

PLASMA ROCK TOOLS

Alloy Ring Cutting Picks & Rock Drilling Tools

Product Catalog & Technical Guide
English Edition

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Company Profile

We are dedicated to the R&D, design, production and sales of wear-resistant materials for construction machinery. Our proprietary high-energy-beam gradient manufacturing technology applies to the upgrading of wear-resistant products across the industry.

Our R&D team originates from an academician-level team at Huazhong University of Science and Technology, and maintains deep cooperation with leading universities and research institutes.

The Alloy Ring cutting pick is our first-in-China innovation: a full-coverage alloy ring is embedded into the pick body through a deep metallurgical bond, giving the ring both high wear resistance and high toughness with superior impact performance. The ring lets the carbide tip, the ring and the steel body wear in three coordinated stages (three-stage co-wear), keeping a sharp cutting cone throughout service life.

We also apply high-energy-beam manufacturing to rock drilling tools: a unique thread-root strengthening process upgrades drill rods with significantly reduced breakage risk and longer service life.

Working alongside major state-owned enterprises and industry leaders, we have accumulated extensive field experience in foundation excavation and mining, and customize products and solutions for specific ground conditions.

Alloy Ring Technology

How it works

A high-energy beam embeds the alloy ring into the pick body with a deep metallurgical bond. The ring fully covers the cutting cone area of the body and fuses with it - no brazed joint to fail.

Key properties

- * Ring depth: 5-8 mm, full coverage of the pick body
- * Bonding: deep metallurgical fusion
- * Ring hardness: HRC 60-62, gradient distribution
- * High toughness - no chipping, no cracking
- * Superior impact resistance

Three-stage co-wear

Body (HRC 42-45), alloy ring (HRC 60-62) and carbide (HRC 72-75) form a hardness/toughness gradient. In normal use the three materials wear synchronously, self-sharpening into a keen cone that cuts faster and lasts longer.

Why it pays off

- * Longer wear life - full utilization of the carbide
- * Faster cutting - sharp cone maintained
- * Lower cost - fewer pick and sleeve changes, less fuel and labor
- * Safer - fewer manual replacement operations
- * Versatile - wear resistance and impact toughness in one pick

Wear Process & Failure Modes

Normal wear of the Alloy Ring pick

- * 1. New condition
- * 2. Initial wear - the edge emerges
- * 3. Normal wear - sharp cone fully exposed
- * 4. Maximum service life reached - carbide released, pick worn normally

Common failure modes of conventional picks

- * Body wears too fast - body and carbide wear out of sync
- * Carbide chipping - mismatched conditions or excessive impact
- * Carbide loss - body can no longer carry the carbide
- * Skew wear - pick does not rotate in the sleeve

Model Range

Cutting picks for rotary drilling

JQ3055-22 / JQ3060-22 / JQ3060-25 / JQ3060-28 / JQ3060-30

Cutting picks for double-wheel trench cutters (hydromill)

JQ3055SLS-19 / JQ3060SLS-19 / JQ3060SLS-21 / JQ3060SLS-22

Cutting picks for roadheaders & coal shearers

JQS135-25-3870 / JQS135-30-3870 / JQS135-30-3880 / JQS135-35-3870 / JQS135-35-3880

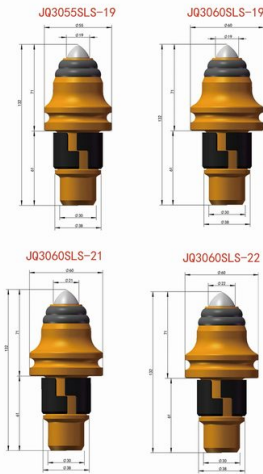
Rock drilling tools

Drill rods with thread-root strengthening for rotary and foundation drilling.

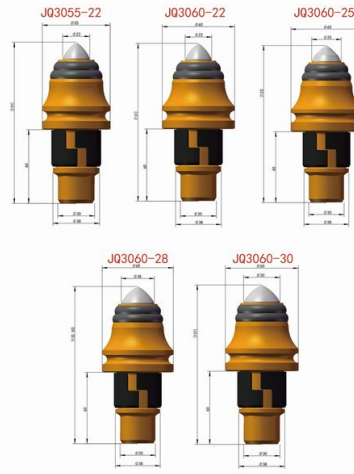
Full dimensional chart on the next page.

The Alloy Ring Cutting Pick

Cutting Pick for double wheel trench cutter



Cutting Pick for rotary drill



Cutting Pick for cantilever excavator and coal shearers



Use Case

Project Name: Guangzhou Metro Line 11

Construction Equipment: Casagrande FD60HD Double Wheel Trench Cutter

Rock Formation Information: 80-120Mpa slightly weathered granite

Working Condition Information: The rock formation is relatively intact with strong impact.

Usage Feedback: Compared to the original imported picks, construction efficiency has increased by 30%, and pick consumption has decreased by 25%.



Project Name: Guangzhou Metro Line 12

Construction Equipment: Solimec SC-135 Double Wheel Trench Cutter

Rock Formation Information: 80-120Mpa argillaceous siltstone

Working Condition Information: The rock formation has faults and impacts.

Usage Feedback: Construction efficiency has increased by 50%, and pick consumption has decreased by 35%.



Project Name: North South Corridor N108 Project of Singapore

Construction Equipment: XCMG XC60 Double Wheel Trench Cutter

Rock Formation Information: 60-70Mpa limestone

Working Condition Information: The rock formation has interlayers and faults, with impacts.

Usage Feedback: Compared to the original imported picks, construction efficiency has increased by 30%, and pick consumption has decreased by 20%.



Field Case Studies

Real jobsite results from metro, trench and piling projects - geology, equipment and usage feedback.

- * Guangzhou Metro Line 12 - Soilmech SC-135 hydromill, 80-120 MPa argillaceous siltstone with faults: efficiency up ~50%, pick consumption down ~35%
- * Singapore N108 trench - XCMG XC60 hydromill, 60-70 MPa limestone with interlayers: efficiency up ~30%, consumption down ~20%
- * Wuhan SWDM420 rotary piling - hard rock foundation: stable penetration, longer intervals between pick changes
- * Results vary with ground conditions - small trial orders welcome



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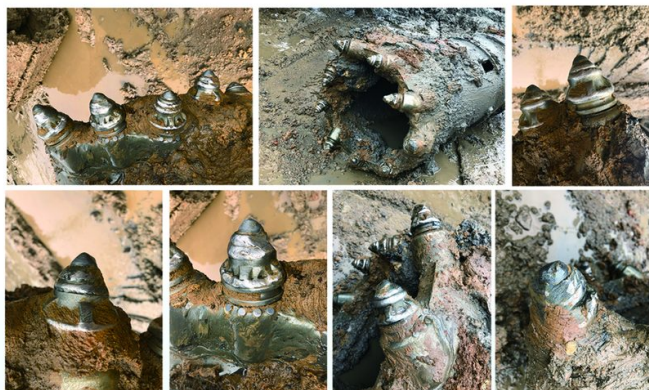
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Project Name: A construction site in Wuhan

Construction Equipment: SunWard SWDM420 Rotary Drill

Rock Formation Information: 90Mpa limestone

Working Condition Information: The rock formation has interlayers and faults, with impacts.

Usage Feedback: Construction efficiency has increased by 45%, and pick consumption has decreased by 35%.

Please consult



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Technology at a Glance

The Alloy Ring Cutting Pick

Through structural optimization, a wear-resistant alloy ring is embedded into the cutting pick body, enhancing its impact resistance and wear durability. The alloy ring, with its high strength and excellent toughness, effectively protects the pick shoulder. The larger diameter and the alloy head undergo three-stage co-grinding, forming a wear-resistant conical surface that significantly improves tunneling efficiency and maximizes the wear performance of the cutting pick.



Main Features

Long-lasting Wear Resistance: The alloy ring effectively enhances the overall wear resistance of the cutting pick. It undergoes three-stage co-grinding wear with the main alloy head and pick body, ensuring full utilization and durable performance.

Enhanced Efficiency: The alloy ring, together with the pick body and main alloy, undergoes three-stage co-grinding wear, forming a sharp conical surface with distinct cutting edges. This significantly improves tunneling speed and operational efficiency.

Cost Efficiency: The cutting pick's superior wear resistance significantly reduces the frequency of replacement for both the pick and the holder. This saves on consumable costs, improves tunneling efficiency, and lowers fuel and labor expenses, leading to a reduction in overall operational costs.

Enhanced Safety: The reduced frequency of pick and holder replacement minimizes manual intervention, thereby improving operational safety.

Wide Applicability: The alloy ring cutting pick combines both wear resistance and impact resistance. Its excellent performance makes it suitable for construction scenarios that demand high durability from both the alloy head and the pick body, simplifying the selection process and reducing the effort required to find the right pick for the job.

Wear Process of Alloy Ring Cutting Pick



Contact

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Samples and small trial orders welcome. Datasheets available on request.