eccentric movement and the specified setting adjustments.

When only one liner is replaced, the geometry and condition of the remaining liner should also be reviewed. A new mantle installed opposite a substantially worn bowl liner, or the reverse, can produce a different chamber profile from the original matched arrangement.

Matching Limitations

Nominal casting weight, overall diameter, and crusher model name are insufficient to establish liner interchangeability. Final matching should be based on approved liner profiles, mounting dimensions, and the equipment manufacturer's applicable configuration requirements.

Where an alternative liner profile is proposed, its compatibility with the corresponding opposing liner and available setting range must be confirmed before installation.

Chamber Selection and Technical Verification

Cone crusher chamber selection requires the combined evaluation of feed characteristics, crushing duty, liner configuration, and the required discharge setting. The objective is to identify a chamber profile that accommodates the incoming material while operating within the crusher's approved mechanical and adjustment limits.

Selection should begin with the actual operating conditions rather than the chamber name alone. Maximum feed size, feed gradation, target product requirements, and the installed liner arrangement must be evaluated before confirming a coarse, medium, or fine configuration.

Essential Chamber Selection Parameters

Selection Parameter	Engineering Information Required	Influence on Chamber Selection
Crusher Model	Exact crusher model and configuration	Determines available chamber and liner options
Crushing Stage	Secondary, tertiary or fine crushing duty	Establishes intended reduction duty
Maximum Feed Size	Largest expected feed particle dimension	Must remain within specified chamber feed limits
Feed Gradation	Distribution of particle sizes entering the crusher	Influences feed entry, chamber loading and material movement
Material Characteristics	Rock type, abrasiveness, strength and relevant feed properties	Influences loading conditions and liner suitability
Target CSS	Required setting and adjustment range	Must be achievable with the selected chamber and liner combination
Required Product Gradation	Target size distribution after crushing	Supports assessment of chamber and setting suitability
Required Throughput	Expected operating capacity	Must be assessed against crusher performance limits
Existing Liner Configuration	Installed mantle and bowl liner profiles, where applicable	Determines whether replacement or profile conversion is required

Technical Chamber Selection Sequence



Engineering Decision Conditions

Technical Condition	Selection Implication
Feed exceeds the approved chamber limit	Change feed conditions or equipment/chamber configuration
Required CSS is outside available range	Review chamber option or intended reduction duty
Mantle and bowl liner are not an approved pair	Do not treat the combination as verified
Target throughput conflicts with limits	Reassess chamber selection and operating requirements
Model-specific performance data is unavailable	Treat selection as preliminary, not confirmed

Selection Constraints

A smaller CSS does not automatically provide a suitable finer-crushing configuration. Chamber geometry, feed conditions, and crusher limits must be considered together.

A liner profile should not be changed independently of its corresponding mantle or bowl liner. Alternative profiles can alter feed opening, compression space, and setting range.

Final selection requires model-specific performance data and approved liner configurations. Coarse, medium, and fine comparisons support preliminary evaluation only.