# CS Series High-Efficiency Spring Cone Crusher Model and Cavity Selection Guide

A practical engineering reference for matching standard and short-head models, cavity profiles, feed size, discharge opening, spring protection and the complete crushing-screening circuit.

| Model Range | Cavity Range |
|---|---|
| Standard models: CS-75B to CS-315B<br>Short-head models: CS-75D to CS-240D | Coarse, medium and fine cavity profiles for secondary, tertiary and fine crushing |
| **Confirmed Power Range** | **Typical Materials** |
| 75-315 kW, depending on model | Granite, basalt, diabase, quartzite, river pebble, iron ore, copper ore 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 upstream crushing | Defines model and cavity opening |
| **Crushing stage** | Secondary, tertiary or fine crushing | Defines standard or short-head duty |
| **Required products** | Target aggregate or ore sizes | Controls cavity and screen selection |
| **Circuit type** | Open or closed circuit | Determines return load and screen duty |

| Feed Analysis | Standard / Short Head | Cavity Selection | Discharge Opening | Screen Matching |
|---|---|---|---|---|

# Standard Model Technical Parameters - Part 1

## CS-75B and CS-110B

| Model | Moving Cone Diameter (mm) | Cavity | Closed-Side Feed Opening (mm) | Open-Side Feed Opening (mm) | Discharge Opening (mm) | Spindle Speed (r/min) | Motor Power (kW) | Capacity (t/h) |
|---|---|---|---|---|---|---|---|---|
| **CS-75B** | 900 | **Fine** | 83 | 102 | 9-22 | 580 | 75 | 45-91 |
| **CS-75B** | 900 | **Coarse** | 159 | 175 | 13-38 | 580 | 75 | 59-163 |
| **CS-110B** | 1200 | **Fine** | 127 | 131 | 9-31 | 485 | 110 | 63-188 |
| **CS-110B** | 1200 | **Medium** | 156 | 156 | 13-38 | 485 | 110 | 100-200 |
| **CS-110B** | 1200 | **Coarse** | 178 | 191 | 19-51 | 485 | 110 | 141-308 |

## Model Dimensions and Weight

| Model | Weight (t) | Dimensions (mm) |
|---|---|---|
| **CS-75B** | 15 | 2821 x 1880 x 2164 |
| **CS-110B** | 20 | 2821 x 1974 x 2651 |

## Selection Notes

- The standard type accepts larger prepared feed and is mainly used for secondary or intermediate crushing.
- The listed feed-opening and discharge-opening values apply to the corresponding cavity profile.
- Published capacity is a catalogue range and must be checked against feed gradation, chamber filling and screen load.

# Standard Model Technical Parameters - Part 2

## CS-160B, CS-240B and CS-315B

| Model | Moving Cone Diameter (mm) | Cavity | Closed-Side Feed Opening (mm) | Open-Side Feed Opening (mm) | Discharge Opening (mm) | Spindle Speed (r/min) | Motor Power (kW) | Capacity (t/h) |
|---|---|---|---|---|---|---|---|---|
| **CS-160B** | 1295 | **Fine** | 109 | 137 | 13-31 | 485 | 185 | 109-181 |
| **CS-160B** | 1295 | **Medium** | 188 | 210 | 16-38 | 485 | 185 | 132-253 |
| **CS-160B** | 1295 | **Coarse** | 216 | 241 | 19-51 | 485 | 185 | 172-349 |
| **CS-240B** | 1650 | **Fine** | 188 | 209 | 16-38 | 485 | 240 | 181-327 |
| **CS-240B** | 1650 | **Medium** | 213 | 241 | 22-51 | 485 | 240 | 258-417 |
| **CS-240B** | 1650 | **Coarse** | 241 | 268 | 25-64 | 485 | 240 | 299-635 |
| **CS-315B** | 2134 | **Fine** | 253 | 278 | 19-38 | 435 | 315 | 381-726 |
| **CS-315B** | 2134 | **Medium** | 303 | 334 | 25-51 | 435 | 315 | 608-998 |
| **CS-315B** | 2134 | **Coarse** | 334 | 369 | 31-64 | 435 | 315 | 789-1270 |

## Model Dimensions and Weight

| Model | Weight (t) | Dimensions (mm) |
|---|---|---|
| **CS-160B** | 27 | 2800 x 2342 x 2668 |
| **CS-240B** | 55 | 3911 x 2870 x 3771 |
| **CS-315B** | 110 | 4613 x 3251 x 4732 |

## Parameter Use

- Select the model from the largest regular feed size and required plant duty, not from motor power alone.
- Use the cavity-specific discharge range as an operating boundary rather than forcing a coarse cavity to produce fine material.
- Actual output must include the effect of closed-circuit return load.

# Short-Head Model Technical Parameters - Part 1

## CS-75D and CS-110D

| Model | Moving Cone Diameter (mm) | Cavity | Closed-Side Feed Opening (mm) | Open-Side Feed Opening (mm) | Discharge Opening (mm) | Spindle Speed (r/min) | Motor Power (kW) | Capacity (t/h) |
|---|---|---|---|---|---|---|---|---|
| **CS-75D** | 914 | **Fine** | 13 | 41 | 3-13 | 580 | 75 | 27-90 |
| **CS-75D** | 914 | **Coarse** | 33 | 60 | 3-16 | 580 | 75 | 27-100 |
| **CS-110D** | 1218 | **Fine** | 29 | 57 | 5-16 | 485 | 110 | 50-132 |
| **CS-110D** | 1218 | **Medium** | 44 | 73 | 10-16 | 485 | 110 | 90-145 |
| **CS-110D** | 1218 | **Coarse** | 56 | 89 | 13-19 | 485 | 110 | 141-181 |

## Model Dimensions and Weight

| Model | Weight (t) | Dimensions (mm) |
|---|---|---|
| **CS-75D** | 15 | 2821 x 1880 x 2410 |
| **CS-110D** | 20 | 2560 x 1942 x 2928 |

## Selection Notes

- Short-head models require smaller and better-controlled feed than standard models.
- Fine and medium cavities are used for tertiary reduction or fine crushing.
- Short-head cavities are normally matched with downstream screening.

# Short-Head Model Technical Parameters - Part 2

## CS-160D and CS-240D

| Model | Moving Cone Diameter (mm) | Cavity | Closed-Side Feed Opening (mm) | Open-Side Feed Opening (mm) | Discharge Opening (mm) | Spindle Speed (r/min) | Motor Power (kW) | Capacity (t/h) |
|---|---|---|---|---|---|---|---|---|
| **CS-160D** | 1295 | **Fine** | 29 | 64 | 3-16 | 485 | 160 | 36-163 |
| **CS-160D** | 1295 | **Medium** | 54 | 89 | 6-16 | 485 | 160 | 82-163 |
| **CS-160D** | 1295 | **Coarse** | 70 | 105 | 10-25 | 485 | 160 | 109-227 |
| **CS-240D** | 1676 | **Fine** | 35 | 70 | 5-13 | 485 | 240 | 90-209 |
| **CS-240D** | 1676 | **Medium** | 54 | 89 | 6-19 | 485 | 240 | 136-281 |
| **CS-240D** | 1676 | **Coarse** | 98 | 133 | 10-25 | 485 | 240 | 190-336 |

## Model Dimensions and Weight

| Model | Weight (t) | Dimensions (mm) |
|---|---|---|
| **CS-160D** | 27 | 2800 x 2342 x 2668 |
| **CS-240D** | 55 | 3917 x 2870 x 3771 |

## Operating Limits

- Do not feed regular oversize into a short-head cavity to increase throughput.
- A smaller discharge opening does not replace correct cavity selection.
- Short-head duty should be confirmed together with the downstream screen aperture and circulating load.

# Standard vs Short-Head Cavity Selection

## Configuration Matching

| Configuration | Feed Condition | Typical Duty | Product Characteristic | Main Selection Limit |
|---|---|---|---|---|
| **Standard coarse cavity** | Large prepared feed | Secondary crushing | Coarse intermediate product | Requires sufficient feed opening |
| **Standard medium cavity** | Controlled medium feed | Secondary or tertiary crushing | Greater reduction | Stable feed gradation required |
| **Standard fine cavity** | Smaller prepared feed | Tertiary crushing | Finer product range | Should not receive regular oversize |
| **Short-head coarse cavity** | Controlled secondary feed | Tertiary reduction | Higher reduction with smaller feed | Requires upstream size control |
| **Short-head medium cavity** | Medium-fine uniform feed | Tertiary or fine crushing | Controlled smaller product | Normally matched with screening |
| **Short-head fine cavity** | Fine and stable feed | Fine crushing | Smallest discharge range | Normally used in closed circuit |

## Selection Rules

- Select the cavity from the largest regular feed size first.
- Select standard or short-head configuration from the required crushing stage.
- Confirm the discharge opening and screen aperture together.
- Do not reduce the discharge opening beyond the permitted cavity range.
- Maximum feed opening is not the recommended average feed size.

## Selection Sequence

| Feed Size | Crushing Stage | Cavity Profile | Discharge Range | Screen Aperture |
|---|---|---|---|---|

# Working Principle and Spring Safety Device

## Compression Crushing Process

| Motor | Drive Shaft | Bevel Gear | Eccentric Sleeve | Moving Cone |
|---|---|---|---|---|

The motor drives the horizontal shaft, pinion and bevel gear, rotating the eccentric sleeve. The eccentric movement causes the moving cone to gyrate inside the crushing chamber. Material is repeatedly compressed between the mantle and concave and moves downward until it passes through the selected discharge opening.

## Main Structure

| Component | Function |
|---|---|
| **Eccentric sleeve** | Generates gyratory movement |
| **Moving cone** | Transfers motion into the crushing chamber |
| **Mantle** | Forms the moving crushing surface |
| **Concave / bowl liner** | Forms the fixed crushing surface |
| **Main shaft** | Supports the moving-cone assembly |
| **Adjustment ring** | Changes the discharge opening |
| **Spring safety device** | Responds to abnormal crushing load |
| **Support sleeve** | Lifts during overload release |
| **Labyrinth seal** | Limits dust entry |
| **Lubrication system** | Supplies oil to gears and bearings |

## Spring Protection Sequence

| Uncrushable Material | Abnormal Load | Spring Compression | Support Sleeve Lifts | Automatic Reset |
|---|---|---|---|---|

*Frequent spring release is not normal crushing. It usually indicates tramp metal, oversized feed, an incorrect cavity, uneven feeding or an excessively narrow discharge opening.*

# Feed, Discharge and Screening Circuit

## Feed Preparation and Circuit 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** | Undersize content in feed | Reduces effective compression |
| **Material moisture** | Surface moisture and clay | Affects material flow and screening |
| **Discharge opening** | Permitted cavity range | Controls grading and chamber load |
| **Screen aperture** | Required 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 |

## Open Circuit

**Jaw Crusher -> Spring Cone Crusher -> Screen or Stockpile**

Used where an intermediate product or broader final-size range is acceptable.

## Closed Circuit

**Jaw Crusher -> Spring 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. Catalogue capacity must be reviewed together with screen efficiency and circulating load.*

# Material and Application Matching

## Rock Characteristics and Recommended Configuration

| Material | Crushing Characteristic | Recommended Configuration | Main Review Point |
|---|---|---|---|
| **Granite** | Hard and abrasive | Standard secondary or short-head tertiary | Liner wear and return load |
| **Basalt** | Dense and wear-resistant | Standard or short-head | Feed stability and grading |
| **Diabase** | Hard and abrasion-resistant | Standard secondary crushing | Mantle and bowl-liner wear |
| **Quartzite** | Very hard and highly abrasive | Compression crushing | Lubrication cleanliness and wear |
| **River pebble** | Hard and rounded | Standard secondary crushing | Central feed distribution |
| **Iron ore** | Hardness varies by deposit | Standard or short-head | Target mill feed size |
| **Copper ore** | Variable hardness and mineral composition | Secondary or tertiary crushing | Downstream grinding duty |
| **Hard limestone** | Lower abrasivity than quartz-rich rock | Standard or fine crushing | Feed size and product grading |

## Typical Application Positions

- Quarry aggregate production
- Mining ore preparation
- Roadstone production
- Railway aggregate preparation
- Closed-circuit hard-rock crushing
- Stationary secondary and tertiary crushing plants

## Application Boundary

The spring cone crusher is not recommended for sticky feed, excessive clay, uncontrolled oversize or repeated tramp-metal entry. These conditions should be corrected by upstream screening, metal removal, feed control or cavity re-selection.

# Final Model Selection Checklist

## Confirm Before Final Selection

| Checklist A | Checklist B |
|---|---|
| Material type confirmed | Material hardness reviewed |
| Material abrasivity reviewed | Maximum regular feed size confirmed |
| Feed gradation available | Moisture and clay condition checked |
| Crushing stage confirmed | Standard or short-head selected |
| Cavity type selected | Feed-opening limit checked |
| Discharge-opening range confirmed | Required product sizes confirmed |
| Upstream jaw-crusher output confirmed | Feed distribution confirmed |
| Tramp-metal removal confirmed | Screen aperture confirmed |
| Screen capacity checked | Closed-circuit return load reviewed |
| Motor power confirmed | Lubrication system confirmed |
| Spring safety device checked | Mantle and bowl-liner profile confirmed |
| Maintenance access confirmed | Lifting space confirmed |

## Final Selection Statement

*The final spring cone crusher should be selected according to feed size, crushing stage, cavity profile, discharge requirement, material abrasivity and the complete screening circuit - not by motor power or catalogue capacity alone.*

## Data Use Notes

- Published parameters are used for preliminary selection and should be checked against the confirmed project datasheet.
- Catalogue capacity must be reviewed against actual feed gradation, material condition, chamber filling and screen load.
- No unverified efficiency percentages, wear-life claims or unsupported performance figures are included in this guide.