

ROLLER BIT MODEL COMPARISON REPORT

1. Overview

Drillnova's MH series roller bits are engineered for Foundation Drilling applications. All models share the same base structure — journal bearing system with double sealing and vacuum grease system — but differ in materials, geometry, and welding design.

2. Model Comparison Table

Model	Material (Body / Cone)	Design Features	Performance Level	Application Focus	Remarks
MH-1	20CrNiMo / 20CrNiMo	<ul style="list-style-type: none"> No pre-set angle → manual welding alignment needed 3rd generation cone on 3rd generation body 	Medium duration & penetration rate	Medium-hard formations (60–120 MPa); cost-sensitive projects	Entry-level option; high cost-performance
MH-2	15CrNi4Mo / 15MnNi4Mo	<ul style="list-style-type: none"> Traditional 1st generation body design No angle preset 	Medium–High strength but outdated design	Medium-hard rock; legacy users in piling or oil & gas	Kept for old customers; less efficient welding and alignment
MH-3	15CrNi4Mo / 15MnNi4Mo	<ul style="list-style-type: none"> 4th generation body with pre-set welding angle Optimized insert layout (14 mm × 52 pcs) Full-coverage design, no blind spots 	Maximum duration & penetration rate (+20%)	Hard and abrasive formations (150–280 MPa); foundation piles	Flagship model; ≈ 90% of export volume
MH-3C	15CrNi4Mo / 15MnNi4Mo	<ul style="list-style-type: none"> Holder-based quick-change system Same cutting structure as MH-3 Additional slotting work for interchangeability 	Same as MH-3 (performance)	Foundation projects requiring rapid bit swap	Quick-change type; minimal downtime on site

3. Technical Highlights

- **Material Advantage (15CrNi4Mo vs 20CrNiMo)**
→ Higher hardness & wear resistance, longer life under high torque and abrasive conditions.
- **Design Evolution (from 1st to 4th generation)**
→ Flat and thicker body, automatic angle alignment, better load capacity (+20% faster welding accuracy).
- **Lubrication System**
→ Vacuum grease with protective O-ring shield extends bearing life under heavy drilling conditions.
- **Insert Layout**
→ Full-coverage 14 mm tungsten carbide inserts ensure consistent rock contact and fewer blind spots.

4. Selection Advice for Dealers

If Customer Needs	Recommended Model	Rationale
Lowest price / general foundation projects	MH-1	Balanced performance and cost; good entry point for new users.
Proven design used in legacy projects	MH-2	Traditional design; kept for customers accustomed to earlier structure.
High efficiency and durability for hard rock / large pile drilling	MH-3	Flagship type; superior penetration and longevity; preferred by 90% of clients.
Frequent bit replacement on site / minimal downtime	MH-3C	Quick-change holder; same performance as MH-3 but faster turnaround.

5. Summary

Model	Positioning	Key Benefit
MH-1	Cost-effective basic type	Affordable and reliable! but not easy for welding
MH-2	Legacy type" design based on tricone#	Stable but outdated design! not recommended for new clients
MH-3	Flagship type	Maximum performance and easy welding
MH-3C	Premium quick-change	Same as MH-3 + fast on-site replacement

ROLLER BIT MH-3

PREMIUM TYPE

52-Inserts Full Coverage

Ensures optimal rock contact for higher penetration and extended working life, boosting overall field performance.

Wear-Resistant Alloy Bearings

Bearings coated with a high-durability alloy, providing longer service life and stable performance - even under harsh drilling conditions.

Real-world tests show an average depth increase from 35m to 45m per run.

Beyond standard O-ring seals, we add a protective layer using high-precision machinery. This design shields the O-ring from cutting wear, further extending the bit's overall lifespan.



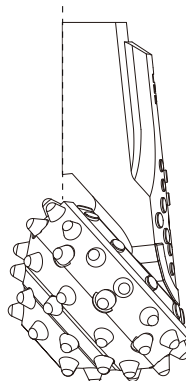
3rd Generation Cone



4th Generation Body

Preloaded Welding Angle

Specially engineered for piling operations, each leg arrives preset with the optimal welding angle. No measuring or adjustments needed — just place it on the cutting ring.



Vacuum Grease System

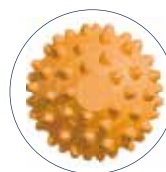
Upgraded lubrication system outperforms traditional methods, optimizing grease flow and effectively reducing heat from friction.

"This design innovation has simplified our daily workflow, allowing us to focus on productivity rather than tedious angle checks."

— On-Site Feedback

Select Cone Design

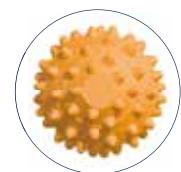
3rd Generation



Chisel
60-110MPa
Medium-Hard



Conical
100-180MPa
Balanced Option



Spherical
150-280MPa
Ultra-Hard

Faster, More Accurate Welding

Real-world tests show up to 20% less setup time and fewer alignment errors, boosting both workshop and on-site

DESIGN EVOLUTION

Continuous innovation for better penetration, simpler welding, and stronger durability

Cone Generation

Smarter Insert Layouts, Better Penetration



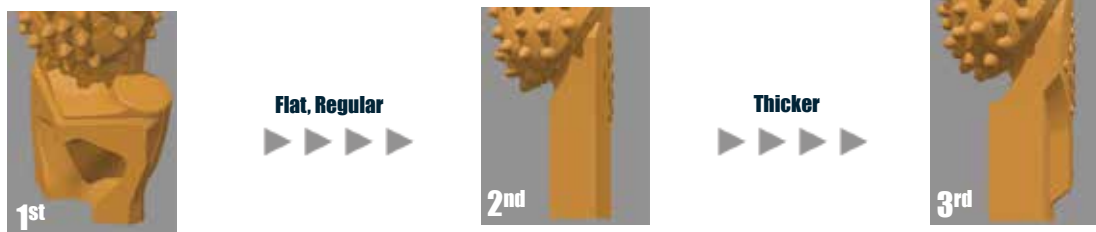
- **Tricone Bit Structure** (OD 118mm)
- **Limited Inserts** → Low penetration rate
- **Blind grooves** → Basic layout, less durability

- **Piling Bit Structure** (OD 118mm)
- **Increased Inserts** → Reduced blind spots, better cutting contact
- **Challenges** → Medium penetration, still room for improvement

- **Full Coverage Inserts** (OD 120mm)
- **No Blind Spot** → Maximized penetration, longer lifespan
- **Field Result** → +10% Drilling Efficiency vs. 2nd Gen

Body Generation

Refining shape & welding angles for robust performance



- **Shape:** Irregular 120° & nozzle segment
- **Challenges:**
 - Difficult welding & positioning
 - Risk of heat damage when cutting nozzle

- **Shape:** Flat, regular body
- **Advantages:** Fast welding to cutting ring
- **Challenges:** Reduced strength due to thinner body

- **Shape:** Flat & thicker body
- **Advantages:** Better drilling weight tolerance
- **Challenges:** Manual angle alignment still needed



- Automatic alignment
- Higher load capacity
- +20% Faster welding

DRILLNOVA - ALWAYS ONE TURN AHEAD

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ROLLER BIT DATA SHEET

DRILLNOVA offers multiple Roller Bit models to tackle varied formations



MH-1
Entrance-level



MH-2
Traiditional



MH-3
Flagship



MH-3C
Qui-Change Holder



MH-3B
Qui-Change Bolts



MH-3H
Large Pile Dia.

Model	Cone Type	Cone (Teeth Dia.×Qty-Dia.)	Body Type	Connect	Selection Advice
MH-1	3rd	13.7×52-134	3rd	Welding	Smaller piles / moderate rock; cost-effective in construction
MH-2	3rd	14×52-139	1st	Welding	Widely used in oil & gas; stable penetration in medium-hard formations
MH-3	3rd	14×52-139	4th	Welding	For tough, abrasive rock; +20% faster drilling in field tests
MH-3H	3rd	17×74-191	4th	Welding	Large-diameter boreholes (OD>2000mm); robust torque capacity
MH-3C	3rd	14×52-139	Holder	Qui-Change	Holder-based quick-change; easy on-site swaps, minimal downtime
MH-3B	3rd	14×52-139	Bolts	Qui-Change	Bolt-type quick replacement; extra stability for specialized core barrels

* MH-1 Raw Material 20CrNiMo

* All models come standard with Journal bearing, Double sealing, and a Vacuum grease system.