STAUFF ANGLIA

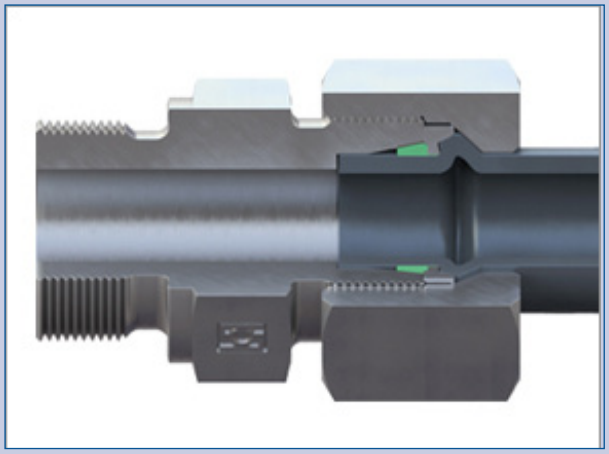
Pipeline Products for all Industries

Product Information

STAUFF®

Assembly Tools

STAUFF Form



DIN 2353 TUBE COUPLINGS

Stauff Anglia Limited
405 Coppersmith Way | Wymondham | Norfolk NR18 0WY
T: 01953 857158 F: 01953 857159 E: Sales@stauffanglia.co.uk

www.stauffanglia.com

Tube Fitting Technology by STAUFF

The STAUFF Connect portfolio is closely aligned with the market requirements and contains an extensive range of tube connectors made of carbon steel for metric tubes with outer diameters ranging from 4 to 42 mm in accordance with ISO 8434-1 / DIN 2353:

- 24° cutting ring fittings
- 24° taper fittings with O-ring
- 24° weld cones with O-ring
- 37° flared tube fittings

The product range is complimented by check and alternating valves for inline installation, thread reducers as well as blanking plugs and screws.

Special product types and sizes as well as alternative materials, material combinations and surface coatings deviating from the standards can be supplied on request.

Automated assembly machinery and hardened, wear-resistant tools enable the reliable assembly of tube connectors – both for series production in the workshop and on-site.

Because of its versatility and flexibility, the patented STAUFF Form tube forming system is undoubtedly the best solution for series production, in particular for applications with highest requirements with regards to safety, reliability and repeatability as well as process stability.

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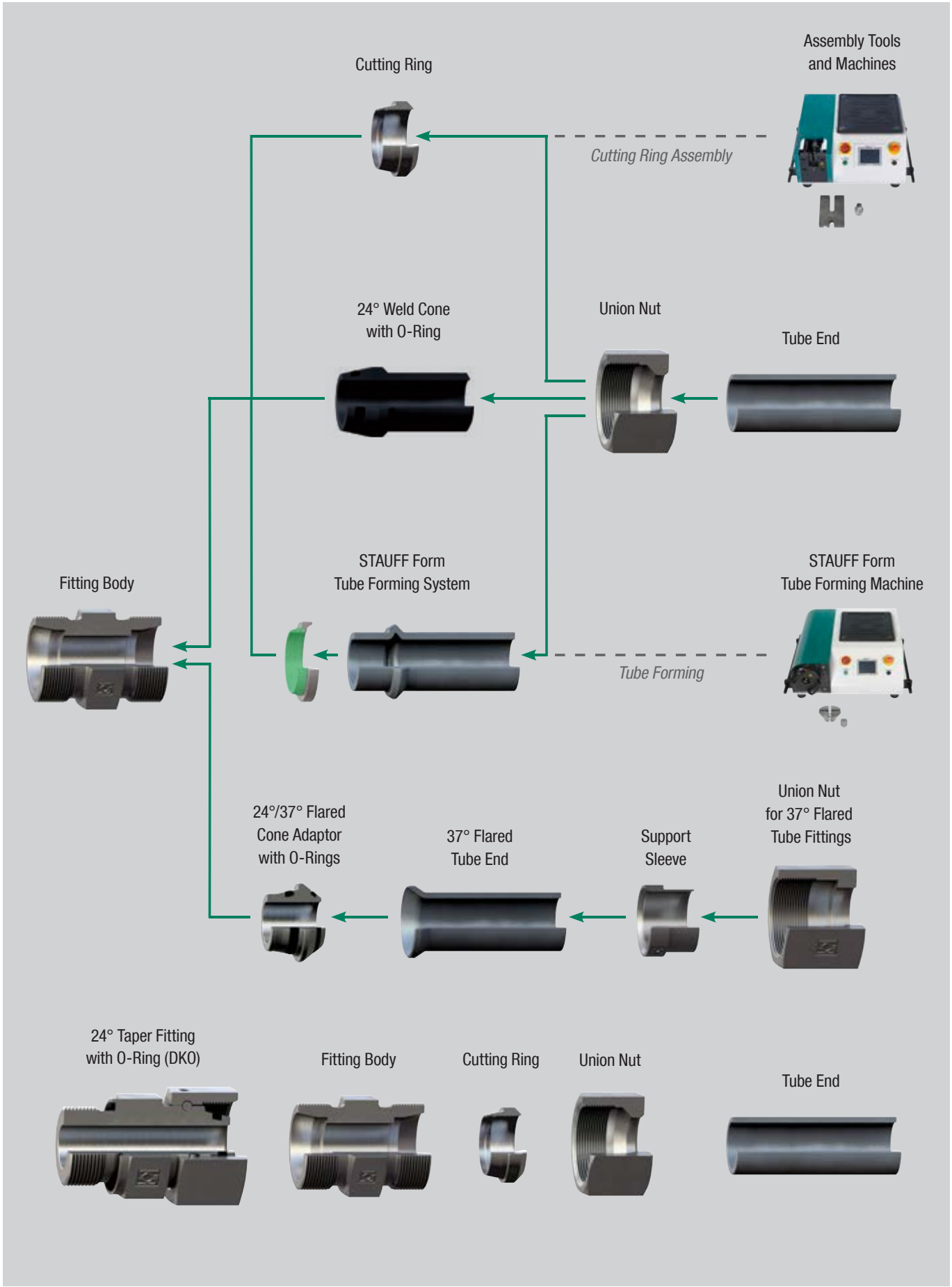

Cutting Ring
Assembly Tools and Machines
Cutting Ring Assembly
24° Weld Cone with O-Ring
Union Nut
Tube End
Fitting Body
STAUFF Form Tube Forming System
STAUFF Form Tube Forming Machine
Tube Forming
24°/37° Flared Cone Adaptor with O-Rings
37° Flared Tube End
Support Sleeve
Union Nut for 37° Flared Tube Fittings
24° Taper Fitting with O-Ring (DKO)
Fitting Body
Cutting Ring
Union Nut
Tube End

STAUFF Form Tube Forming System

Performance

The patented STAUFF Form tube forming system is without doubt one of the most high-performing solutions currently available on the market for connecting metric sized tubes. Apart from its simplicity, it also provides a maximum level of safety, reliability and reproducibility.

STAUFF Form has been designed as standard for seamless cold-drawn precision steel tubes as well as stainless steel tubes with dimensions between 6 x 1.5 mm and 42 x 4 mm in the Light Series and between 6 x 1.5 mm and 38 x 6 mm in the Heavy Series. Parameters for alternative materials (copper, brass, CuNiFe, Tungum etc.) can be added by the manufacturer, if required.

System Design and Components

The system is based on standard parts and consists of only four key components:

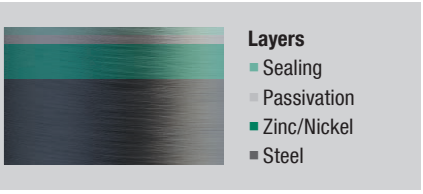
The STAUFF Form Ring with an integrated and thus undetachable elastomeric sealing is slid onto the tube end, which has previously been mechanically contoured. This creates a positive-locking connection that provides a reliable, permanent and maintenance-free seal when used with a conventional fitting body with 24° conical bore and a union nut, both according to ISO 8434-1.

Versatility and Flexibility

Users benefit from the great versatility and flexibility of the system, as well as the many combination and adaptation options offered by using standard components from the STAUFF Connect product range.

There is therefore no need to duplicate the stock-keeping of similar components with a correspondingly high likelihood of confusion, as is often the case with comparable systems. Material and logistics costs can thus be correspondingly reduced.

Materials and Surface Finishing



Like all other components in the STAUFF Connect product range, STAUFF Form Rings are designed as standard with a high-quality zinc/nickel surface coating.

With over 1,200 hours of resistance to red rust / base metal corrosion in the salt-spray chamber in accordance with DIN EN ISO 9227, the coating offers most reliable corrosion protection far beyond previously accepted market standards.

Even after shipping, handling and assembly of the components, the coating significantly exceeds the requirements for the highest corrosion protection class K5 defined in VDMA Standard Sheet 24576 for tube connectors.

Sealing

The sealing of the only possible leakage path is provided primarily by the large-volume elastomeric sealing fitted to the STAUFF Form Ring, which is specifically positioned between the surface of the tube and the 24° conical bore of the fitting body during assembly.

FKM/FPM (Viton®) is used as the standard sealing material and enables problem-free use of the STAUFF Form tube forming system for challenging applications involving high temperatures or aggressive media.

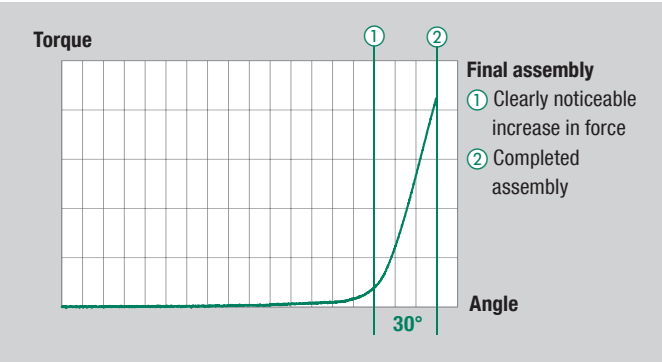
The unique sealing profile has a particularly large cross-section in order to provide a safe, reliable and permanent seal even in the event of unfavourable tolerances of the tube and fitting. The sealing effect is assisted by the system pressure of the hydraulic system so that the STAUFF Form tube forming system is also the perfect choice for high-pressure applications.

Pressure Resistance

When the STAUFF Form tube forming system is used in conjunction with genuine products from the STAUFF Connect product range, it provides pressure resistance of up to 800 bar in the Heavy Series and 500 bar in the Light Series (generally with a four-fold safety factor and depending on the series, design and size of the fitting body and taking into consideration various pressure reducing factors). This is the result of exceptional care taken in the development of the system and the selection, handling and processing of the raw materials.

Maximum tear-out strength can be guaranteed for the system due to the contour shaped at the tube end.

Final Assembly in the Fitting Body



Final assembly is performed by tightening the union nut until the point with clearly noticeable increase in force (fixed point). The assembly is completed with another approximately 1/12 of a turn (30°) beyond this point.

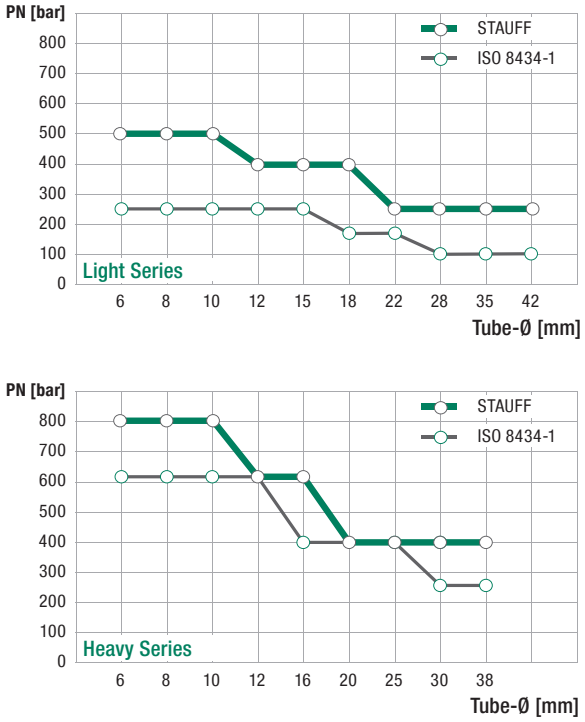
This incredibly simple assembly method has several benefits for the user:

- Considerably lower torques and short assembly paths (once the fixed point has been reached)
- Significant increase in torque to clearly indicate the end of the assembly
- Maximum safety to combat over-assembly
- No need for time-consuming and expensive training

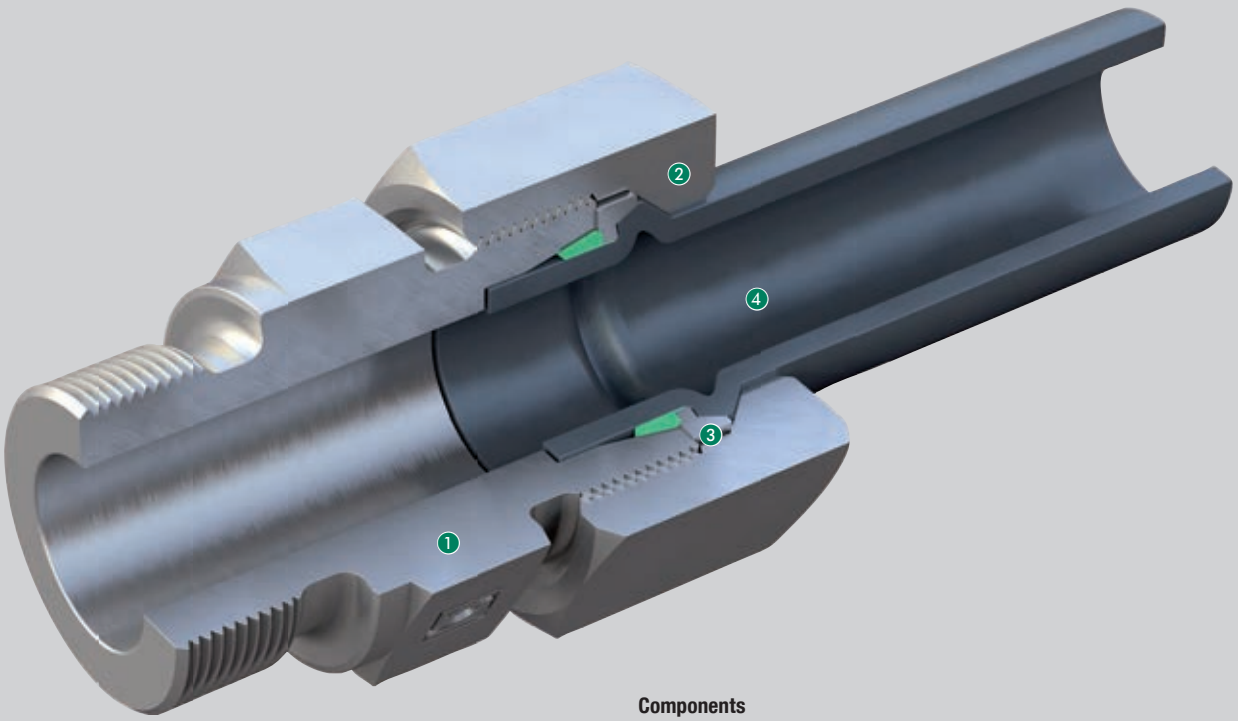
Connections made with the STAUFF Form can be untightened as often as required and reassembled without wear, as any damaging expansion of the 24° conical bore of the fitting body is technically avoided.

Main Features and Benefits

- Suitable **for both steel and stainless steel tubing** as standard– also applicable for alternative tube materials on request
- Covers all common **metric tube dimensions from 6x1.5mm to 42x4mm** in the Light Series and **38x6mm** in the Heavy Series respectively
- **Requires only standard parts** from the STAUFF Connect range according to ISO 8434-1: No need to duplicate the stock-keeping of similar components with a correspondingly high likelihood of confusion
- High-quality zinc/nickel surface coating provides **maximum protection and corrosion resistance** – standard for all parts in the STAUFF Connect range
- **Positive-locking connection** with a **large-volume elastomeric sealing** providing a **safe, reliable and permanent seal** even in the event of unfavourable tolerances
- The use of FKM/FPM (Viton®) as the standard seal material makes the system **perfect for the most challenging applications**
- Suitable **for nominal pressures up to 800 bar** in the Heavy Series – designed with **four-fold safety** and **maximum tear-out strength**
- Incredibly **simple final assembly in the fitting body** with low assembly torques as well as short assembly paths (once the fixed point
- has been reached) with **a minimised risk of over-assembly**



Nominal pressure levels of the STAUFF Form System compared to the requirements of ISO 8434-1 (only applicable in conjunction with fitting bodies and union nuts of the STAUFF Connect product range)



Components

1. Regular STAUFF Connect Fitting Body – ISO 8434-1
2. Regular STAUFF Connect Union Nut – ISO 8434-1
3. STAUFF Form Ring with Integrated Elastomeric Sealing
4. Formed Tube End

STAUFF Form
Tube Forming Machine ▪ Type SFO-F

Product Description

The type SFO-F tube forming machine facilitates the economical and most reliable production of tube ends made of steel, stainless steel and other materials with a contour typical for the STAUFF Form tube forming system.

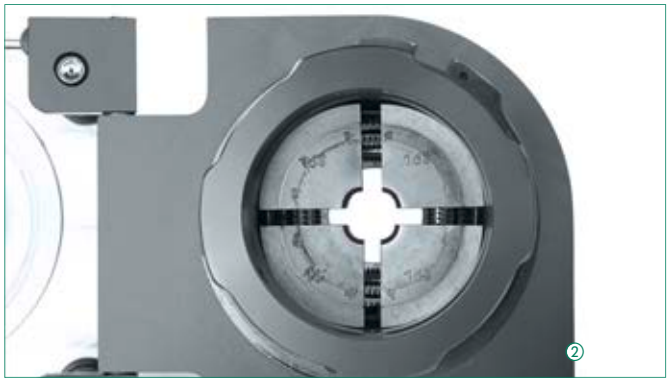
The machine is designed as a robust table-top device for continuous operation in the workshop. It is used in connection with FI-FST tube shapers and FI-FB clamping jaws. Tube shapers with FI-ID internal tube supports are used with selected tube dimensions, which prevent the tube from being constricted in the shaping area.

Tube shapers, clamping jaws and internal tube supports have been specifically designed for the mechanical forming process and can be quickly and simply replaced without the need for any tools, if required. The resulting short tool change and set-up times contribute to the high efficiency of the system as well as ensuring low cycle times.

All the tools needed for the forming process are clearly labelled with the tube dimensions so that assembly errors caused by incorrect assignment can be largely ruled out.

Operating elements of the assembly machine

Noise-reducing tool tray with durable rubber mat



Open clamping head with clamping jaws inserted

Inserting the tube shaper into the tool holder – with no tools required

Characteristics

Performance

- Constant high process safety, reliability and reproducibility by the combined pressure/position-control of the machine, which performs the shaping process following a manual start and monitors it by means of stored parameters
- Maximum efficiency thanks to short cycle times – ideal for series production
- Quick and simple replacement of tube shapers (with bayonet lock) and clamping jaws when changing the tube dimensions – with no tools required
- Potential risk of confusion and assembly errors caused by incorrect assignment can virtually be ruled out by the clear labelling of all the necessary assembly tools
- Surface-friendly clamping of the tube during the forming process
- Counters for lot/batch sizes and total quantities (separated by tool size)
- Predefined menu languages: English, German, French and Italian
- High degree of user comfort with clear information displayed on the operating panel

Design

① Robust and ergonomically designed machine housing
② Easily accessible clamping head for simple positioning of the clamping jaws and optimised assembly area with approx. 115 mm / 4.52 in distance from the tube axis to the interfering edge of the machine housing, which allows processing of tubes with low bending radii or complex geometries
③ Noise-reducing tool tray with durable rubber mat
④ Lateral handle bars as attachment points for transport (e.g. with lifting belts)
⑤ Secure positioning thanks to flexible rubber machine feet
⑥ Type plate, with technical data, serial number, year of manufacture etc.

Operating Elements

⑦ Operating panel for display and selection of all relevant settings and forming parameters
⑧ Button for definite confirmation of entries made on the operating panel
⑨ Status light to indicate readiness for operation and running assembly processes

Safety Devices

⑩ Main power switch (can be secured against unauthorised actuation when required)
⑪ Separate emergency stop button to immediately stop all machine movements

Connections (at the back of the machine)

⑫ Electrical connection according to IEC 60309 CEE 16A (cable length: 4 m / 13.12 ft) and Ethernet connection (RJ45) for maintenance and data input by the manufacturer

Tube Forming Tools

⑬ Tube Shaper FI-FST with clear identification of the tube dimensions
⑭ Version of a Tube Shaper FI-FST with Internal Tube Support FI-ID
⑮ Clamping Jaws FI-FB with clear identification of the tube dimension

Lateral handle bars and rubber machine feet with a suitable clearance height to enable the simple and safe transport using a forklift or pallet jack

Electrical connection plug and Ethernet port (RJ45)

Ordering Codes

Tube Forming Machine (without tube shapers and clamping jaws)

SFO-F - A - A
① ② ③

① Series and Type		② Motor Configuration		③ Plug Type	
Tube Forming Machine STAUFF Form	**SFO-F**	400 V AC @ 50 Hz - 3 phases / 460 V AC @ 60 Hz - 3 phases	**A**	Phase reversing plug according to IEC 60309 CEE 16A	**A**

Alternative motor configurations are available on request. Please consult STAUFF for details.

Alternative plug types are available on request. Please consult STAUFF for details.

STAUFF Form
Tube Forming Machine ▪ Type SFO-F

Technical Data

Area of Application

- Function: Cold forming of seamless cold drawn precision steel tubes acc. to to EN 10305-1 (materials E235, E355) and stainless steel tubes (material 1.4571 / AISI 316 Ti)

Parameters for alternative materials (copper, brass, CuNiFe, Tungum etc.) can be added by the manufacturer, if required. Please consult STAUFF for details.

- Operating principle: Tube forming with combined pressure/position-control
- Series and dimensions: Light Series (L): 6 x 1,5 mm to 42 x 4 mm
  Heavy Series (S): 6 x 1,5 mm to 38 x 6 mm

Dimensions / Weight

- Dimensions (W x D x H): 850 mm x 890 mm x 330 mm
  33.46 in x 35.04 in x 12.99 in
  with lateral handle bars (detachable)
- Distance from the tube axis to the interfering edge of the machine housing: 115 mm / 4.52 in
- Clearance height: 65 mm / 2.56 in (height of the machine feet) enables simple and safe transport using a forklift or pallet jack
- Weight: 210 kg / 463 lbs (including operating fluid, excluding forming tools)

Materials

- Machine frame: Aluminium
- Machine housing: Steel, painted
- Tool tray: NBR (Perbunan®)
- Machine feet: Natural rubber
- Form rings: Steel, zinc/nickel-plated – delivery standard
  Stainless steel – currently in preparation
- Form rings (seal): FKM/FPM (Viton®)

Motor Configuration

- Power supply: 400 V AC @ 50 Hz - 3 phases
  460 V AC @ 60 Hz - 3 phases
- Current consumption: 2,55 A
- Connected load: 1,0 kW
- Electrical connection: Phase reversing plug according to IEC 60309 CEE 16A
- Cable length: 4 m / 13.12 ft

Alternative motor configurations and plug types are available on request. Please consult STAUFF for details.

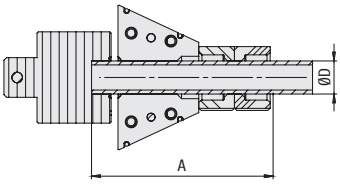
Hydraulic System

- Operating fluid: Hydraulic oil Shell Tellus S2 MA 46 or equivalent (filled and ready for operation when delivered)
- Fluid volume: 6,1 litres / 1.61 US Gallon
- Max working pressure: 700 bar / 10153 PSI

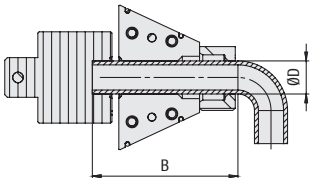
Operating Conditions

- Storage temperature: -10°C … +70°C / +14°F … +158°F
- Ambient temperature: +15°C … +35°C / +59°F … +95°F
- Ambient conditions: Dry, no condensing humidity, operation in horizontal position only
- Noise emission: less than 68 dB(A) as per EN ISO 11202

Minimum Clamping Lengths



Series	Tube OD [mm]	Straight Tubes [mm]	Straight Sections next to Tube Bends [mm]
L	6	109	94
	8	107	92
	10	111	95
	12	110	94
	15	113	96
	18	114	96
	22	120	100
	28	123	101
	35	143	118
	42	144	119



Series	Tube OD [mm]	Straight Tubes [mm]	Straight Sections next to Tube Bends [mm]
S	6	113	96
	8	111	94
	10	115	97
	12	114	96
	16	120	99
	20	130	106
	25	147	120
	30	155	126
	38	168	135

Quick Start Guide

Additional information and instructions on the operation of the tube forming machine can be found in the detailed operating manual.

Insert the tube shaper into the tool holder of the machine and use the bayonet lock to secure it.

Insert the clamping jaws into the clamping head of the machine and push them completely in until it stops.

Close the clamping head, push it into the machine and lock it by turning in clockwise direction.

Use the operating panel and the Acknowledge button to start the reference movement.

Put the union nut FI-M onto the tube end. Pay attention to the correct alignment.

Gently slide the tube into the machine and push it in until it stops.

Use the operating panel to start the actual forming process.

Remove and visually check the formed tube end.

Tube Shapers ▪ Type FI-FST
Internal Tube Supports ▪ Type FI-ID

Tube Shapers FI-FST
(with/without Internal Tube Support FI-ID)

Selection Chart and Ordering Codes

Tube OD [mm]	Tube Wall Thickness [mm]	Ordering Codes Tube Shapers	Internal Tube Supports	Weight [kg] ca. per piece
6	1,5	**FI-FST-06L/S-S-A**		1,7
8	1,5	**FI-FST-08L/S-S-A**		1,7
	2,0			
10	1,5	**FI-FST-10L/S-S-A**		1,7
	2,0			
	2,5			
	3,0			
12	1,5	**FI-FST-12L/S-1,5-S-A**	**FI-ID-12x1,5-HR**	1,7
	2,0	**FI-FST-12L/S-2,0/2,5/3,0-S-A**		
	2,5			
	3,0			
15	1,5	**FI-FST-15L-S-A**	**FI-ID-15x1,5-HR**	1,7
	2,0		**FI-ID-15x2,0-HR**	
	2,5		**FI-ID-15x2,5-HR**	
16	2,0	**FI-FST-16S-2,0/2,5-S-A**	**FI-ID-16x2,0-HR**	1,7
	2,5		**FI-ID-16x2,5-HR**	
	3,0	**FI-FST-16S-3,0/4,0-S-A**		
	4,0			
18	2,0	**FI-FST-18L-2,0/2,5-S-A**	**FI-ID-18x2,0-HR**	1,7
	2,5		**FI-ID-18x2,5-HR**	
	3,0	**FI-FST-18L-3,0-S-A**		
20	2,0	**FI-FST-20S-2,0/2,5-S-A**	**FI-ID-20x2,0-HR**	1,7
	2,5		**FI-ID-20x2,5-HR**	
	3,0	**FI-FST-20S-3,0/4,0-S-A**		
	4,0			
22	2,0	**FI-FST-22L-2,0/2,5-S-A**	**FI-ID-22x2,0-HR**	1,7
	2,5		**FI-ID-22x2,5-HR**	
	3,0	**FI-FST-22L-3,0/3,5-S-A**		
	3,5			
25	2,0	**FI-FST-25S-2,0/2,5-S-A**	**FI-ID-25x2,0-HR**	1,7
	2,5		**FI-ID-25x2,5-HR**	
	3,0	**FI-FST-25S-3,0/3,5/4,0/5,0-S-A**		
	3,5			
	4,0			
	5,0			
28	2,0	**FI-FST-28L-2,0/2,5/3,0-S-A**	**FI-ID-28x2,0-HR**	1,7
	2,5		**FI-ID-28x2,5-HR**	
	3,0		**FI-ID-28x3,0-HR**	
	3,5	**FI-FST-28L-3,5/4,0-S-A**		
	4,0			
30	2,5	**FI-FST-30S-2,5/3,0-S-A**	**FI-ID-30x2,5-HR**	1,6
	3,0		**FI-ID-30x3,0-HR**	
	4,0	**FI-FST-30S-4,0/5,0/6,0-S-A**		
	5,0			
	6,0			
35	2,5	**FI-FST-35L-2,5/3,0-S-A**	**FI-ID-35x2,5-HR**	1,6
	3,0		**FI-ID-35x3,0-HR**	
	4,0	**FI-FST-35L-4,0/5,0-S-A**		
	5,0			
38	3,0	**FI-FST-38S-3,0/4,0-S-A**	**FI-ID-38x3,0-HR**	1,7
	4,0		**FI-ID-38x4,0-HR**	
	5,0	**FI-FST-38S-5,0/6,0-S-A**		
	6,0			
42	3,0	**FI-FST-42L-S-A**	**FI-ID-42x3,0-HR**	1,6
	3,5		**FI-ID-42x3,5-HR**	
	4,0		**FI-ID-42x4,0-HR**	

Please note:

The selection chart is only applicable in conjunction with seamless cold drawn precision steel tubes according to EN 10305-1 (materials E235 and E355).

Please consult STAUFF for information regarding the processing of stainless steel tubes.

Clamping Jaws ▪ Type FI-FB

Ordering Codes

Tube OD [mm]	Series	Ordering Codes Clamping Jaws	Weight [kg] ca. per piece
6	L / S	**FI-FB-06L/S-A**	2,4
8	L / S	**FI-FB-08L/S-A**	2,4
10	L / S	**FI-FB-10L/S-A**	2,3
12	L / S	**FI-FB-12L/S-A**	2,3
15	L	**FI-FB-15L-A**	2,3
16	S	**FI-FB-16S-A**	2,3
18	L	**FI-FB-18L-A**	2,2
20	S	**FI-FB-20S-A**	2,2
22	L	**FI-FB-22L-A**	2,2
25	S	**FI-FB-25S-A**	2,2
28	L	**FI-FB-28L-A**	2,1
30	S	**FI-FB-30S-A**	2,0
35	L	**FI-FB-35L-A**	2,0
38	S	**FI-FB-38S-A**	1,9
42	L	**FI-FB-42L-A**	1,8

Clamping Jaws FI-FB

Form Rings ▪ Type FI-AR

Ordering Codes

Tube OD [mm]	Series	Ordering Codes Form Rings	Weight [kg] ca. per 100
6	L / S	**FI-AR-06L/S-V-W3**	0,09
8	L / S	**FI-AR-08L/S-V-W3**	0,10
10	L / S	**FI-AR-10L/S-V-W3**	0,17
12	L / S	**FI-AR-12L/S-V-W3**	0,19
15	L	**FI-AR-15L-V-W3**	0,23
16	S	**FI-AR-16S-V-W3**	0,26
18	L	**FI-AR-18L-V-W3**	0,29
20	S	**FI-AR-20S-V-W3**	0,42
22	L	**FI-AR-22L-V-W3**	0,42
25	S	**FI-AR-25S-V-W3**	0,69
28	L	**FI-AR-28L-V-W3**	0,52
30	S	**FI-AR-30S-V-W3**	0,79
35	L	**FI-AR-35L-V-W3**	0,94
38	S	**FI-AR-38S-V-W3**	1,79
42	L	**FI-AR-42L-V-W3**	1,09

Form Ring FI-AR
with Integrated Elastomeric Sealing

(Actual colour of the sealing might differ from the pictured one!)

FI-AR - 15 - L - V - W3
① ② ③ ④ ⑤

① Type

STAUFF Form Ring	**FI-AR**

② Outside Tube Diameter (in mm)

③ Series

Light Series	**L**
Heavy Series	**S**

④ Seal Material

FKM/FPM (Viton®) – delivery standard	**V**

Consult STAUFF for alternative seal materials.

⑤ Material / Surface Finishing

Steel, zinc/nickel-plated – delivery standard	**W3**
Stainless steel – currently in preparation	**W5**

Consult STAUFF for alternative materials.