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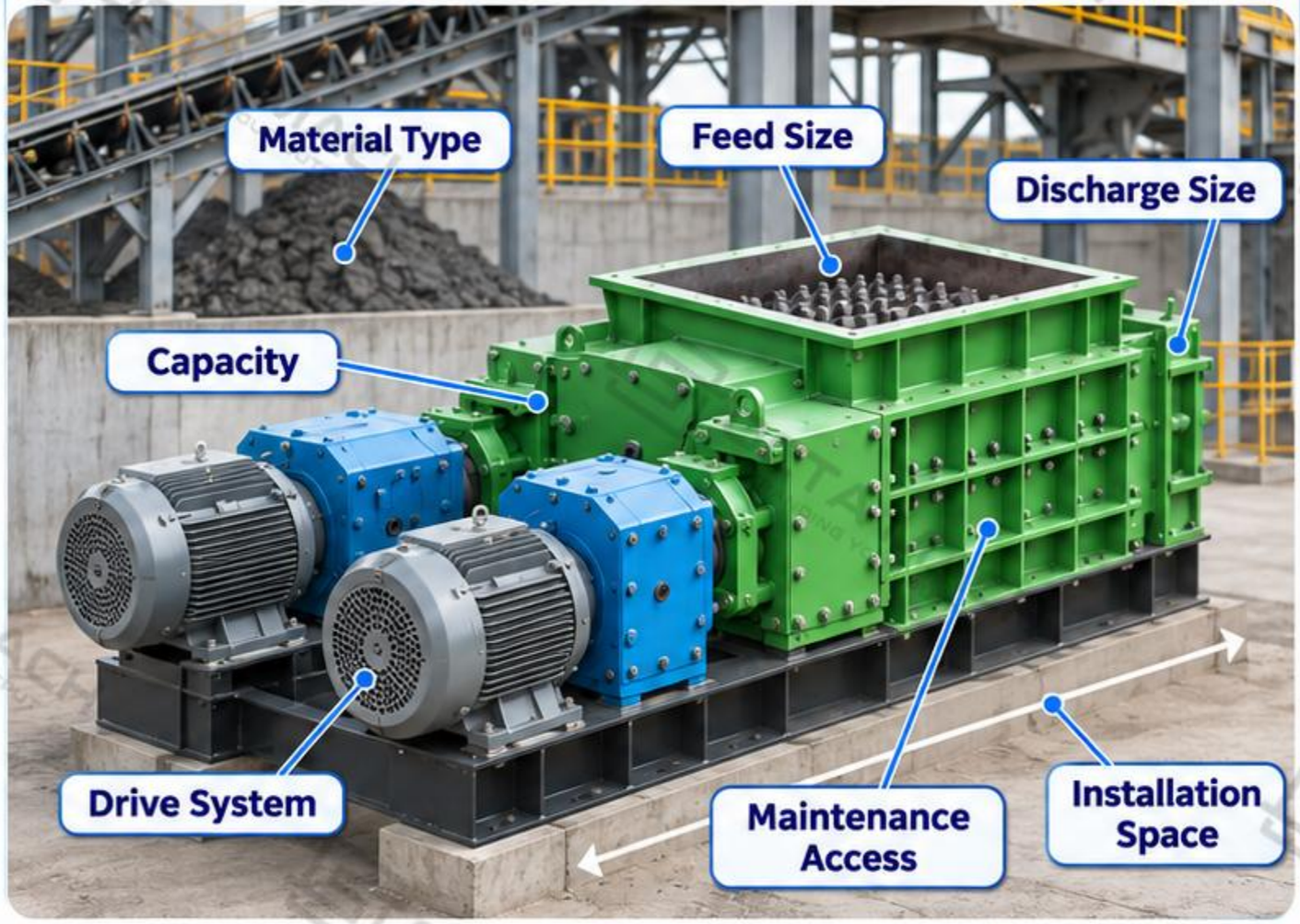
Project Requirements

Define Your Toothed Roll Crusher Requirements

Project Requirement Overview



Project Information to Confirm

Project Information	Details to Confirm
Application	Coal crushing / gangue crushing / bulk material reduction
Material Type	Coal, gangue, low- to medium-hardness rock
Feed Size	Maximum lump size (mm)
Discharge Size	Required output size (mm)
Capacity	Target throughput (t/h)
Moisture Content	Material moisture and clay content
Installation Space	Foundation, height and maintenance clearance
Power Supply	Motor configuration and electrical requirements

Selection Preparation Sequence

01 Define Material → **02** Confirm Feed Size → **03** Review Discharge Target → **04** Check Capacity & Layout → **05** Confirm Utilities

Engineering Note

Accurate equipment selection starts with confirmed material properties, feed size, discharge target, plant layout and available utilities.

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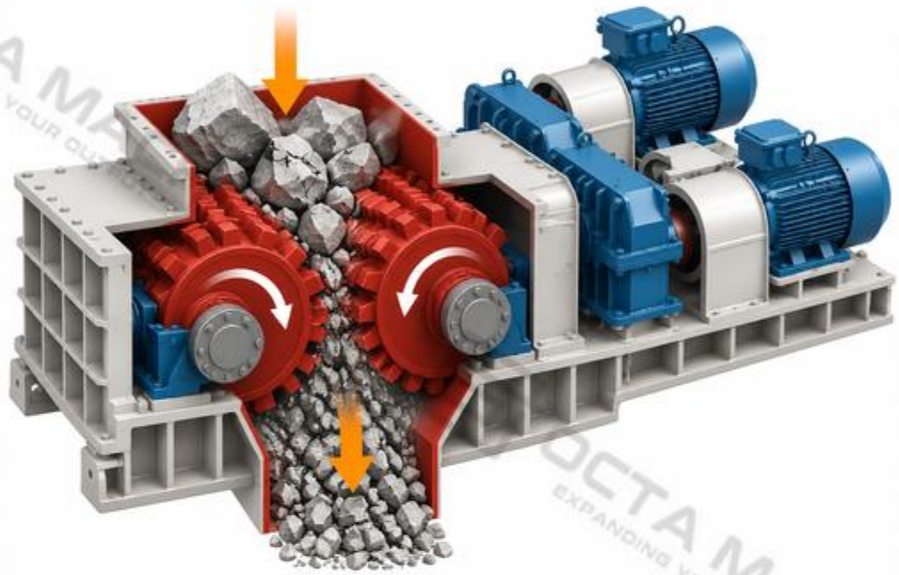
Equipment Specifications

Model Range, Feed Size & Crushing Capacity

TOOTHED ROLL CRUSHING CONFIGURATION



Counter-rotating toothed rolls grip and reduce large feed lumps.

KEY PERFORMANCE RANGE

MAXIMUM FEED SIZE

2,000 mm

Large-lump feed capability

MAXIMUM CAPACITY

10,000 t/h

Selected configuration

DISCHARGE SIZE

30–500 mm

Model-dependent range

ROLL CENTER DISTANCE

500–1,500 mm

Across configurations

SELECTED LARGE-FEED MODEL GROUPS

FEED GROUP	MAX. FEED SIZE	DISCHARGE SIZE	PROCESSING CAPACITY	MOTOR POWER
Group 1	Up to 900 mm	150–300 mm	300–4,000 t/h	2 × 110–280 kW
Group 2	Up to 1,500 mm	300–500 mm	600–7,000 t/h	2 × 250–355 kW
Group 3	Up to 2,000 mm	400–500 mm	800–10,000 t/h	2 × 280–450 kW

ENGINEERING NOTE Confirm final model against material properties, feed distribution, discharge target and site conditions.

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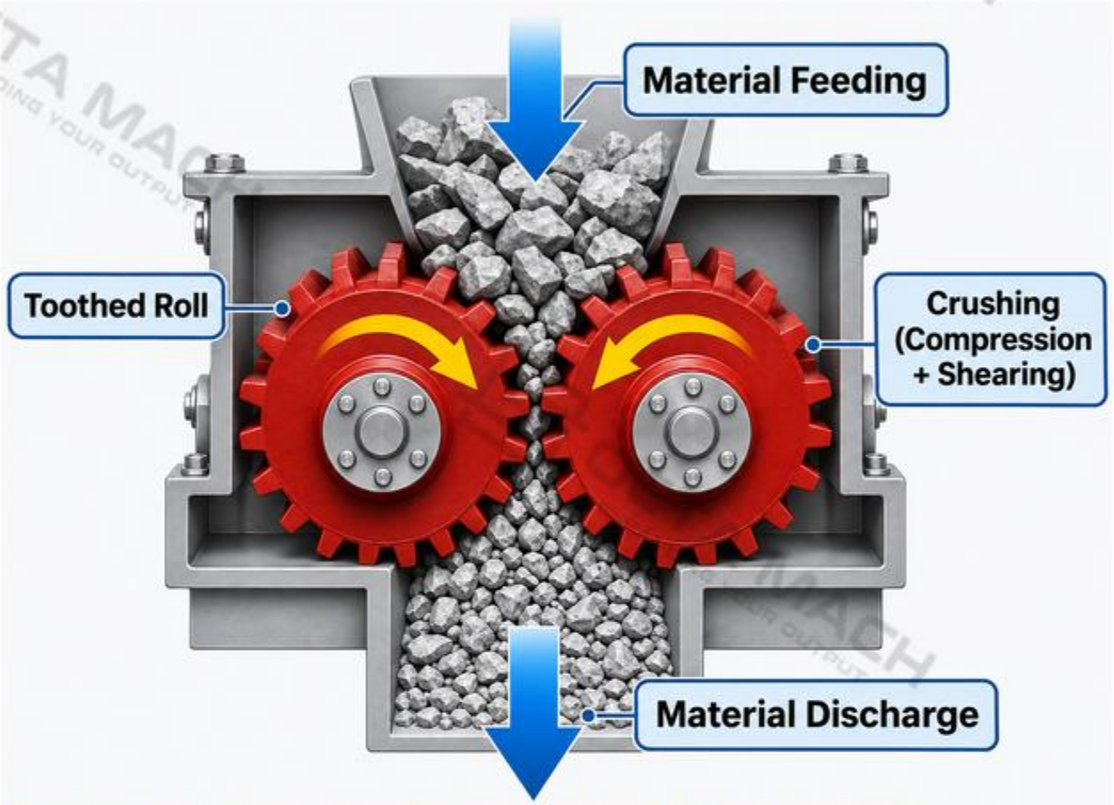
Working Principle & Main Structure

How Counter-Rotating Teeth Grip, Split and Reduce Feed Material

DOUBLE TOOTHED ROLL CRUSHER — WORKING PRINCIPLE



Two rolls rotate in opposite directions and draw feed into the crushing zone.

THREE-STAGE CRUSHING SEQUENCE

01 — MATERIAL FEEDING & GRIPPING

Large lumps enter through the upper opening. The inward-moving teeth engage irregular particles and pull them between the rolls.

02 — SPLITTING, COMPRESSION & SHEARING

Tooth penetration creates concentrated forces. Internal cracks develop as compression and relative tooth movement reduce the material.

03 — MATERIAL DISCHARGE

Reduced particles pass through the space between the rolls and leave through the lower discharge opening.

MAIN MACHINE ASSEMBLIES & ENGINEERING FUNCTIONS

CRUSHING ROLLS & TEETH

The toothed surfaces engage incoming lumps. Tooth geometry, spacing and material selection affect gripping, crushing performance and wear resistance.

ROLL SHAFTS & BEARINGS

Shafts transmit roll rotation. Bearing assemblies support the shafts; lubrication and alignment help maintain rotational stability.

DRIVE & TRANSMISSION

The motor-driven system supplies operating torque. Crusher configurations include single- and dual-motor arrangements, depending on model.

FRAME & MATERIAL FLOW

The heavy-duty frame supports the working assemblies. The upper structure guides feed into the chamber and the lower opening connects to discharge conveying.

ENGINEERING NOTE Actual particle distribution and throughput depend on feed size, material strength, abrasiveness, moisture and operating conditions.

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Applications & Material Suitability

Typical Applications, Suitable Materials and Operating Conditions

Typical Application Scenarios









Applicable Materials


Raw Coal


Coal Gangue


Limestone


Shale


Iron Ore


Coke

Material & Operating Conditions

Material Hardness	Low to medium hardness (≤ 200 MPa)
Feed Size	Large lumps, generally ≤ 2,000 mm (depending on model)
Discharge Size	Typically 30 – 500 mm, adjustable by roller spacing and tooth profile
Moisture Content	Suitable for dry and slightly wet materials (≤ 15%)
Material Types	Coal, coal gangue, coke, limestone, shale, claystone, medium-hard ores, etc.

Key Advantages in These Applications

- **Strong Handling Capacity** – Suitable for large feed size and high-capacity crushing.
- **Controllable Product Size** – Discharge size can be adjusted to meet downstream process requirements.
- **Reliable & Low Maintenance** – Simple structure and wear-resistant toothed rollers.
- **Wide Process Adaptability** – Well suited for coal, metallurgy, cement and ore preparation lines.

Engineering Note

The toothed roll crusher is a large-feed, medium- and coarse-crushing solution for bulk materials such as coal and coal gangue, with a focus on high throughput, stable operation and lower operating cost.

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Model Selection & Configuration

Matching Feed Conditions, Product Size and Throughput Targets

FIVE-STEP MODEL SELECTION WORKFLOW

01 DEFINE FEED CONDITIONS
Confirm maximum lump dimensions and the full feed-size distribution.

02 CHARACTERIZE THE MATERIAL
Identify material type, crushing strength, abrasiveness, moisture and bulk density.

03 SET THE DISCHARGE TARGET
Specify the required product size based on downstream screening, conveying or grinding.

04 CONFIRM CAPACITY & DRIVE
Set the hourly throughput target and match motor power to material load and operating configuration.

05 CHECK SITE & INTEGRATION
Verify footprint, foundation, feeding height, discharge clearance and maintenance access.

INITIAL FEED-SIZE SCREENING BY MODEL GROUP

FEED GROUP 1	FEED GROUP 2	FEED GROUP 3
Up to **900 mm** Feed size	Up to **1,500 mm** Feed size	Up to **2,000 mm** Feed size



Crusher drive-side configuration — motor and reducer arrangement varies by model.

SELECTION PARAMETERS — INFORMATION TO CONFIRM

PARAMETER	WHAT TO CONFIRM	WHY IT MATTERS
Feed size	Maximum lump size and particle distribution	Determines the required feed opening and model range.
Material	Type, crushing strength, abrasiveness and bulk density	Influences crushing load and tooth / wear-part selection.
Moisture	Moisture content and clay-bearing characteristics	Affects feeding flow, material buildup and discharge behavior.
Discharge size	Required finished particle size and downstream process	Guides roll configuration and the required crushing effort.
Capacity & drive	Target hourly throughput and motor / electrical requirements	Helps match model capacity and drive power to the operating load.
Installation	Available space, foundation, feed / discharge height and access	Confirms equipment layout, connection points and maintenance clearance.

ENGINEERING NOTE Maximum feed size is only an initial screening point. Final selection should be checked against material test data, target output size and actual site conditions.