

HELP YOU FIND THE BEST CHINESE INDUSTRIAL MANUFACTURER

# Dissolvable Materials & Plugs



# COMPANY INTRODUCTION



TINVO is founded in 2007, becomes a professional sourcing and service company focusing on accessories of steel rolling mill. The company mainly deals in various types of rolling mill rolls, metallurgical steel rolling blades, etc., TINVO is focusing on supply chain integration in industrial vertical fields like metallurgy, cement, power, mining, petrochemical and other industries, the core of TINVO strength is based on "Made in China", with the complete Chinese industrial capability, TINVO is providing one-stop Chinese and international brand supply chain services for global customers. It is committed to becoming "a Reliable&Preferred selecting platform based on Chinese industrial factories" . At the same time, TINVO also provides enterprises with comprehensive foreign trade services, including industrial import and export, cross-border logistics, factory acceptable test and etc. Promote efficiency and accuracy of the matching between Chinese manufacturing&suppliers and foreign customers.





# FOOTPRINT

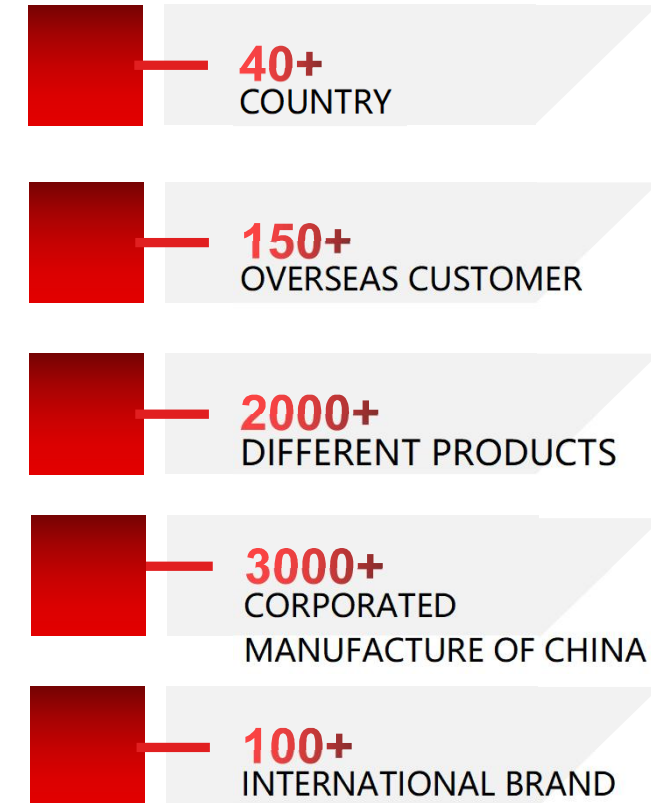


那些我们足迹已经到过的地方!

The places we've been to

剩下的, 我们正在努力!

the rest we are fighting for !



# SOLUTION



## ONE-STOP SOLUTION FOR OIL AND GAS INDUSTRY

## EQUIPMENT

- 1: TINVO own products.
- 2: Extended products outsourcing in the same area of industries.
- 3: Provide adequate choices on manufacturers with best cost-performance.
- 4: Factory&production site inspection.
- 5: Help end-user find the original source of EPC items.

## PRICE&QUOTATION

- 1: TINVO gets favorable price with own background.
- 2: TINVO handles your inquiry and promise, replied within 8-24 working hours.
- 3: TINVO provides optional price choice.
- 4: TINVO discovers better sources to meet customer's target.

## ONE-STOP SOLUTION FOR METALLURGY INDUSTRY



## RISK CONTROL

- 1: TINVO is responsible for all problems of products with warantee&guarantee time.
- 2: TINVO provides tech collection evaluation before quotation for those items without details.
- 3: TINVO provides Factory&Production site inspection.

## TECH SERVICE

- 1: Technical service (product site tech evaluation, project optimise design, product maintanance, etc.)
- 2: The users can demonstrate on a projector or computer, or print the presentation and make it into a film to be used in a wider field.

# FACOTRY BASE



## 1. Scale strength:

- 120+ acres occupation
- Annual yield of 300,000 pcs of soluble magnesium alloy+ 6,000 tonnes of magnesium alloy
- Rare earth alloys→magnesium alloy materials→magnesium alloy products

## 2. Core technology:

- vacuum casting/sand casting/metal mould casting/low pressure casting/
- Process: casting → extrusion → moulding → precision machining whole process



## 3. Core products:

- Magnesium-based intermediate alloys
- Magnesium alloy cast rods/plates/extruded profiles/forging parts
- Oil and gas development with soluble magnesium alloy special products

## 4. Applications:

- Aerospace
- Oil and gas exploration
- High-end equipment manufacturing

# MANUFACTURE FACILITY AND PROCESS



Mg Alloy Melting

★ magnesium alloy melting furnaces (2.5T) x12 5500T/year

★ 3600T extruder x1, 700T extruder x1, 5000T/year

Extrusion moulding

★Turning and milling machine x 32,

CNC Machining

★ 4-axis CNC center x8, 5-axis CNC center x9,  
Yield 300Kilo pcs of dissolvable ball / dissolvable bridge  
plugs and other products.

Surface Coating

★Micro-arc oxidation, passivation, electrophoresis,  
electroplating, powder spraying, and other coatings,  
heat treatment of the production line x2

CNC machining  
scrap recycling

★ CNC machining waste material recycling production line x2



# MANUFACTURE FACILITY



3600T extruding machine



Magnesium ally casting



# MANUFACTURE FACILITY



CNC machining center



EDM



CNC milling and turning



Laser cutting



CNC bending



# MANUFACTURE FACILITY



Heat treatment furnace

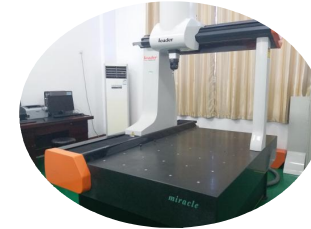


Surface treatment production line  
*Micro-arc oxidation, passivation, electrophoresis, electroplating,  
powder spraying, and other coatings*

CNC machining waste recycling line



# TEST FACILITY AND LAB INSTRUMENT



- ICP spectral detector
- Metallographic microscope
- Metallographic polishing instrument
- Coordinate measuring machine
- Constant temperature & humidity test chamber
- Salt spray tester
- Electronic universal testing machine

- Electronic Brinell hardness detector
- Fatigue testing machine
- Film Thickness Gauge
- High temperature and high-pressure test system
- Scanner
- Sulphurisation Meter



# TEST FACILITY AND LAB INSTRUMENT



ICP spectral detector



Universal testing machine



Coordinate measuring machine



Scanner

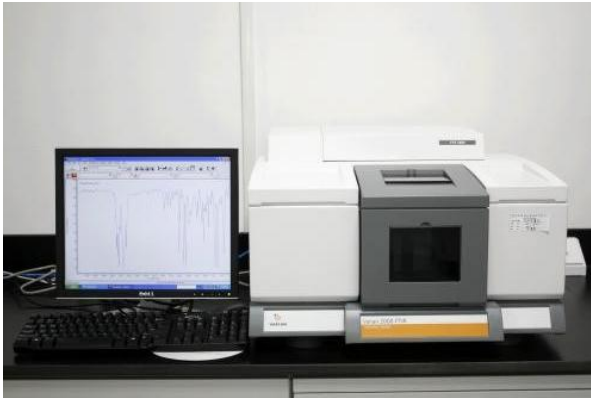


Testbay system of dissolvable bridge plug





# TEST FACILITY AND LAB INSTRUMENT



Sulphurisation



UV aging chamber



Aging instrument



HT & LT testing machine



infrared spectrometer



Low temperature  
brittleness machine



O<sub>3</sub> aging chamber

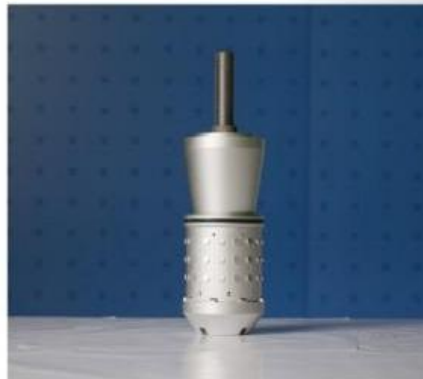
# PRODUCT



Ultra-high temperature soluble bridge plug



Mono slip soluble bridge plug



Full metal soluble bridge plug



Elastomer soluble bridge plug



Double slips soluble bridge plug



Ball-in-place soluble bridge plug



3.5" soluble bridge plug

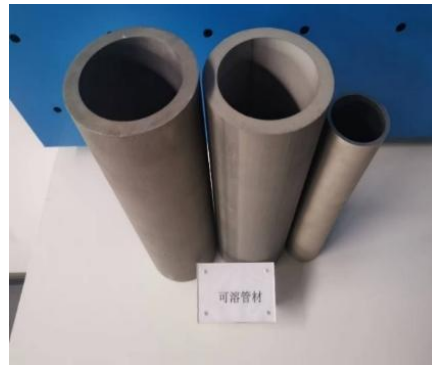


Dissolvable frac plug

# PRODUCT



Soluble nail



Soluble pipe/hollow rod



Dissolvable magnesium rod



Magnesium extrusion rod



Acid soluble ball seat



Acid resistance soluble ball



Block ball for temporary



Magnesium machining parts



# PRODUCT

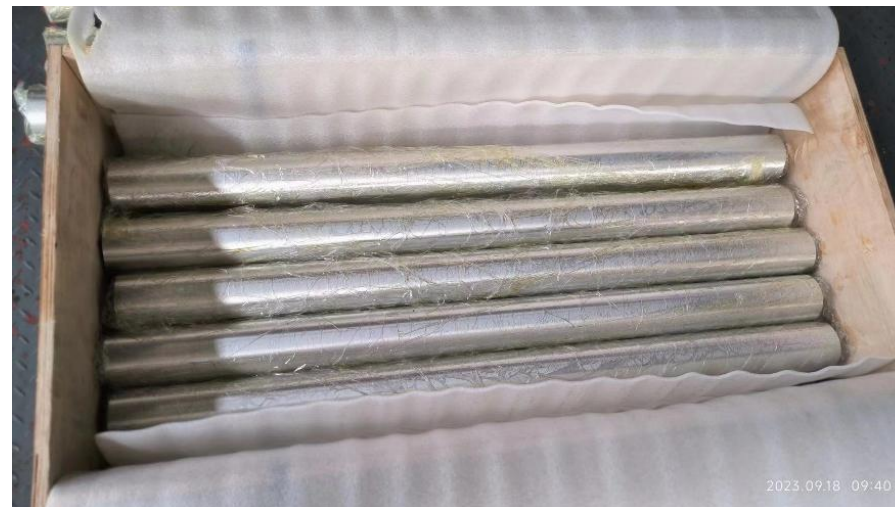
## Dissolvable Magnesium Material



| Material model | Mechanical Property  |                    |              | hardness HB | Dissolution Rate      |                                |
|----------------|----------------------|--------------------|--------------|-------------|-----------------------|--------------------------------|
|                | Tensile strength Mpa | Yield Strength MPa | Elongation % |             | Dissolution condition | Rate/{mg/(cm <sup>2</sup> .h)} |
| 006            | ≥360                 | ≥260               | ≥3.0         | ≥90         | 93°C/3%KCl            | 50-80                          |
| 006A           | ≥300                 | ≥210               | ≥5.0         | ≥70         | 93°C/3%KCl            | 50-80                          |
| 008            | ≥400                 | ≥300               | ≥3.0         | ≥100        | 93°C/3%KCl            | 30-60                          |
| 008C           | ≥310                 | ≥220               | ≥10.0        | ≥75         | 93°C/3%KCl            | 30-60                          |
| 011            | ≥410                 | ≥300               | ≥3.0         | ≥100        | 93°C/3%KCl            | 15-35                          |
| 016            | ≥270                 | ≥180               | ≥14.0        | ≥60         | 93°C/3%KCl            | 30-60                          |
| 018            | ≥230                 | ≥180               | ≥12.0        | ≥55         | 50°C/0.84KCl          | 35-55                          |
| 019            | ≥220                 | ≥170               | ≥14.0        | ≥55         | 50°C/0.84KCl          | 35-60                          |
| 010            | ≥170                 | ≥100               | ≥30.0        | ≥50         | 93°C/3%KCl            | 15-35                          |
| 022            | ≥300                 | ≥200               | ≥5.0         | ≥70         | 43°C/0.05%KCl         | 35-55                          |
| 023            | ≥270                 | ≥200               | ≥7.5         | ≥65         | 43°C/0.05%KCl         | 25-35                          |
| 024            | ≥250                 | ≥200               | ≥7.0         | ≥60         | 43°C/0.05%KCl         | 50-80                          |
|                |                      |                    |              |             | 30°C/0.05%KCl         | 70-100                         |
| 015            | ≥270                 | ≥210               | ≥5.0         | ≥60         | 30°C/0.84%KCl         | 80-130                         |
|                |                      |                    |              |             | 20°C/0.01%KCl         | 30-50                          |
| 025            | ≥270                 | ≥200               | ≥10.0        | ≥70         | 50°C/0.84%KCl         | 80-110                         |
| 808            | ≥360                 | ≥260               | ≥3.0         | ≥100        | 50°C/0.84%KCl         | 50-80                          |
| MM8            | ≥270                 | ≥220               | ≥10.0        | ≥65         | 93°C/3%KCl            | 90-160                         |
| 026            | ≥440                 | ≥330               | ≥3.0         | ≥110        | 93°C/3%KCl            | 10-30                          |
| 035            | ≥100                 | ≥60                | ≥40.0        | ≥40         | 93°C/3%KCl            | 50-100                         |
|                |                      |                    |              |             | 50°C/0.84%KCl         | 20-40                          |
| 055            | ≥210                 | ≥160               | ≥12.0        | ≥55         | 93°C/3%KCl            | 100-150                        |
| MM3            | ≥310                 | ≥230               | ≥12.0        | ≥70         | 93°C/3%KCl            | 2-10                           |
| MM4            | ≥310                 | ≥230               | ≥6.0         | ≥70         | 93°C/3%KCl            | 1-5                            |
| MM6            | ≥270                 | ≥220               | ≥9.0         | ≥70         | 50°C/0.84%KCl         | 70-110                         |
| MM7            | ≥280                 | ≥220               | ≥5.0         | ≥70         | 50°C/0.84%KCl         | 80-130                         |
| 088            | 3190                 | 3130               | ≥32.0        | ≥50         | 93°C/3%KCl            | 20-60                          |

# PRODUCT

## Dissolvable Magnesium Material



# PRODUCT

## Dissolvable Magnesium Material



### Note:

1. We can produce dissolvable bar as per customers' demand with specifications such as  $\Phi 3$ 、5、6、9.5、10、16、20、25、28、38、46、51、55、60、65、70、78、80、84、90、93、96、100、103、105、110、113、115、117、120、125、128、130、134、150、160、170、180. (mm)
2. We can drill to produce pipes with an inner hole  $\Phi 30$ 、31、38、40、45、50、60、70、77、90 (mm) and other specifications, length is 1 meter.
3. Pipes of other specifications can be extruded by customer's demand.





# PRODUCT

## Dissolvable Bridge Plug



# PRODUCT

## Dissolvable Bridge Plug



### Mono Slip Dissolvable Bridge Plug

The design of the dissolvable bridge plug uses the conventional Baker10#/20# setting tool to set. The special adaptor is connected with the bridge plug, when the bridge plug is pumped to the predetermined setting position, the setting tool is set push the cylinder to push the bridge plug downward compression and setting, after the bridge plug is set, release the thread cutting, setting tools and set joint successfully released.

| Casing OD (mm) | Casing ID (mm) | Plug Model | plug length (mm) | Internal diameter (mm) | Soluble ball (mm) | Setting force(T) | Working pressure differential(MPa) | Operating Temperature (°C) |
|----------------|----------------|------------|------------------|------------------------|-------------------|------------------|------------------------------------|----------------------------|
| 3.5"(88.90)    | 76             | Y257R-65   | 275              | 25                     | 31.5              | 4-5              | 70                                 | 30-150                     |
| 4.5"(114.3)    | 97.2-101.6     | Y257R-89   | 290              | 30                     | 40.5              | 10-14            | 70                                 | 30-150                     |
| 5.0°(127)      | 102.7-105.6    | Y257R-89   | 290              | 30                     | 40.5              | 10-14            | 70                                 | 30-150                     |
|                | 108.6          | Y257R-95   | 290              | 32                     | 44.5              | 12-16            | 70                                 | 30-150                     |
| 5.5"(139.7)    | 114.3-118.6    | Y257R-103  | 290              | 45                     | 52.5              | 12-16            | 70                                 | 30-150                     |
|                | 121.4-124.3    | Y257R-109  | 290              | 50                     | 62.5              | 12-16            | 70                                 | 30-150                     |
| 6"(152.4)      | 130.0-133.0    | Y257R-115  | 290              | 60                     | 69.5              | 14-18            | 70                                 | 30-150                     |

# PRODUCT

## Dissolvable Bridge Plug



### Double Slip Dissolvable Bridge Plug

The design of the dissolvable bridge plug uses the conventional Baker10#/20# setting tool to set. The special adaptor is connected with the bridge plug, when the bridge plug is pumped to the predetermined setting position, the setting tool is set push the cylinder to push the bridge plug downward compression and setting, after the bridge plug is set, release the thread cutting, setting tools and set joint successfully released.

| Casing OD (mm) | Casing ID (mm) | Plug Model | plug length (mm) | Internal diameter (mm) | Soluble ball (mm) | Setting force(T) | Working pressure differential(MPa) | Operating Temperature (°C) |
|----------------|----------------|------------|------------------|------------------------|-------------------|------------------|------------------------------------|----------------------------|
| 4.5"(114.3)    | 97.2-101.6     | Y457R-88   | 420              | 30                     | 40.5              | 10-14            | 70                                 | 30-150                     |
| 5.0"(127)      | 102.7-105.6    | Y457R-88   | 420              | 30                     | 40.5              | 10-14            | 70                                 | 30-150                     |
|                | 108.6          | Y457R-95   | 430              | 32                     | 44.5              | 12-16            | 70                                 | 30-150                     |
| 5.5"(139.7)    | 114.3-118.6    | Y457R-103  | 430              | 40                     | 50.5              | 12-16            | 70                                 | 30-150                     |
|                | 121.4-124.3    | Y457R-109  | 430              | 45                     | 54.5              | 12-16            | 70                                 | 30-150                     |



# PRODUCT

## Dissolvable Bridge Plug



### Ball-in-place Dissolvable Bridge Plug

The design of the dissolvable bridge plug uses the conventional Baker10#/20# setting tool to set. The special adaptor is connected with the bridge plug, when the bridge plug is pumped to the predetermined setting position, the setting tool is set push the cylinder to push the bridge plug downward compression and setting, after the bridge plug is set, release the thread cutting, setting tools and set joint successfully released.



| Casing OD (mm) | Casing ID (mm) | Plug Model | plug length (mm) | Internal diameter (mm) | Soluble ball (mm) | Setting force(T) | Working pressure differential(MPa) | Operating Temperature (°C) |
|----------------|----------------|------------|------------------|------------------------|-------------------|------------------|------------------------------------|----------------------------|
| 4.5"(114.3)    | 97.2-101.6     | Y257R-89   | 245              | 28                     | 34.5              | 10-14            | 70                                 | 20-210                     |
| 5.0"(127)      | 102.7-105.6    | Y257R-89   | 245              | 28                     | 34.5              | 10-14            | 70                                 | 20-210                     |
|                | 108.6          | Y257R-95   | 245              | 30                     | 37.5              | 12-16            | 70                                 | 20-210                     |
| 5.5"(139.7)    | 114.3-118.6    | Y257R-103  | 260              | 35                     | 40.5              | 12-16            | 70                                 | 20-210                     |
|                | 121.4-124.3    | Y257R-108  | 260              | 35                     | 40.5              | 12-16            | 70                                 | 20-210                     |

# PRODUCT

## Dissolvable Bridge Plug



### Full Metal Dissolvable Bridge Plug

The design of the dissolvable bridge plug uses the conventional Baker10#/20# setting tool to set. The special adaptor is connected with the bridge plug, when the bridge plug is pumped to the predetermined setting position, the setting tool is set push the cylinder to push the bridge plug downward compression and setting, after the bridge plug is set, release the thread cutting, setting tools and set joint successfully released.

| Casing OD (mm) | Casing ID (mm) | Plug Model | plug length (mm) | Internal diameter (mm) | Soluble ball (mm) | Setting force(T) | Working pressure differential(MPa) | Operating Temperature (°C) |
|----------------|----------------|------------|------------------|------------------------|-------------------|------------------|------------------------------------|----------------------------|
| 3.5"(88.90)    | 76             | Y257R-65   | 210              | 25                     | 31.5              | 4-5              | 70                                 | 20-210                     |
|                | 97.2-99.6      | Y257R-85   | 220              | 35                     | 44.5              | 10-14            | 70                                 | 20-210                     |
| 4.5"(114.3)    | 99.6-101.6     | Y257R-89   | 220              | 40                     | 51.5              | 10-14            | 70                                 | 20-210                     |
|                | 102.7          | Y257R-89   | 220              | 40                     | 51.5              | 10-14            | 70                                 | 20-210                     |
| 5"(127)        | 104.8-105.6    | Y257R-95   | 220              | 45                     | 53.5              | 10-14            | 70                                 | 20-210                     |
|                | 108.6          | Y257R-98   | 220              | 45                     | 53.5              | 12-16            | 70                                 | 20-210                     |
| 5.5"(139.7)    | 114.3-118.6    | Y257R-103  | 230              | 50                     | 61.5              | 12-16            | 70                                 | 20-210                     |
|                | 118.6-121.4    | Y257R-106  | 230              | 55                     | 66.5              | 12-16            | 70                                 | 20-210                     |
|                | 121.4-124.3    | Y257R-109  | 230              | 60                     | 71.5              | 12-16            | 70                                 | 20-210                     |
| 6"(152.4)      | 130.0-133.0    | Y257R-118  | 235              | 70                     | 82.5              | 12-16            | 70                                 | 20-210                     |

# PRODUCT

## Dissolvable Bridge Plug



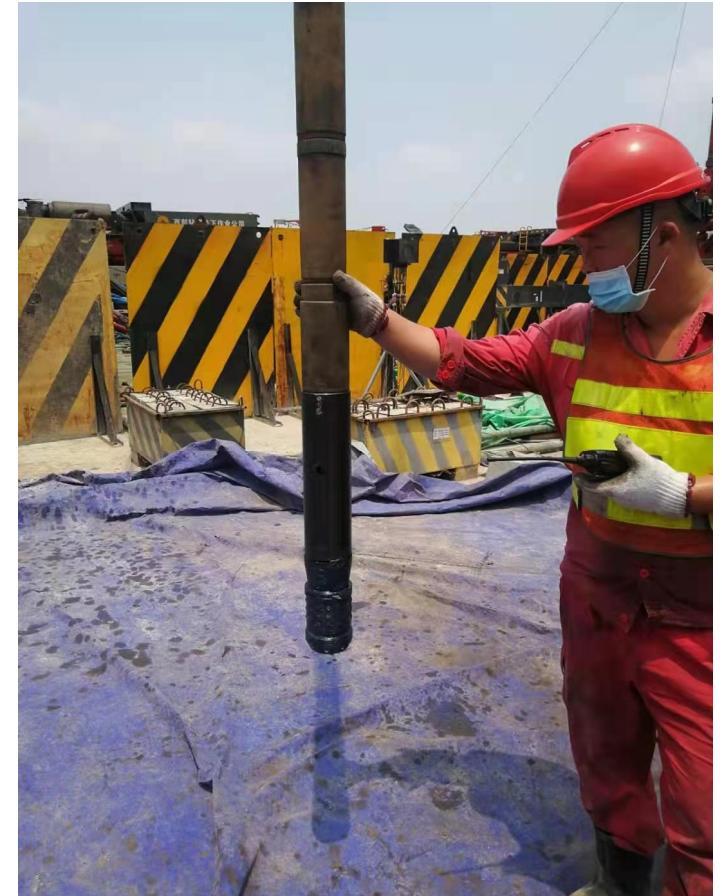
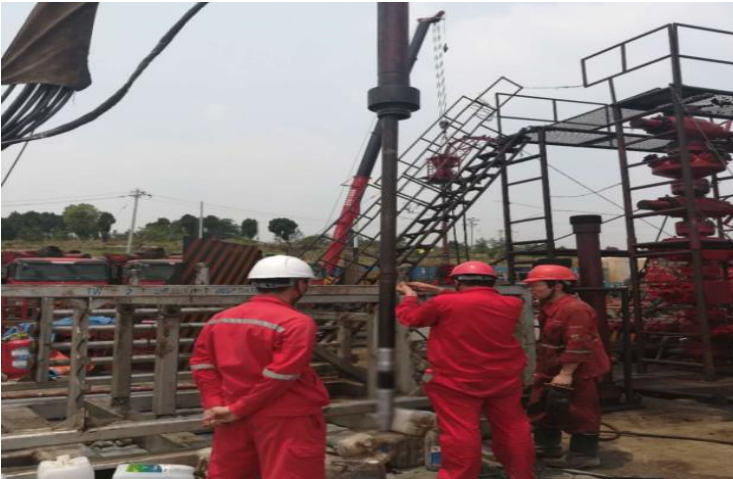
### Dream Dissolvable Bridge Plug

The design of the dissolvable bridge plug uses the conventional Baker10#/20# setting tool to set. The special adaptor is connected with the bridge plug, when the bridge plug is pumped to the predetermined setting position, the setting tool is set push the cylinder to push the bridge plug downward compression and setting, after the bridge plug is set, release the thread cutting, setting tools and set joint successfully released.

| Casing OD (mm) | Casing ID (mm) | Plug Model | plug length (mm) | Internal diameter (mm) | Soluble ball (mm) | Setting force(T) | Working pressure differential(MPa) | Operating Temperature (°C) |
|----------------|----------------|------------|------------------|------------------------|-------------------|------------------|------------------------------------|----------------------------|
| 4.5"(114.3)    | 97.2-101.6     | Y257R-89   | 290              | 40                     | 47.5              | 10-14            | 70                                 | 30-150                     |
|                | 102.7-105.6    | Y257R-89   | 290              | 40                     | 47.5              | 10-14            | 70                                 | 30-150                     |
| 5.0"(127)      | 108.6          | Y257R-95   | 290              | 50                     | 60.5              | 12-16            | 70                                 | 30-150                     |
| 5.5"(139.7)    | 114.3-118.6    | Y257R-103  | 290              | 60                     | 69.5              | 12-16            | 70                                 | 30-150                     |
|                | 121.4-124.3    | Y257R-108  | 290              | 65                     | 72.5              | 12-16            | 70                                 | 30-150                     |



# APPLICATION



# APPLICATION



Since 2015, the dissolvable bridge plugs of various specifications, such as 4.5-inch and 5.5-inch, have been used to carry out field tests in Changqing, Daqing, Tuha, Sichuan, Jilin and other oilfields, with a cumulative total of more than 30,000 segments used in the field of segmental fracturing. The test data verify that the technical performance of dissolvable bridge plugs has reached the design requirements and can meet the production requirements of segmental fracturing. Meanwhile, TINVO has established long-term cooperative relationship with CNPC, CNOOC, Sinopec, SJS, Jiangnan Oilfield Tools and other units and subsidiaries, and has supplied dissolvable bridge plugs, aluminum-magnesium alloy dissolvable rods and dissolvable frac ball to well-know petroleum companies and oil service companies worldwide.



HELP YOU FIND THE BEST CHINESE INDUSTRIAL MANUFACTURER



# CONTACT US

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