

**ONTON**



Self-Drilling Hollow Bar  
Build-in-resin Bolt  
Anchor Bolt  
Soil Nail  
Micropile

**ONTON**

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# FACTORY HISTORY

Beginner and innovator of self-drilling anchor bar manufacturing in China

( Since 1991 )



- 1991**  
Founded
- 1992**  
The first Chinese company to produce Self-Drilling Anchor Bar by cut threading
- 1994**  
The first Chinese company to make Self-Drilling Anchor Bar by cold rolling
- 1995**  
Self-Drilling Anchors were first applied in Jiazhuqing Tunnel, China
- 1998**  
Hot rolling was first introduced by ONTON
- 2006**  
Hot roll – Heat treat – Cold roll Integrated Process Methods
- 2008**  
Participated in drafting Railway Standards issued by Ministry of Railway PRC
- 2012**  
Began to export Self-Drilling Anchors to Japan. ONTON products have already had a good sale in Japan, Europe and South America
- 2020**  
Participated in the development of national railway standards. Technical specification for Railway Tunnel Bolting of CR9248-2020
- 2024**  
Build-in-resin prestressed hollow bolt R&D has been successful and put into use in tunnelling and mining

# COMPANY PROFILE



Since 1991, beginner and innovator of self-drilling anchor bar manufacturing in China.

Over thirty years, ONTON has entirely dedicated a branch of the company to an independent manufacturer in support of the specialized field of ground drilling and consolidation where anchors are utilized widely. It has become a pioneer of excellence in rock anchors construction.

Its self-drilling anchors have been increasing progressively to cover the domestic market due to the innovation of heat treatment technology and the experience in the metal industry. ONTON has participated in the construction of almost all high-speed rail projects in China, and has participated in or co-participated in the development of most of Chinese railway industry standards.

With certification ISO 9001:2015, ONTON guarantees high standard of SDA products. As a rock bolt manufacturer, the self drilling anchor system production and testing are according to EN14490, ASTM F432, EN14199, EN100803, FHWA-NHI-14-007.

ONTON has been focusing on the oversea market since 2008, the first customer was from Japan.

In Dec. 2023, ONTON successfully developed a new patented fast and efficient installation hollow bolt – Build-in-Resin Prestressed Hollow Bolt, which has been written into industrial standard.

## Product advantages

Different from traditional cold rolling, ONTON has its own self-drilling hollow anchor manufacturing process - hot rolling and special heat treatment to produce anchor bar with thinner wall thickness. Its strength is equal to or higher than that of traditional self-drilling anchor bars, and it can be produced in any length (from 1m to 12m) without any additional cost. Thinner wall thickness is conducive to increasing the drilling speed and expanding the grouting channel through the larger cooling water channel, which can improve the grouting fullness of the anchor bar and ensure the installation quality. In other words, a larger inner hole is more conducive to grouting.



## Self-Drilling Hollow Bar


### Features


- Excellent internal and external quality control
- Fulfill standard EN14199/ EN14490/ ASTM F432/ ASTM A615/ FHWA-NHI-14-007



Customization is available for all the special requirement, different unit weight, internal diameter, cross sectional area, tensile load, yield load, elongation, length, etc.

# R25

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
R25	25	14.5	210	200	150
		12.5	254	350	200
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	1.65	S355/ C45/ S460NH	Agt ≥2.5%	R thread ISO 10208 Left hand	1, 2, 3, 4, 5, 6, 7, 8,9, 10, 11, 12
	2.00		Agt ≥5%		
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type	
	R25	36	150	HRC 20-30	40Cr/ C45	0.70	R thread ISO 10208 Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy							






Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
R25 Hex Nut	41	41	HRC 20-30	40Cr/ C45	0.29	R thread ISO 10208 Left hand
R25 Domed Nut	41	41	HRC 20-30	40Cr/ C45	0.31	
 <b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	R25	150 X 150	8	30	Q235B/ Q345B	1.40
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)
R25	70	35	ZG45	0.35
				


Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
R25	EX Steel cross bit	42, 51	HRC 49-54	42CrMo	R thread ISO 10208 Left hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	42, 51	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	42, 51	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	42, 51	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	76	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
 <b>Options of Anti-corrosion:</b> Painting						


# R32

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
R32L	32	21	331	210	160
R32N		20	331	280	230
R32S		19	369	360	280
R32SS		18	407	400	330
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	2.60	S355/ C45/ S460NH	Agt ≥2.5% Agt ≥5%	R thread ISO 10208 Left hand	1, 2, 3, 4, 5, 6, 7, 8,9, 10, 11, 12
	2.60				
	2.90				
3.20					
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
	R32	42	HRC 20-30	40Cr/ C45	0.82	R thread ISO 10208
					1.00	Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
R32 Hex Nut	46	45	HRC 20-30	40Cr/ C45	0.35	R thread ISO 10208 Left hand
R32 Domed Nut		65			0.60	
		45			0.45	
		65			0.70	
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)
	R32	150 X 150	8	Q235B/ Q345B	1.40
	200 X 200	8	2.50		
	200 X 200	10	3.10		
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)	
R32	70	35	ZG45	0.35	

Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
R32	EX Steel cross bit	51, 76, 90	HRC 49-54	42CrMo	R thread ISO 10208 Left hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	51, 76, 90	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	51, 76, 90	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	51, 76, 90	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	76, 90, 110	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
	EY Steel drop centre bit	76, 90	HRC 49-54	42CrMo		Loose to medium dense ground conditions
	EYY Carbide drop centre bit	76, 90	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	EC Steel arching bit	51, 76, 90	HRC 49-54	42CrMo		Unconsolidated soil with small boulders
	ECC Carbide arching bit	51, 76, 90	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
						
<b>Options of Anti-corrosion:</b> Painting						

# R38

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
R38N	38	24	509	500	400
R38S		22.5	560	560	460
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	4.00 4.40	S355/ C45/ S460NH	Agt ≥2.5% Agt ≥5%	R thread ISO 10208 Left hand	1, 2, 3, 4, 5, 6, 7, 8
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
	R38	51	HRC 20-30	40Cr/ C45	1.40	R thread
					1.72	ISO 10208 Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						




Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
R38 Hex Nut	50	60	HRC 20-30	40Cr/ C45	0.48	R thread
R38 Domed Nut	55	65			0.85	ISO 10208 Left hand
 <b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	R38	200 X 200	12	41	Q235B/ Q345B	3.70
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)	
R38	70	35	ZG45	0.35	


Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
R38	EX Steel cross bit	76, 90, 110	HRC 49-54	42CrMo	R thread ISO 10208 Left hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	76, 90, 110	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	76, 90, 110	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	76, 90, 110	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	76, 90, 110	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
	EY Steel drop centre bit	76, 90, 110	HRC 49-54	42CrMo		Loose to medium dense ground conditions
	EYY Carbide drop centre bit	76, 90, 110	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	EC Steel arching bit	76, 90, 110	HRC 49-54	42CrMo		Unconsolidated soil with small boulders
	ECC Carbide arching bit	76, 90, 110	HRA 87-89	40Cr + YG9C		Soft to medium rock formations



Options of Anti-corrosion: Painting

# R51

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
R51L	51	38	637	550	450
R51N		34	892	800	630
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	5.00 7.00	S355/ C45/ S460NH	Agt ≥2.5% Agt ≥5%	R thread ISO 1720 Left hand	1, 2, 3, 4, 5, 6, 7, 8
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type	
	R51	63	200	HRC 20-30	40Cr/ C45	1.85	R thread ISO 1720 Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy							


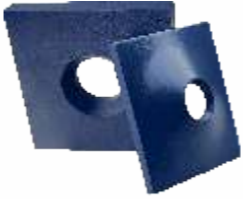

Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
R51 Hex Nut	75	70	HRC 20-30	40Cr/ C45	1.60	R thread
R51 Domed Nut	75	70			1.70	ISO 1720 Left hand
	<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	R51	200 X 200	16	60	Q235B/ Q345B	4.90
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)	
R51	85	40	ZG45	0.52	


Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
R51	EX Steel cross bit	90, 115, 130	HRC 49-54	42CrMo	R thread ISO 1720 Left hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	90, 115, 130	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	90, 115, 130	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	90, 115, 130	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	90, 115, 130	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
	EY Steel drop centre bit	90, 115, 130	HRC 49-54	42CrMo		Loose to medium dense ground conditions
	EYY Carbide drop centre bit	90, 115, 130	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	EC Steel arching bit	90, 115, 130	HRC 49-54	42CrMo		Unconsolidated soil with small boulders
	ECC Carbide arching bit	90, 115, 130	HRA 87-89	40Cr + YG9C		Soft to medium rock formations




Options of Anti-corrosion: Painting


# T30

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
T30/11	30	11	446	320	260
T30/14		14	407	320	260
T30/16		16	331	260	220
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	3.50	S355/ C45/ S460NH	Agt ≥2.5% Agt ≥5%	T thread T international Left hand	1, 2, 3, 4, 5, 6, 7, 8
	3.20				
	2.60				
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
	T30	42	105	HRC 20-30	40Cr/ C45	0.45
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
T30 Hex Nut	46	41	HRC 20-30	40Cr/ C45	0.35	T thread
T30 Domed Nut	46	41			0.38	T international Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	T30	150 X 150	8	35	Q235B/ Q345B	1.40
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)
T30	70	35	ZG45	0.35
				

Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
T30	EX Steel cross bit	51, 76, 90	HRC 49-54	42CrMo	T thread T international Left hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	51, 76, 90	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	51, 76, 90	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	51, 76, 90	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	76, 90, 110	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
						
<b>Options of Anti-corrosion:</b> Painting						





# T40

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
T40/16	40	16	917	660	525
T40/16		18	853	660	525
T40/20		20	713	540	430
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	7.20	S355/ C45/ S460NH	Agt ≥2.5% Agt ≥5%	T thread T international Left hand	1, 2, 3, 4, 5, 6, 7, 8
	6.70				
	5.60				
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
	T40	57	HRC 20-30	40Cr/ C45	1.70	T thread
					1.49	T international Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
T40 Hex Nut	60	68	HRC 20-30	40Cr/ C45	0.90	T thread
T40 Domed Nut	60	68			1.10	T international Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	T40	200 X 200	14	54	Q235B/ Q345B	4.10
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)
T40	88	40	ZG45	0.56
				

Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
T40	EX Steel cross bit	76, 90, 110	HRC 49-54	42CrMo	T thread T international Left hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	76, 90, 110	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	76, 90, 110	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	76, 90, 110	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	76, 90, 110	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
						
<b>Options of Anti-corrosion:</b> Painting						

# T52

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
T52/26	52	26	1146	929	730
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	9.00	S355/ C45/ S460NH	Agt ≥2.5% Agt ≥5%	T thread T international Left hand	1, 2, 3, 4, 5, 6, 7, 8
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
	T52	68	HRC 20-30	40Cr/ C45	1.96	T thread
		180			2.20	T international Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						






Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
T52 Hex Nut	75	70	HRC 20-30	40Cr/ C45	1.43	T thread
T52 Domed Nut	75	70			1.90	T international Left hand
 <b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						


Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	T52	200 X 200	30	60	Q235B/ Q345B	8.70
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)	
T52	112	35	ZG45	0.74	

Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
T52	EX Steel cross bit	90, 115, 130	HRC 49-54	42CrMo	T thread T international Left hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	90, 115, 130	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	90, 115, 130	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	90, 115, 130	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	115, 130, 150	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
 <b>Options of Anti-corrosion:</b> Painting						

# T73

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
T73/35	73	35	1910	1865	1430
T73/53		53	1615	1258	975
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	15.00	S355/ C45/ S460NH	Agt ≥2.5%	T thread T international Right hand	1, 2, 3, 4, 5, 6, 7, 8
	13.90		Agt ≥5%		
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type	
	T73	95	245	HRC 20-30	40Cr/ C45	6.30	T thread T international Right hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy							





Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
T73 Hex Nut	100	70	HRC 20-30	40Cr/ C45	2.45	T thread
T73 Domed Nut	100	70			3.19	T international Right hand
	<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					


Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	T73	250 X 250	40	80	Q235B/ Q345B	18.00
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)	
T73	130	50	ZG45	1.15	

Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
T73	EX Steel cross bit	110, 130, 150	HRC 49-54	42CrMo	T thread T international Right hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	110, 130, 150	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	110, 130, 150	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	110, 130, 150	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	130, 150, 175	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
						
<b>Options of Anti-corrosion:</b> Painting						

# T76

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
T76L	76	55	1528	1200	1000
T76N		51	1911	1600	1200
T76S		45	2420	1900	1500
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	12.00	S355/ C45/ S460NH	Agt ≥2.5% Agt ≥5%	T thread T international Left hand	1, 2, 3, 4, 5, 6, 7, 8
	15.00				
	19.00				
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
	T76	97	200	HRC 20-30	40Cr/ C45	4.60
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						






Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
T76 Hex Nut	100	80	HRC 20-30	40Cr/ C45	2.67	T thread
T76 Domed Nut	100	80			3.90	T international Left hand
	<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					


Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	T76	250 X 250	40	80	Q235B/ Q345B	18.00
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)	
T76	130	50	ZG45	1.20	

Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
T76	EX Steel cross bit	115, 130, 175	HRC 49-54	42CrMo	T thread T international Left hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	115, 130, 175	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	115, 130, 175	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	115, 130, 175	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	130, 150, 175	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
						
<b>Options of Anti-corrosion:</b> Painting						

# T103

Self Drilling Hollow Bar	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
T103/51	103	51	5682	3460	2730
T103/78		78	3140	2244	1770
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	44.60	S355/ C45/ S460NH	Agt ≥2.5%	T thread T international Right hand	1, 2, 3, 4, 5, 6, 7, 8
	25.30		Agt ≥5%		
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Coupler	Outside Diameter (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
	T103	133	HRC 20-30	40Cr/ C45	13.50	T thread
		145			290	20.10
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						





Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type
T103 Hex Nut	125	90	HRC 20-30	40Cr/ C45	3.83	T thread T international Right hand
		130			5.51	
T103 Domed Nut		90			4.18	
		130			5.92	
 <b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	T103	300 X 300	50	110	Q235B/ Q345B	31.40
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Centralizer	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)
T103	165	80	ZG45	4.00
				

Drill bit	Type	Outside Diameter (mm)	Hardness	Material	Thread Type	Stratum Type
T103	EX Steel cross bit	150, 175, 200	HRC 49-54	42CrMo	T thread T international Right hand	Loose to medium dense ground conditions
	EXX Carbide cross bit	150, 175, 200	HRA 87-89	40Cr + YG9C		Soft to medium rock formations
	ES Steel button bit	150, 175, 200	HRC 49-54	42CrMo		Unconsolidated rock with boulders
	ESS Carbide button bit	150, 175, 200	HRA 87-89	40Cr + YG9C		Medium to hard rock formations
	EW Stepped clay bit	175, 200, 220	HRC 49-54	42CrMo		Optimized geometry for very soft to soft clay
 <b>Options of Anti-corrosion:</b> Painting						

Built-in Resin Prestressed Self-Drilling Hollow Bar

## Product advantages

Build-in-resin prestressed self-drilling hollow bolt is ONTON's new developed and patented product at the end of 2023, which is the improvement on the basis of traditional self-drilling anchor bar. It consists of more than 10 devices, in addition to the traditional self drilling anchor bar, nut and plate, but also added resin capsule, stop plug, washer and so on. It can achieve two steps installation with much shorter time than that of traditional self-drilling anchor bar.

## Built-in Resin Prestressed Self-Drilling Hollow Bolt

Build-in-resin prestressed self drilling hollow bolt has been widely applied in tunneling and will be gradually extended to mining, slope stabilization, etc. It is especially suitable for anchoring the vault that is prone to collapse. It has the following advantages:

A

### Embedded resin capsules with tapered resin outlet anchor head:

Solve the problems such as resin capsules falling down from vault construction and difficulty in resin capsules propulsion in slightly collapsed holes, ensuring that the resin capsules are pushed to the bottom of the hole accurately, reliably and completely.

B

### Two-step process:

Reduce the process of resin capsules into the anchor hole, suitable for all types of construction machinery and operation methods, which can realize the mechanization of the whole process of bolt construction and can significantly improve the work efficiency. A single bolt construction time is no more than 4.5 minutes.

C

### Built-in blade to thicken the anchor rod body:

The resin is squeezed into the bottom of the anchor hole, and the capsule package remains in the rod, so the influence of capsule package on the anchoring performance is excluded. The optimized three paths matching is to improve the anchoring quality and to make the anchoring force reach more than 100kN.

# Build-in-resin R25



Build-in-resin Prestressed Hollow Bolt	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
R25	25	14.5	210	200	150
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	1.65	S355/ C45/ S460NH	Agt ≥5%	R thread ISO 10208 Left hand	3, 4, 5, 6
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Rod Body	Outside Diameter (mm)	Length (mm)	Ultimate Load (kN)	Material	Unit Weight (Kg/pc)	
	R37	37	650	200	S355/ C45	2.30
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Resin Capsule	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)	Anchor Capacity after 1 Min. Setting (kN)	Anchor Capacity after 5 Min. Setting (kN)	
	MSCka2850	28	500	Resin	0.60	60	200
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy							

Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type	
	R25 Hex Nut	36	30	HRC 20-30	40Cr/ C45	0.14	R thread ISO 10208 Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy							

Washer	Outside Diameter (mm)	Thickness (mm)	Material	Unit Weight (Kg/pc)	
	R25	45 x 26	20	C45	0.10
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	R25	150 x 150	6.5	37	Q235B/ Q345B	1.00
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

# Build-in-resin R32



Build-in-resin Prestressed Hollow Bolt	Outside Diameter (mm)	Internal Diameter (mm)	Cross sectional area (mm <sup>2</sup> )	Ultimate Load (kN)	Load at 0.2% Yield (kN)
R32	32	19	369	360	290
	Weight (kg/m)	Material	Elongation %	Thread Type	Length (m)
	2.90	S355/ C45/ S460NH	Agt ≥5%	R thread ISO 10208 Left hand	3, 4, 5, 6
<b>Options of Anti-corrosion:</b> Anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Rod Body	Outside Diameter (mm)	Length (mm)	Ultimate Load (kN)	Material	Unit Weight (Kg/pc)	
	R55	55	650	360	S355/ C45	4.00
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						

Resin Capsule	Outside Diameter (mm)	Length (mm)	Material	Unit Weight (Kg/pc)	Anchor Capacity after 1 Min. Setting (kN)	Anchor Capacity after 5 Min. Setting (kN)	
	MSCka3550	35	500	Resin	1.00	100	360
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy							

Nut	Key Size (mm)	Length (mm)	Hardness	Material	Unit Weight (Kg/pc)	Thread Type	
	R32 Hex Nut	46	45	HRC 20-30	40Cr/ C45	0.35	R thread ISO 10208 Left hand
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy							

Washer	Outside Diameter (mm)	Thickness (mm)	Material	Unit Weight (Kg/pc)	
	R32	57 x 34	20	C45	0.25
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy					

Plate	Dimension (mm)	Thickness (mm)	Hole Diameter (mm)	Material	Unit Weight (Kg/pc)	
	R32	150 x 150	8	44	Q235B/ Q345B	1.25
<b>Options of Anti-corrosion:</b> Painting or anti-rust oil; Hot-dipped galvanization (HDG), EN ISO 1461:1999 Epoxy coating, ISO 14654:1999; HDG + Epoxy						



# Bend Test



180 U-shape | No visible crack | No break

Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

## Bend/Rebend Test

for Hollow Threaded Bar(SDA, IBO)

The ductility of hollow bars can be checked easily on site by a bend/rebend test:

Bending around 180°(U-shape) over a pin diameter  $D \geq 6 \times$  diameter of hollow bar.

e.g.for ONTON R32N  $D = 6 \times 32\text{mm} = 192\text{mm}$ .

If there are visible cracks or the hollow bar breaks,there is not enough ductility as required in detail in ASTM A 615."Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement".

## Sufficient ductility is important to safety

On-site test | Check easily | ASTM A615

For the recent years, the grouting concrete anchor bars are applied in micropiles, soil nails,wall tiedown and tieback anchor systems, etc. And there have been existing standards in Europe and America for these applications.

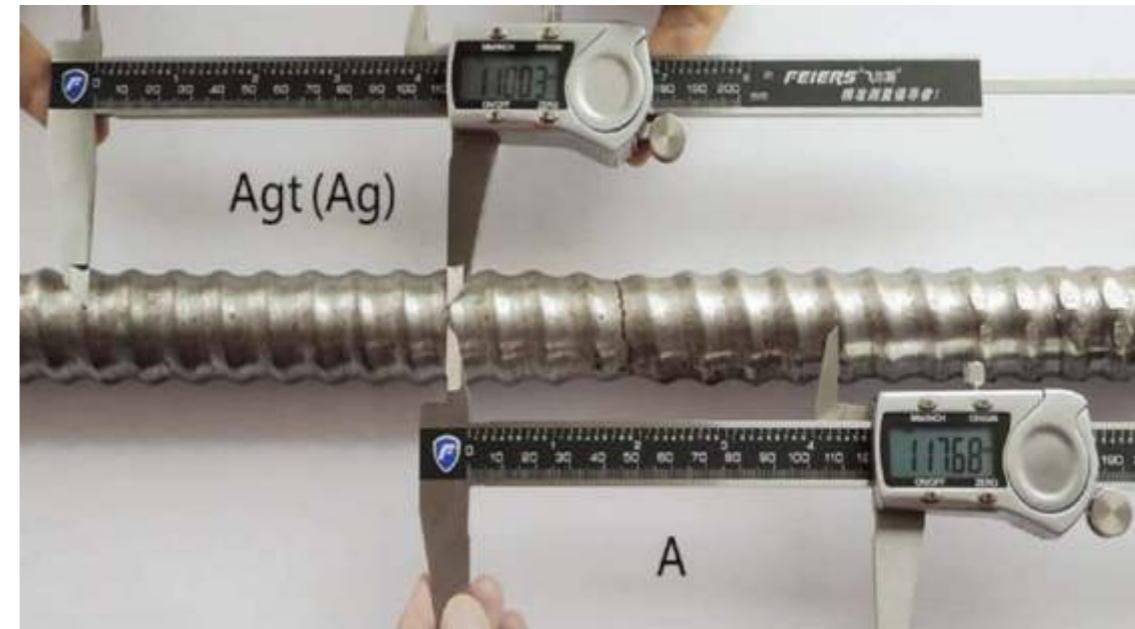
Self-drilling hollow bars with high ductility are the reliable protections for civilians in case of earthquake and other disasters happen.

All ONTON hollow bar anchors can pass this bend test easily benefiting by its high ductility. And in the same time, there isn't any loss of its strength performance.

The ductility is paid more and more attention either in Europe or America.

Whether from the standpoint of safety or market, people need High Ductility hollow bar anchors.

# Agt & A



Ductility Index

Agt: total elongation rate of maximum load    A: breaking elongation

## What is the difference between Agt and A?

By Titan | ASTM A370

The breaking elongation A is the ductility index of the reinforcement, but it is only the residual elongation of broken region rather than the ductility of the reinforcement.

Total elongation rate of maximum load Agt denotes the elongation up to ultimate load without reduction of cross-section.

Usually elongation, A, has double the value of Agt.

The ductility of  $Agt > 5\%$  is required for the finished hollow-bar not for the steel tube it is manufactured from and which is given on the mill certificate of the steel mill.

(The information is from the Titan website)

## How to measure Agt?

By Manual Method

For the example shown in the picture above, Assume the tensile strength of this hollow bar,  $R_m = 800\text{N/mm}^2$ , Measurement ( as shown ) and calculated:

$$Ag = \{(110.03\text{mm} - 100\text{mm}) / 100\text{mm}\} * 100 = 10$$

$$R_m / 2000 = 800 / 2000 = 0.4$$

$$Agt = Ag + R_m / 2000 = 10.4$$

$$A = \{(117.68\text{mm} - 100\text{mm}) / 100\text{mm}\} * 100 = 17.6$$

Result: The elongation of the hollow bar:

$$Agt = 10.4(\%), A = 17.6(\%)$$

# PROJECT CASES

