

FIN-FAN

Maintenance tools



KRAIS®
Tube & Pipe Tools

MiniDrill GFF

The **MiniDrill GFF** is a dedicated machining solution specifically developed for **FinFan air coolers**, enabling fast and precise repair of plug threads and sealing surfaces directly on-site.

Engineered for **FinFan maintenance**, the system supports drilling, re-machining, and seat restoration operations with a single machine, changing only the tool, eliminating the need for disassembly. Its rigid, torque-reactive design and dual clamping arms ensure stable mounting on adjacent tube holes, allowing accurate alignment across typical FinFan tube layouts.

With an **80 mm stroke**, controlled speed, and high torque output, the MiniDrill GFF delivers reliable performance even in demanding field conditions. The result is repeatable machining accuracy, reduced downtime, and restored sealing integrity of critical FinFan connections.

A compact, robust, and purpose-built tool for efficient FinFan thread repair and maintenance operations.



TAILOR MADE ONLY!

WORKING RANGE	LOCKING RANGE	WORKING STROKE	FREE SPEED	POWER	TORQUE		
12,5– 51,0 mm	According to the drawing	80 mm	100 Rpm	1,3 Hp	140 Nm		
0,492 – 2,000"		3,150"			105 Ft.Lbs		
AIR USE		BODY WIDTH		BODY HEIGHT		BODY WEIGHT	
55 cfm	1,3 m3/min	2,32"	59 mm	13,1"	335 mm	17,5 Lbs	8 kg



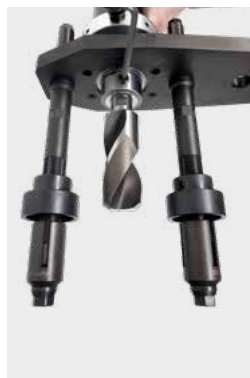
RIGID LOCKING

On standard FinFan gas coolers machine locks onto two shafts on the adjacent holes. The locking plate is manufactured according to the tube hole pitch to ensure precise tool alignment.



UNIVERSAL REACTION PLATE

MiniDrill FinFan is delivered with locking plate and 2 reaction shafts. Construction of the plate allows for locking machine with both shafts on one side to allow to machine the last holes in the row. Plate can be etc.



FINFAN THREAD REPAIR PROCESS

PROPER MACHINE LOCKING FOR ALL STEPS

Choose the correct locking jaws to suit the existing plug holes



PLUG SIZE			JAW SET (2 REQUIRED)	
1-1/8"	28,58 mm	12 TPI	701MM	#36-1-1/8-GFF
1-1/4"	31,75 mm	12 TPI	703MM	#36-1-1/4-GFF
1-3/8"	34,93 mm	12 TPI	705MM	#36-1-3/8-GFF
1-1/2"	38,10 mm	12 TPI	707MM	#36-1-1/2-GFF
1-5/8"	41,28 mm	12 TPI	709MM	#36-1-5/8-GFF
1-3/4"	44,45 mm	12 TPI	711MM	#36-1-3/4-GFF
1-7/8"	47,63 mm	12 TPI	713MM	#36-1-7/8-GFF

STEP 1 // Heads for weld removal over the welded plugs (in case are welded)



PLUGS SIZE			HEAD	INSERT	SCREW
1-1/8"	28,58 mm	12 TPI	TFWR-GFF-350	CS-5D	MHS-4
1-1/4"	31,75 mm	12 TPI	TFWR-GFF-380	CS-5D	MHS-4
1-3/8"	34,93 mm	12 TPI	TFWR-GFF-410	CS-5D	MHS-4
1-1/2"	38,10 mm	12 TPI	TFWR-GFF-440	CS-5D	MHS-4
1-5/8"	41,28 mm	12 TPI	TFWR-GFF-470	CS-5D	MHS-4
1-3/4"	44,45 mm	12 TPI	TFWR-GFF-500	CS-5D	MHS-4
1-7/8"	47,63 mm	12 TPI	TFWR-GFF-540	CS-5D	MHS-4

STEP 2 // Select the appropriate size drill head to match the desired new thread size



DRILL HEAD SIZE		DRILL HEAD	INSERT	SCREW
1-1/8 to 1-1/4"	28,58 to 31,75 mm	MD-29,6-DRILL-L-130	CS-0.4	MHS-4
1-1/4 to 1-3/8"	31,74 to 34,93 mm	MD-32,9-DRILL-L-130	CS-0.4	MHS-4
1-3/8 to 1-1/2"	34,93 to 38,10 mm	MD-36,1-DRILL-L-130	CS-0.4	MHS-4
1-1/2 to 1-5/8"	38,10 to 41,28 mm	MD-39,3-DRILL-L-130	CS-0.4	MHS-4
1-5/8 to 1-3/4"	41,28 to 44,45 mm	MD-42,5-DRILL-L-130	CS-0.4	MHS-4
1-3/4 to 1-7/8"	44,45 to 47,63 mm	MD-45,5-DRILL-L-130	CS-0.4	MHS-4

STEP 3 // Select the chamfering head to chamfer the hole before tapping (heads need a Weldon flange: MD-FLANGE-STWRMH)



RANGE		HEAD	INSERT	SCREW
0,787 to 1,653"	20,00 to 42,00 mm	STWRMH-317	WRI	MHS-4
1,417 to 2,244"	36,00 to 57,00 mm	STWRMH-444	CDI	MHS-4

STEP 4 // Select tapping head to suit the required thred size



PLUGS THREAD SIZE			TAP HEAD	RATCHED FEED ARM
1-1/8"	28,58 mm	12 TPI	MDFFPT-1-1/8_12	MD-RS-H28
1-1/4"	31,75 mm	12 TPI	MDFFPT-1-1/4_12	MD-RS-H28
1-3/8"	34,93 mm	12 TPI	MDFFPT-1-3/8_12	MD-RS-H28
1-1/2"	38,10 mm	12 TPI	MDFFPT-1-1/2_12	MD-RS-H28
1-5/8"	41,28 mm	12 TPI	MDFFPT-1-5/8_12	MD-RS-H28
1-3/4"	44,45 mm	12 TPI	MDFFPT-1-3/4_12	MD-RS-H28
1-7/8"	47,63 mm	12 TPI	MDFFPT-1-7/8_12	MD-RS-H28

STEP 5

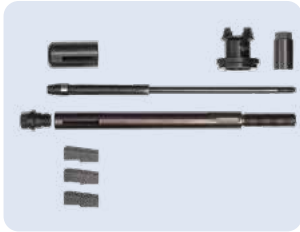
Produce new gasket seat using MiniMill-300GFF. Choose heads and jaws on next page.



MiniMill 300GFF

Ideal for gasket seat machining of any size of fin fan cooler. A standard machine is equipped with a cutter head and a special locking system to fit your application. The machine locks directly into the plug thread.

STANDARD SET UP



GASKET FINFAN SET

Supplied with 20 mm shaft, one set of jaws to suit plug thread diameter, pilot and gasket seat milling head. Plug size details must be provided by customer with order.



Custom machined jaws. Showing locked and up-locked position.



STANDARD WORKING RANGE				FEED STROKE	FREE SPEED	POWER	TORQUE
APPLICATION RANGE (ID-OD)		LOCKING RANGE (ID)					
12 TPI		Suit to thread of the plug		20 mm	300 Rpm	1,3 Hp	43 Nm
1,125 - 2,125"				0,787"			32 Ft.Lbs
AIR USE		BODY WIDTH		BODY HEIGHT		BODY WEIGHT	
55 cfm	1,3 m³/min	2,32"	59 mm	13,1"	335 mm	13,2Lbs	6 kg

EXAMPLE TOOL APPLICATION



FinFan cooler before a maintenance



Plug hole before re machining the gasket seat



Safely re-machine gasket surfaces in seconds.



All types of water box materials can be machined with the carbide inserts of the MiniMill 300 GFF.

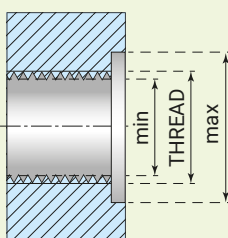
MiniMill 300GFF

GASKET SEAT FACING HEADS AND JAWS NUMBERS

HEAD TYPE	PLUG SIZE			SEAL NEST DIAMETER				INSERT	NO. OF INSERTS	JAWS SET NUMBER	PLUG SIZE		TPI	PILOT
	[INCH]	[MM]		MIN [INCH]	MAX [INCH]	MIN [MM]	MAX [MM]				[INCH]	[MM]		
FFGSMH-1125	1,125	28,58	12	0,940	1,496	24,00	38,00	CI 5x5	4	701MM #36-1-1/8-GFF	1,125	28,575	12	PGFF-1125
FFGSMH-1250	1,250	31,75	12	1,063	1,614	27,00	41,00	CI 5x5	4	703MM #36-1-1/4-GFF	1,250	31,750	12	PGFF-1250
FFGSMH-1350	1,375	34,93	12	1,220	1,772	31,00	45,00	CI 5x5	4	705MM #36-1-3/8-GFF	1,375	34,925	12	PGFF-1350
FFGSMH-1500	1,500	38,10	12	1,339	1,890	34,00	48,00	CI 5x5	4	707MM #36-1-1/2-GFF	1,500	38,100	12	PGFF-1500
FFGSMH-1625	1,625	41,27	12	1,457	2,008	37,00	51,00	CI 5x5	4	709MM #36-1-5/8-GFF	1,625	41,275	12	PGFF-1625
FFGSMH-1750	1,750	44,45	12	1,590	2,140	40,40	54,40	CI 5x5	4	711MM #36-1-3/4-GFF	1,750	44,450	12	PGFF-1750
FFGSMH-1875	1,875	47,62	12	1,720	2,270	43,60	57,60	CI 5x5	4	713MM #36-1-7/8-GFF	1,875	47,625	12	PGFF-1875

Other sizes on request. If plug holes are damaged beyond repair, our MiniDrill 55 can be used to upsize them to the next size. Example - 1-1/8" to 1-3/8".

Seal nest diameter diagram



OTHER OPTIONAL ACCESSORIES



FAST CLAMPING SYSTEM

System offers rapid tube to tube cycle time, increased productivity (up to 4x) with little operator fatigue. Ideal for large amount of end preps.

MiniMill 300FF

The MiniMill 300FF is a pneumatic tube facing machine engineered for professional maintenance and repair of fin fan gas coolers and air-cooled heat exchangers. Compact, robust, and built for demanding industrial environments, it delivers consistent results across the entire tube sheet with a cycle time of approx. 1 min per tube.



All FinFan attachments feature an extended-reach shaft design, allowing the cutting head to access tube ends recessed deep within the tube sheet. The distance between the plug thread engagement point and the cutting zone is fully accommodated, enabling reliable machining without contact with the surrounding structure.



APPLICATION RANGE (ID-OD)		LOCKING RANGE		FEED STROKE		POWER		FREE SPEED		TORQUE					
12,5– 51,0 mm		According to the drawing		20 mm		1,3 Hp		300 Rpm		43 Nm / 32 Ft.Lbs					
0,492 – 2,000"				0,787"				100 Rpm		120 Nm / 88,5 Ft.Lbs					
AIR USE			BODY WIDTH			BODY HEIGHT			BODY WEIGHT						
55 cfm		1,3 m³/min		2,32"		59 mm		13,1"		335 mm		13,2Lbs		6 kg	

OPTIONAL ACCESSORIES



SPEED REDUCER

Easy to use gearbox for 3x speed reduction. Increases the torque, enabling the machine to generate a thick chip whilst reducing the cutting time.



RATCHET FEED

Feed system allowing to work in narrow and tight locations, eg. in water walls.



LEVER FEED

Quick and easy feed system. Used in many basic applications.



EXAMPLE TOOL APPLICATION



The machine is designed for work on gas coolers: an elongated special head and a nut fixing the tool in the socket.



The bit edge covers the entire weld to be removed



Removal of the weld ends with a visible groove between the tube and the tube sheet.

MiniMill 300FF

FINFAN ATTACHMENT FOR FACING TUBES (DEFAULT)

Attachment for facing tube ends in fin fan gas coolers. Features an adjustable-length locking shaft and a support bushing that threads into the plug, ensuring precise, repeatable positioning from tube to tube. Cycle time: approx. 1 min per tube. Recommended machine speed: 300 RPM.



TOOL	TUBE CAPACITY (OD)			BIT	CENTER NUT	JAWS COVER	
	[INCH]	[MM]	BWG			MIN	MAX
597-FINFAN-CSS-12	0,750	19,05	12-18	CSZ	7/8	307MM#36	313MM#36
600-FINFAN-CSS-12	0,875	22,23	12-18	CSZ	1	316MM#36	319MM#36
601-FINFAN-CSS-12	1,000	25,40	12-23	CSS	1-1/8	207MM#36	213MM#36
603-FINFAN-CSS-12	1,125	28,58	12-23	CSS	1-1/4	211MM#36	217MM#36
605-FINFAN-CSS-12	1,250	31,75	11-23	CSS	1-3/8	103MM#36	107MM#36
607-FINFAN-CSS-12	1,500	38,10	11-23	CS	1-5/8	107MM#36	111MM#36
609-FINFAN-CSS-12	1,750	44,45	9-23	CS	1-7/8	111MM#36	115MM#36
611-FINFAN-CSS-12	2,000	50,80	9-23	CS	2-1/8	115MM#36	119MM#36

FINFAN SEAL WELD REMOVAL ATTACHMENT

Attachment for seal weld removal in air-cooled heat exchangers. The adjustable-length locking shaft and support bushing thread into the plug for secure, consistent engagement. Cycle time: approx. 1 min per tube. Recommended machine speed: 100 RPM.



TOOL	TUBE CAPACITY (OD)			BIT	CENTER NUT	JAWS COVER	
	[INCH]	[MM]	BWG			MIN	MAX
597-FINFAN-SWR-12	0,750	19,05	12-18	CSZ	7/8	307MM#36	313MM#36
600-FINFAN-SWR-12	0,875	22,23	12-18	CSZ	1	316MM#36	319MM#36
601-FINFAN-SWR-12	1,000	25,40	12-23	CSS	1-1/8	207MM#36	213MM#36
603-FINFAN-SWR-12	1,125	28,58	12-23	CSS	1-1/4	211MM#36	217MM#36
605-FINFAN-SWR-12	1,250	31,75	11-23	CS	1-3/8	103MM#36	107MM#36
607-FINFAN-SWR-12	1,500	38,10	11-23	CS	1-5/8	107MM#36	111MM#36
609-FINFAN-SWR-12	1,750	44,45	9-23	CS	1-7/8	111MM#36	115MM#36
611-FINFAN-SWR-12	2,000	50,80	9-23	CS	2-1/8	115MM#36	119MM#36

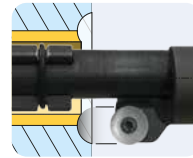
FINFAN CHAMFERING ATTACHMENT

Attachment for chamfering tube sheet holes in fin fan units prior to welding. Features an adjustable-length locking shaft and a support bushing that threads into the plug. Cycle time: approx. 1 min per tube. Recommended machine speed: 300 RPM.



TOOL	TUBE CAPACITY (OD)			BIT	CENTER NUT	JAWS COVER	
	[INCH]	[MM]	BWG			MIN	MAX
601-FINFAN-CMF-12	1,000	25,40	12-23	CI-6x6	1-1/8	207MM#36	213MM#36
605-FINFAN-CMF-12	1,250	31,75	11-23	CI-6x6	1-3/8	103MM#36	107MM#36
607-FINFAN-CMF-12	1,500	38,10	11-23	CI-6x6	1-5/8	107MM#36	111MM#36

FINFAN JPREP ATTACHMENT



Attachment for simultaneous facing of tube ends and tube sheet surfaces in fin fan units. The specially shaped head carries a large round cutting insert, enabling full coverage of the weld area in a single pass. Recommended machine speed: 100 RPM.



TOOL	TUBE CAPACITY (OD)			INSERT	CENTER NUT	JAWS COVER	
	[INCH]	[MM]	BWG			MIN	MAX
601-FF-JPREP-12"	1,000	25,40	12-23	O10-Co	1-1/8	207MM#36	213MM#36
603-FF-JPREP-12"	1,125	28,58	12-23	O10-Co	1-1/4	211MM#36	217MM#36
605-FF-JPREP-12"	1,250	31,75	11-23	O10-Co	1-3/8	215MM#36	219MM#36
607-FF-JPREP-12"	1,500	38,10	11-23	O10-Co	1-5/8	107MM#36	111MM#36
609-FF-JPREP-12"	1,750	44,45	9-23	O10-Co	1-7/8	111MM#36	115MM#36
611-FF-JPREP-12"	2,000	50,80	9-23	O10-Co	2-1/8	115MM#36	119MM#36

LENGTHS AVAILABLE ON REQUEST

MODEL	LENGTH	
	[MM]	[INCH]
xxx-FINFAN-6	152,4	6"
xxx-FINFAN-8	203,2	8"
xxx-FINFAN-10	254,0	10"
xxx-FINFAN-12	305,0	12"
xxx-FINFAN-14	355,6	14"
xxx-FINFAN-16	406,4	16"

FinMill

KRAIS FinMill is a air powered tool designed for removing fin from the outside diameter of a tube. The tool is based on the same quality drive and housing as our other PrepMill series tools. Thanks to heavy duty locking system The FinMill fin tube removal tool clamps reliably in the tube and offers chatter-free work at any position.

STANDARD SET UP



DOUBLE SIDE HEAD

Special shaped head, allows to remove left- and right-handed fins.



SHAFT25

Self-align, heavy duty locking system. Shafts and jaws are longer and wider to ensure maximum clamping force.

OPTIONAL



STAR WHEEL

The most precise feed system. Used in many basic and demanding applications.



Reversible motor allow to work and remove left and right hand fins.

STANDARD WORKING RANGE				FEED STROKE	FREE SPEED	POWER	TORQUE
APPLICATION RANGE (ID-OD)		LOCKING RANGE (ID)					
31,75 - 63,50 mm		25 - 122 mm		100 mm	100 Rpm	2,2 Hp	370 Nm
1-1/4" – 2-1/2"		0,984 - 4,803"		4"			277 Ft.Lbs
AIR USE		BODY WIDTH		BODY HEIGHT		BODY WEIGHT	
75 cfm	2,2 m³/min	2,59"	66 mm	14,5"	370 mm	19 Lbs	9 kg

HEAD NUMBERS

RANGE		HEAD
[INCH]	[MM]	
1-1/4	31,75	FMRH-317
1-1/2	38,10	FMRH-381
1-3/4	44,45	FMRH-444
2	50,80	FMRH-508
2-1/4	57,15	FMRH-571
2-1/2	63,50	FMRH-635

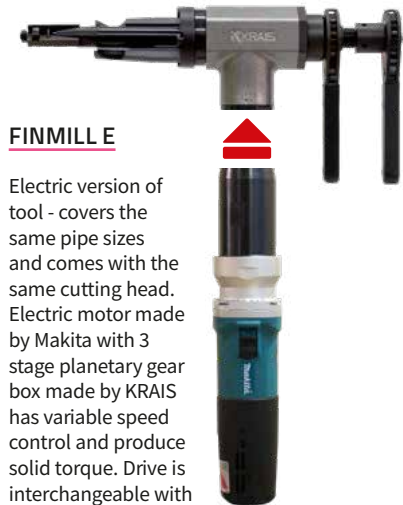
LOCKING RANGES WITH SHAFT25

RANGE [MM]		RANGE [INCH]		JAWS	SPRING	
MIN	MAX	MIN	MAX		NR	QTY.
25	30	0,984	1,181	NS-1	SP-24	1
30	35	1,181	1,378	NS-2	SP-24	1
35	40	1,378	1,575	NS-3	SP-25	2
40	45	1,575	1,772	NS-4	SP-25	2
45	50	1,772	1,969	NS-5	SP-25	2
50	55	1,969	2,165	NS-6	SP-25	2
55	60	2,165	2,362	NS-7	SP-25	2
60	65	2,362	2,559	NS-8	SP-25	2

EXAMPLE TOOL APPLICATION



Removes 4.0" (101 mm) depth of fin from the tube OD in less than 2 minutes



FINMILL E

Electric version of tool - covers the same pipe sizes and comes with the same cutting head. Electric motor made by Makita with 3 stage planetary gear box made by KRAIS has variable speed control and produce solid torque. Drive is interchangeable with pneumatic drive and can be purchased separately at any time.

Free Speed..... 115 RPM
 Power..... 750 W
 Torque..... 366 NM (280 Ft.Lbs)
 Feed Stroke 20 mm (0,787")
 FinMill E works only with right hand fins.

SPS plugging system for FinFan

THE CHALLENGE

Traditional plugging of damaged tubes in FinFan gas coolers requires maintaining expensive, extensive inventory. For every tube outer diameter (OD), you must stock separate plugs for every possible wall thickness (BWG). This ties up capital, consumes warehouse space, and delays reaction time during critical failures.

THE NEW STANDARD

KRAIS changes the rules. We have developed a system based on precision reaming of the tube interior to a fixed, pre-defined dimension. Consequently, for a given tube diameter in FinFan gas coolers, you only need one single plug size, regardless of the tube's wall thickness (BWG).

KEY BENEFITS

- ▶ Inventory reduction: one plug type per tube diameter.
- ▶ Instant readiness: no delays for non-standard plugs during emergency repairs.
- ▶ Cost efficiency: lower costs and reduced obsolete stock risk.
- ▶ Reliability: precision preparation ensures superior sealing performance.

MINIMILL301 FF-SPS

For FinFan gas cooler applications, we developed a dedicated version of our proven MiniMill301FF machine for preparing tube ends for SPS plug installation. This compact pneumatic unit is designed for precise internal reaming of tube ends. The system removes corrosion, deposits, and pitting while calibrating the tube Internal Diameter (ID) to match the universal KRAIS T_APPLE SPS plugs with high accuracy.

- ▶ Cutting heads are manufactured from M2 high-speed steel or 6% cobalt alloy steel for extended tool life and reliable machining performance.
- ▶ All cutting tools can be resharpened by specialist multiple times, helping reduce maintenance costs and extend operational usability.
- ▶ Optional Oerlikon oxide coatings are available for machining hard alloys and exotic tube materials commonly used in FinFan gas cooler service.

WORKING RANGE		FEED STROKE		POWER	FREE SPEED	TORQUE	
APPLICATION RANGE	LOCKING RANGE						
12,4 – 25,4 mm	12,4 – 24,0 mm	25 mm	0,787»	1,3 HP	300 RPM	43 Nm	32 ft.lbs
0,488 – 1,000"	0,488 – 0,945"						
AIR USE		BODY WIDTH		BODY HEIGHT		BODY WEIGHT	
55 cfm	1,3 m³/min	2,32"	59 mm	13,1"	335 mm	15,4 Lbs	7 kg

FINFAN MODULE



To prepare tubes for SPS plugs in FinFan gas coolers, use the MiniMill 301FF with the optional 601-FINFAN-SPS-xx module. The tool is mounted inside the tube, and an additional nut is used to stiffen and secure within the plug hole, ensuring precise coaxial reaming.

TOOL	TUBE CAPACITY (OD)			BIT	CENTER NUT	JAWS COVER	
	[INCH]	[MM]	BWG			MIN	MAX
601-FINFAN-SPS-xx	1,000	25,40	12-16	SPS	1-1/8	207MM#36	213MM#36

AVAILABLE LENGTHS

MODEL	LENGTH	
	[MM]	[INCH]
601-FINFAN-SPS-6	152,4	6"
601-FINFAN-SPS-8	203,2	8"
601-FINFAN-SPS-10	254,0	10"
601-FINFAN-SPS-12	305,0	12"
601-FINFAN-SPS-14	355,6	14"
601-FINFAN-SPS-16	406,4	16"

SPS plugging system for FinFan

T_APPL SPS SYSTEM PLUGS

Designed specifically for the KRAIS Smart Plugging System (SPS), this universal plug eliminates the need for gauge-specific sizing. By mating with the precision-reamed bore created by the MiniMill-301 SPS, a single plug size securely seals any wall thickness for a given tube outer diameter (OD)

- **Universal compatibility:** replaces gauge-specific plugs with one single item per Tube OD, drastically reducing inventory.
- **Torque-controlled installation:** ensures consistent radial expansion without tube deformation.
- **Simplified tooling:** installs with a standard manual torque wrench; no hydraulic equipment required.
- **Engineered reliability:** delivers a secure seal capable of withstanding high thermal cycling and vibration.



SPS PLUGS SELECTION TABLE FOR FINFAN

Please measure your tube ID and select a proper material (XX): CS for Carbon Steel, BR for Admiralty Brass, SS for Stainless Steel, CN for Cu Nickel

TUBE OD		WALL	TUBE ID		PLUG NR	TOOL NR
[INCH]	[MM]	[BWG]	[INCH]	[MM]		
1"	25,4	18	0,902	22,91	SPS-2300-FF-XX	SPST-2330

TOOL REAMING RANGE TABLE

Please check before order if your measured tube ID fits in tool reaming range.

TOOL NR	TUBE OD		BWG	[INCH]		[MM]		CUT LENGTH
	[INCH]	[MM]		MIN	MAX	MIN	MAX	
SPST-2330	1"	25,4	10-18	0,900	0,920	18,60	22,90	25 mm

AVAILABLE LOCKING JAWS

JAWS	RANGE [MM]		RANGE [INCH]		SPRING
	MIN	MAX	MIN	MAX	
209 MM#36	18,90	21,00	0,744	0,827	DW-15,5
211 MM#36	19,90	22,00	0,783	0,866	
213 MM#36	20,90	23,00	0,823	0,906	
214 MM#36	21,90	24,00	0,862	0,944	

SAFE PLUGGING PROCEDURE (STEP-BY-STEP)

1. MEASURE: use the **KRAIS Tube Hole Gauge** to precisely determine the tube condition and dimension prior to machining.
2. PRESSURE RELIEF (CRITICAL): before plugging, the tube must be pierced to relieve internal pressure. Use the **ORTCC (One Revolution Tube Cutter type C)**. This ensures operator safety and procedural compliance.
3. REAM: use the **MiniMill-301 SPS** to machine the tube interior to the required dimension.
4. PLUG: install the universal **KRAIS T_APPL SPS** plug.

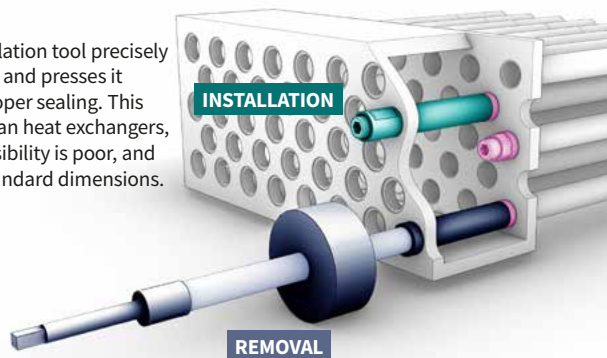
EASY PLUG REMOVAL



A dedicated slide hammer, connected to the threaded part of the plug, allows safe extraction of the plug for tube inspection or replacement

PUSH-IN SPANNER

A specially designed installation tool precisely positions the T_APPL plug and presses it into the tube to ensure proper sealing. This solution is tailored for fin fan heat exchangers, where access is limited, visibility is poor, and tool reach must exceed standard dimensions.



T_APPL tube plugs for FinFan

High pressure plugs for applications in FinFan air-cooled heat exchangers

The KRAIS T_APPL FFP series tube plugs are a specialized, mechanical plug engineered for use in air-cooled fin fan heat exchangers. Designed for high-pressure environments, it offers secure sealing without damaging the tube wall, even under severe thermal stress or vibration. Unlike general-purpose plugs, the T_APPL is designed for difficult-to-reach tube sheet locations, especially where compact water box openings and restricted visibility are common.

KEY ADVANTAGES

- Torque-controlled installation - ensures repeatable, consistent radial expansion with no tube deformation.
- Installation requires only a manual torque wrench. No high pressure pumps, no hydraulic oil leaks.
- The long-reach Push-in Spanner enables easy access in deep or narrow configurations in fin fan systems.
- Engineered expansion delivers a reliable mechanical seal, even under high thermal cycling and vibration.



PROPER TORQUE



A torque wrench should be used to ensure correct plug installation - only precise torque application can achieve reliable and leak-tight tube sealing. Recommendation: T_APPL TW#100

TOOL SELECTION TABLE

Please measure your tube ID and select a proper material (XX): CS for Carbon Steel, BR for Admiralty Brass, SS for Stainless Steel, CN for Cu Nickel

TUBE OD		WALL		TUBE ID		TOOL NR
[INCH]	[MM]	[BWG]	[INCH]	[MM]		
7/8"	22,22	15	0,731	18,57	FFP-1853-xx	FFP-1853-xx
		16	0,745	18,92	FFP-1892-xx	
		17	0,759	19,28	FFP-1892-xx	
		18	0,777	19,74	FFP-1973-xx	FFP-1973-xx
		19	0,791	20,09	FFP-1973-xx	
		20	0,805	20,45	FFP-2044-xx	FFP-2044-xx
		21	0,811	20,60	FFP-2044-xx	
		22	0,819	20,80	FFP-2080-xx	

TUBE OD		WALL		TUBE ID		TOOL NR
[INCH]	[MM]	[BWG]	[INCH]	[MM]		
1"	25,4	10	0,732	18,59	FFP-1853-xx	FFP-1853-xx
		11	0,760	19,30	FFP-1892-xx	FFP-1892-xx
		12	0,782	19,86	FFP-1973-xx	FFP-1973-xx
		13	0,810	20,57	FFP-2044-xx	FFP-2044-xx
		14	0,834	21,18	FFP-2184-xx	FFP-2184-xx
		15	0,856	21,74	FFP-2174-xx	FFP-2174-xx
		16	0,870	22,10	FFP-2174-xx	FFP-2174-xx
		17	0,884	22,45	FFP-2245-xx	FFP-2245-xx
		18	0,902	22,91	FFP-2236-xx	FFP-2236-xx
		19	0,916	23,27	FFP-2326-xx	FFP-2326-xx
		20	0,930	23,62	FFP-2326-xx	

TOOL EXPANSION RANGE TABLE

Please check before order if your measured ID fits within plugs range.

TOOL NR	[INCH]		[MM]	
	MIN	MAX	MIN	MAX
FFP-1853-XX	0,730	0,750	18,54	19,05
FFP-1892-XX	0,750	0,770	19,05	19,56
FFP-1973-XX	0,780	0,800	19,81	20,32
FFP-2044-XX	0,800	0,820	20,32	20,83
FFP-2080-XX	0,820	0,840	20,83	21,34
FFP-2184-XX	0,840	0,860	21,34	21,84
FFP-2174-XX	0,860	0,880	21,84	22,35
FFP-2245-XX	0,880	0,900	22,35	22,86
FFP-2236-XX	0,900	0,920	22,86	23,37
FFP-2326-XX	0,920	0,940	23,37	23,88
FFP-2397-XX	0,940	0,960	23,88	24,38

Modular tube wall reducing tool



This HSS modular reamer features a Morse Taper shank and a precision-ground pilot tailored to the specific tube gauge. Engineered for deep-reach applications, it utilizes screw-in extensions to facilitate gauge reduction in thick or double tube sheets, as well as finned coolers. Designed for tube removal, the tool enables drilling of up to 80% of the tube sheet thickness, ensuring efficient extraction.



This tool is not suitable for tube plugging!

TUBE OD		TUBE GAUGE	TUBE ID		TOOL NO.	TOOL OD		EXTENSION	MORSE TAPER
[INCH]	[MM]	[BWG]	[INCH]	[MM]		[INCH]	[MM]		
1	25,4	8	0,670	17,02	MWTRT-0825	0,972	24,7	MWTRT-EXT25-xx	MWTRT-MT3
		10	0,732	18,59	MWTRT-1025	0,972	24,7		
		11	0,760	19,30	MWTRT-1125	0,972	24,7		
		12	0,782	19,86	MWTRT-1225	0,972	24,7		
		13	0,810	20,57	MWTRT-1325	0,972	24,7		
		14	0,834	21,18	MWTRT-1425	0,972	24,7		

EXTENSION FOR FINFAN APPLICATIONS



An extension shaft (FF-WTRT-EXTxx), fitted with a dedicated locking nut that secures the tool within the FinFan tube sheet bore to prevent lateral movement and ensure axial alignment during operation.

AVAILABLE EXTENSION LENGTHS

MODEL	LENGTH	
	[MM]	[INCH]
WTRT-EXTxx-6	152,4	6"
WTRT-EXTxx-8	203,2	8"
WTRT-EXTxx-10	254,0	10"
WTRT-EXTxx-12	305,0	12"

Other tools

KRAIS Tube Hole Gauge K200

Choosing the correct plug size is essential for optimal performance, reliability, and safety of KRAIS tube plugs. Use the detailed sizing chart to determine the appropriate plug dimensions, ensuring compatibility and precise fitting within your specific tubing system and operational requirements



SIZE*		ID RANGE				TOOL NUMBER		REACH		SETTING RING	MANDREL EXTENSION	BODY EXTENSION
		MIN		MAX								
[INCH]	[MM]	[INCH]	[MM]	[INCH]	[MM]	IMPERIAL	METRIC	[INCH]	[MM]			
3/8	9,53	0,290	0,350	7,37	8,89	K200-375	K200-95	4	101,6	SR-3/8	K200-95-ME	K200-95-BE
1/2	12,70	0,350	0,450	8,89	11,43	K200-500	K200-127	4	101,6	SR-1/2	K200-127-ME	K200-127-BE
5/8	15,88	0,440	0,560	11,18	14,22	K200-625	K200-158	4	101,6	SR-5/8	K200-158-ME	K200-158-BE
3/4	19,05	0,550	0,715	13,97	18,16	K200-750	K200-190	8	203,2	SR-3/4	K200-190-ME	K200-190-BE
7/8	22,23	0,675	0,840	17,15	21,34	K200-875	K200-222	8	203,2	SR-7/8	K200-222-ME	K200-222-BE
1	25,40	0,800	0,965	20,32	24,51	K200-1000	K200-254	8	203,2	SR-1	K200-254-ME	K200-254-BE
1 1/4	31,75	0,950	1,170	24,13	29,72	K200-1250	K200-317	8	203,2	SR-1-1/4	K200-317-ME	K200-317-BE
1 3/8	34,93	1,085	1,295	27,56	32,89	K200-1375	K200-350	8	203,2	SR-1-3/8	K200-350-ME	K200-350-BE
1 1/2	38,10	1,240	1,450	31,50	36,83	K200-1500	K200-381	8	203,2	SR-1-1/2	K200-381-ME	K200-381-BE
1 3/4	44,45	1,476	1,685	37,49	42,80	K200-1750	K200-444	8	203,2	SR-1-3/4	K200-444-ME	K200-444-BE
2	50,80	1,700	1,910	43,18	48,51	K200-2000	K200-508	8	203,2	SR-2	K200-508-ME	K200-508-BE
2 1/4	57,15	1,948	2,16	49,479	54,86	K200-2250	K200-571	8	203,2	SR-1-1/4	K200-571-ME	K200-571-BE
2 1/2	63,50	2,200	2,41	55,880	61,21	K200-2500	K200-635	8	203,2	SR-2-1/2	K200-635-ME	K200-635-BE
3	76,20	2,660	2,87	67,564	72,90	K200-3000	K200-762	8	203,2	SR-3	K200-762-ME	K200-762-BE

* other sizes on request

One Revolution Tube Cutter - C version



One Revolution Tube Cutter version C is used for piercing heavy wall, carbon steel tubes for ventilation prior to plugging the leaky tubes. Delivered in two length version 6" and 12".



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