CS/CH Single-Cylinder Hydraulic Cone Crusher Model and Cavity Selection Guide

A practical reference for matching CS420–CS660 and CH420–CH890 models, cavity types, feed size, minimum discharge opening, hydraulic functions and the complete crushing-screening circuit.

Model Range	Cavity Range
CS420, CS430, CS440 and CS660 CH420, CH430, CH440, CH660, CH870 and CH890	S1 Extra Coarse, S2 Medium Coarse, S3 Coarse, H1 Fine, H2 Medium Fine and H3 Extra Fine
Typical Duty	**Material Examples**
Secondary, tertiary and fine crushing of hard and abrasive material	Granite, basalt, river pebble, iron ore, copper ore, quartzite, diabase and hard limestone

Selection Inputs

Selection Input	Required Information	Selection Effect
Feed material	Rock type, hardness and abrasivity	Confirms crushing duty and liner service condition
Maximum feed size	Largest regular lump after primary crushing	Defines model range and cavity opening
Required products	Required aggregate or ore sizes	Controls cavity and screen selection
Crushing stage	Secondary, tertiary or fine crushing	Defines reduction duty
Circuit type	Open or closed circuit	Determines return load and screen duty
Feed condition	Gradation, fines, moisture and distribution	Affects chamber filling and operating stability

CS Series Technical Parameters

CS Series Coarse-Crushing Technical Parameters

Model	Cavity Type	Maximum Inlet Size (mm)	Minimum Outlet Size (mm)	Maximum Installed Power (kW)
CS420	S1 Extra Coarse	240	22	90
CS420	S2 Medium Coarse	200	19	90
CS430	S1 Extra Coarse	360	25	160
CS430	S2 Medium Coarse	300	22	160
CS430	S3 Coarse	235	19	160
CS440	S1 Extra Coarse	450	35	250
CS440	S2 Medium Coarse	400	29	250
CS440	S3 Coarse	300	25	250
CS660	S1 Extra Coarse	560	41	315
CS660	S2 Medium Coarse	500	38	315

- CS models use S-series cavities for larger prepared feed.
- S1 provides the largest feed acceptance, while S2 and S3 provide progressively greater reduction.
- Cavity selection should be completed before the discharge opening is finalized.
- Published inlet and outlet values are used for preliminary model screening.

CH Series Technical Parameters (Part 1)

CH420 to CH660 Fine-Crushing Technical Parameters

Model	Cavity Type	Maximum Inlet Size (mm)	Minimum Outlet Size (mm)	Maximum Installed Power (kW)
CH420	H1 Fine	135	10	90
CH420	H2 Medium Fine	65	8	90
CH420	H3 Extra Fine	38	4	90
CH430	H1 Fine	185	13	160
CH430	H2 Medium Fine	90	10	160
CH430	H3 Extra Fine	50	6	160
CH440	H1 Fine	215	16	250
CH440	H2 Medium Fine	110	13	250
CH440	H3 Extra Fine	70	8	250
CH660	H1 Fine	275	16	315
CH660	H2 Medium Fine	135	16	315
CH660	H3 Extra Fine	65	13	315

CH Series Technical Parameters (Part 2)

CH870 to CH890 Technical Parameters

Model	Cavity Type	Maximum Inlet Size (mm)	Minimum Outlet Size (mm)	Maximum Installed Power (kW)
CH870	H1 Fine	300	22	560
CH870	H2 Medium Fine	155	19	560
CH870	H3 Extra Fine	80	10	560
CH890	H1 Fine	370	25	750
CH890	H2 Medium Fine	195	22	750
CH890	H3 Extra Fine	85	10	750

S-Series and H-Series Cavity Selection

Cavity	Feed Condition	Typical Duty	Main Selection Limit
S1 Extra Coarse	Large prepared feed	Coarse secondary crushing	Requires the largest feed opening
S2 Medium Coarse	Medium-large feed	Secondary crushing	Used before intermediate screening
S3 Coarse	Controlled coarse feed	Secondary or intermediate reduction	Requires more stable upstream feed
H1 Fine	Smaller prepared feed	Tertiary crushing	Used after effective primary or secondary control
H2 Medium Fine	Controlled fine feed	Tertiary or fine crushing	Requires stable feed gradation
H3 Extra Fine	Fine and uniform feed	Fine crushing	Normally matched with closed-circuit screening

Cavity Notes and Working Principle

Key Cavity Selection Notes

- Select the cavity from the largest regular feed size first.
- Do not use an excessively small discharge opening to imitate a finer cavity.
- Do not feed oversized lumps into H2 or H3 cavities.
- Feed opening, discharge opening and screen aperture must be reviewed together.
- The maximum inlet size is not the recommended average feed size.

Working Principle and Single-Cylinder Hydraulic Control

Drive Path: Motor → Horizontal Shaft → Pinion → Large Gear → Eccentric Sleeve → Moving Cone → Compression Crushing

The motor drives the horizontal shaft, pinion and large gear, rotating the eccentric sleeve. The eccentric movement causes the moving cone to gyrate around the main shaft. Material is compressed between the mantle and concave when the chamber closes and moves downward when the chamber opens.

Main Structure Review

Component	Function
Main shaft	Supports the moving-cone assembly
Eccentric sleeve	Generates gyratory movement
Moving cone	Transfers movement into the crushing chamber
Mantle	Moving crushing surface
Concave	Fixed crushing surface
Hydraulic cylinder	Adjusts and supports the moving assembly
Pinion and large gear	Transfer motor torque
Thrust bearing	Supports axial crushing load
Dustproof seal	Limits dust entry
Lubrication ports	Supply and return lubricating oil

Hydraulic Functions and Circuit Review

Hydraulic Functions

Hydraulic Function	Main Purpose
Discharge-opening adjustment	Raises or lowers the moving-cone assembly
Hydraulic overload protection	Responds to abnormal crushing pressure
Tramp release	Allows uncrushable material to pass
Cavity clearing	Enlarges the chamber after blockage
Pressure monitoring	Identifies abnormal operating load

Hydraulic protection reduces equipment damage but does not replace correct feed preparation or tramp-metal control.

Feed Preparation, Discharge Opening and Screen Matching

Selection Factor	What to Confirm	Effect on Operation
Maximum feed size	Largest regular lump	Determines model and cavity
Feed gradation	Coarse, intermediate and fine fractions	Affects chamber filling
Excessive fines	Percentage of undersize in feed	Can reduce effective compression
Material moisture	Surface moisture and clay	Affects flow and screening
Discharge opening	Permitted range for selected cavity	Controls grading and crusher load
Screen aperture	Required final product sizes	Determines oversize return
Return load	Circulating oversize volume	Increases total crusher duty
Feed distribution	Central and even feeding	Controls liner wear and power stability

Crushing Circuit and Application Matching

Crushing Circuit Review

Open Circuit

Jaw Crusher → Single-Cylinder Cone Crusher → Screen or Stockpile

Used where intermediate product or broad final-size control is acceptable.

Closed Circuit

Jaw Crusher → Single-Cylinder Cone Crusher → Vibrating Screen → Oversize Return

Used where stable final product grading is required.

Net plant output is not the same as total crusher throughput in a closed circuit.

A smaller correctly matched crusher can operate more consistently than a larger crusher receiving segregated or intermittent feed.

Rock Characteristics and Application Matching

Material	General Crushing Characteristic	Recommended Duty	Main Review Point
Granite	Hard and abrasive, commonly contains quartz	Secondary or tertiary crushing	Cavity profile and liner wear
Basalt	Dense, hard and wear-resistant	Secondary and tertiary crushing	Feed stability and product grading
River pebble	Hard, rounded and abrasion-resistant	Secondary crushing	Central feeding and chamber distribution
Iron ore	Hardness and abrasivity vary by deposit	Secondary crushing before grinding	Target mill feed size
Copper ore	Variable hardness and mineral composition	Secondary and tertiary crushing	Downstream grinding requirement

Material Matching and Final Checklist

Additional Material Matching

Material	General Crushing Characteristic	Recommended Duty	Main Review Point
Quartzite	Very hard and highly abrasive	Compression crushing	Liner wear and lubrication cleanliness
Andesite	Medium-hard to hard volcanic rock	Aggregate and roadstone crushing	Required particle grading
Diabase	Hard, dense and abrasion-resistant	Roadstone and railway aggregate	Wear cost and closed-circuit load
Hard limestone	Lower abrasivity than quartz-rich rock	Secondary or fine crushing	Feed top size and required grading

Typical Application Positions

- Quarry aggregate production
- Mining ore preparation
- Roadstone production
- Railway ballast preparation
- Closed-circuit hard-rock crushing
- Mobile hard-rock crushing station

Final Model and Cavity Selection Checklist

Checklist A	Checklist B
Material type confirmed	Material hardness reviewed
Abrasivity reviewed	Maximum regular feed size confirmed
Feed gradation available	Moisture and clay condition checked
Crushing stage confirmed	Required final products confirmed
CS or CH series selected	Cavity type selected
Maximum inlet size checked	Minimum outlet size reviewed

Checklist A	Checklist B
Upstream jaw-crusher output confirmed	Feeder distribution confirmed
Screen aperture confirmed	Screen capacity checked
Return load reviewed	Power supply confirmed
Hydraulic system requirements confirmed	Lubrication system requirements confirmed
Dust-sealing requirements confirmed	Liner-replacement access confirmed
Lifting and maintenance space confirmed	

The final single-cylinder hydraulic cone crusher should be selected according to feed size, cavity profile, discharge requirement, material abrasivity and the complete screening circuit—not by installed power or maximum inlet size alone.