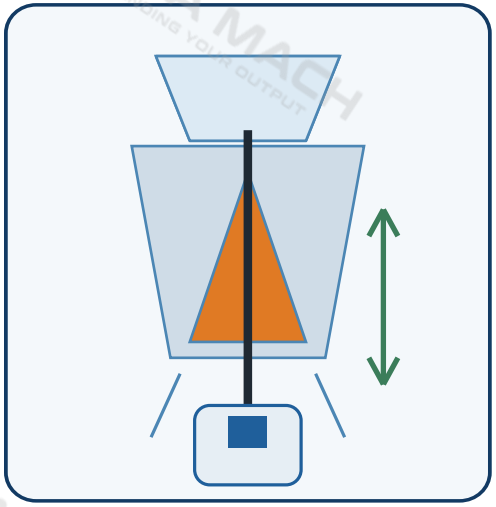
Single-Cylinder vs Multi-Cylinder Cone Crusher Selection Guide

Single-Cylinder

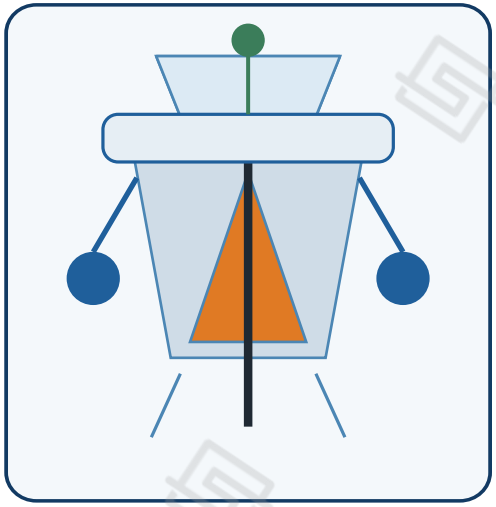
A practical comparison of shaft support, CSS adjustment, hydraulic protection and typical crushing duty.

Multi-Cylinder



Main shaft moves vertically

	Single-Cylinder	Multi-Cylinder
Main-shaft arrangement	Movable shaft assembly	Fixed shaft in many HP-style designs
CSS adjustment	Main shaft raised or lowered	Bowl or adjustment ring repositioned
Hydraulic locking	Main-cylinder support system	Multiple locking cylinders
Tramp release	Main assembly lowers or releases	Upper assembly releases hydraulically
Cavity clearing	Shaft movement enlarges opening	Clearing cylinders lift or release
Typical stage	Secondary / medium crushing	Tertiary / fine crushing



Fixed shaft; upper assembly adjusts

Key point

The difference is not simply the number of cylinders. It is how the crusher supports the main shaft, changes the chamber setting and responds to overload or a stalled cavity.

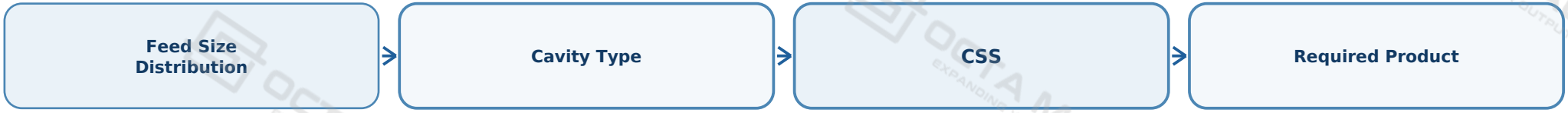
Selection rule: Compare both designs at the same feed curve, cavity family, CSS, material condition and screening duty. Cylinder count alone does not define capacity or product shape.

Feed, Cavity and CSS Selection

Model selection begins with the complete feed-size distribution. The largest particle checks the feed opening; the smaller fractions determine chamber filling, liner loading and the usable CSS range.

Selection Input	Single-Cylinder Tendency	Multi-Cylinder Tendency	Why It Matters
Crushing stage	Secondary or medium crushing	Tertiary or fine crushing	Defines feed size, reduction duty and downstream screening load.
Feed condition	Larger controlled feed	Smaller, well-graded feed	Oversize or segregated feed reduces chamber utilization and liner life.
Cavity	Coarse or medium	Medium, fine or extra-fine	The cavity must match both the top size and the target product curve.
CSS	Moderate product setting	Tighter, controlled setting	Tighter settings can increase pressure, power draw and return load.
Product target	Intermediate crushed material	Finer grading and cubical aggregate	Qualified final product matters more than crusher-only throughput.

Selection relationship



1. Feed opening

The largest controlled particle must enter continuously without bridging or intermittent loading.

2. Cavity match

Coarse cavities accept larger feed; fine cavities require smaller, stable and well-graded feed.

3. CSS range

Use the approved setting range for the selected model and liner profile, not a generic value.

Crushing Performance and Circuit Conditions

Crusher performance is determined by the chamber, feed condition, CSS, power utilization and the downstream circuit. A fair comparison must use equivalent operating conditions.

Throughput

Feed grading, cavity volume, CSS, bulk density and power draw.

Reduction duty

Feed size, product target and the reduction assigned to this stage.

Product gradation

CSS, chamber profile, speed, feed level and screen return.

Particle shape

Inter-particle crushing and stable full-chamber feeding.

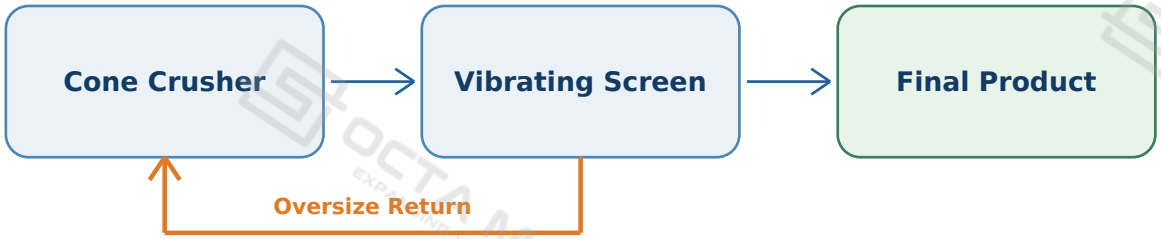
Circulating load

Screen aperture, efficiency, liner condition and return capacity.

Screen matching

Effective deck area, cut size, moisture and number of final fractions.

Simplified closed-circuit flow



Important

Multi-cylinder does not automatically mean higher capacity. A coarse-cavity single-cylinder unit may pass more tonnes per hour, while a fine-cavity multi-cylinder unit may produce a finer and more stable product.

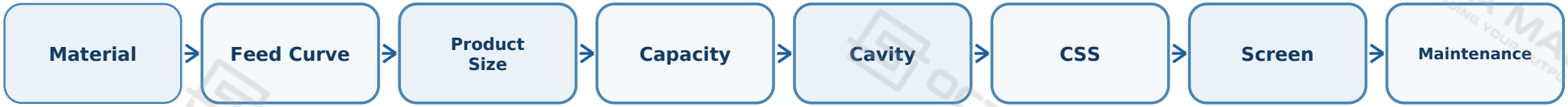
Compare qualified final product, not crusher-only throughput. Use the same cavity family, CSS, feed grading and screening condition before judging capacity or particle shape.

Final Selection Matrix

Use this matrix as a pre-selection tool. Final model sizing still requires the verified material, feed curve, target product and circuit capacity.

Application	Recommended Tendency	Main Confirmation	Reason
Large feed after jaw crusher	Single-cylinder	Feed opening and coarse cavity	Favors larger controlled feed and secondary crushing duty.
Granite or basalt secondary crushing	Model-dependent	Abrasiveness, cavity and liner	Hardness alone cannot define the correct crusher type.
Tertiary aggregate crushing	Multi-cylinder	CSS and full-chamber feeding	Supports controlled fine reduction and product grading.
Fine closed-circuit crushing	Multi-cylinder	Screen efficiency and circulating load	Performance depends on stable recirculation and screen matching.
Maintenance-limited site	Single-cylinder tendency	Service access and spare parts	Fewer hydraulic control points may simplify local support.

Final decision chain



Choose a single-cylinder tendency when

The circuit receives a relatively large controlled feed, the duty is secondary or medium crushing, and direct hydraulic setting adjustment with fewer control components is preferred.

Choose a multi-cylinder tendency when

The feed is smaller and well graded, the duty is tertiary or fine crushing, and the circuit requires stable chamber loading, tighter grading and matched closed-circuit screening.