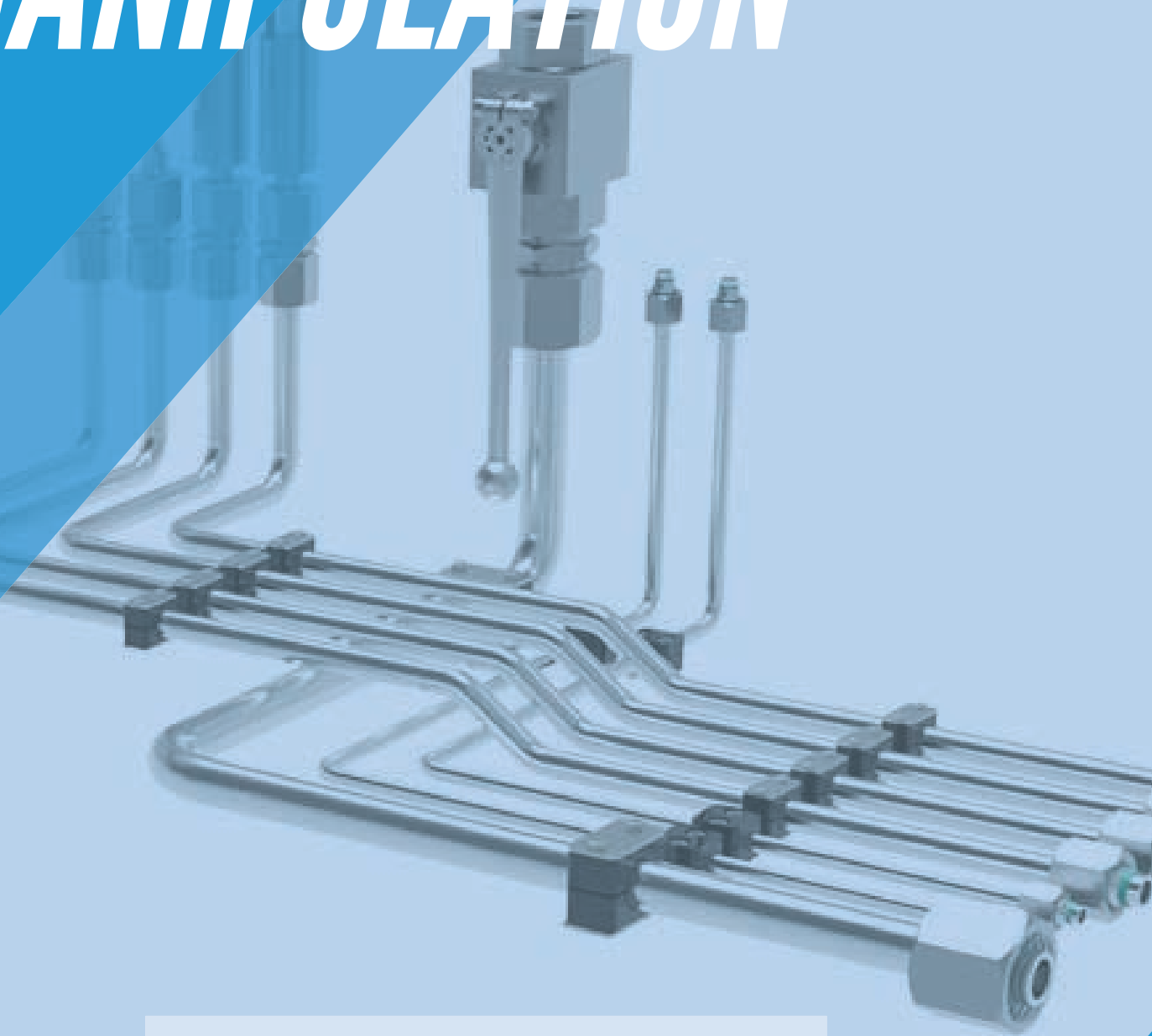


STEEL TUBE MANIPULATION



VOSS

PARTNERS

STEEL TUBE MANIPULATION

INTRODUCTION

DISTAG QCS – CNC TUBE BENDING –

RE-ORDER REPEATABILITY & REVISION CONTROL

Our investment in Fully automatic CNC TUBE BENDING machines, bespoke bending software alongside Solidworks design, has fully enhanced customer design interaction. All our bending machines are operated through bespoke server-based bending software & centralised customer steel pipe database, making it simple for your re-order, repeatability & revision control.

Take a look through our service offerings;

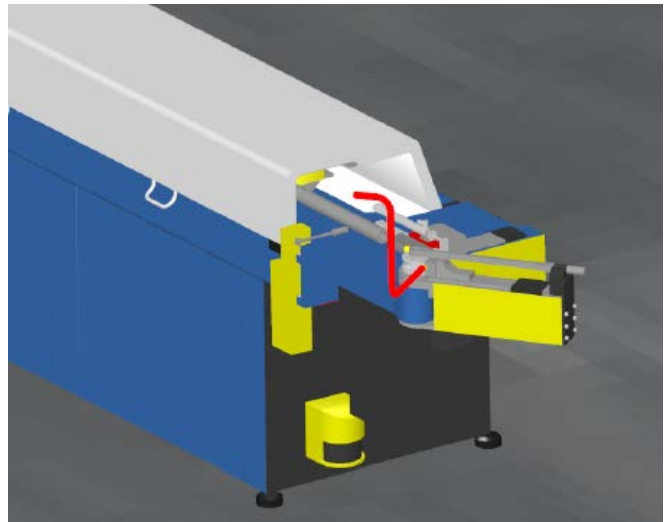
INDEX

PIPE ROUTING DESIGN	H-1
TUBE PROCESSING	H-3
TUBE SELECTION	H-6
TUBE END TERMINATIONS	H-11
CUTTING RING END TERMINATIONS	H-14
ADDITIONAL END OPTIONS	H-19
TUBE FINISHING SERVICES	H-21

Distag QCS has the ability to import customer piping data and process it using bespoke software for maximum accuracy and consistency. Precise tube manipulation with zero bend deformation is achieved using retractable internal mandrels.

All customers can ask for a detailed bend data sheet prior to producing their order, using our bespoke bending software which features a built-in simulator.

A built-in visual bending simulator allows us to quickly view any issues with a pipe prior to production and quickly liaise with the customer.



PIPE ROUTING DESIGN CAPABILITIES-

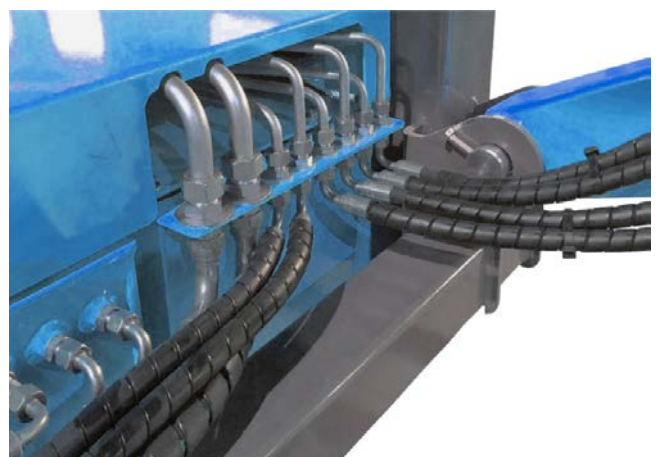
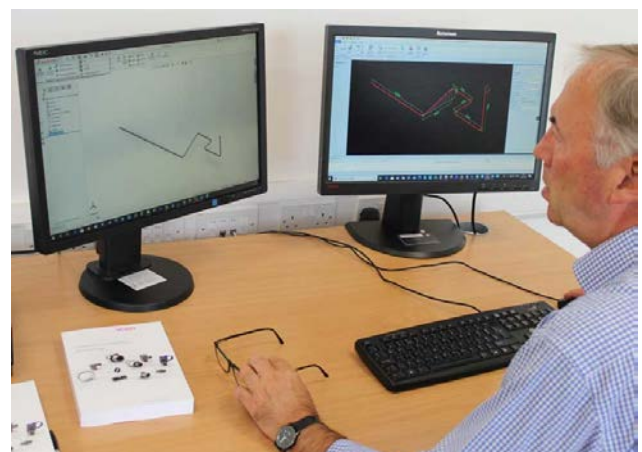
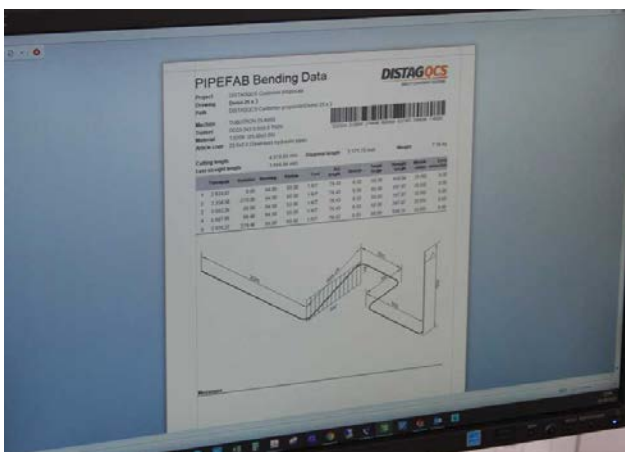
PRECISE TUBE MANIPULATION

All customers can ask for a fully detailed bend datasheet which underpins our integrity prior to producing their order.

Pipes can be produced in Zinc plate or self-coloured finish if the customer requires cutting rings to be fitted, we offer both Vossring – M or Voss ES-4 designs or Vossform SQR design, all three systems are fully compatible with DIN 2353 24° Tube connecting parts, 24° connecting pieces and single parts/accessories end fittings.

Distag QCS also supply the complete range of Voss Tube connecting parts, 24°. Connecting piece range and single parts/accessories which are finished with Voss coat which provides the best possible corrosion protection.

Weld-on end fitting are available on request.





Tube bending capacity on both our CNC machine and is semi-automatic machine 6mm OD to 42mm OD.

- Maximum single pipe length 6000mm.
- if required, pipes can be joined together with Voss straight connections without any flow restrictions.
- Automatic circular saw with digital backstop for medium batch work.
- Laser-guided circular saw for precise cutting on short pipe bend sections.
- Step file and CSV (xyz coordinates) data importation.
- Customer CAD interaction on Solidworks single pipes or assemblies at the design stage.

BESPOKE SOFTWARE FOR MAXIMUM ACCURACY & CONSISTENCY FOR LOW-MEDIUM BATCHES

For fast turnaround Distag QCS utilise Barcode data uploader on low-medium volume batches.

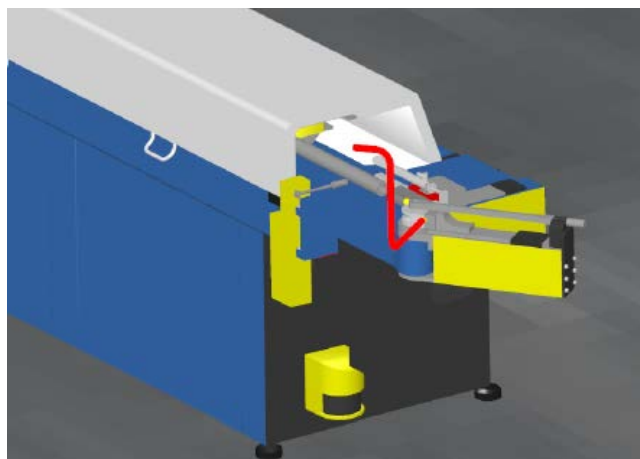


Automatic circular saw with digital back stop for medium batch work.



Simulator

Data Bend Sheet



PIPEFAB Bending Data

Project: DISTAGQCS Customer proposal
Drawing: Demo 25 x 3
Path: DISTAGQCS Customer proposal/Demo 25 x 3
Machine: TUBCORN 25 8000
Toolset: QCS (S&S 850 0 79425)
Material: 1.0338 (25.30x3.05)
Article code: 25.3x3.0 (Seamless hydraulic pipe)

Cutting length: 4.276.00 mm Diagonal length: 3.121.75 mm Weight: 7.16 kg
Last straight length: 1.542.54 mm

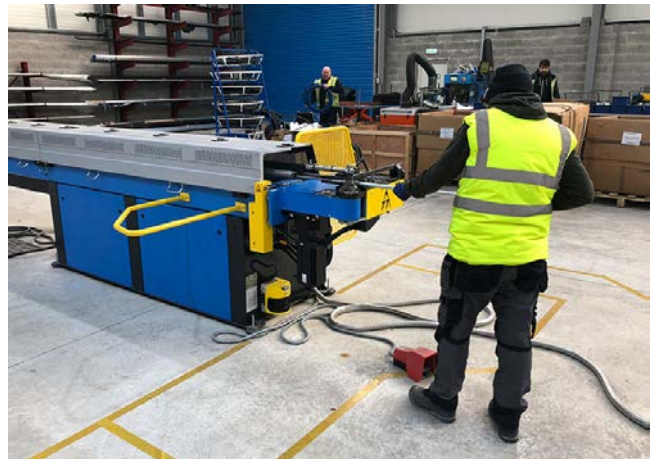
Sequence	Radius	Bending	Radius	Feed	Axis length	Stretch	Target Angle	Stretch length	Weight	Modul	Spine correction
1	3.020.07	0.00	84.50	50.00	1.907	76.42	6.03	90.00	449.94	10.000	0.00
2	3.256.56	270.00	84.50	50.00	1.907	76.42	6.03	90.00	497.97	10.000	0.00
3	3.042.26	90.00	84.50	50.00	1.907	76.42	6.03	90.00	197.97	10.000	0.00
4	3.607.96	99.46	84.50	50.00	1.907	76.42	6.03	90.00	397.97	10.000	0.00
5	2.025.57	279.46	84.50	50.00	1.907	76.42	6.03	90.00	506.16	10.000	0.00

**BESPOKE SOFTWARE FOR MAXIMUM ACCURACY,
CONSISTENCY & DESIGN INTEGRITY**

Pipe Deburring Machine



VOSS FORM Machine



TUBE SELECTION

STEEL TUBE ASSEMBLY

When designing a Hydraulic Steel Tube assembly, it is critical to select the correct tube specification for the application, Distag QCS offers two types of hydraulic tube grades based on customers' requirements.



VOSS

STEEL ASSEMBLIES- SEAMLESS COLD DRAWN HYDRAULIC LINEPIPE

Distag QCS Hydraulic Steel assemblies are typically produced using Seamless Cold Drawn Hydraulic Linepipe according to EN10305-4 (DIN 2445/2). (CR 6 Free Electrolytic galvanised).

The tube has the following specifications;

Grade: E235

Yieldstrenght:

<16mm =235N/mm²

>16<40 225N/mm²

>40 <65 215N/mm²

See below for standard stock sizes available from Distag QCS

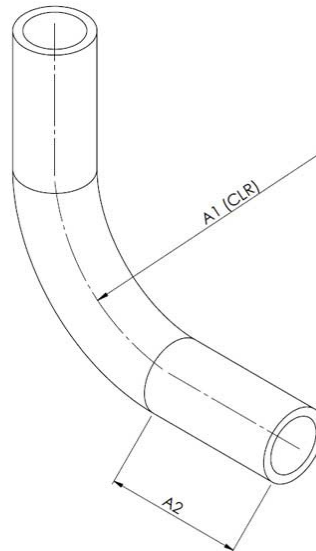


STEEL TUBE SIZES AVAILABLE-

Tube O.D (mm)	Wall Thickness (mm)	Design Pressure (Bar)	Maximum Flow Rate (Litres Per Minute)			Centre Line Radius (A1) (mm)	Straight Clamp Length (A2) (mm)	L (Light)	S (Heavy)
			Pressure Lines	Return Lines	Suction Lines				
6	1	389	6	2.5	1	18.5	16	*	*
8	1.5	431	9	4	1.5	20	16	*	*
10	1	282	23	9.5	4	20.5	20	*	*
10	1.5	373	18	10	3	20.5	20	*	*
10	2	478	14	5.5	2	20.5	20	*	*
12	1.5	353	30	12	5	24	24	*	*
12	2	409	24	9	3.75	24	24	*	*
14	2	403	36	15	6	28	28		*
15	1.5	282	52.5	21	8.25	30	30	*	
15	2	376	43	18	7	30	30	*	
16	2	353	52.5	21	8.25	32	32		*
16	2.5	386	43	18	7	32	32		*
18	2	313	70	28	11	36	36	*	
18	2.5	392	60	24	10	36	36	*	
20	2.5	353	80	32	13	40	40		*
22	2.5	320	105	40	16.5	44	44	*	
25	3	338	130	52.5	21	50	50		*
28	2	201	210	82.5	33	56	56	*	
28	3	302	175	70	28	56	56	*	
30	3	282	210	82.5	33	60	60		*
35	3	242	300	125	48	70	70	*	
38	3	223	370	150	60	76	76		*
38	4	297	330	130	52.5	76	76		*
42	3	201	475	190	75	84	84	*	

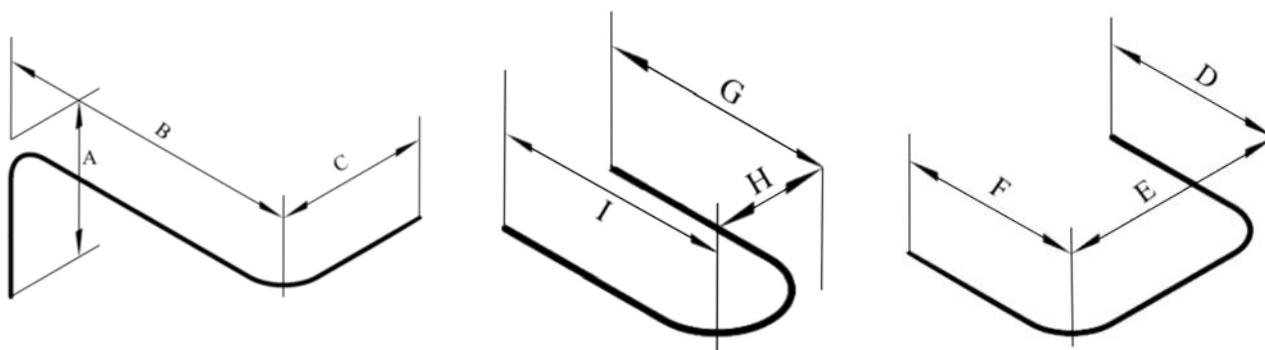
Disclaimer - All technical information is given as a guideline only

Maximum Tube length = 6000mm



BENDING DESIGN PARAMETERS-

The table below shows the minimum dimensions required when manipulating various sizes of steel tubes.



Tube O.D (mm)	Wall Thickness	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
8	1.5	39.2	76	39.2	39.2	55	39.2	39.2	32.92	39.2
10	1	40.7	81	40.7	40.7	63	40.7	40.7	40.97	40.7
10	1.5	40.7	81	40.7	40.7	63	40.7	40.7	40.97	40.7
10	2	40.7	81	40.7	40.7	63	40.7	40.7	40.97	40.7
12	1.5	49	86	49	49	75	49	49	49	49
12	2	49	86	49	49	75	49	49	49	49
15	1.5	61	94	61	61	93.5	61	61	61.4	61
15	2	61	94	61	61	93.5	61	61	61.4	61
16	2	65	99.2	65	65	99.3	65	65	64.6	65
16	2.5	65	99.2	65	65	99.3	65	65	64.6	65
18	2	73	112	73	73	112	73	73	72.6	73
18	2.5	73	112	73	73	112	73	73	72.6	73
20	2.5	81	124	81	81	124	81	81	81.3	81
22	2.5	89	136	89	89	136	89	89	89.2	89
25	3	101	155	101	101	154	101	101	101.2	101
28	2	113	171	113	113	171	113	113	113	113
28	3	113	171	113	113	171	113	113	113	113
30	3	121	184	121	121	184	121	121	122	121
35	3	141	214	141	141	214	141	141	142	141
38	3	153	231	153	153	231	153	153	154	153
38	4	153	231	153	153	231	153	153	154	153
42	3	169	257	169	169	255	169	169	170	169

Disclaimer - All technical information is given as a guideline only

ZISTAPLEX-BY BENTELER

In addition to the standard range of Cold Drawn Hydraulic Linepipe according to EN10305-4 Steel tubing we also offer customers the alternative ZISTAPLEX Option as offered by Benteler.

The ZISTAPLEX tube offers optimal protection after deformation. Due to many customers placing the highest requirement on surface coating of as tube. The ZISTAPLEX is a Chrome VI-Free Tube with an additional organic surface layer.

It is possible to use fittings according to DIN and SAE without removing the coating.



ZISTAPLEX - 8 X1 MM, Before and after a 600h corrosion test.

PROPERTIES OF ZISTAPLEX STEEL TUBE-

Because of its outstanding deformation characteristics, this unique surface with an additional organic surface layer offers the highest corrosion protection, also for demanding final applications.

SURFACE CONDITION-

Zinc Layer	Layer thickness: min.8µm, 12µm, 18µm or 25µm.
Passivation	Chrome VI-free.
Organic Layer	Standard; 50µm epoxy in colour shade black, RAL 9005 (Option: ≤ µm or >100µm).

CHARACTERISTICS & DISTINCTIVE ASPECTS-

Highest corrosion resistance	Because of duplex system (zinc with organic coating).
Media and chemical resistance	eg.fertiliser, defrosting agents, standard hydraulic motor and engine oils.
Extreme plasticity	Outstanding characteristics also after deformation processes such as bending and end formation.
Colour choice	Colours of RAL system selectable.
Conformity guidelines	The chrome VI-free organic coating satisfies all requirements of the end of life vehicle directive, REACH Regulation and EU directives.

TUBE END TERMINATIONS

VOSS FORM SQR

VOSSFORM SQR

Forming device for VOSSForm SQR tube forming – for highest process-reliability in Steel-tube assembly.



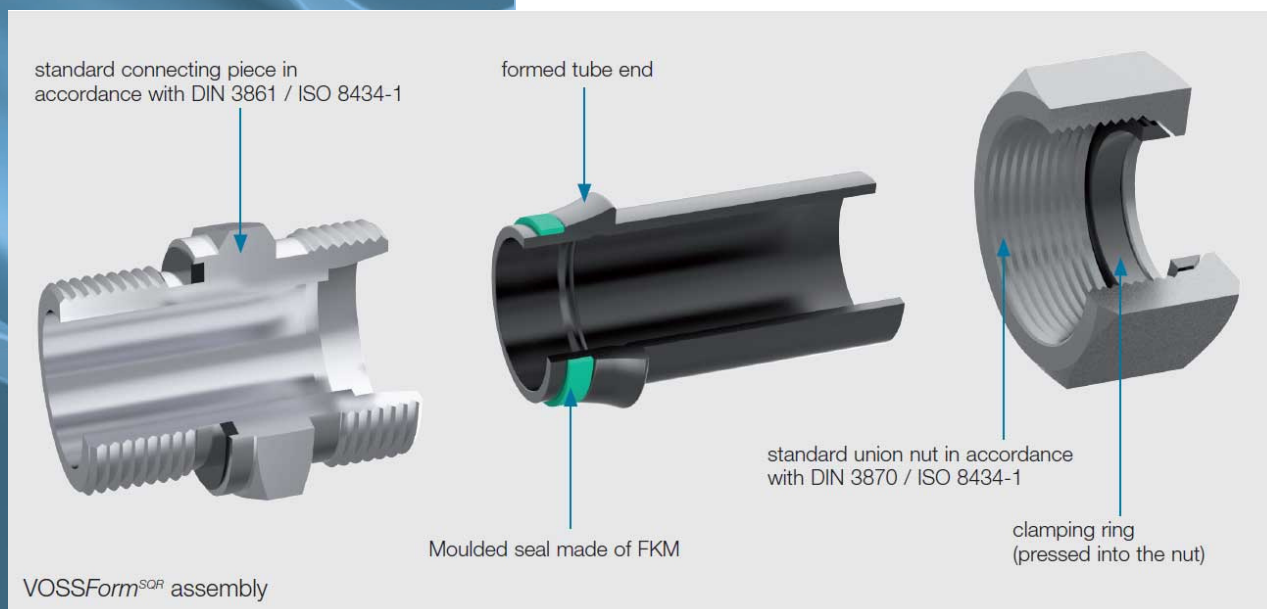
VOSS

VOSS FORM SQR – TUBE COUPLING SYSTEM

The new VOSSFormSQR tube coupling system meets the primary requirements of hydraulic connections.

With its innovative design, VOSSFormSQR is based on proven and reliable VOSS design principles.

A contour is formed on the end of the commercially available hydraulic tube using the VOSS forming unit. Supplemented with a soft seal in the secondary area and the SQR nut, a simple and superior quality connection is created which provides maximum resilience and reliability.



VOSS

MAXIMUM LOAD-BEARING CAPACITY & SAFETY –VOSS FORM RELIEVES WEAK POINT

VOSS

The critical area is the transition from the formed contour to the tube. Here, the forming process can cause the material to become brittle. With the VOSSFormSQR system, the weak point is effectively relieved. Firstly, the radius at the transition minimises the notch effect, and secondly, the SQR nut with integrated clamping ring clamps the tube radially around the circumference, absorbing the dynamic loads outside of the critical area, thus increasing the pressure load-bearing capacity and breakage resistance.



SOFT SEALS ENSURE LEAK-TIGHTNESS – PREVENTS CONNECTION SWEATING

Soft seals offer considerable advantages over purely metallic seals. Any settling that occurs due to mechanical loads is compensated, effectively preventing connection sweating. A connection that remains completely leak-tight even under the most stringent inspection is more economical, protects the environment and demonstrates the quality of the connection, and thus of the entire product.

CUTTING RING END TERMINATIONS

VOSS RING M-ES4 CUTTING RING

VOSS RING M –
THE NEW CUTTING RING
SYSTEM FROM VOSS FLUID

ES4 CUTTING RING
THE SOFT SEALING CUTTING
RING WITH MANY
ADVANTAGES AND 4 - FOLD
BENEFITS

VOSS

VOSS RING M – THE NEW CUTTING RING SYSTEM FROM VOSS FLUID

VOSS

The new cutting ring system from VOSS Fluid provides maximum reliability, pressure resistance and quality. The patented solution comprises a metallically sealing cutting ring, the VOSSRingM, and a tool specially developed for this application, the VOSSRingM pre-assembly.

The VOSSRingM guarantees the best possible cut on all steel and stainless steel tubes. This is ensured by proven twin-cutting technology, which guarantees a solid material throw-up together with an especially firm cutting ring seat. The ring's material, geometry, and technical characteristics are designed for maximum pressure and dynamic load capacity. That means application is also possible even under the most extreme system pressures, which are up to 500 bar in lightweight "L" series and up to 800 bar in the heavy-duty "S" series. The requirements of DIN EN ISO 8434-1 are even significantly surpassed with fourfold reliability. Several features that for instance prevent stud damage or tube slippage give the ring an above average customer benefit.

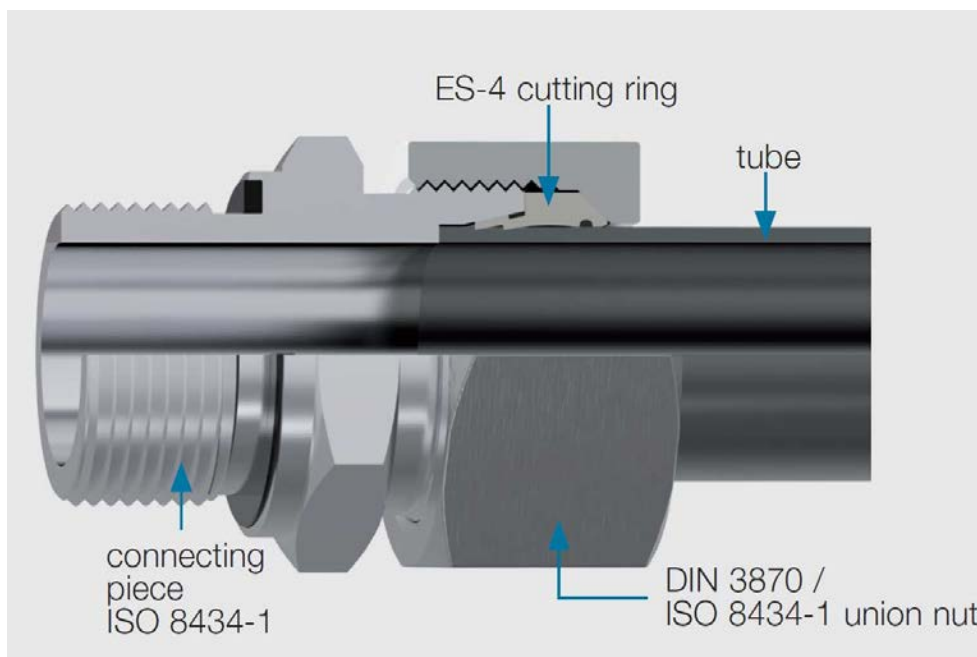


VOSS ES-4 - TUBE COUPLINGS INFORMATION

VOSS

VOSS ES-4: soft seal couplings in accordance with DIN / ISO and with 4-fold benefits:

1. Design based on the tried and tested VOSS cutting ring.
2. Additional precision sealing using soft-sealing elements made of FKM.
3. Reliable leak-tightness thanks to gap-free chambering of the soft seals.
4. Guided assembly up to the tightening torque limit.



With “ES-4”, VOSS engineers have developed a soft-seal coupling that not only offers additional reliability but is also much more economical.

As regards the tube connection side, ES-4 couplings cover the application range between the proven cutting ring coupling for standard applications and 10° flared couplings for heavy loads and high stresses.

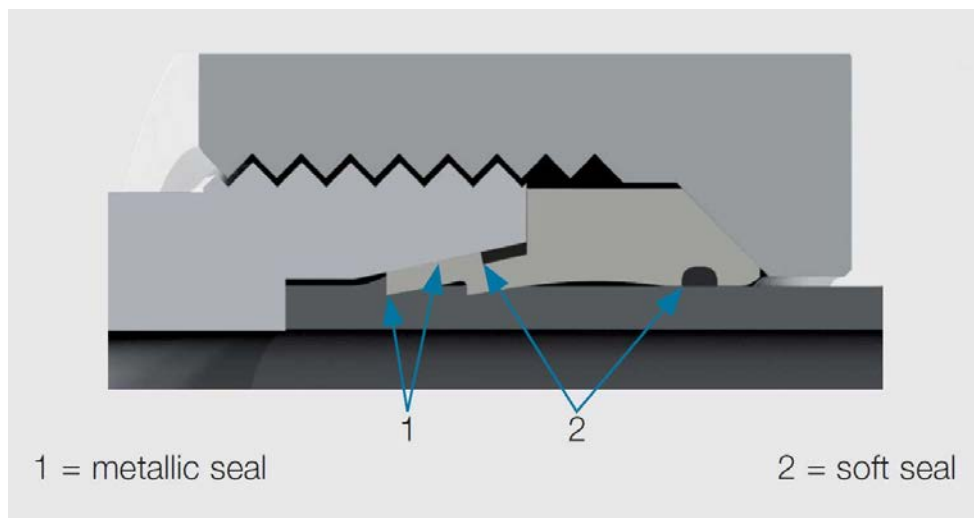
LEAK PREVENTION

The special moulded seal in the groove on the cutting ring taper and the additional O-ring between the cutting ring and the tube eliminate leaks which might otherwise occur due to slackening of the metallic seal, e. g. due to creep characteristics.

DYNAMIC LOADS

VOSS

If the medium succeeds in passing the metallic sealing zone when there is an alternating pressure load, it is stopped by the soft seals located behind the metal seal. The arrangement of the elastomer seals behind the metallic sealing zone means that the alternating pressures can only act on the soft seal after being considerably damped. This quasi-static load, which is lower than the operating pressure, ensures excellent long-term stability of the elastomers.



STATIC LOADS

Assuming that a leak develops in the metallic sealing zone while the assembly is exposed to static pressure loads, the full operating pressure would build up and act on the front of the soft seal – however with a considerable time delay. In such cases, complete enclosure of the soft-seal elements without any gaps ensures reliable sealing.

VOSS RING AS THE BASIS

The basis for the soft seal coupling is the proven VOSS tube couplings conforming to DIN 2353 / ISO 8434-1. In this design, the cutting ring is supplemented by soft seals fitted on the secondary side.

The reliable functional properties of cutting rings remain totally unaffected:

- In the final assembled state, loading by bending moments is counteracted adequately by support from the broad contact area and by the uninterrupted force transfer.
- In addition, the first, strong cutting edge and the additional second cutting edge ensure a secure hold i. e. for tear-out protection in the case of sudden pressure increases.

VOSS Ring^M

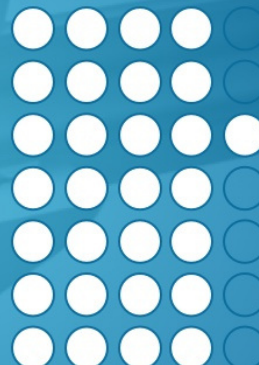
Standards	DIN EN ISO 8434-1
Type of Seal	Metallic
Material	Steel
Series Tube - OD	L/S 6-24

VOSS

FEATURE

PRESSURE LOAD CAPABILITY
TEMPERATURE RESISTANCE
CORROSION RESISTANCE
MEDIA RESISTANCE
EASE OF ASSEMBLY
LEAK RESISTANCE
SYSTEM RELIABILITY

RATING



VOSS ES-4 CUTTING RING

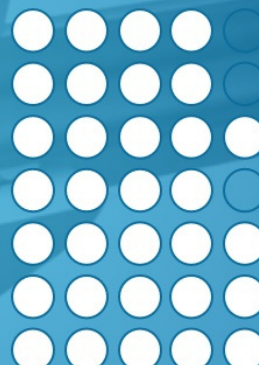
Standards	DIN EN ISO 8434-1
Type of Seal	Metallic & Soft Sealing
Material	Steel/Stainless Steel
Series Tube - OD	L/S 6-24

VOSS

FEATURE

PRESSURE LOAD CAPABILITY
TEMPERATURE RESISTANCE
CORROSION RESISTANCE
MEDIA RESISTANCE
EASE OF ASSEMBLY
LEAK RESISTANCE
SYSTEM RELIABILITY

RATING



VOSS FORM^{SQR}

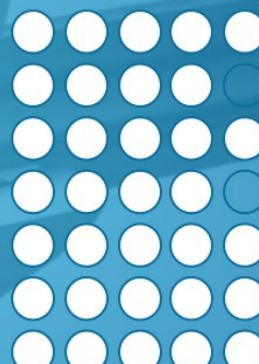
Standards	DIN EN ISO 8434-1
Type of Seal	Metallic & Soft Sealing
Material	Steel/Stainless Steel
Series Tube - OD	L/S 6-24

VOSS

FEATURE

PRESSURE LOAD CAPABILITY
TEMPERATURE RESISTANCE
CORROSION RESISTANCE
MEDIA RESISTANCE
EASE OF ASSEMBLY
LEAK RESISTANCE
SYSTEM RELIABILITY

RATING



VOSS

Distag can offer hydraulic tube with weld-on ends, without zinc plating. This tube is suitable for internal use such as tanks or for finish painting.

TUBE ADDITIONS –

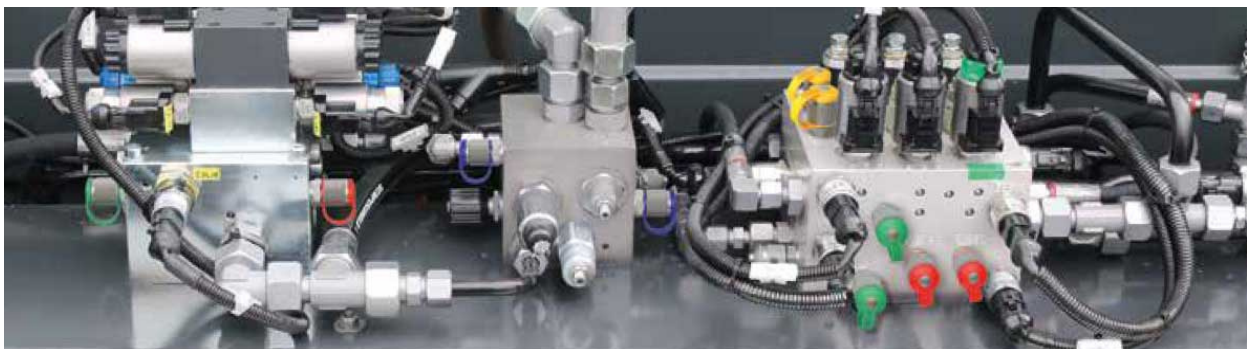
In addition to the bending of tubes additional extra for tubes supplied include;

- Measuring Couplings.
- Tube Threading - With metric & Imperial dies to suit a variety of threads.
- Internal and external threading available.
- Tube Expanding,
- Tube Flaring,
- Tube Forming.

However, it must be noted Tube Expanding, flaring & forming are typically supplied on externally sourced tubes.

With threading capabilities available in-house.

**MEASURING COUPLINGS –
VOSS POINT DC**





HOSE CLEANING -

Hose Cleaning systems, projectile launchers, multiple media types and sizes of projectiles available.



END SEALING -

After cleaning all the steel tubes are sealed to prevent dust particles from entering the finished product.



LABELLING -

We can offer many different types of label system as per the customer requirements.

WWW.DISTAG.COM
Get in touch

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