



KSS B150

KSS 150

KSS 110

KSS 85

Cable Protection Systems



*Leading in ideas*

**UGA**<sup>®</sup>

SYSTEM-TECHNIK

# KSS

## Cable Protection System

### Your advantage

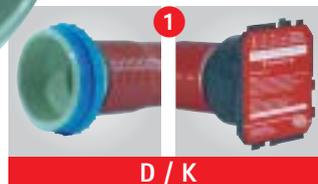
Cable Protection System KSS offers many ways of application. The most common are shown under 1 to 8.

The KSS system consists of a flexible, very stress-resistant plastic spiral hose. The system components can be chosen at random and ensure connection to an imbedded sealing collar or diamond tipped drilled hole on one side.

On the other side, connection to rigid or flexible cable protective tubes or sealing of the inserted cables is possible.



- ▶ reliable sealing
- ▶ changing of direction possible immediately after emerging from the building
- ▶ project-related special systems
- ▶ compatible with all common protective tubes for cables
- ▶ movements of the building or of the soil won't damage the cables
- ▶ gas- and watertight connection of protective tubes or underground cables
- ▶ no expensive earthworks required when changing the assignment of cables
- ▶ hose systems can be imbedded into concrete without any problems



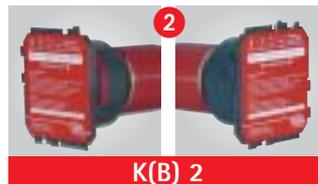
D / K

Cable Protection System, one side for connection to concrete sealing collar. Other side with sealing collar for connection of system covers.



D / KM

Cable Protection System, one side for connection to concrete sealing collar. Other side with glue-in sleeve for connection of pipes.



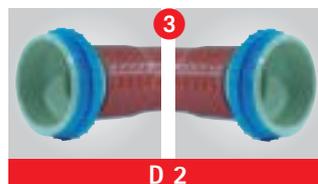
K(B) 2

Cable Protection System for imbedding in concrete. Sealing collars on both sides for connection of system covers.



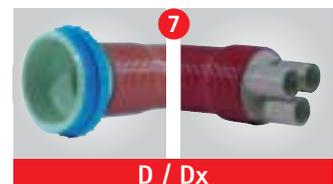
K / SM

Cable Protection System for imbedding in concrete. One side with sealing collar for connection of system covers. Other side with plug-type sleeve for connection of smooth-walled pipes.



D 2

Cable Protection System for connection to concrete sealing collars on both sides.



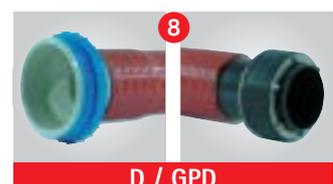
D / Dx

Cable Protection System, one side for connection to concrete sealing collar. Other side system cover with x connection pieces, suitable for sealing cables in shrink-on technique.



D / O

Cable Protection System, one side for connection to concrete sealing collar. Other side without connecting element (subsequent installation possible)



D / GPD

Cable Protection System, one side for connection to concrete sealing collar. Other side with GPD for connection to diamond tipped drilled hole or pipe lining.

# System Components

## Application and Function



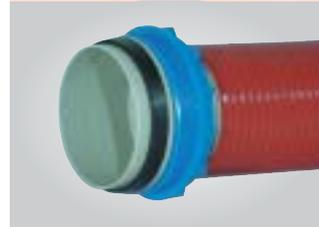
**System connection D (for BKD 150)** for gas- and watertight connection to a bayonet sealing collar.

Available for system: KSS B150.



**System connection D (for KD 150, KD 85)** for gas- and watertight screw connection to a sealing collar.

Available for systems: KSS 150, KSS 85.



**System connection D (for KD 110)** for gas- and watertight screw connection to a sealing collar.

Available for system: KSS 110.

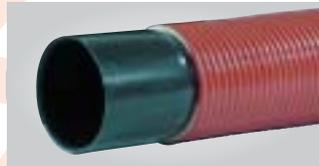
KSS system components can be combined at random within one system size or hose size. The components shown here can be chosen for this purpose.

For special applications please contact our technical department.



**Sealing collar with combination frame K** for reception of a system connection or a system cover.

Available for systems: KSS B150, KSS 150, KSS 110, KSS 85



**Glue-in Sleeve KM** for connection of a cable protection tube.

**KM 110**, e.g. for tubes with an outside dia. of 110 mm.

Available for systems: KSS B150, KSS 150, KSS 110, KSS 85,

**KM 75**, e.g. for tubes with an outside dia. of 75 mm.

Available for system: KSS 85



**Plug-type Sleeve SM** for connection of a smooth-walled cable protection tube.

**SM 110**, e.g. for smooth-walled tubes with an outside dia. of 110 mm.

Available for systems: KSS B150, KSS 150, KSS 110, KSS 85,

**SM 75**, e.g. for smooth-walled tubes with an outside dia. of 75 mm.

Available for system: KSS 85



**Rubber Press Seal GPD** GPD for gas- and watertight connection to diamond tipped drilled holes or pipe linings.

Available for all KSS systems

Standard:

KSS B150, KSS 150, KSS 110: for diamond tipped drilled hole or pipe lining with an inside dia. of 150 mm.

KSS 85: for diamond tipped drilled hole or pipe lining with an inside dia. of 125 mm.

Also available for bigger diamond tipped drilled holes or pipe linings.

## Application and Function



**System cover D1** with 1 connection piece for sealing one cable by means of shrink-on technique

Available for systems:

KSS B150, KSS 150: D1-110 (for 1 cable of dia. 34 to 108 mm)

KSS B150, KSS 150, KSS 110: D1-80 (for 1 cable of dia. 26 to 78 mm)

KSS 85: D1-75 (for 1 cable of dia. 26 to 73 mm)



**System cover D3** with 3 connection pieces for sealing cables by means of shrink-on technique

Available for systems:

KSS B150, KSS 150, KSS 110: D3-46 (for 3 cables of dia. 16 to 44 mm)

KSS 85: D3-30 (for 3 cables of dia. 12 to 28 mm)

Cables are sealed by means of heat shrink-on sleeves.

As an option cold shrink-on sleeves are also available.

Unused connection pieces are sealed with sealing plugs VS and are thus available for subsequent use.

For special applications please contact our technical department.



**Cable protection system without connecting element**

For subsequent installation if required.



**System cover D5** with 5 connection pieces for sealing cables by means of shrink-on technique

Available for system:

KSS 85: D5-20 (for 5 cables of dia. 7 to 18 mm)



**System cover D7** with 7 connection pieces for sealing cables by means of shrink-on technique

Available for systems:

KSS B150, KSS 150, KSS 110: D7-32-25 (for 3 cables of dia. 12 to 30 mm and 4 cables of dia. 7 to 23 mm)

We provide replacements for all parts which are impaired in their function due to faults in the material. No replacement for defects that are due to transport or storage or result from faulty processing or installation or the effects thereof. Our specifications are based on the current state of the art. Subject to technical modifications. Due to the amount of possible influences during installation and application our specifications do not release processors and users from checking and testing the material themselves.

# KSS Variants

## KSS B150 / KSS 150 / KSS 110 / KSS 85

Example	side one	side two	order no.	
<b>KSS B150</b>	1	for connection to sealing collar BKD 150	with sealing collar BKD 150	KSS B150/110/D/K/ (L)
	2	with sealing collar BKD 150	with sealing collar BKD 150	KSS B150/110/K(B)2/ (L)
	3	for connection to sealing collar BKD 150	for connection to sealing collar BKD 150	KSS B150/110/D2/ (L)
	4	for connection to sealing collar BKD 150	without connecting element	KSS B150/110/D/0/ (L)
	5	for connection to sealing collar BKD 150	with glue-type sleeve for connection of a pipe $\varnothing$ 110 mm	KSS B150/110/D/KM110/ (L)
	6	with sealing collar BKD 150	with plug-type sleeve for connection of a smooth-walled pipe $\varnothing$ 110 mm	KSS B150/110/K/SM110/ (L)
	7	for connection to sealing collar BKD 150	with 1 connection piece $\varnothing$ i 80 mm for sealing in shrink-on technique	KSS B150/110/D/D1-80/ (L)
	7	for connection to sealing collar BKD 150	with 3 connection pieces $\varnothing$ i 46 mm for sealing in shrink-on technique	KSS B150/110/D/D3-46/ (L)
7	for connection to sealing collar BKD 150	with 7 connection pieces $\varnothing$ i 32/25 mm for sealing in shrink-on technique	KSS B150/110/D/D7-32-25/ (L)	
8	for connection to sealing collar BKD 150	with GPD for installation into diamond tipped drilled hole or pipe lining $\varnothing$ i 150 mm	KSS B150/110/D/GPD150/ (L)	
<b>KSS 150</b>	1	for connection to sealing collar KD 150	with sealing collar KD 150	KSS 150/110/D/K/ (L)
	2	with sealing collar KD 150	with sealing collar KD 150	KSS 150/110/K(B)2/ (L)
	3	for connection to sealing collar KD 150	for connection to sealing collar KD 150	KSS 150/110/D2/ (L)
	4	for connection to sealing collar KD 150	without connecting element	KSS 150/110/D/0/ (L)
	5	for connection to sealing collar KD 150	with glue-type sleeve for connection of a pipe $\varnothing$ 110 mm	KSS 150/110/D/KM110/ (L)
	6	with sealing collar KD 150	with plug-type sleeve for connection of a smooth-walled pipe $\varnothing$ 110 mm	KSS 150/110/K/SM110/ (L)
	7	for connection to sealing collar KD 150	with 1 connection piece $\varnothing$ i 80 mm for sealing in shrink-on technique	KSS 150/110/D/D1-80/ (L)
	7	for connection to sealing collar KD 150	with 3 connection pieces $\varnothing$ i 46 mm for sealing in shrink-on technique	KSS 150/110/D/D3-46/ (L)
7	for connection to sealing collar KD 150	with 7 connection pieces $\varnothing$ i 32/25 mm for sealing in shrink-on technique	KSS 150/110/D/D7-32-25/ (L)	
8	for connection to sealing collar KD 150	with GPD for installation into diamond tipped drilled hole or pipe lining $\varnothing$ i 150 mm	KSS 150/110/D/GPD150/ (L)	
<b>KSS 110</b>	1	for connection to sealing collar KD 110	with sealing collar KD 110	KSS 110/110/D/K / (L)
	2	with sealing collar KD 110	with sealing collar KD 110	KSS 110/110/K(B)2/ (L)
	3	for connection to sealing collar KD 110	for connection to sealing collar KD 110	KSS 110/110/D2/ (L)
	4	for connection to sealing collar KD 110	without connecting element	KSS 110/110/D/0/ (L)
	5	for connection to sealing collar KD 110	with glue-type sleeve for connection of a pipe $\varnothing$ 110 mm	KSS 110/110/D/KM110/ (L)
	6	with sealing collar KD 110	with plug-type sleeve for connection of a smooth-walled pipe $\varnothing$ 110 mm	KSS 110/110/K/SM110/ (L)
	7	for connection to sealing collar KD 110	with 1 connection piece $\varnothing$ i 80 mm for sealing in shrink-on technique	KSS 110/110/D/D1-80/ (L)
	7	for connection to sealing collar KD 110	with 3 connection pieces $\varnothing$ i 46 mm for sealing in shrink-on technique	KSS 110/110/D/D3-46/ (L)
7	for connection to sealing collar KD 110	with 7 connection pieces $\varnothing$ i 32/25 mm for sealing in shrink-on technique	KSS 110/110/D/D7-32-25/ (L)	
8	for connection to sealing collar KD 110	with GPD for installation into diamond tipped drilled hole $\varnothing$ 150 mm	KSS 110/110/D/GPD150/ (L)	
<b>KSS 85</b>	1	for connection to sealing collar KD 85	with sealing collar KD 85	KSS 85/110/D/K/ (L)
	2	with sealing collar KD 85	with sealing collar KD 85	KSS 85/110/K(B)2/ (L)
	3	for connection to sealing collar KD 85	for connection to sealing collar KD 85	KSS 85/110/D2/ (L)
	4	for connection to sealing collar KD 85	without connecting element	KSS 85/110/D/0/ (L)
	5	for connection to sealing collar KD 85	with glue-type sleeve for connection of a pipe $\varnothing$ 75 mm	KSS 85/110/D/KM75/ (L)
	6	with sealing collar KD 85	with plug-type sleeve for connection of a smooth-walled pipe $\varnothing$ 75 mm	KSS 85/80/K/SM75/ (L)
	7	for connection to sealing collar KD 85	with 1 connection piece $\varnothing$ i 75 mm for sealing in shrink-on technique	KSS 85/80/D/D1-75/ (L)
	7	for connection to sealing collar KD 85	with 3 connection pieces $\varnothing$ i 30 mm for sealing in shrink-on technique	KSS 85/80/D/D3-30/ (L)
7	for connection to sealing collar KD 85	with 5 connection pieces $\varnothing$ i 20 mm for sealing in shrink-on technique	KSS 85/80/D/D5-20/ (L)	
8	for connection to sealing collar KD 85	with GPD for installation into diamond tipped drilled hole $\varnothing$ 125 mm	KSS 85/80/D/GPD125/ (L)	

(L) = total length in mm

### System Data

System	Spiral hose inside dia.		Bending radius at 20°C	
	standard	variants	standard	variants
KSS 150	110 mm	125 mm, 150 mm	730 mm	834 mm, 994 mm
KSS 110	110 mm	125 mm, 150 mm	730 mm	834 mm, 994 mm
KSS 85	80 mm	110 mm	540 mm	730 mm

### Plastic Spiral Hose as yard ware

clear width mm	weight g/m	bending radius mm	wall thickness mm	roll length m	order no. running m
80	1900	540	5,0	25	KSS - S 85
110	3100	730	5,8	25	KSS - S 110
125	3600	834	7,0	25	KSS - S 125
150	4500	994	7,8	25	KSS - S 130

Example for ordering

KSS B150 / 110 / D / SM110 / (L)

total length in mm

side two e.g. with plug-type sleeve for connection to a smooth-walled pipe  $\varnothing$  110 mm

side one e.g. for connection to sealing collar BKD 150

clear width of spiral hose

system designation

# Accessory



**Pipe Clamp RS**  
for parallel guiding of KSS systems next to each other or one on top of the other (extendable).

- 🔗 **order no.: RS 90**  
for hose Øi 80 mm
- 🔗 **order no.: RS 125**  
for hose Øi 110 mm
- 🔗 **order no.: RS 140**  
for hose Øi 125 mm
- 🔗 **order no.: RS 170**  
for hose Øi 150 mm



**Double Pipe Clamp RSD**  
for parallel guiding of two KSS systems.

- 🔗 **order no.: RSD 90**  
for hose Øi 80 mm
- 🔗 **order no.: RSD 125**  
for hose Øi 110 mm
- 🔗 **order no.: RSD 140**  
for hose Øi 125 mm
- 🔗 **order no.: RSD 170**  
for hose Øi 150 mm

**Cold Shrink-on Technique KS**  
for quick and simple installation without auxiliaries under all weather conditions. Gas- and watertight up to 2 bars. Absorbs tension and pressure loads.



🔗 **Available for all system covers.**



**Melt-type Adhesive Tape SKB**  
is a cold welding-type tape with very good adhesive properties. Suitable for all cable sheath materials, for plastics and metals, for sealing and corrosion protection.

Tape thickness: 1 mm  
Tape width: 50 mm  
Roll length: 3.30 m

🔗 **order no.: SKB**



**Sealing Plugs VS**  
for sealing unused cover connection pieces. Plugs can be removed for using the connection piece.

Available for connection pieces of dia. 20, 25, 32, 35, and 46 mm

- 🔗 **order no.: VS 20, VS 25, VS 30, VS 32, VS 46**



**Articulated Face Spanner GSS**  
with adjustable leg. Suitable for mounting all system covers and KSS systems.

🔗 **order no.: GSS**

**Square Mounting Wrench VMS**  
suitable for efficiently mounting and dismantling KD 150 and KD 85 blind covers with 1/2" ratchet spanner.

🔗 **order no.: VMS**



**Cable Cleaner KR**  
for ecologically cleaning cables of all types, removes even tenacious dirt. Inodoruous, evaporating without residues.

Density at 20 °C: 0.762  
Flash point: >+55 °C  
Evaporation number: 60  
Characteristic value: 0  
Duty to mark: none  
Packing drum: 1000 ml  
5000 ml  
500 ml  
spray bottle.

🔗 **order no.: KR**



**Three-finger Joint Box AK**  
(heat shrink-on technique) for sealing 3 cables in one cover connection piece.

- 🔗 **order no.: AK 35-3F-12/2**  
for connection pieces up to Øi 30 mm and cables with an outside diameter of 2-12 mm
- 🔗 **order no.: AK 50-3F-22/5**  
for connection pieces up to Øi 46 mm and cables with an outside diameter of 5-22 mm
- 🔗 **order no.: AK 75-3F-29/8**  
for connection pieces up to Øi 60 mm and cables with an outside diameter of 8-29 mm



**Four-finger Joint Box AK**  
(heat shrink-on technique) for sealing 4 cables in one cover connection piece.

- 🔗 **order no.: AK 35-4F-13/2**  
for connection pieces up to Øi 30 mm and cables with an outside diameter of 2-13 mm
- 🔗 **order no.: AK 50-4F-20/5**  
for connection pieces up to Øi 46 mm and cables with an outside diameter of 5-20 mm
- 🔗 **order no.: AK 75-4F-29/8**  
for connection pieces up to Øi 60 mm and cables with an outside diameter of 8-29 mm

# Test Report UGA Systems BKD 150 and KD

The tests with systems BKD 150 and KD were carried out at the Fraunhofer Gesellschaft Bremen (IFAM). These tests were to show if UGA's cable bushings type KD 85, KD 110, KD 150, BKD 150 and system KSS are gas- and watertight.

A special test specimen consisting of a concrete part and a test bell was developed for this test. The corresponding sealing collar was imbedded into the concrete part with a waterproof concrete. The surface of the concrete part was sealed as this test was to reveal the bonding characteristics of the sealing collar to the concrete and not the tightness of the concrete itself.

All test specimens proved successful in the tests for gastightness, presswater tightness and presswater tightness at low temperatures.

Three system covers of each system were tested: the blind cover, the system cover with one connection piece and the system cover with three connection pieces.

In the presswater tightness test at low temperatures, only the system cover with three connection pieces was tested.

In the shock wave test, pressure was increased until the cover collapsed.

In the helium test the specimens were checked for gastightness. In this test, the partial pressure of helium in the atmosphere directly after the experimental set-up is to give conclusions about the leakage rate of the system.

In the test for presswater tightness at low temperatures the specimens were checked for presswater tightness (with a water / anti-freeze compound solution) at extremely low temperatures for a period of 24 hours.

Due to the closeness of system BKD 150 to system KD only system cover BKD 150-D3/60 of system BKD 150 was subjected to the helium gastightness test and the presswater tightness test at low temperatures as an example.

**The obtained results confirm that systems BKD 150 and KD are excellent sealing systems and exceed the values demanded for practical purposes by far.**

## Test Results in Detail

The following tightness tests were carried out:

- gastightness with air at a pressure of 1 bar
- presswater tightness at a pressure of 5 bars

- gastightness with helium at a pressure of 5 bars
- presswater tightness at low temperatures at a pressure of 5 bars at  $-27^{\circ}\text{C}$  /  $-25^{\circ}\text{C}$ .
- shock wave test (destructive test)

▶ **Result of Shock Wave Test KD 85:**

KD 85-D (blind cover)	5.00 bars
KD 85-D1/75	20.76 bars
KD 85-D3/30	21.15 bars

▶ **Result of Shock Wave Test KD 110:**

KD 110-D (blind cover)	5.00 bars
KD 110-D1/80	20.24 bars
KD 110-D3/46	19.28 bars
KD 110-WA/3x32	12.37 bars

▶ **Result of Shock Wave Test KD 150:**

KD 150-D (blind cover)	5.00 bars
KD 150-D1/80	20.20 bars
KD 150-D3/60	21.92 bars

▶ **Result of Gastightness Test:**

Partial pressure (directly after experimental set-up) was  $5.4 \times 10^{-6}$  mbars. This is a very good value as the partial pressure of helium in the atmosphere is ca.  $4.8 \times 10^{-6}$  mbars.

▶ **Result of Presswater Tightness Test:**

Liquid did not emerge. A feature was made of the optimum structure of the sealing collar and the very good expansion seal which is applied annularly around the sealing collar. This expansion seal guarantees that the connection between sealing collar and concrete does not break when the concrete dries.



Sealing systems and fire protection for cables and pipes

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