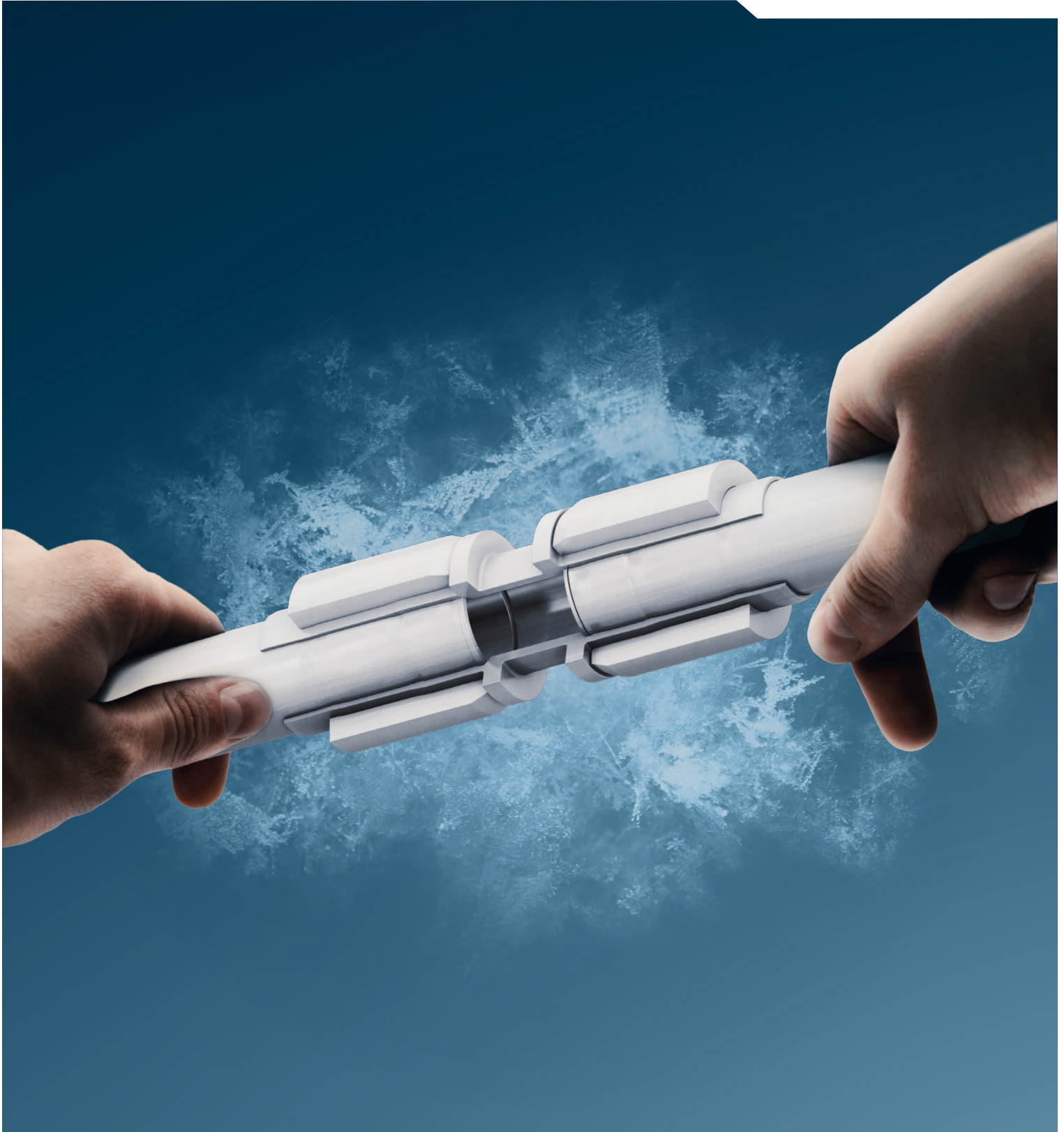


LOKRING® ALUMINIUM CONNECTORS TYPE 50

TECHNICAL DOCUMENTATION AND SUBMITTAL VERSION 1.4



CONTENT

1.0	INTRODUCTION	02
2.0	COMPONENTS OF A LOKRING® CONNECTION	02
3.0	FUNCTIONAL PRINCIPLE	03
4.0	LOKPREP (ANAEROBIC SEALANT)	03
4.1	SPREADING THE LOKPREP	04
4.2	CURING TIME	05
5.0	TECHNICAL SPECIFICATIONS AND APPROVALS OF THE LOKRING CONNECTION	05
6.0	CONNECTIONS FROM ALUMINIUM TO COPPER TUBE	06
7.0	ASSEMBLY	07
8.0	ASSEMBLY TOOLS	08
9.0	ALUMINIUM TUBE SPECIFICATION / ALUMINIUM STABILISATION INSERT (LOKRING VH AL)	09
10.0	STRAIGHT ALUMINIUM CONNECTOR (LOKRING NK AL 50)	10
11.0	STRAIGHT ALUMINIUM REDUCING CONNECTOR (LOKRING NR AL 50)	11
12.0	ALUMINIUM FLARE NUTS (LOKRING FN AL)	12
13.0	DECLARATION REGARDING PASSED TESTS ACCORDING EN 16084:2011	13
	ONLINE-SERVICE	16
	VALIDITY CLAUSE	17

1.0 INTRODUCTION

The purpose of this document is to give technicians all information necessary about the solder-free LOKRING® tube connection technology in general and especially about aluminium LOKRING® connectors type 50 for use in refrigeration and air conditioning technology.

2.0 COMPONENTS OF A LOKRING® CONNECTION



JOINT (1)

The shape of the aluminium joint to be used is defined by one of the many types, sizes and repair situations.



RING (2)

Up to a diameter of 12 mm, the rings are pre-assembled on the joint when delivered.



STABILISATION INSERT (3)

Aluminium stabilisation inserts bring additional safety into the LOKRING® connection by increasing the necessary pull-out force. They also help correct slight ovality found in coiled line sets. Stabilisation inserts must always be used for LOKRING® aluminium connections type 50 when the operating exceeds 25 bar (360 psi).



LOKPREP

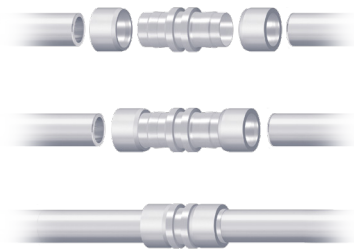
LOKPREP is an important component of the LOKRING® connection technology. LOKPREP will compensate for any unevenness in the tube surface such as longitudinal grooves or surface porosity, thus ensuring that every LOKRING® connection is hermetically sealed.



LOKTOOL

The hand assembly tool reduces the manual force needed during assembly. The assembly jaws are easy to exchange to match the size of the LOKRING® to be fitted.

3.0 FUNCTIONAL PRINCIPLE



The LOKRING® tube connection works on the basis of »simple« physical laws. It consists of two rings and one tubular joint which takes the two tube ends. During assembly, the tube ends are inserted into the joint to the inner limit.

Then an assembly tool is used to push the two rings axially onto the joint. Due to the conical inner contour of the rings and the special outer and inner contour of the joint, the diameter of the joint is reduced during assembly so that the tube and the joint form a metallic hermetic connection through surface contact.

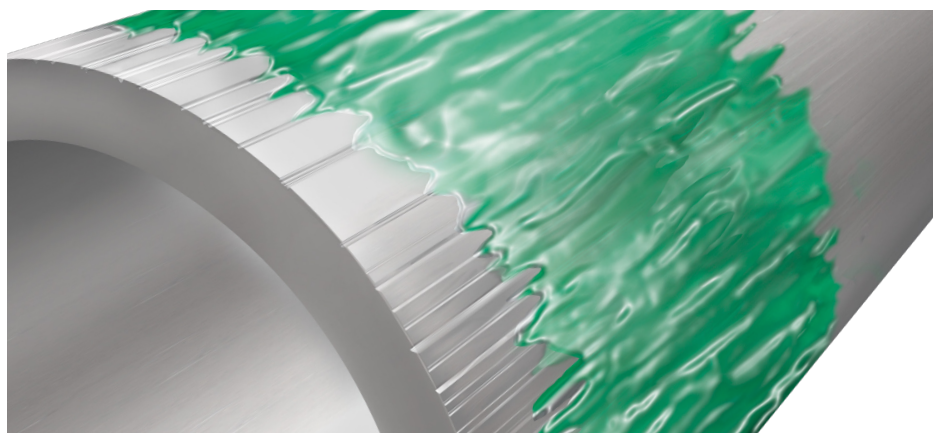
The lifetime air-tightness of the fitted connection is ensured by the state of permanent elastic pre-tension, which is produced by the balance of the radial forces acting in opposite directions from tube to ring.

4.0 LOKPREP (ANAEROBIC SEALANT)



Metal tubes can have longitudinal grooves on the surface from production. These production related faults can be compensated quite easily by moistening the tube ends to be connected with LOKPREP fluid before assembly. Thanks to its capillary characteristic, it can even flow into microscopic cavities and fill these out completely.

LOKPREP is not an adhesive, rather an anaerobic sealant which hardens under oxygen exclusion and in contact with free metal ions. Its elastic structure is permanently retained in a temperature range of -50 to 150°C (-58°F to 302°F), thus compensating material-specific deformations due to fluctuations in temperature. Since LOKPREP does not contain solvents which have to evaporate during hardening, the finished connection is ready for use shortly after assembly.

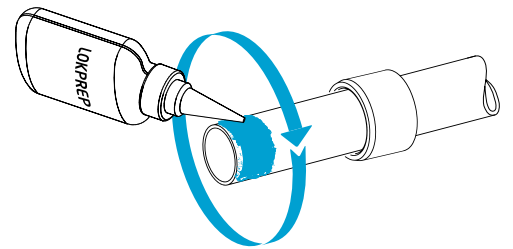


4.1 SPREADING THE LOKPREP

ALWAYS MAKE SURE THAT THE WHOLE TUBE CIRCUMFERENCE IS MOISTENED WITH LOKPREP.

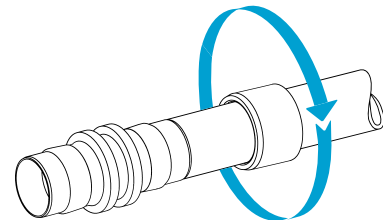
POSSIBILITY A

Move the nozzle 360° around the tube to distribute the LOKPREP evenly.



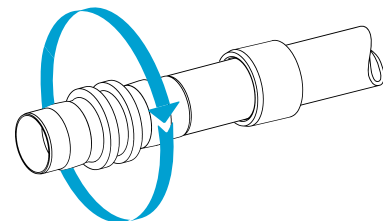
POSSIBILITY B

Rotate the moistened tube through 360° inside the joint.



POSSIBILITY C

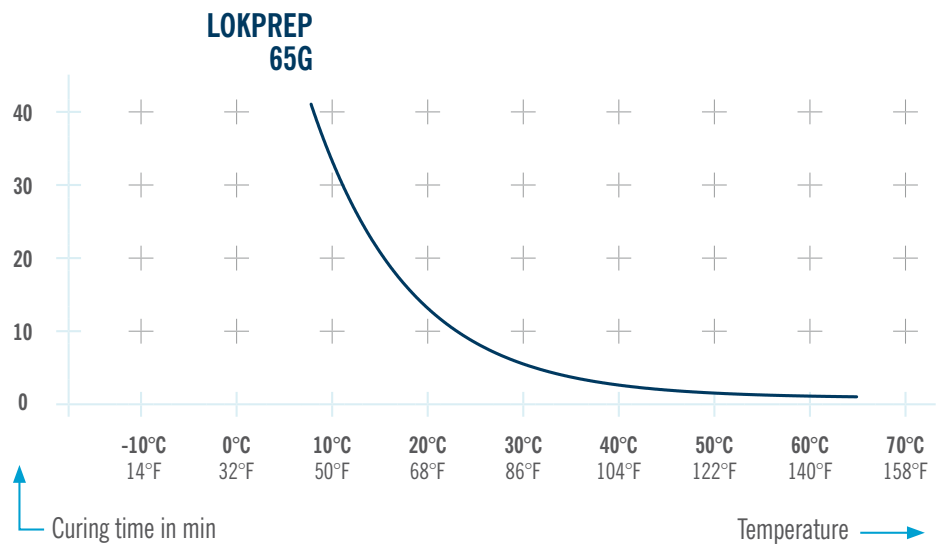
Rotate the joint through 360° around the end of the tube.





4.2 CURING TIME

Always make sure that the LOKPREP is properly cured before exerting any force on the LOKRING connection by moving, turning or bending the tube.



5.0 TECHNICAL SPECIFICATIONS AND APPROVALS OF THE LOKRING CONNECTION

Suitable for the following tube materials	Aluminium to Aluminium, Aluminium to Copper, Other material combinations on request
Suitable for the following refrigerants	All HCs, HFCs and mixtures. Not suitable for NH ₃ .
Tube diameter range	6.35 to 22.23 mm (1/4" to 7/8")
Minimum tube wall thickness	0.8 mm
Max. operating pressure	50 bar (725 psi)
Temperature range	-50°C to 150°C (-58°F to 302°F)
Approvals	TÜV (Registered No. 44 780 08 344780) UL (File SA12004)
Reference standards	EN 378-2 and EN 16084



6.0 CONNECTIONS FROM ALUMINIUM TO COPPER TUBE

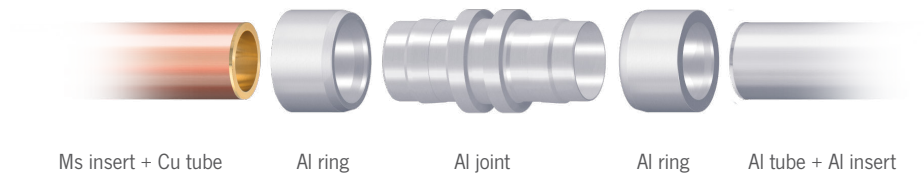
FOR CONNECTIONS FROM ALUMINIUM TO COPPER A HEAT SHRINK SLEEVE MUST BE USED TO PROTECT THE CONNECTION AGAINST CONTACT CORROSION.



INSIDE THE COPPER TUBE A BRASS STABILIZATION INSERT HAS TO BE USED.



NOTE: For both, the aluminium tube and the copper tube LOKPREP 65G has to be used.



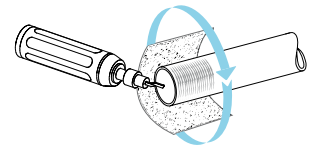
7.0 ASSEMBLY



For a more detailed description, please see our official LOKRING assembly instructions on www.vulkan.com.

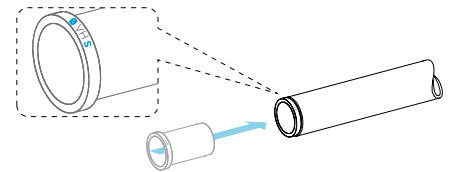
TREAT THE TUBE END

First, deburr the tube end all the way round using a tube deburrer. As the tube ends must be metallic bright and free of longitudinal grooves caused by production, clean the tube ends with sandpaper or abrasive mats.



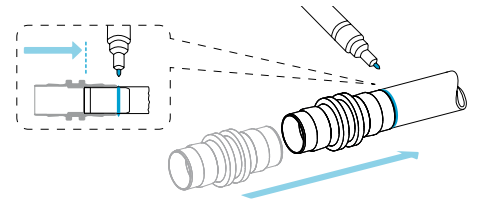
USE STABILISATION INSERTS

Always insert stabilisation inserts into the tube ends.



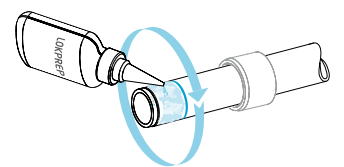
MARK THE INSERTION DEPTH

Marking the correct insertion depth makes it possible to check if the tube stays inserted to the inner limit of the joint until the assembly is finished. Furthermore, the marking defines the area where LOKPREP needs to be applied.



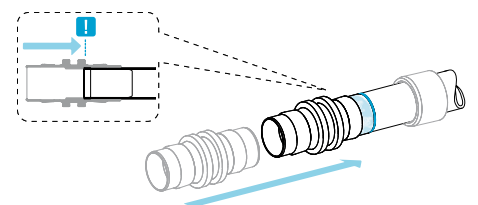
APPLY LOKPREP

Moisten the whole tube circumference with LOKPREP. Apply the LOKPREP a little away from the cut edge to avoid it getting onto the inside of the tube.



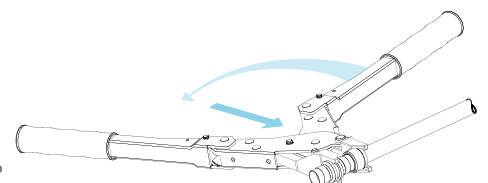
INSERT TUBES

Insert the tube ends with the LOKPREP film into the joint. Make sure that the ends of the tubes are inserted to the inner limit of the joint and remain fixed in this position during assembly.



PUSH THE RING ON TO THE JOINT

Finally, set the assembly tool behind the ring and the assembly stop on the joint and press the ring axially onto the joint until it is flush to the assembly stop. Respect the curing time of the LOKPREP before applying forces to the connection.



8.0 ASSEMBLY TOOLS



For further information see our videos on www.vulkan.com.

LOKTOOL MZ

The LOKTOOL MZ was developed especially for LOKRING® assembly. Only one tool is needed because the assembly jaws are exchangeable.



LOKTOOL MZ-V

The LOKTOOL MZ-V was developed for use in areas that are difficult to access. The handles of the MZ-V are offset on both sides, allowing full use in places difficult to access.



LOKTOOL MB EVP

The assembly jaws fit the hand assembly tools LOKTOOL MZ and MZ-V. They can be replaced quickly and easily, thus making LOKRING® assembly possible with only one tool for different tube diameters.

9 different sizes are available to cover the whole diameter range from 6 to 35 mm (1/4" to 1 3/8").



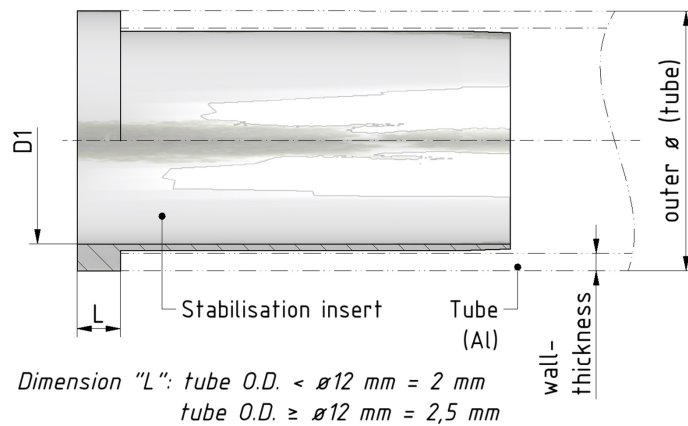
LOKPRESS

The cordless assembly tool enables the fast and safe processing of type 50 LOKRING connections with a diameter of 6 to 35 mm (1/4" to 1 3/8"). The assembly jaws move together when the start button is pressed.

Until the force has been built up, i.e. until the start of assembling, the assembly tool switches to automatic mode until the LOKRING® connection has been pressed completely. A special hydraulics valve and an electronic monitoring system guarantee safe assembly.

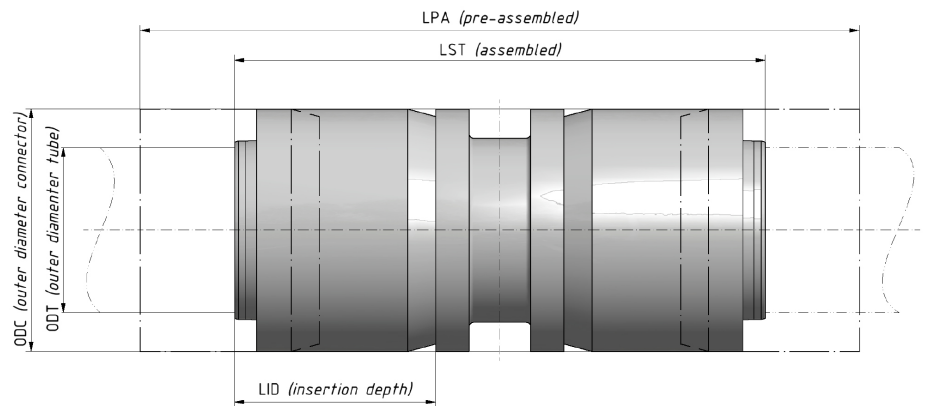


9.0 ALUMINIUM TUBE SPECIFICATION / ALUMINIUM STABILISATION INSERT (LOKRING VH AL)



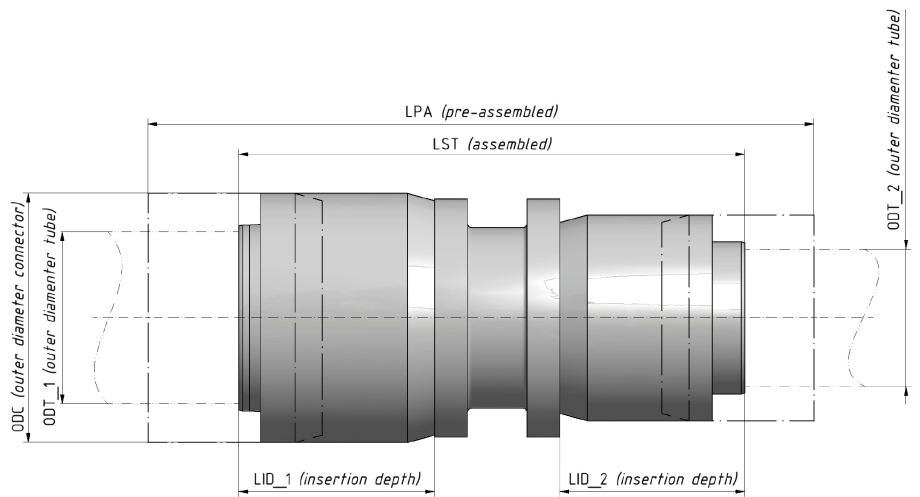
Article no.	Article name	max. tube outer- \varnothing mm	min. tube outer- \varnothing mm	max. wall thickness mm	min. wall thickness mm
L13005456	LOKRING 6,35 VH AI 08	6.40	6.30	0.88	0.72
L13005482	LOKRING 6,35 VH AI 10	6.40	6.30	1.10	0.90
L13005457	LOKRING 8 VH AI 08	8.05	7.89	0.88	0.72
L13005483	LOKRING 8 VH AI 10	8.05	7.89	1.10	0.90
L13005458	LOKRING 9,53 VH AI 08	9.05	8.95	0.88	0.72
L13005484	LOKRING 9,53 VH AI 10	9.05	8.95	1.10	0.90
L13005574	LOKRING 10 VH AI 10	10.05	9.95	1.10	0.90
L13005459	LOKRING 12,7 VH AI 08	12.75	12.65	0.88	0.72
L13005485	LOKRING 12,7 VH AI 10	12.75	12.65	1.10	0.90
L13005577	LOKRING 12,7 VH AI 12	12.75	12.65	1.32	1.08
L13005575	LOKRING 15 VH AI 10	15.05	14.95	1.10	0.90
L13005460	LOKRING 16 VH AI 10	16.05	15.83	1.10	0.90
L13005578	LOKRING 16 VH AI 12	16.05	15.83	1.32	1.08
L13005580	LOKRING 16 VH AI 15	16.05	15.83	1.65	1.35
L13005576	LOKRING 18 VH AI 10	18.05	17.95	1.10	0.90
L13005461	LOKRING 19 VH AI 10	19.11	18.99	1.10	0.90
L13005700	LOKRING 19 VH AI 12	19.11	18.99	1.32	1.08
L13005579	LOKRING 19 VH AI 15	19.11	18.99	1.65	1.35
L13005462	LOKRING 22 VH AI 12	22.29	21.94	1.32	1.08

10.0 STRAIGHT ALUMINIUM CONNECTOR (LOKRING NK AL 50)



Article no.	Article name	ODT mm (in)	ODC mm	LID mm	LST mm	LPA (ca.) mm
L13005444	LOKRING 6,35 NK Al 50	6.35 (1/4)	13	12	32.5	50
L13005445	LOKRING 8 NK Al 50	8 (5/16)	14	12	32.5	48
L13005446	LOKRING 9,53 NK Al 50	9.53 (3/8)	16	13	35.5	56
L13005502	LOKRING 10 NK Al 50	10	16	13	35.5	56
L13005447	LOKRING 12,7 NK Al 50	12.7 (1/2)	19	15.5	41	65
L13005564	LOKRING 15 NK Al 50	15	23	18.5	48.5	79
L13005448	LOKRING 16 NK Al 50	16 (5/8)	23	20	51.5	68
L13005501	LOKRING 18 NK Al 50	18	26	20.8	53.5	70
L13005449	LOKRING 19 NK Al 50	19.05 (3/4)	26	21.8	55.5	72
L13005450	LOKRING 22 NK Al 50	22 (7/8)	30	24.6	61.5	79

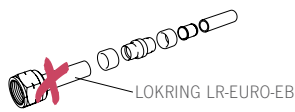
11.0 STRAIGHT ALUMINIUM REDUCING CONNECTOR (LOKRING NR AL 50)



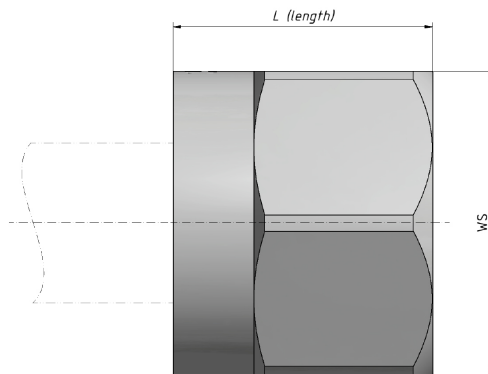
Article no.	Article name	ODT_1 mm (in)	ODT_2 mm (in)	ODC mm	LID_1 mm	LID_2 mm	LST mm	LPA (ca.) mm
L13005451	LOKRING 9,53/6,35 NR AI 50	9.53 (3/8)	6.35 (1/4)	16	16	13.5	39	51
L13005664	LOKRING 9,53/8 NR AI 50	9.53 (3/8)	8 (5/16)	16	16	15	40.5	52.5
L13005668	LOKRING 10/9,53 NR AI 50	10	9.53 (3/8)	16	16	16	41.5	54.5
L13005452	LOKRING 12,7/9,53 NR AI 50	12.7 (1/2)	9.53 (3/8)	19	17	16	43	56
L13005453	LOKRING 16/12,7 NR AI 50	16 (5/8)	12.7 (1/2)	22	18	17	46.5	61.5
L13005663	LOKRING 16/15 NR AI 50	16 (5/8)	15	22	18	18	47.5	65.5
L13005454	LOKRING 19/16 NR AI 50	19.05 (3/4)	16 (5/8)	26	20	18	50.5	69
L13005671	LOKRING 19/18 NR AI 50	19.05 (3/4)	18	26	20	19	51.5	71
L13005455	LOKRING 22/19 NR AI 50	22 (7/8)	19.05 (3/4)	30	22	20	54.5	76

12.0 ALUMINIUM FLARE NUTS (LOKRING FN AL)

DO NOT USE EURO FLARE-FITTINGS TYPE LOKRING LR-EURO-EB WITH ALUMINIUM LOKRING CONNECTORS.



All connections of aluminium nuts with threaded connections made from a different material than aluminium have to be protected against contact corrosion.



Article no.	Article name	ODT	LAN (ca.)	WS (Nut)	Thread (Nut)	Tightening torque (Nm)
		mm (in)	mm	mm	in	
L13005463	LOKRING AI FN 6,35	6.35 (1/4)	15,5	17	1/4 SAE	20
L13005464	LOKRING AI FN 9,53	9.53 (3/8)	17,5	22	3/8 SAE	30
L13005465	LOKRING AI FN 12,7	12.7 (1/2)	20,6	24	1/2 SAE	40
L13005466	LOKRING AI FN 16	16 (5/8)	23,9	27	5/8 SAE	50
L13005467	LOKRING AI FN 19	19.05 (3/4)	32	36	3/4 SAE	60

13.0 DECLARATION REGARDING PASSED TESTS ACCORDING EN 16084:2011

In the time frame of:	July to September 2013
tests on tube joints according EN 16084:2011 have been performed at or on behalf of:	VULKAN Lokring Rohrverbindungen GmbH & Co. KG Heerstraße 66, 44653 Herne, Germany
The joints consisted of:	aluminium tube of following sizes: ø6.35 x 0.8 mm; ø9.53 x 0.8 mm; ø15.88 x 1 mm; ø22.23 x 1.25 mm.
joined by:	LOKRING aluminium connectors of appropriate size for applications up to 50 bar operating pressure
using:	LOKPREP 65G
The test-plan according to the standard includes:	<ul style="list-style-type: none"> ⊕ Tightness-test, preparatory ⊕ Vacuum-test* ⊕ Pressure-temperature-test** ⊕ Vibration-test ⊕ Freezing-test ⊕ Pressure-test ⊕ Fatigue-test ⊕ Tightness-test, terminatory

*The procedure of the vacuum-test according to the parameters of the standard is controversial. Corresponding comments have been given to the standardization organization and have been confirmed by a member of the corresponding workgroup. A revision of the standard is planned. Due to this the vacuum-test is omitted until further notice.

**The pressure-temperature test already was performed 2012 at an external laboratory. However, the related tightness tests before and after the test have been made within VULKAN Lokring.

VULKAN Lokring Rohrverbindungen GmbH & Co. KG assures that all test are performed carefully and according the actual interpretation of the standard and that the involved equipment is adequate for the performed tests.

The tested samples after running through the load tests have met the requirements of tightness control level A1 (hermetic joints, max. $7.5 \cdot 10^{-6}$ mbar·l/s Helium at 10 bar and 20°C).

16.06.2014

Matthias Thome
Development Manager

NOTES

A large grid of small dots for taking notes, consisting of 20 columns and 30 rows of dots.



ONLINE-SERVICE

FOR FURTHER INFORMATION, PLEASE REFER TO OUR WEBSITE WWW.VULKAN.COM.



AUTHORISED DISTRIBUTORS

www.vulkan.com/en-us/lokring/contact/



VIDEOS

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TECHNICAL DOCUMENTATION AND SUBMITTAL

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IMPRINT

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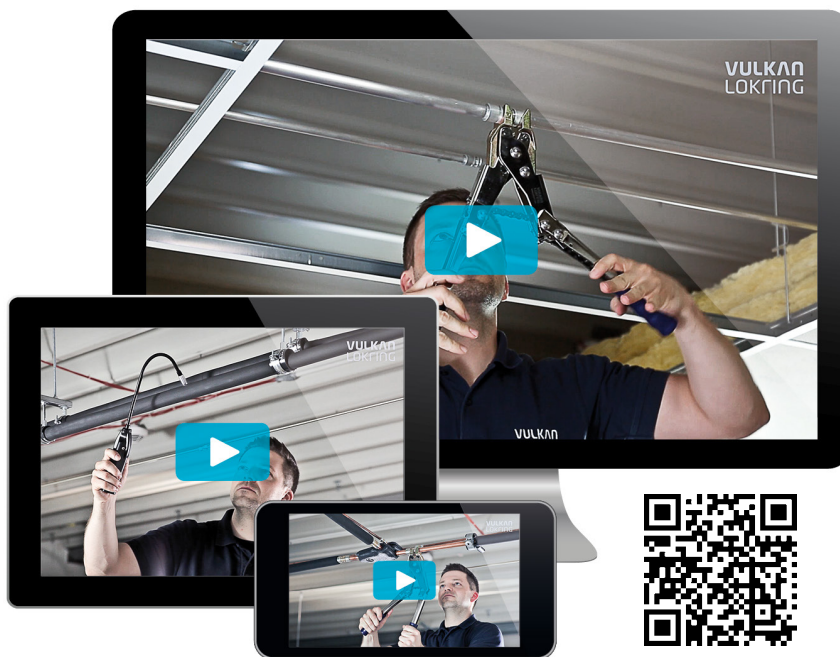
VALIDITY CLAUSE

The LOKRING® tube connection technology represents a proven method of producing hermetically sealed metal-to-metal tube connections. The LOKRING® tube connections are mainly used in the refrigeration and air conditioning industries. The use of LOKRING® tube connection technology in other fields is to be discussed with VULKAN Lokring. VULKAN Lokring as the supplier is responsible for the qualitative delivery of the tube connections and tools which are ordered.

The purchaser is responsible for the use of the LOKRING® tube connections and tools as directed. The assembly has to be done accordingly to the instructions and exclusively with original LOKRING® parts. The present submittal shall replace all previous editions. The data contained in this submittal refers to the valid state of affairs in time of the copy deadline. Any changes due to technical progress are reserved.

Status: 02/2017

All duplication, reprinting and translation rights are reserved. Further remarks for the LOKRING® assembly are available on request.



www.vulkan.com/en-us/lokring/videos/