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Features and Benefits of KEENSERTS[®] Inserts

- FEATURE:** Designed and manufactured by a well-known and respected manufacturer of thread repair parts. Supplier to OEMs, industrial maintenance, military, and all phases of the aftermarket.
- BENEFIT:** No need to doubt its performance . . . regardless of application.
- FEATURE:** Solid bushing with locking kees.
- BENEFIT:** Positive mechanical lock against rotation.
- FEATURE:** May be used in virtually any material . . . aluminum, magnesium, cast iron, cold rolled steel and plastic.
- BENEFIT:** No restrictions on parent material.
- FEATURE:** High strength and reliability.
- BENEFIT:** Provides maximum pullout strength- -breaks grade 8 bolt.
- FEATURE:** No special skill required to use KEENSERTS Inserts.
- BENEFIT:** Installation procedures can be learned in minutes.
- FEATURE:** Hole preparation with standard drill and tap.
- BENEFIT:** No special, costly, single-purpose drills or taps required.
- FEATURE:** Inserted with fingers.
- BENEFIT:** No special rewinder tools required.
- FEATURE:** Impossible to cross-thread during installation.
- BENEFIT:** Perfect installation every time.
- FEATURE:** Can be removed very simply when necessary.
- BENEFIT:** Permanently installed unless removal is required.
- FEATURE:** Prepared hole not affected when insert is removed.
- BENEFIT:** New insert can be installed in same hole.
- FEATURE:** No tang to break off after installation.
- BENEFIT:** No need to worry about metal piece falling into prepared hole.
- FEATURE:** Available in inch and metric sizes.
- BENEFIT:** One line for all types of threads.
- FEATURE:** Available in Thinwall (10-24 through 1/2-20 I.D.) and Heavy Duty (8-32 through 1 3/4-12 I.D.). Special sizes quoted on request.
- FEATURE:** Also available in stainless.
- BENEFIT:** One line for all applications.
- FEATURE:** Available for spark plug applications.
- BENEFIT:** Designed for both tapered and straight seats.

1. Edge Distance

Boss Diameter: 1 1/2 x O.D. of insert.

Edge distance to a flat side: Can be as little as 1/32 over 1/2 O.D. of the insert. Tap marks may show on flat side and the insert should be positioned with kees 45° to 90° (2 kees).

2. Broaching

General material harder than R^c 30 may require that the tapped holes be broached for the kees. Aluminum, anodized after tapping, also may require broaching. Broach blades may not stand up for more than 3 or 4 holes when broaching inconel and similar alloys. It is possible to drive kees of the KNH and KNHXXH series in harder material than the KN series because of wall collapse. Tools with threads to support to the inside of the insert are available if wall collapse is encountered.

3. Thickness of Parent Material

Miniature KEENSERTS Inserts - .015 (minimum) thicker than the length of the insert if it is undesirable to have it protrude through underside of panel. "T"
+ .015 if protrusion through underside is permissible.

KN, KNH and KNHXXH KEENSERTS Inserts - General minimum thickness should be equal to bolt diameter . Insert will protrude through bottom surface unless length is coded.

4. Internal Thread Lock

All our internal thread locks conform to MIL-N-25027.

MIL-N-25027 does not call for seating the bolt.

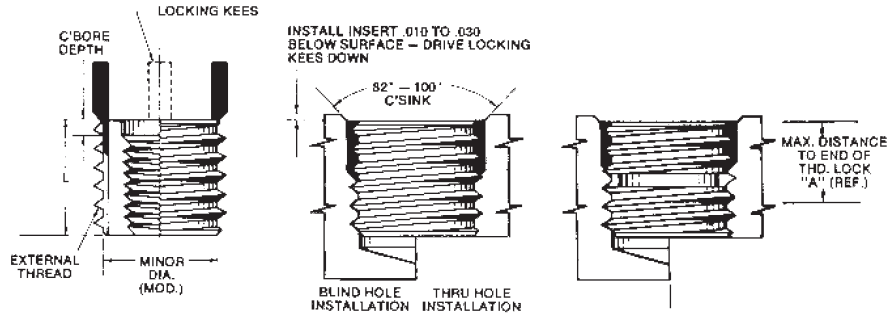
We test with minimum P.D. 3A bolts. 2A bolts, being smaller, will provide very little or no torque and should not be used. Bolts should have 4 turns after encountering the lock. Less turns may not provide the required torque and more turns will wear out the lock faster. For a metric thread a 4H Class bolt is used to test locking feature.

Seating the bolt will affect the locking torque and the number of locking cycles. How it will be affected depends on the material of the bolt and the insert, the finish on bolt and insert, lubrication on the threads and under the head of the bolt, and the seating torque.

5. Standard Minor Diameter Versus Modified Minor

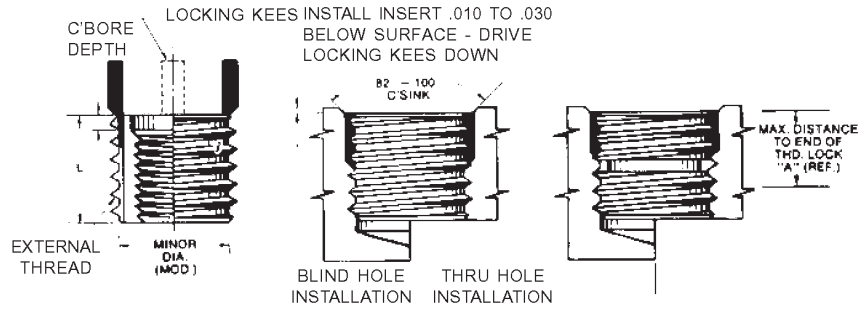
All other things being equal standard minor diameters will provide greater shear engagement areas. This would be desirable where a bolt goes directly into a tapped hole. In the case of inserts where the O.D. of the insert is so much larger than the diameter of the bolt being used, using a larger tap drill, as we do, does not lower the pullout values to any great extent.

Heavy Duty Inserts



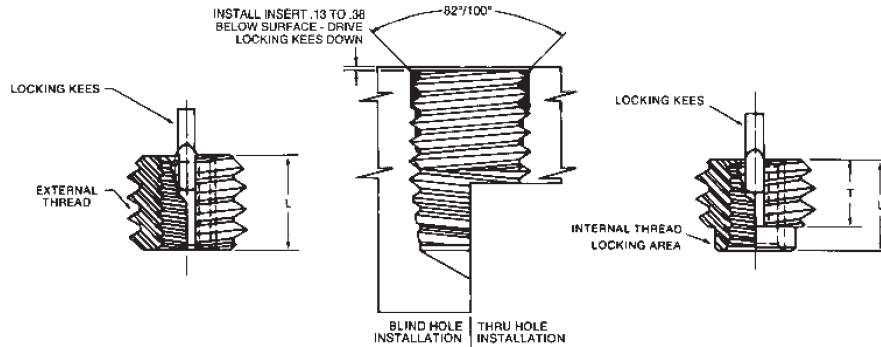
PART NO.		DIMENSIONS				INSTALLATION						REMOVAL DATA		
NON-LOCKING	INTERNAL THREAD LOCKING	INTERNAL THREAD CLASS 3B	EXTERNAL THREAD		L	C' BORE DEPTH	A	TAP DRILL DIA.	C'SINK DIA. +.010 -0.000	THREAD TAP		INSTALLATION TOOL PART NUMBER	DRILL	
			* SIZE CLASS 2A	SHEAR ENGAG.						SIZE UNC-2B	MIN. DEPTH		SIZE	DEPTH
*KNH0832J	*KNHL0832J	8 - 32	5/16 - 18	.1517	.31	.04	.29	.272	.323	5/16 - 18	.37	THD 0832L	7/32	1/8
*KNH1032J	*KNHL1032J	10 - 32	3/8 - 16	.1901										
KNH1024J	KNHL1024J	10 - 24	3/8 - 16	.1901										
*KNH428J	*KNHL428J	1/4 - 28	7/16 - 14	.2842										
*KNH420J	*KNHL420J	1/4 - 20	7/16 - 14	.1970	.37	.07	.332	.385	7/16 - 14	.43	THD 428L	11/32	3/16	
*KNH524J	*KNHL524J	5/16 - 24	1/2 - 13	.2842										
*KNH518J	*KNHL518J	5/16 - 18	1/2 - 13	.1970	.43	.07	.36	.510	1/2 - 13	.50	THD 420L	13/32	3/16	
*KNH624J	*KNHL624J	3/8 - 24	9/16 - 12	.3588										
*KNH616J	*KNHL616J	3/8 - 16	9/16 - 12	.2608	.50	.07	.34	.516	9/16 - 12	.56	THD 524L	15/32	3/16	
KNH720J	KNHL720J	7/16 - 20	5/8 - 11	.3588										
KNH714J	KNHL714J	7/16 - 14	5/8 - 11	.2608	.62	.07	.37	.572	9/16 - 12	.56	THD 518L	17/32	3/16	
*KNH820J	*KNHL820J	1/2 - 20	11/16 - 11 NS	.4975										
*KNH813J	*KNHL813J	1/2 - 13	11/16 - 11 NS	.3843	.68	.07	.41	.700	11/16 - 11 NS	.75	THD 624L	19/32	3/16	
KNH918J	KNHL918J	9/16 - 18	13/16 - 16	.4975										
KNH912J	KNHL912J	9/16 - 12	13/16 - 16	.3843	.81	.07	.42	.766	13/16 - 16 UN	.94	THD 616L	23/32	3/16	
KNH1018J	KNHL1018J	5/8 - 18	7/8 - 14	.7172										
KNH1011J	KNHL1011J	5/8 - 11	7/8 - 14	.5831	.87	.10	.46	.828	7/8 - 14 UNF	1.00	THD 720L	25/32	3/16	
KNH1216J	KNHL1216J	3/4 - 16	1-1/8 - 12	.8884										
KNH1210J	KNHL1210J	3/4 - 10	1-1/8 - 12	.7368	.87	.10	.42	1.062	1.145	1-1/8 - 12 UNF	THD 714L	31/32	3/16	
KNH1414J	KNHL1414J	7/8 - 14	1-1/4 - 12	.8884										
KNH1409J	KNHL1409J	7/8 - 9	1-1/4 - 12	.7368	.87	.10	.47	1.187	1.270	1-1/4 - 12 UNF	THD 820L	1-3/32	5/16	
KNH1612J	KNHL1612J	1 - 12	1-3/8 - 12	1.2493										
*KNH1608J	*KNHL1608J	1 - 8	1-3/8 - 12	1.0247	.87	.10	.47	1.312	1.395	1-3/8 - 12 UNF	THD 813L	1-7/32	5/16	
				1.2493										

Extra Heavy Duty Inserts



PART NO.		DIMENSIONS				INSTALLATION DATA						REMOVAL DATA		
NON-LOCKING	INTERNAL THREAD LOCKING	INTERNAL THREAD CLASS 3B	EXTERNAL THREAD		L	C' BORE DEPTH	A	TAP DRILL DIA.	C'SINK DIA ±.010 -.000	THREAD TAP		INSTALLATION TOOL PART NUMBER	DRILL	
			* SIZE CLASS 2A	SHEAR ENGAG						SIZE UNC-2B	MIN DEPTH		SIZE	DEPTH
KNHXH0638J	KNHXHL0638J	6-32	5/16-18	.0855	.25	.04	.25	.272	.323	5/16-18	.31	THXHD	7/32	1/8
KNHXH0832J	KNHXHL0832J	8-32	3/8-16	.1901			.31	.332	.385	3/8-16		THXHD	9/32	
KNHXH1032J	KNHXHL1032J	10-32	7/16-14	.2299	.31		.31	.397	.447	7/16-14	.37	THXHD	11/32	
KNHXH1024J	KNHXHL1024J	10-24		.1403			.2299	.31						
KNHXH428J	KNHXHL428J	1/4-28	1/2-13	.2997	.37		.33	.453	.510	1/2-13	.44	THXHD	15/32	
KNHXH420J	KNHXHL420J	1/4-20		.2005			.2997	.36						
KNHXH524J	KNHXHL524J	5/16-24	9/16-12	.4163	.43		.34	.516	.572	9/16-12	.50	THXHD	17/32	
KNHXH518J	KNHXHL518J	5/16-18		.3029			.4163	.37						
KNHXH624J	KNHXHL624J	3/8-24	5/8-11	.5584	.50		.37	.578	.635	5/8-11	.56	THXHD	19/32	
KNHXH616J	KNHXHL616J	3/8-16		.4243			.5584	.41						
KNHXH720J	KNHXHL720J	7/16-20	11/16-11 NS	.8000	.62		.42	.641	.700	11/16-11 NS	.68	THXHD	23/32	
KNHXH714J	KNHXHL714J	7/16-14		.6498			.8000	.46						
KNHXH820J	KNHXHL820J	1/2-20	13/16-16	1.0293	.68		.42	.766	.822	13/16-16 UNF	.75	THXHD	25/32	
KNHXH813J	KNHXHL813J	1/2-13		.8642			1.0293	.47						
KNHXH918J	KNHXHL918J	9/16-18	7/8-14	1.3761	.81		.48	.828	.885	7/8-14 UNF	.94	THXHD	27/32	
KNHXH912J	KNHXHL912J	9/16-12		1.1131			1.3761	.54						
KNHXH1018J	KNHXHL1018J	5/8-18	1-12	1.6420	.87		.51	.937	1.020	1-12 UNF	1.00	THXHD	1-3/32	
KNHXH1011J	KNHXHL1011J	5/8-11		1.2770			1.6420	.59						
KNHXH1216J	KNHXHL1216J	3/4-16	1-1/4-12	2.7966	1.12		.57	1.187	1.270	1-1/4-12 UNF	1.31	THXHD	1-7/32	
KNHXH1210J	KNHXHL1210J	3/4-10		2.5505	1.25		.64					1.44		THXHD
KNHXH1414J	KNHXHL1414J	7/8-14	1-3/8-12	3.4652	1.25		.63	1.312	1.395	1-3/8-12 UNF	1.44	THXHD	1-7/32	
KNHXH1409J	KNHXHL1409J	7/8-9		3.2769	1.37		.71					1.56		THXHD
KNHXH1612J	KNHXHL1612J	1-12	1-1/2-12	4.2374	1.37		.70	1.437	1.520	1-1/2-12 UNF	1.56	THXHD	1-11/32	
KNHXH1608J	KNHXHL1608J	1-8		4.2135	1.50		.78					1.68		THXHD

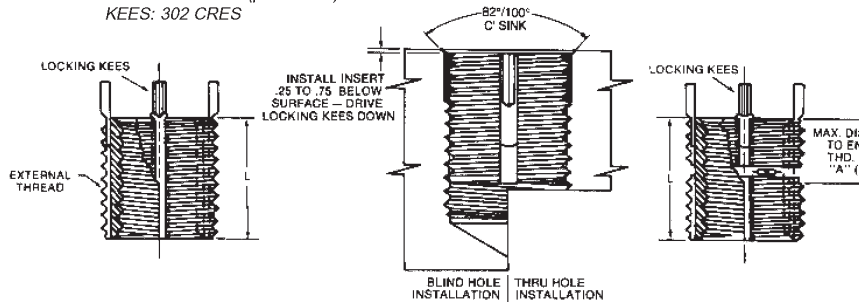
Miniature Inserts



PART NO.		DIMENSIONS					INSTALLATION DATA					REMOVAL DATA	
NON-LOCKING	INTERNAL THREAD LOCKING	INTERNAL THREAD CLASS 5H	EXTERNAL THREAD		L ±0.25	T	TAP DRILL DIA.	C'SINK DIA. +.25 -.00	THREAD TAP		INSTALLATION TOOL PART NUMBER	DRILL	
			SIZE CLASS 4h	SHEAR ENGAG.					SIZE CLASS 6h	MIN. DEPTH		SIZE	DEPTH
KNCM 2x0.4		M 2x0.4	M 4x0.7	16.5	3.0		3.4	4.1	M 4x0.7	4.0	TKNCM 2x0.4	2.8	2.00
	KNCML 2x0.4			10.3									
KNCM 2.5x0.45		M 2.5x0.45	M 4.5x0.75	26.5	3.8		3.9	4.6	M 4.5x0.75	5.0	TKNCM 2.5x0.45	3.0	2.00
	KNCML 2.5x0.45			15.9									
KNCM 3x0.5		M 3x0.5	M 5x0.8	33.1	4.25		4.4	5.1	M 5x.8	5.5	TKNCM 3x0.5	3.5	2.25
	KNCML 3x0.5			21.4									
KNCM 4x0.7		M 4x0.7	M 6x0.75	58.4	5.25		5.5	6.1	M 6x0.75	6.5	TKNCM 4x0.7	4.6	2.50
	KNCML 4x0.7			42.9									

EXTERNAL THREAD FURNISHED WITH 2 LOCKING KEES. STANDARD MATERIALS: Insert: 303 CRES (passivated) KEES: 302 CRES INSTALLATION TAP-DRILL TOLERANCE 2.0 TO 5.5= -.025 +.08

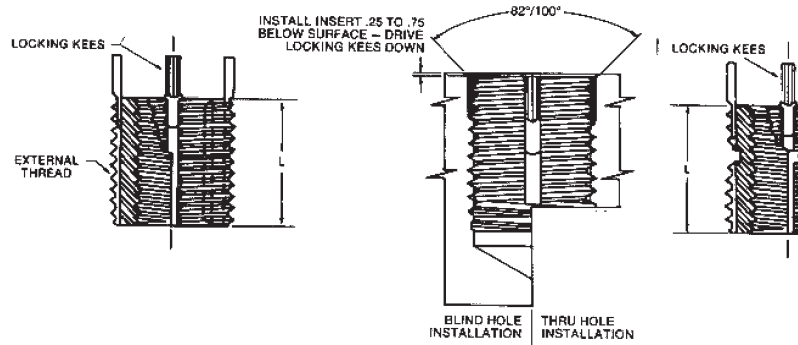
Lightweight Inserts



INSTALLATION TAP-DRILL TOLERANCE 4.0 TO 12.70 = -.025 +.100 ABOVE 12.70 = -.025 +.130

PART NO.		DIMENSIONS					INSTALLATION DATA					REMOVAL DATA	
NON-LOCKING INTERNAL	INTERNAL THREAD LOCKING	INTERNAL THREAD CLASS 5H	EXTERNAL THREAD		L ±0.3	A	TAP DRILL DIA.	C'SINK DIA. +.25 -.00	THREAD TAP		INSTALLATION TOOL PART NUMBER	DRILL	
			SIZE CLASS 4h	SHEAR ENGAG.					SIZE CLASS 6H	MIN. DEPTH		SIZE	DEPTH
KNM 5x0.8		M 5x0.8	M 8x1.25	104.9	8.0	-	6.9	8.25	M 8x1.25	9.5	TM - 5	5.50	4.00
	KNML 5x0.8			83.1									
KNM 5x0.5		M 5x0.5	M 8x1.25	104.9	8.0	-	6.9	8.25	M 8x1.25	9.5	TM - 5	5.50	4.00
	KNML 5x0.5			83.1									
KNM 6x1.0		M 6x1.0	M 10x1.25	177.7	10.0	-	8.8	10.25	M 10x1.25	11.5	TM - 6	7.50	4.75
	KNML 6x1.0			152.7									
KNM 6x0.75		M 6x0.75	M 10x1.25	177.7	10.0	-	8.8	10.25	M 10x1.25	11.5	TM - 6	7.50	4.75
	KNML 6x0.75			152.7									
KNM 8x1.25		M 8x1.25	M 12x1.25	266.7	12.0	-	10.8	12.25	M 12x1.25	13.5	TM - 8	9.50	4.75
	KNML 8x1.25			242.5									
KNM 8x1.0		M 8x1.0	M 12x1.25	266.7	12.0	-	10.8	12.25	M 12x1.25	13.5	TM - 8	9.50	4.75
	KNML 8x1.0			242.5									
KNM 10x1.5		M 10x1.5	M 14x1.5	341.6	14.0	-	12.8	14.25	M 14x1.5	15.5	TM - 10	11.50	4.75
	KNML 10x1.5			316.4									
KNM 10x1.25		M 10x1.25	M 14x1.5	341.6	14.0	-	12.8	14.25	M 14x1.5	15.5	TM - 10	11.50	4.75
	KNML 10x1.25			316.4									
KNM 12x1.75		M 12x1.75	M 16x1.5	470.2	16.0	-	14.75	16.25	M 16x1.5	17.5	TM - 12	13.50	4.75
	KNML 12x1.75			441.4									
KNM 12x1.25		M 12x1.25	M 16x1.5	470.2	16.0	-	14.75	16.25	M 16x1.5	17.5	TM - 12	13.50	4.75
	KNML 12x1.25			441.4									

Heavy Duty Inserts



PART NO.		DIMENSIONS					INSTALLATION DATA					REMOVAL DATA	
NON-LOCKING	INTERNAL THREAD LOCKING	INTERNAL THREAD CLASS 5H	EXTERNAL THREAD		L ±0.3	A	TAP DRILL DIA.	C'SINK DIA. +.25 -.00	THREAD TAP		INSTALLATION TOOL PART NUMBER	DRILL	
			SIZE CLASS 4H	SHEAR ENGAG. (MM)*					SIZE CLASS 6H	MIN. DEPTH		SIZE	DEPTH
KNHM 4x0.7	KNHML 4x0.7	M 4x0.7	M 8x1.25	104.9	8.0	8.0	6.9	8.25	M 8x1.25	9.5	THM - 4	5.50	4.00
			M 8x1.25	83.1									
KNHM 5x0.8	KNHML 5x0.8	M 5x0.8	M 10x1.25	177.7	10.0	8.7	8.8	10.25	M 10x1.25	12.5	THM - 5	7.50	4.75
			M 10x1.25	152.7									
KNHM 6x1.0	KNHML 6x1.0	M 6x1.0	M 12x1.25	266.7	12.0	9.5	10.8	12.25	M 12x1.25	14.5	THM - 6	9.50	4.75
			M 12x1.25	242.5									
KNHM 8x1.25	KNHML 8x1.25	M 8x1.25	M 14x1.5	341.6	14.0	10.0	12.8	14.25	M 14x1.5	16.5	THM - 8	11.50	4.75
			M 14x1.5	316.4									
KNHM 8x1.0	KNHML 8x1.0	M 8x1.0	M 14x1.5	341.6	14.0	10.0	12.8	14.25	M 14x1.5	16.5	THM - 8	11.50	4.75
			M 14x1.5	316.4									
KNHM 10x1.5	KNHML 10x1.5	M 10x1.5	M 16x1.5	470.2	16.0	10.0	14.75	16.25	M 16x1.5	18.5	THM - 10	13.50	4.75
			M 16x1.5	441.4									
KNHM 10x1.25	KNHML 10x1.25	M 10x1.25	M 16x1.5	470.2	16.0	10.0	14.75	16.25	M 16x1.5	18.5	THM - 10	13.50	4.75
			M 16x1.5	441.4									
KNHM 12x1.75	KNHML 12x1.75	M 12x1.75	M 18x1.5	608.5	18.0	10.7	16.75	18.25	M 18x1.5	20.5	THM - 12	15.50	4.75
			M 18x1.5	561.8									
KNHM 12x1.5	KNHML 12x1.5	M 12x1.5	M 18x1.5	608.5	18.0	10.7	16.75	18.25	M 18x1.5	20.5	THM - 12	15.50	4.75
			M 18x1.5	561.8									
KNHM 12x1.25	KNHML 12x1.25	M 12x1.25	M 18x1.5	608.5	18.0	10.7	16.75	18.25	M 18x1.5	20.5	THM - 12	15.50	4.75
			M 18x1.5	561.8									
KNHM 14x2.0	KNHML 14x2.0	M 14x2.0	M 20x1.5	770.5	20.0	12.4	18.75	20.25	M 20x1.5	22.5	THM - 14	17.50	4.75
			M 20x1.5	724.4									
KNHM 14x1.5	KNHML 14x1.5	M 14x1.5	M 20x1.5	770.5	20.0	12.4	18.75	20.25	M 20x1.5	22.5	THM - 14	17.50	4.75
			M 20x1.5	724.4									
KNHM 16x2.0	KNHML 16x2.0	M 16x2.0	M 22x1.5	896.8	22.0	12.4	20.5	22.25	M 22x1.5	24.5	THM - 16	17.75	6.35
			M 22x1.5	855.2									
KNHM 16x1.5	KNHML 12x1.5	M 16x1.5	M 22x1.5	896.8	22.0	12.4	20.5	22.25	M 22x1.5	24.5	THM - 16	17.75	6.35
			M 22x1.5	855.2									
KNHM 18x1.5	KNHML 18x1.5	M 18x1.5	M 24x1.5	1084.4	24.0	16.8	22.5	24.25	M 24x1.5	26.5	THM - 18	19.75	6.35
			M 24x1.5	1051.5									
KNHM 20x2.5	KNHML 20x2.5	M 20x2.5	M 30x2.0	1774.3	30.0	17.5	28.0	30.25	M 30x2.0	34.5	THM - 20	25.75	6.35
			M 30x2.0	1736.4									
KNHM 20x1.5	KNHML 20x1.5	M 20x1.5	M 30x2.0	1774.3	30.0	17.5	28.0	30.25	M 30x2.0	34.5	THM - 20	25.75	6.35
			M 30x2.0	1736.4									
KNHM 22x1.5	KNHML 22x1.5	M 22x1.5	M 32x2.0	2045.9	32.0	18.3	30.0	32.25	M 32x2.0	36.5	THM - 22	27.75	6.35
			M 32x2.0	2014.7									
KNHM 24x3.0	KNHML 24x3.0	M 24x3.0	M 33x2.0	2189.4	33.0	19.0	31.0	33.25	M 33x2.0	37.5	THM - 24	28.75	6.35
			M 33x2.0	2161.9									
KNHM 24x2.0	KNHML 24x2.0	M 24x2.0	M 33x2.0	2189.4	33.0	19.0	31.0	33.25	M 33x2.0	37.5	THM - 24	28.75	6.35
			M 33x2.0	2161.9									

PART NO.	INSTALLATION DATA							REMOVAL DATA	
	INTERNAL THREAD SIZE	EXTERNAL THREAD SIZE	LENGTH	TAP DRILL DIA.	C'SINK DIA.	TAP SIZE	INSERT TOOL PART NO.	DRILL	
								SIZE	DEPTH
▲KNM 5x0.8F	M 5x0.8	M 8x1.25	8	6.9	8.25	M 8x1.25	TRKM 5	5.50	4.00
▲KNM 6X1F	M 6x1.0	M 10x1.25	10	8.8	10.25	M 10x1.25	TRKM 6	7.50	4.75
KNM 7X1F	M 7x1.0	M 11x1.0	11	9.8	11.25	M 11x1.0	TRKM 7	8.50	
▲KNM 8X1F	M 8x1.0	M 12x1.25	12	10.8	12.25	M 12x1.25	TRKM 8	9.50	
▲KNM 8X1.25F	M 8x1.25	M 12x1.25							
▲KNM 10X1.25F	M 10x1.25	M 14x1.5	14	12.8	14.25	M 14x1.5	TRKM 10	11.50	
▲KNM 10X1.5F	M 10x1.5	M 14x1.5							
▲KNM 12X1.25F	M 12x1.25	M 16x1.5	16	14.75	16.25	M 16x1.5	TRKM 12	13.50	
▲KNM 12X1.75F	M 12x1.75	M 16x1.5							
KNM 14X1.5F	M 14x1.5	M 20x1.5	20	18.75	20.25	M 20x1.5	TRKHM 14	17.50	
KNM 14X2F	M 14x2.0	M 20x1.5							
KNM 16X1.5F	M 16x1.5	M 22x1.5	22	20.5	22.25	M 22x1.5	TRKHM 16	17.75	
KNM 18X1.5F	M 18x1.5	M 24x1.5	24	22.5	24.25	M 24x1.5	TRKHM 18	19.75	
KNM 20X1.5F	M 20x1.5	M 30x2	30	28.0	30.25	M 30x2.0	TRKHM 20	25.75	6.35
KNM 22X1.5F	M 22x1.5	M 32x2	32	30.0	32.25	M 32x2.0	TRKHM 22	27.75	
KNM 24X2F	M 24x2.0	M 33x2	33	31.0	33.25	M 33x2.0	TRKHM 24	28.75	

Note. For further information or technical assistance, please contact Clarendon.