

J-LOK® Resin Cartridge Drill Hole and Fill Charts



Mining Applications

The required diameter and length of J-LOK cartridges for civil and tunneling applications, not governed by ASTM F-432-10, is calculated by estimating the volume of the annulus between the bolt and the borehole. J-LOK cartridges are manufactured in diameters of 23, 28, 32, 35, and 40 mm. Cartridges may be manufactured in lengths to suit specific bolt and borehole combinations. However, it is generally more efficient to employ multiple standard one foot (305 mm) long cartridges to anchor each bolt.

The following English and metric tables, with 15% excess for borehole irregularities, assist in the selection and ordering J-LOK cartridges. The English unit table estimates the inches grouted by a standard one foot long cartridge. The metric unit table estimates the millimeters grouted by a standard 305 mm long cartridge.

Metric

Nominal Rebar Diameter, mm	Drill Hole Diameter, mm					
	25	28	33	35	42	51
	Resin Cartridge Diameter, mm					
	23	23	28	32	35	40
16	380					
18	466	305				
20	624	365	302			
22		468	344	367		
25			448	453		
28				616	332	
32					439	
35					603	308

English

Nominal Rebar Rebar Diameter, in.	Drill Hole Diameter, in.							
	1	1-1/4	1-3/8	1-1/2	1-3/4	2	2-1/4	
	Resin Cartridge Diameter, in.							
	0.9	1-1/8	1-1/4	1-1/4	1-3/8	1-9/16	1-9/16	
#6	3/4	19.6	12.7					
#7	7/8		15.9	14.7				
#8	1		22.5	18.6	13.2			
#9	1-1/8			26.5	16.8			
#10	1-1/4				24.1	13.2		
#11	1-3/8					16.9	12.3	
#12	1-1/2					24.4	14.8	9.2
#13	1-5/8						19	10.7
#14	1-3/4							12.9

For Example: a project requires a 3 meter long 22 millimeter diameter rebar, anchored with a one meter long resin anchor. The metric table indicates that this rebar may be installed in a 28, 33, or 35 mm borehole. Assume available equipment is best suited to drill a 33 mm borehole. A 28 mm diameter cartridge is best suited for this rebar and borehole combination. A 305 mm long 28 mm cartridge grouts 344 mm. Therefore, three 305 mm cartridges would be required per bolt. Typically a fast cartridge would be followed by two slow set cartridges, to provide for efficient insertion and rapid tensioning.

Civil & Tunneling Applications

Metric & English

Grade 75 All-Thread Rebar Grade 60 Solid Rebar	Drill Hole Diameter, in. (mm)										
	1 (25)	1-1/4 (32)	1-1/2 (38)	1-9/16 (40)	1-1/2 (38)	1-9/16 (40)	1-3/4 (44)	1-7/8 (48)	2 (51)	2-1/4 (57)	2-1/2 (64)
	Resin Cartridge Diameter, in. (mm)										
	15/16 (24)	1-1/8 (29)	1-1/4 (32)	1-1/4 (32)	1-3/8 (35)	1-3/8 (35)	1-9/16 (40)	1-9/16 (40)	1-3/4 (44)	1-3/4 (44)	
#6, 3/4 in. (19 mm)	20 (508)	13 (330)									
#7, 7/8 in. (22 mm)		16 (406)									
#8, 1 in. (25 mm)		23 (584)	13 (330)		16 (406)	15 (381)					
#9, 1-1/8 in. (29 mm)			16 (406)	14 (356)	20 (508)	16 (406)					
1-3/16 in. (30 mm)			19 (483)	15 (381)	23 (584)	18 (457)	15 (381)				
#10, 1-1/4 in. (32 mm)				18 (457)		22 (559)	17 (432)				
#11, 1-3/8 in. (35 mm)							21 (533)	15 (381)	12 (305)		
#14, 1-3/4 in. (44 mm)										14 (356)	
150 KSI All-Thread Bar											
1 in. (25 mm)			15 (381)	12 (305)	18 (457)	15 (381)					
1-1/4 in. (32 mm)							23 (584)	16 (406)	12 (305)		
1-3/8 in. (35 mm)								19 (483)	14 (356)		
1-3/4 in. (44 mm)										18 (457)	12 (305)

The Resin Cartridge Drill Hole Fill Chart shows the length of drill hole that will be encapsulated by a 12 in. (305 mm) resin cartridge. This chart can be used as a guide for the most common combinations of hole, bolt, and resin diameters. Other combinations are possible as long as the annular space does not exceed 1/4 to 3/8 in. (6 to 10 mm). Due to difficulty in overcoming drag of the bar through the resin cartridges during insertion, encapsulated resin drill holes are most practical with shorter anchorages.