

DEEPWATER

I-ROD® STRIPS

General

Half-round I-Rod is available in 5ft (1.5 m) or 10 ft (3 m) lengths or pre-cut-and-drilled for any standard pipe U-bolt. I-Rod is a durable extruded thermoplastic cut into a half-round shape. It is the key component in all of Deepwater's I-Rod brand pipe supports.

There are three different diameter sizes for I-Rod: (0.75 in, 1 in, and 1.5 in) as well as a high-temperature version (I-Rod HT) and PEEK (unfilled) for harsher conditions. I-Rod HT and PEEK have the same dimensions as standard I-Rod, but different specifications.

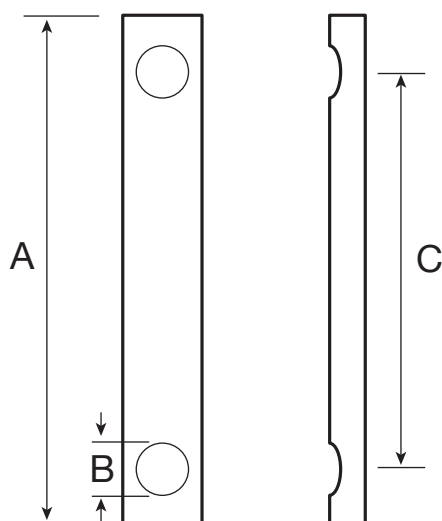
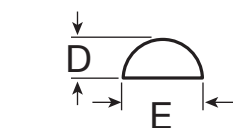


I-Rod, I-Rod HT, and PEEK specifications

I-Rod thermoplastic is standard for most Nu-Bolt assemblies. In extreme conditions, I-Rod HT or Peek can be substituted.

Property	I-Rod Metric [Imperial]	I-Rod HT Metric [Imperial]	PEEK unfilled Metric [Imperial]
Density (23°C)	1.41 g/cm ³ [0.0509 lb/in ³]	1.28 g/cm ³ [0.0462 lb/in ³]	1.31 g/cm ³ [0.047 lb/in ³]
Tensile strength	64.8 MPa [9.4 ksi]	114 MPa [16.5 ksi]	110 MPa [16 ksi]
Tensile modulus	2.62 GPa [380 ksi]	3.45 GPa [500 ksi]	3.44 GPa [500 ksi]
Elongation @ break	30-60%	30-60%	20%
Flexural modulus	2.76 GPa [400 ksi]	3.45 GPa [500 ksi]	4.13 GPa [600 ksi]
Flexural strength	82.7 MPa [13 ksi]	138 MPa [20 ksi]	172 MPa [25 ksi]
Comp. strength	103 MPa [15 ksi]	152 MPa [22 ksi]	127 MPa [20 ksi]
Coefficient of friction	0.25	0.42	-
IZOD impact	0.534 J/cm [1 ft-lb/in]	0.267 J/cm [0.5 ft-lb/in]	0.534 J/cm [1 ft-lb/in]
Rock. hardness M/R	88/120	112/125	100/126
Min. service temp*	-110°C [-166°F]	-	-
Max. service temp	83°C [181°F]	171°C [340°F]	249°C [480°F]
Melting point	168°C [329°F]	210°C [410°F]	340°C [644°F]
Coefficient of linear expan.	97.2 µm/m/°C [54 µin/in/°F]	55.8 µm/m/°C [31 µin/in/°F]	-
Heat deflection	104°C [220°F]	204°C [400°F]	160°C [320°F]
Flammability rating	HB	V/0	V/0
Dielectric strength	16.5 kV/mm	32.7 kV/mm	18.9 kV/mm

Cut and drilled I-Rod / I-Rod HT / PEEK dimensions



Nominal pipe size mm [in]	U-Bolt stock Ø mm [in]	(A) I-Rod length mm [in]	(B) Hole Ø diameter mm [in]	(C) Holes C-to C mm [in]	(D) I-Rod height mm [in]	(E) I-Rod width mm [in]
15 [1/2]	6 [1/4]	64 [2 1/2]	10 [3/8]	31 [1 3/16]	8 [5/16]	19 [3/4]
20 [3/4]	6 [1/4]	76 [3]	10 [3/8]	35 [1 3/8]	8 [5/16]	19 [3/4]
25 [1]	6 [1/4]	76 [3]	10 [3/8]	41 [1 5/8]	8 [5/16]	19 [3/4]
25 [1]	10 [3/8]	76 [3]	13 [1/2]	44 [1 3/4]	11 [7/16]	25 [1]
32 [1 1/4]	10 [3/8]	89 [3 1/2]	13 [1/2]	54 [2 1/8]	11 [7/16]	25 [1]
40 [1 1/2]	10 [3/8]	102 [4]	13 [1/2]	60 [2 3/8]	11 [7/16]	25 [1]
50 [2]	10 [3/8]	114 [4 1/2]	13 [1/2]	71 [2 13/16]	11 [7/16]	25 [1]
65 [2 1/2]	13 [1/2]	127 [5]	16 [5/8]	87 [3 7/16]	11 [7/16]	25 [1]
80 [3]	13 [1/2]	152 [6]	16 [5/8]	103 [4 1/16]	11 [7/16]	25 [1]
100 [4]	13 [1/2]	178 [7]	16 [5/8]	129 [5 1/16]	11 [7/16]	25 [1]
120 [5]	13 [1/2]	203 [8]	16 [5/8]	156 [6 1/8]	11 [7/16]	25 [1]
150 [6]	16 [5/8]	229 [9]	18 [11/16]	187 [7 3/8]	11 [7/16]	25 [1]
200 [8]	16 [5/8]	279 [11]	18 [11/16]	238 [9 3/8]	11 [7/16]	25 [1]
250 [10]	19 [3/4]	343 [13 1/2]	22 [7/8]	295 [11 5/8]	18 [11/16]	38 [1 1/2]
300 [12]	22 [7/8]	406 [16]	25 [1]	349 [13 3/4]	18 [11/16]	38 [1 1/2]
350 [14]	22 [7/8]	432 [17]	25 [1]	381 [15]	18 [11/16]	38 [1 1/2]
400 [16]	22 [7/8]	483 [19]	25 [1]	432 [17]	18 [11/16]	38 [1 1/2]
450 [18]	25 [1]	546 [21 1/2]	28 [1 1/8]	486 [19 1/8]	18 [11/16]	38 [1 1/2]
500 [20]	25 [1]	597 [23 1/2]	28 [1 1/8]	537 [21 1/8]	18 [11/16]	38 [1 1/2]
600 [24]	25 [1]	699 [27 1/2]	28 [1 1/8]	638 [25 1/8]	18 [11/16]	38 [1 1/2]
700 [28]	25 [1]	800 [31 1/2]	28 [1 1/8]	740 [29 1/8]	18 [11/16]	38 [1 1/2]
750 [30]	25 [1]	851 [33 1/2]	28 [1 1/8]	791 [31 1/8]	18 [11/16]	38 [1 1/2]
900 [36]	25 [1]	1003 [39 1/2]	28 [1 1/8]	943 [37 1/8]	18 [11/16]	38 [1 1/2]

*This was lowest temperature possible at testing facility; actual minimum service temperature is probably lower.

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3M Double-sided tape

When used as a beam dressing, place the I-Rod material in continuous lengths across the upper flange of a pipe support beam so the curved surface contacts the pipe. The rod may be secured to the beam with special double-sided tape, by bolting or by the stabilizing U-Bolts used on the piping.

Adhesive type	745 (rubber adhesive)
Adhesive carrier	Closed cell, crosslinked, polyethylene foam
Thickness (nominal)	1.6 mm [1/16 in]
Tolerance	1.4 - 2.0 mm [0.053 - 0.080 in]
Approximate density	65 kg/m ³ [4 lb./ft. ³]
Peel adhesion (ASTM D3330)	140 N/100 mm width [8 lb./in.]
Static shear (ASTM D3654)	@22 °C [72 °F] -1000 g
Normal tensile (ASTM D897)	@49 °C [120 °F] -250 g
Dynamic shear (ASTM D1002)	275 kPa [40 lb./in. ²]
Temperature resistance	240 kPa [35 lb./in. ²]
Short term (hours)	240 kPa
Long term (weeks)	70 °C [158 °F]
Cold flex (at -30°C)	49 °C [120 °F]
Shelf life	No cracking at 6.4 mm [1/4 in]
Slitting tolerance	18 months*
	+/- 0.8 mm [1/32 in.]

* when stored in original cartons at 70 °F (21 °C) and 50% relative humidity

I-Rod compressive strength testing

From an independent lab test conducted in 1996. I-Rod was subjected to compressive loading with a fixture simulating a 12 inch OD pipeline and crosshead extension was measured.

Load applied kg [lb]	Extension 1 rod mm [in]	Extension 2 rods mm [in]	Extension 3 rods mm [in]
227 [500]	0.254 [0.010]	0.229 [0.009]	0.381 [0.015]
454 [1,000]	0.508 [0.020]	0.356 [0.014]	0.584 [0.023]
681 [1,500]	0.711 [0.028]	0.457 [0.018]	0.686 [0.027]
909 [2,000]	0.864 [0.034]	0.508 [0.022]	0.762 [0.030]
1,363 [3,000]	1.143 [0.045]	0.711 [0.028]	0.889 [0.035]
1,818 [4,000]	1.321 [0.052]	0.864 [0.034]	0.991 [0.039]
2,272 [5,000]	1.473 [0.058]	0.991 [0.039]	1.092 [0.043]
2,727 [6,000]	1.626 [0.064]	1.118 [0.044]	1.194 [0.047]
3,181 [7,000]	1.753 [0.069]	1.219 [0.048]	1.270 [0.050]
3,636 [8,000]	1.905 [0.075]	1.346 [0.053]	1.346 [0.053]
4,090 [9,000]	2.057 [0.081]	1.448 [0.057]	1.422 [0.056]
4,545 [10,000]	2.184 [0.086]	1.549 [0.061]	1.524 [0.060]
5,000 [11,000]	2.337 [0.092]	1.651 [0.065]	1.600 [0.063]
5,454 [12,000]	2.464 [0.097]	1.753 [0.069]	1.651 [0.065]

Pipe weight guide (for a pipe filled with water)

The maximum loading for each one-inch (1 inch) rod is **8,000 lb (3636 kg)**.
The maximum loading for each one-and-a-half inch (1 1/2 inch) rod is **10,000 lb (4545kg)**.

The table below conservatively estimates total weight/foot (or meter) of pipe filled with water. Multiply this number by support spacing to get total weight loading then select number of 1 inch I-Rods if pipe is less than 12 inches. 1 1/2 inch I-Rods are generally recommended for piping over 12 inches. Do not mix I-Rod sizes.

Nominal pipe size mm [in]	STD kg/m [lb / ft]	Sch 40 kg/m [lb / ft]	X-Strong kg/m [lb / ft]	Sch 80 kg/m [lb / ft]	Sch 120 kg/m [lb / ft]	Sch 140 kg/m [lb / ft]	Sch 160 kg/m [lb / ft]	XX Strong kg/m [lb / ft]
50 [2]	9 [6]	9 [6]	11 [7]	11 [7]			14 [9]	17 [11]
80 [3]	18 [12]	18 [12]	21 [14]	21 [14]			27 [18]	35 [23]
100 [4]	27 [18]	27 [18]	33 [22]	33 [22]	39 [26]		44 [29]	51 [34]
150 [6]	50 [33]	51 [34]	66 [44]	66 [44]	77 [51]		90 [60]	102 [68]
200 [8]	77 [51]	81 [54]	103 [69]	103 [69]	129 [86]	139 [93]	150 [100]	147 [98]
250 [10]	114 [76]	120 [80]	141 [94]	156 [104]	193 [129]	214 [143]	232 [155]	214 [143]
300 [12]	156 [104]	165 [110]	181 [121]	215 [144]	270 [181]	291 [195]	321 [215]	270 [181]
350 [14]	182 [122]	196 [131]	209 [140]	258 [173]	324 [217]	354 [237]	381 [255]	
400 [16]	226 [151]	256 [171]	256 [171]	335 [224]	418 [280]	463 [310]	496 [332]	
450 [18]	273 [183]	323 [216]	306 [205]	421 [282]	528 [354]	573 [384]	624 [418]	
500 [20]	324 [217]	390 [261]	361 [242]	516 [346]	645 [432]	712 [477]	767 [514]	
600 [24]	439 [294]	552 [370]	485 [325]	737 [494]	933 [625]	1012 [678]	1100 [737]	
650 [26]	503 [337]		552 [370]					
700 [28]	572 [383]		625 [419]					
750 [30]	643 [431]		701 [470]					
900 [36]	885 [593]	1091 [731]	953 [639]					
1050 [42]	1164 [780]		1244 [834]					