German
Institute for
Construction
Engineering

DIBt

General Technical Approval

Approval body for construction products and types of construction

German construction industry inspection authority
A public law institution supported jointly by the Federal States and the Federal Republic of Germany

Member of the European Organisation for Technical Approvals (EOTA), the European Association for Technical Approval in Construction (UEAtc) and the World Federation of Technical Assessment Organisations (WFTAO)

Date: 15.06.2016

Reference: II 22-1.40.23-6/16

Approval number
Z-40.23-515

Duration of validity until;
from **2nd July 2016**
to **2nd July 2021**

Applicant:
Klenk GmbH
Eichelstraße 15
D-88285 Bodnegg-Rotheidlen

Object of approval:
Flexible double-walled hose system "System Klenk", Type DWSL for transporting water-hazardous liquids during transfer and filling procedures

The German Construction Industry Inspection Authority hereby issues general approval for the above specified product. This General Technical Approval comprises ten pages and two annexes with four additional pages. This General Technical Approval replaces General Technical Approval No. Z-65.25-220 dated 1st July 2014. The object was first given General Technical Approval on the 8th June 1999.

I GENERAL PROVISIONS

1 The General Technical Approval provides evidence that the approved product is suited for applications and use within the meaning of the building and construction regulations enacted by the different Federal States.

2 Insofar as demands are made within the General Technical Approval on the special expertise and experience of persons entrusted with the production of construction products and construction types in accordance with regulations of the Federal States corresponding to Section 17 para. 5 of the Model Building Code, it should be noted that this expertise and experience can also be documented by equivalent proof from other member states of the European Union. This may also apply to other equivalent proofs presented under the provisions of agreements made via the European Economic Area (EEA) or other bilateral agreements.

3 The General Technical Approval does not replace the permits, licences and certifications otherwise required by German law for construction projects.

4 The General Technical Approval is granted without prejudice to the rights, particularly private property rights, of third parties.

5 The manufacturer and distributor of the approved product must, without prejudice to more extensive regulations given in the "Special Provisions", provide the user or operator of the approved product with copies of the General Technical Approval and draw attention to the fact that the General Technical Approval must be available at the place where the approved object is used. On request, the authorities involved must likewise be provided with copies of the General Technical Approval.

6 The General Technical Approval may only be reproduced in full. The publication of excerpts requires the prior consent of the German Institute for Construction Engineering (Deutsches Institut für Bautechnik). Texts and drawings publicised in promotional literature must not be contrary to the General Technical Approval. Translations of the General Technical Approval must contain the note "Translation of the original German version not reviewed by the German Institute for Construction Engineering."

7 The General Technical Approval is granted subject to revocation at any time. The terms of the General Technical Approval can be subsequently altered and supplemented, particularly if new technical knowledge requires that this be done.

II SPECIAL PROVISIONS

1 Object of approval and scope of application

(1) This General Technical Approval concerns and relates to flexible double-walled hose lines with the type designation DWSL, System Klenk, up to a length of 50 m, consisting of double-walled hoses with a nominal width of the inner hoses of DN 15 to DN 75 as well as connector components and their sealants (Annex 1). The monitoring space between the inner and outer hose of the flexible double-walled hoses is suitable for serving as part of a leak detector device for monitoring according to the vacuum pressure principle. Leaks in the walls of the flexible double-walled hoses are detected by an increase in pressure in the monitoring area of the leak detector, which gives a visual and acoustic warning.

(2) If a suitable vacuum pressure leak detector with evidence of building inspectorate proof of usability is connected, the flexible double-walled hoses may be used above ground or in a pipe duct in systems for storage, filling and transferring of water-hazardous liquids at a maximum supply pressure of 10 bar to pump flammable and non-flammable water-hazardous liquids, which are listed in the DIN EN 121151 resistance table in the Suitability Group A as suitable for the material concerned, although these may not tend towards high viscosity[2] or discharge of solids. In all other cases, the selection of metal and sealing materials used in the specific application is limited to those that have evidence of testing deposited with the DIBt for resistance to the pumped liquid.

(3) The approved operating temperatures are between -20 °C and +60 °C.

(4) The General Technical Approval is granted without prejudice to provisions on testing or approval in other legal sectors.

(5) Due to this General Technical Approval, the need for an assessment of suitability for the approved product according to Paragraph 63 of the German Federal Water Management Act (Wasserhaushaltsgesetz, WHG3) does not apply. However, it is the user's responsibility to check according to the Ordinance on Installations whether the entire system requires an assessment of suitability, although this is not required for the approved product.

(6) The validity period of this General Technical Approval (see page 1) relates to the utilisation of the approved product, meaning its installation or mounting, and not to any later use.

2 Provisions concerning the construction of the product

2.1 General

The flexible double-walled pipes in the "System Klenk" with the type designation DWSL have to comply with the Special Provisions as defined in this decision, as well as the information deposited with the German Institute for Construction Engineering.

1 DIN EN 12115:2011-04 Rubber and plastic hoses and hose assemblies for liquid or gaseous chemicals - requirements
2 Kinematic viscosity < 5000 cSt a +4 °C
3 Water Regulation Act (Gesetz zur Ordnung des Wasserhaushalts) (Water Management Act, Wasserhaushaltsgesetz WHG) dated 31st July 2009 (BGBl, German Federal Law Gazette I page 2585)

2.2 Characteristics and structure

2.2.1 Inner and outer hoses

(1) The inner and outer hoses must correspond to Type D or Type SD (with or without spring steel wire) as specified in the standard DIN EN 121154 and the Appendix B of the German Technical Regulations for Combustible Liquids (TRbF) 505.
(2) The monitored space is realised using an intermediate layer as a spacer, consisting of a thermoplastic poly(ether)ester elastomer following the specifications laid down in DIN EN 12115 with the type designation Hytrel. This intermediate layer consists of a plastic net pulled over the inner hose.
(3) The permitted nominal width combination of the inner and outer hose can be found in Annex 2.
(4) The inner and outer hoses must be resistant to the fluids to be pumped
(see paragraph 1 (2), table of resistance according to DIN EN 12115).

2.2.2 Connecting components and sealants

(1) The connecting components are metal hose connecting fittings, which according the connection facilities of the system can take the form of nipples or nozzles or sleeve components for the hoses, clamps, threaded hose fittings, flanges or tank truck couplings.
(2) The details of the design of the connecting components must correspond to the drawings referred to in Annex 2 in combination with the parts lists also referred to in the annex. The metallic connectors are to be manufactured in accordance with the DIN EN 144206 standard. The specifications of the metal materials must correspond to the information deposited with the DIBt.
(3) The sealants must be manufactured in compliance with DIN 3771-17 to DIN 3771-5, must meet the requirements of DIN ISO 18178 and correspond to the the information deposited with DIBt.
(4) Evidence must be provided of the resistance of all the metal materials used in the manufacture of the connecting elements and the sealants used to the pumped fluid.

2.2.3 Double-walled hose system "System Klenk", Type DWSL

(1) The double-walled hose system "System Klenk", Type DWSL, manufactured according to the General Technical Approval, must consist of the components according to Section 2.2.1 and 2.2.2 and be produced at the factory according to the assembly instructions deposited with the German Institute for Construction Engineering.
(2) If the approved product is used for liquids with a flash point lower than 55 °C or if it is used in potentially explosive areas, evidence must be provided with regard to the demands on its electric conductivity according to DIN EN 12115" for the specific example of application.

4	DIN EN 12115:2011-04	Rubber and plastic hoses and hose assemblies for liquid or gaseous chemicals - Requirements
5	Technical Regulations for Combustible Fluids (Technische Regeln für brennbare Flüssigkeiten), TRbF 50 Pipelines ("Rohrleitungen"), BArbBl. 6/2002 p. 69	
6	DIN EN 14420-1:2013-09	Hose fittings with clamp units - Part 1: Requirements, types of fixing and connection, designation and testing
	DIN EN 14420-2:2013-09	Hose fittings with clamp units - Part 2: Hose side parts of hose tail
	DIN EN 14420-3:2013-09	Hose fittings with clamp units - Part 3: Clamp units, bolted or pinned
	DIN EN 14420-4:2013-09	Hose fittings with clamp units - Part 4: Flange connections
	DIN EN 14420-5:2013-09	Hose fittings with clamp units - Part 5: Threaded connections
	DIN EN 14420-6:2013-09	Hose fittings with clamp units - Part 6: TW Tank truck couplings
7	DIN 3771-1:1984-12	Fluid systems; O-rings; dimensions as in ISO 3601/1
	DIN 3771-2:1984-12	Fluid systems; O-rings; testing; identification marking
	DIN 3771-3:1984-12	Fluid systems; O-rings; materials, areas of application
	DIN 3771-4:1984-12	Fluid systems; O-rings; shape and surface deviations
	DIN 3771-5:1993-12	Fluid systems; O-rings; calculation and dimensions of housings
8	DIN ISO 1817:2008-08	Elastomers - Determination of behaviour when exposed to fluids (ISO 1817: 2005)

(3) Contrary to the Specification Sheet[9], all suitable leak detectors operating according to the vacuum system and that have a building inspectorate certificate of usability may be connected to the flexible double hose assembly. The leak detector must be suitable for a maximum permissible operating negative pressure in the monitoring space of up to -550 mbar. In the event of a leak, the leak detector must be

- triggered by an alarm switch-on value of -325 mbar at the latest,
- be able to resist an overpressure of at least 10 bar or by means of self-actuating automatic shut-off valves, e. g. solenoid valves, prevent an unacceptable pressurisation of the components of the leak detector,
- prevent further evacuation by switching off the vacuum pump.

(4) Evidence of the suitability of the vacuum leak detectors for connection to the monitoring space of a flexible double-walled hose system and for leak monitoring must be displayed in the place where the leak detector is used.

2.3 Manufacture, transport, storage and marking

2.3.1 Manufacture

(1) The works in which the manufacture of the inner and outer hoses according to paragraph 2.2.1 and the connecting elements and sealants according to paragraph 2.2.2 takes place must be those for which information is deposited with the German Institute of Construction Engineering.
(2) The manufacture of the finished double-walled hose system "System Kienk", Type DWSL, according to paragraph 2.2.3 is to take place in the factory D-88285 Bodnegg-Rotheidlen.

2.3.2 Transport and storage

Transport and storage of the flexible double-walled hose systems must be carried out in a manner that does not adversely affect their fitness for use. Components damaged by transport and storage must be excluded from further use.

2.3.3 Marking

(1) The flexible double-walled hose systems must be marked by the applicant with the conformity mark (Ü-mark) according to the conformity mark regulations of the Federal States. Marking may only be carried out if the conditions of Section 2.4 have been met.
(2) In addition, the manufacturer of the finished flexible double-walled hose system"System Klenk", Type DWSL, according to paragraph 2.2.3 must mark the system, as well as with the marking required by DIN EN 12115[4], with permanent marking of the fittings at the hose end with the following information:

- Type designation of the hose system (Type DWSL),
- Manufacturer or manufacturer's mark,
- Date of manufacture,
- Materials,
- Nominal widths of inner and outer hoses,
- Type designation of the hose fittings according to DIN EN 14420 Parts 1 to 6,
- Approved filling pressure 10 bar (can instead optionally be marked at the filling point),
- Approved media,
- Approval number (Z-40.23-515).

9 "Specification Sheet of the double-walled hose system" dated 15.06.2009, tested by the TÜV NORD Systems GmbH & Co. KG on the 18.06.2009

2.4 Proof of conformity

2.4.1 General

(1) Confirmation of the conformity of the approved product with the provisions of this General Technical Approval must be provided for each factory with a manufacturer's declaration of conformity based on the factory's own production control and an initial type test by a recognised inspection agency authorised to perform such tests. The manufacturer is to submit this declaration of conformity by marking the flexible, double-walled hose line "System Klenk", Type DWSL, with the conformity mark (Ü-mark), with a note of its intended use.
(2) For the flexible double-walled hose line according paragraph 2.2.3, the applicant is considered to be the manufacturer in this sense. If the manufacturer of the double-walled hose line is not also the manufacturer of the components used according to paragraph 2.2.1 and 2.2.2, he must give contractual assurances that these components are subject to an approval-appropriate factory production control system.

2.4.2 Factory control system

(1) A factory control system is to be set up and implemented at the manufacturer's own works. Factory production control in the above sense means continuous supervision to be carried out by the applicant of the manufacture of the approved product. With this, the applicant will ensure that the double-walled hose line produced by him according to paragraph 2.2.3 and the components used in its manufacture according to paragraphs 2.2.1 and 2.2.2 comply with the provisions of this General Technical Approval.
(2) As part of the factory production control, the following tests must be carried out as a minimum requirement:
a) Inner and outer hoses according to paragraph 2.2.1

- Goods inwards control
  The inner and the outer hoses are to be subjected to the tests according to Appendix A and Appendix B of DIN EN 12115[4] in the minimum frequency there stated, and also to the tests according to DIN EN ISO 8031[10] and DIN EN ISO 1402[11].
  The intermediate layer is to be subjected to the AD (dimension tests) and AR (examination of materials certificates) according to DIN 3230-3[12].
- Tests for materials, dimensions and leak tightness will be according to DIN 3230-3[12]
  Also to be carried out in the applicant's factory, or in one of the factories of his suppliers, are the following tests: AD (dimension tests) and AR (examination of certificates), BN with evidence of leakage rate 1 (leak tightness test of the hose connection using water with a maximum operating pressure of 10 bar) and BQ (leak tightness test of the hose connection using water in the inner hose with 1.5 times the maximum operating pressure) .

b) Connecting components and sealants according to paragraph 2.2.2

- Goods inwards control
  Metallic connection fittings are to be tested according to the standard DIN EN 12266[13]. The sealants are to be tested according to DIN 3771-3[7] and DIN ISO 1817[8].

10	DIN EN ISO 8031 2010-04	Rubber and plastic hoses and hose assemblies - Determination of electrical resistance and electrical conductivity (ISO 8031:2009)
11	DIN EN ISO 1402:2010-04	Rubber and plastic hoses and hose assemblies - Hydrostatic test (ISO 1402:2009)
12	DIN 3230-3:1982-04	Technical delivery conditions for valves Compilation of test methods
13	DIN EN 12266-1:2012-06	Industrial valves - Testing of metallic valves- Part 1: Pressure tests, test procedures and acceptance criteria - Binding requirements
14	DIN EN 12266-2:2012-04	Industrial valves- Testing of metallic valves- Part 2: Tests, test procedures and acceptance criteria - Additional requirements

- Materials and dimension tests according to DIN 3230-3[12]
  Also to be carried out in the applicant's factory, or in one of the factories of his suppliers, are the following tests: AD (dimension tests) and AR (examination of materials certificates), in combination with the parts lists given in Annex 2 and the design drawings.
  The results of the above-mentioned tests must establish the compliance with requirements for the components according to paragraph 2.2.2.

c) Flexible double-walled hose line "System Klenk", Type DWSL, according to paragraph 2.2.3
Prior to its first use, each flexible double walled hose line "System Klenk", Type DWSL, needs to be subjected to a leak test of the connected hose fittings according to DIN EN 12266-1[13]. The medium to be used for testing is gas. The test is to be carried out by maintaining, at ambient temperature, test pressures of (6 ± 1) bar in the inner hose and of (6 ± 1) bar in the monitoring space for at least 60 seconds. There must be no bubbles rising to the surface of the water if the hose fitting is submerged in water. If, as an alternative to the above, the hose is coated with a leak detection liquid, there must be no continuous formation of bubbles.
If the test results are unsatisfactory, the necessary measures to rectify the defect must be taken immediately.

(3) The results of the factory production control must be recorded and analysed. The recorded results must as a minimum contain the following information:

- Designation of the approved product,
- Type of control or test,
- Date of manufacture and testing of the approved product, results of controls or tests
- Signature of the person responsible for the factory production control.

(4) The applicant must keep all recorded information on file for at least five years. The information must be submitted to the German Institute for Construction Engineering and the highest building inspection authority on request.
(5) Inner hoses, outer hoses, intermediate layers, connection fittings, nipples and sleeves plus their sealants that fail to meet the requirements are to be handled in such a manner that they cannot be confused with conforming components of the same kind. After elimination of the defect the corresponding test or control must, insofar as is technically feasible and required as evidence that the defect has been rectified, be repeated immediately.

2.4.3 Initial type test

As part of the initial type test, all the tests listed in paragraph 2.4.2, which also have to be carried out as part of the factory production control, must be performed at least once and their requirements met. If the evidence on which the General Technical Approval is based has been provided by samples from ongoing production, these tests will replace the initial type test.

3 Design-related provisions

(1) The conditions for laying the flexible double-walled hose line "System Klenk", Type DWSL, can be found in the water, health and safety at work and legal construction regulations.

(2) The resistance of the materials used for the inner and outer hoses according to paragraph 2.2.1 to the pumped fluid and the conformity of the results of the above-mentioned tests with the requirements for the components according to paragraph 2.2.1 is to be certified as part of goods inward control by acceptance test certificates 3.1 according to DIN EN 10204[14].
(3) The resistance of the materials used for the connection fittings according to paragraph the requirements for the components according to paragraph 2.2.1 is to be certified as part of goods inward control by acceptance test certificates 3.1 according to DIN EN 10204[14]. Furthermore, the conformity of the intended areas of application of the sealants given in the delivery note with the planned area of application is to be checked.
(4) If the flexible double-walled hose lines are used for liquids with a flashpoint below 55 °C, evidence of safe use in connection with electrostatic charging of the surfaces according to DIN EN 12115[4] must be provided. If the contact between the hose line and the fitting is created by the metal inserts of the line, evidence must also be provided of problem-free contact between the metal inserts and the hose line fitting when the hose line is integrated.
(5) Metallic parts of the system must be earthed in potentially explosive areas in compliance with the definition in the Technical Rules for Hazardous Substances (Technische Regeln für Gefahrstoffe, TRGS) 72715, if in Zone 0 (constantly potentially explosive atmosphere) they exceed a capacitance of 3 pF and in Zone 1 (occasionally potentially explosive atmosphere) a capacitance of 10 pF. The conditions of the manufacturer's installation and assembly instructions must be observed.

4 Implementation-related provisions

4.1 Requirements for the applicant and the implementing businesses

(1) Only by the applicant instructed companies[16] are to be charged with the assembly and laying of the double-walled hose lines according to this General Technical Approval at the site of installation and with connection of the leak detector. For these activities, these companies must be specialised companies in the meaning of Section 3 of the Ordinance for Plants Handling Water-Hazardous Materials[17] and have professional knowledge regarding the installation of leak detectors according to TRbF 503[18], unless their activities are excepted from the Federal State statutory provisions or the applicant carries out these activities with his own qualified staff.
(2) The applicant is obliged to inform all persons charged with the design and execution of the flexible, double-walled hose lines about the Special Provisions of this General Technical Approval and about the evidence to be provided as part of of the design (see Section 3).
(3) Statutory health and safety at work requirements remain unaffected.

4.2 Assembly of the flexible hose line DWSL, System Klenk

(1) The flexible double-walled hose lines must be laid so as to protect them from mechanical damage. The fastening screws of the flexible double-walled line, the connection fittings and the nipples must be secured against unintentional loosening. The approved bending radii corresponding to the Specification Sheet[9] must not fall below the specifications.

14 DIN EN 10204:2005-01 Metallic products - Types of inspection documents
15 TRGS 727:2016-01 Avoidance of ignition hazards following electric charge
16 Training is to be repeated annually
17 Ordinance regarding plants handling water-hazardous materials dated 31st March 2010 (BGBl. I page 377)
18 TRbF 503 - Guideline for supervising the monitoring of leak detectors, Version May 1987

(2) The information in the Specification Sheet of the vacuum leak detector is to be observed when connecting and operating the vacuum leak detector.
(3) A nozzle for the connection of the leak detector must be provided at one end of the flexible double-walled hose line. The other end of the flexible double-walled hose line must be fitted with a test screw that allows for checking the free passage through the monitoring space.
(4) The connecting lines for the relevant leak detectors must be permanently marked in a clearly visible manner as follows:
- Monitoring space nozzle, depending on the leak detector system, with "Suction" or "Pressure".
- All other monitoring nozzles with "Test" or if required "Measure".

(5) After completing the assembly of the flexible double-walled hose line, Type DWSL, System Klenk and the installation of the leak detector, the specialised company carrying out the above according to paragraph 4.1 (1) is to perform a function test as set out in the buildings inspectorate certificate of usability for the leak detector in combination with the accompanying Specification Sheet.
(6) The confirmation of the conformity of the installed flexible double-walled hose line "System Klenk", Type DWSL, equipped with leak detector, with the provisions of this General Technical Approval must be provided by the executing specialised company according to paragraph 4.1 (1) by means of a confirmation of conformity. Conformity can be confirmed as part of the installation and test certification procedure. This confirmation is to be submitted to the operator in every individual case and to be placed by the operator in the construction file.

5 Provisions regarding use, maintenance and care, including recurring inspections

5.1 Use

5.1.1 Pumped liquids

The flexible double-walled hose lines "System Klenk", Type DWSL, may be used for delivering liquid corresponding to Section 1 (2).

5.1.2 Documents

The operator of the flexible double-walled hose lines according to this General Technical Approval is to be provided with the following documents by the applicant:
- A copy of the General Technical Approval No. Z-65.25-220,
- A copy of the Specification Sheet[9],
- A copy of the Specification Sheet of the leak detector used,
- Confirmation of conformity according to paragraph 4.2 (6).

5.1.3 Operation

(1) Before operating the hose line, checks should be carried out as to which approved liquids the operation is intended for and whether the approved operating pressure and approved operating temperature can be complied with.
(2) Statutory health and safety at work requirements remain unaffected.
(3) If the approved product is used for liquids with a flashpoint of less than 55 °C or used in potentially explosive areas, the requirements of the legal authorities responsible for such uses are to be complied with.

5.2 Maintenance and care

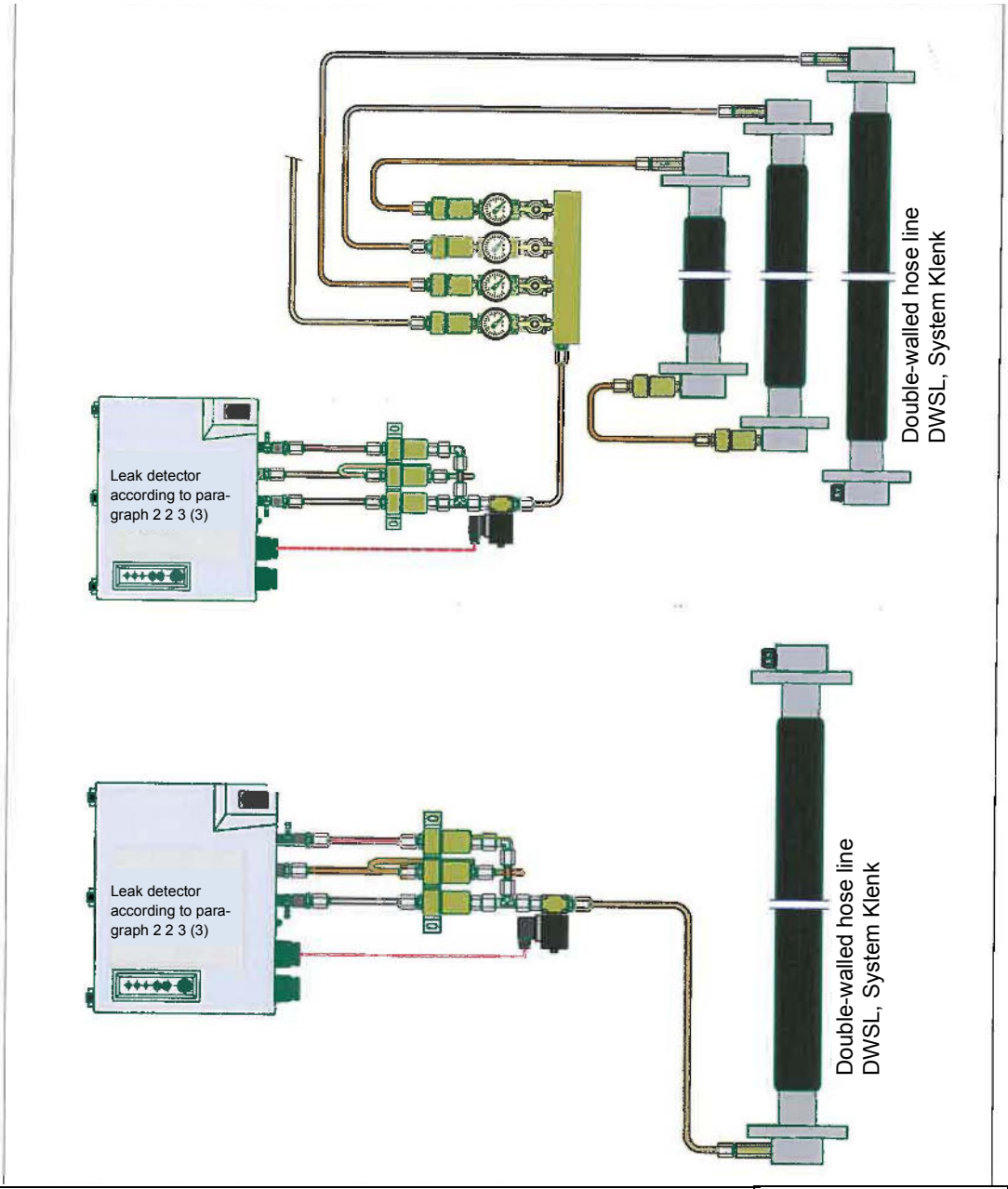
(1) The operator of a plant for the storage, filling and transfer of water-hazardous liquids using flexible double-walled hose lines according to this General Technical Approval is obliged to charge only such companies with maintenance and repair as are specialised companies for these activities as set out in Section 3 of the Ordinance for Plants Handling Water-Hazardous Materials[17]. These activities do not need to be carried out by specialist companies if, according to the laws of the relevant Federal States, they are excepted from the obligation to be a specialised company or the work is carried out by the applicant with his own qualified staff.
(2) The operator of a plant for the storage, filling and transfer of water-hazardous fluids using flexible double-walled hose lines according to this General Technical Approval is obliged, when changing the pumping medium, to charge only such companies with cleaning of the hose lines as are specialised companies for these activities as set out in Section 3 of the Ordinance for Plants Handling Water-Hazardous Materials[17], unless these activities are, according to the laws of the relevant Federal States, excepted from the obligation to be carried out by a specialised company..
(3) If the leak detector signals an alarm, the operator of the plant must immediately inform the applicant or another specialised company according to 4.1 (1) and charge them with determining and rectifying the cause of the alarm signal. If necessary, the hose line must be taken out of service.
(4) Measures to rectify any damage must be taken in agreement with the person responsible according to water legislation.
(5) Statutory health and safety at work requirements remain unaffected.

5.3 Tests

(1) The condition of the approved product must be tested recurrently at suitable intervals, but at least once a year. The leak-tightness and free passage through the monitoring space are to be checked by opening the test screw and checking pressure changes in the monitoring space.
(2) The testing of the leak detector connected to the monitoring space must be carried out as specified in its buildings inspectorate certificate of usability, combined with the accompanying Specification Sheet.
(3) All tests, checks and inspections prescribed by different laws remain unaffected.

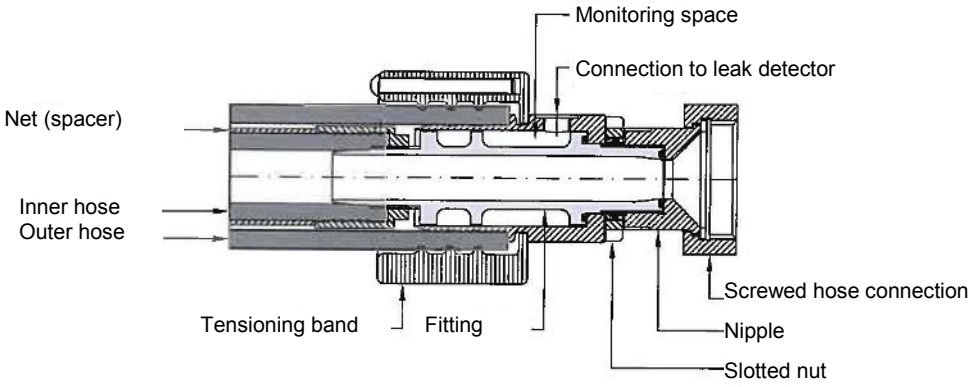
Holger Eggert
Head of Section

Certified



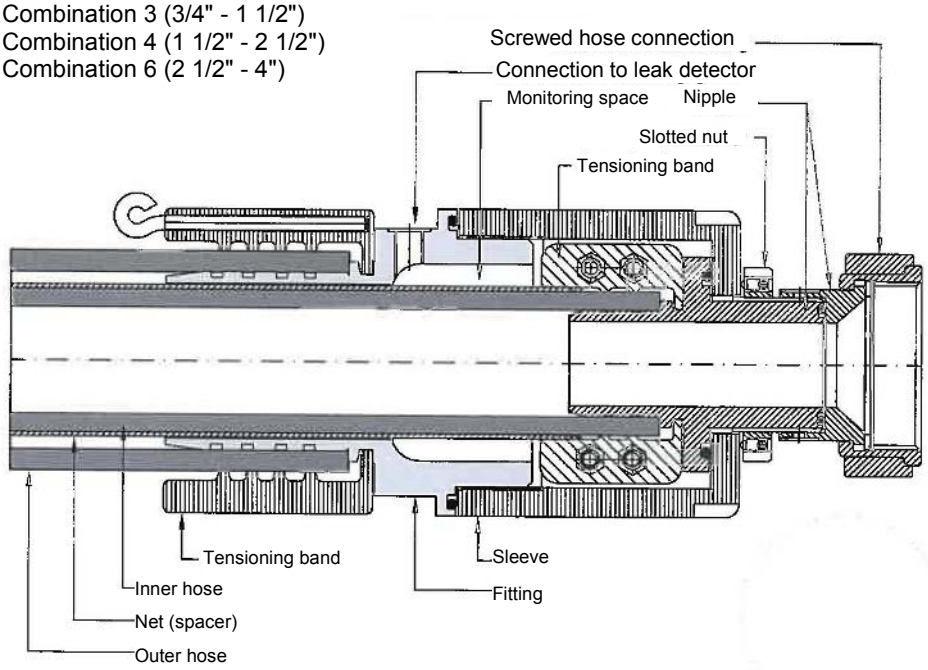
Flexible double-walled hose line "System Klenk", Type DWSL, for transporting water-hazardous liquids in transferring and filling procedures	Annex 1
Sample assembly	

Double-walled hose line, "System Klenk"
Combination 1 (1/2" - 1 1/4")
Combination 2 (3/4" - 1 1/2")



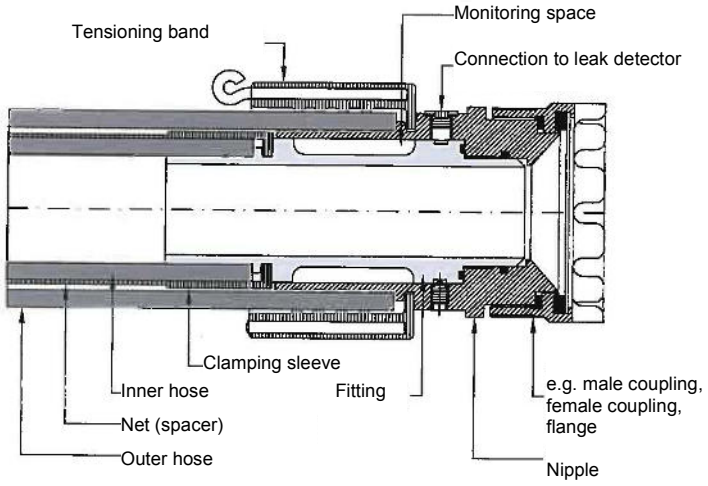
Double-walled hose line, "System Klenk"

Combination 3 (3/4" - 1 1/2")
Combination 4 (1 1/2" - 2 1/2")
Combination 6 (2 1/2" - 4")

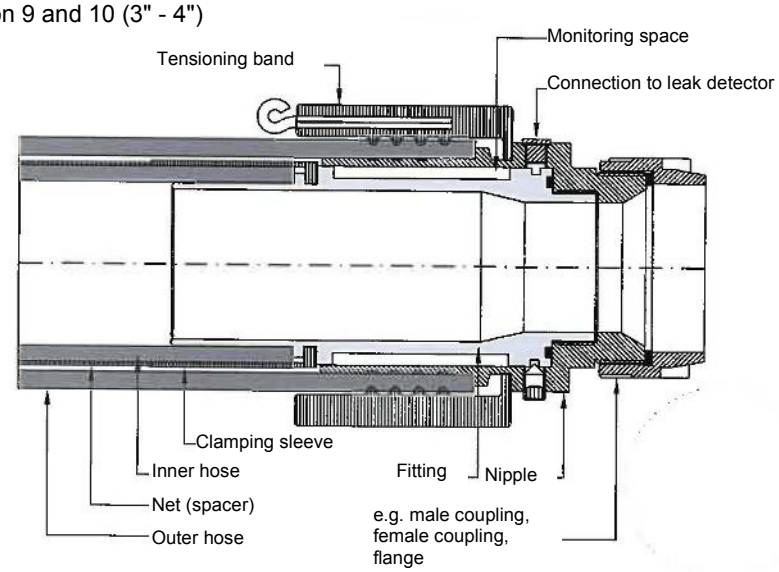


Flexible double-walled hose line "System Klenk", Type DWSL, for transporting water-hazardous liquids in transferring and filling procedures	Annex 1.1
Sample combinations DWSL 1, DWSL 2, DWSL 3, DWSL 4 and DWSL 6	

Double-walled hose line, "System Klenk"
Combination 7 and 8 (2" - 3"}



Double-walled hose line, "System Klenk"
Combination 9 and 10 (3" - 4")



Flexible double-walled hose line "System Klenk", Type DWSL, for transporting water-hazardous liquids in transferring and filling procedures	Annex 1.2
Sample combinations DWSL 7, DWSL 8, DWSL 9 and DWSL 10	

Flexible double-walled hose line "System Klenk", Annex 2
Type DWSL for transporting water-hazardous liquids
in transferring and filling procedures

Technical data and materials for the nominal width combination

Combination Nominal width combination	Inner / outer hose	Volume* in l/m	Connection design, drawing number	Metallic fittings materials
DWSL 1	DN 15 (1/2") DN 32 (1 1/4")	0.424	With union screw, parts list dated 29.10.2008, No. 1-2-5/10	Brass (Ms58) or stainless steel screw connection, Pinned aluminium clamp fitting, Stainless steel socket (nozzle on the hose side)
DWSL 2	DN 20 (3/4") DN 40 (1 1/2")	0.380	With union screw, parts list dated 29.10.2008, 1-2-5/1_0	
DWSL 3	DN 20 (3/4") DN 40 (1 1/2")	0.380	With union screw, parts list dated 29.10.2008, 3-4-6/1_0	Brass (Ms58) or stainless steel screw screw connection, Screwed aluminium clamp fitting, Stainless steel socket (nozzle on the hose side)
DWSL 4	DN 40 (1 1/2") DN 65 (2 1/2")	1.080	With union screw, parts list dated 29.10.2008, 3-4-6/1_0	
DWSL 5	DN 40 (1 1/2") DN 65 (2 1/2")	1.080	With union screw, parts list dated 29.10.2008, 1-2-5/1_0	Brass (Ms58) or stainless steel screw connection, Pinned aluminium clamp fitting, Stainless steel socket (nozzle on the hose side)
DWSL 6	DN 65 (2 1/2") DN 100 (4")	3.075	With union screw, parts list dated 29.10.2008, 3-4-6/1_0	Brass (Ms58) or stainless steel screw connection, Screwed aluminium clamp fitting, Stainless steel socket (nozzle on the hose side)
DWSL 7	DN 50 (2") DN 75 (3")	0.89	With tank wagon coupling, parts list dated 18.3.2009, 7-8/VM_0, 7-8/3_0, 7-8/2_0	Brass (Ms58) or stainless steel, Pinned stainless steel or aluminium clamp fitting, Stainless steel socket (nozzle on the hose side)
DWSL 8			With flange connection, parts list dated 28.10.2008, 7-8/F_0, 7-8/1_0, 7-8/2_0	
DWSL 9	DN 75 (3") DN 100(4")	1.075	With tank wagon coupling, parts list dated 28.10.2008, 9-10/VM_0, 9-10/3_0, 9-10/2_0	Brass (Ms58) or stainless steel, Pinned stainless steel or aluminium clamp fitting, Stainless steel socket (nozzle on the hose side)
DWSL 10			With threaded connection, parts list dated 28.10.2008 9-10/F_0, 7-8/1_0, 7-8/2_0	

*Volume of the monitoring space