

Tie Technology DK, SK Reliable sealing of tie points

Product Brochure – Issue 01/2018



Content

System advantages

- 4 Tie Technology DK, SK
- 6 The right solution for all requirements
- 8 Careful working procedures guarantee tight and clean tie points
- 10 Special application features

Overview

- 12 DK Sealing Cones
- 14 SK Anchor Cones

Issue 01/2018

Publisher

PERI GmbH Formwork Scaffolding Engineering Rudolf-Diesel-Strasse 19 89264 Weissenhorn Germany Phone +49 (0)7309.950-0 Fax +49 (0)7309.951-0 info@peri.de www.peri.de Project examples16 Tie Technology DK, SK

Components18 Tie Technology DK, SK components

Important information

All current safety regulations and guidelines applicable in those countries where our products are used must be observed.

The photos shown in this brochure feature construction sites in progress. For this reason, safety and anchor details in particular cannot always be considered as conclusive or final. These are subject to the risk assessment carried out by the contractor.

In addition, computer graphics are used which are to be understood as system representations. For ensuring a better understanding, these and the detailed illustrations shown have been partially reduced to show certain aspects. The safety installations which have possibly not been shown in these detailed descriptions must nevertheless still be available. The systems or items shown might not be available in every country.

Safety instructions and load specifications are to be strictly observed at all times. Separate structural calculations are required for any deviations from the standard design data.

The information contained herein is subject to technical changes in the interests of progress. Errors and typographical mistakes reserved.



Tie Technology DK, SK

The difficulties

The conventional methods used to waterproof tie points are, in practice, not reliable. During hardening, shrinkage cracks form in the concrete which run through the entire wall thickness along the tie point. Difficulties also arise during striking. Construction sequences require striking to take place just one day after concreting. In the process, the tie rod nut is released by means of several hammer blows. Tie rods and mounting parts can therefore be shaken through the vibrations. Furthermore, the tension force of the tie rod acts in one direction after the release of one formwork half. This results in the formation of hairline cracks around the mounting parts. The customary expansion of the tie rod during concreting, and the inevitable compression when being released, results in cracks being formed between the tie rod and concrete.

The requirements

The two variants from PERI fully meet the requirements.

In order to seal the tie points, great care must be taken regardless of the method used.

PERI has developed a new technique for the subsequent sealing of tie points. Thereby, there is a much better chance of achieving dense and tight walls rather than using conventional solutions.By sealing the tie points, the end result can still be influenced whereas embedded sealing components are no longer accessible. And the experienced operator knows just how many uncertainties are involved in concreting and curing.

The solution

- PERI Tie Systems DK and SK are:
- waterproof
- gas impermeable
- fire-resistant F 90
- soundproof

Faulty mounting of waterstop centre piece

One very common installation error is working with spacer tubes on the two tie rods on either side of the mounted component. These permeable tubes allow the water to penetrate right into the middle of the wall thus making the expensive waterstop centre piece ineffective.

Faulty mounting of fibre concrete spacer tube

The biggest disadvantage is that the tubes can split. One hammer blow too many or slight overtightening of the nuts leads to cracking or splitting of the fibre concrete spacer tubes. The safe solution With PERI Tie Technology DK and SK.



Shrinkage crack formation endangers the water impermeability with waterstop centre pieces ...



.. as well as with concreted tie rods



A tightly closed tie point is the most cost-effective!

The right solution for all requirements

DK Sealing Cone System

Advantages

- DK Sealing Cones can be effortlessly unscrewed with the cone spanner.
- DK Sealing Cones can be re-used many times.
- All DK Sealing Cones DW 15, 20, 26 have the same outside form, i.e. one concrete cone fits all cone openings.
- Targeted use for dealing with seepage water.
- Waterproof concrete, soundproof and fireproof walls for wall thicknesses up to 60 cm.

Application

The system consists of 2 re-usable DK Sealing Cones and one concreted Spacer Tube. The end-to-end tie rod is advantageous when shuttering. The Sealing Ring DW 15 between the cone and formwork compensates for any unevenness, and prevents laitance trickling in.



SK Tie Cone System

Advantages

- SK Tie Cones have a long service life. Plastic tubes can be replaced.
- SK Tie Cones can be simply unscrewed for ease of striking.
- Used for walls in high security areas with lost tie rods.
- Can also be used as a stable spacer with tube for wall thicknesses greater than 60 cm. The tie rod is re-usable.

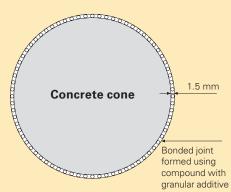
Application

The SK System consists of 2 re-usable SK Tie Cones and 3 tie rods, the middle one of which can be embedded in the concrete (e.g. for vaults and strongrooms, and buildings providing radiation protection). For all other applications, a spacer tube is used to enable the middle tie rod to be recovered. The closing process with the Sealing Ring DW 15, 20, 26 is carried out similar to the handling with the DK Sealing System.



The concrete cones

- Smooth non-porous surface
- Grey concrete colour
- Hardness strength in the centre 100 N/mm²
- Imperviousness tested on the basis of DIN 1048 Part 5 (corresponds to 50 m head of water)



A granular material with particles of a suitable size for the gap is added to the sealing compound which centres the concrete cone in the pocket, and prevents any settling.

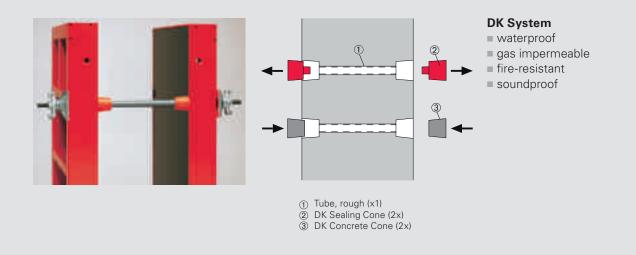
Sealing compound

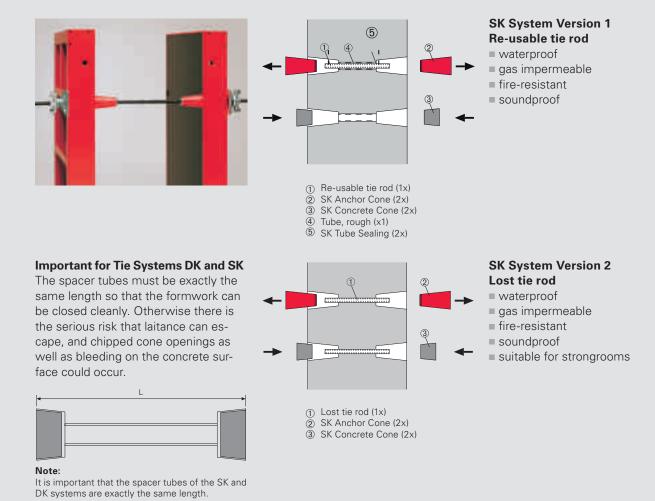
- 2-component adhesive
- Grey concrete colour
- Processing time of 1 hour at 23 °C
- Salt water resistant
- Heat and cold resistant

Acid resistant to limited extent
 In accordance with the KTW recommendation concerning the levels of polymers in drinking water and the recommendation of the DVGW (German Technical and Scientific Association for Gas and Water) suitable for:

drinking water tanks

containers for foodstuffs





Careful working procedures guarantee tight and clean tie points

Removing the DK Sealing Cone

After striking, the DK Sealing Cone is removed by means of the DK Cone Spanner UNI. The spanner is simply fitted on the cone, then slightly turned and pulled out together with the sealing cone. The cones can be re-used.

A careful working procedure when installing the spacer tubes results in tight and clean tie points.



Removing the DK Sealing Cones with the DK Cone Spanner UNI.

Installing the Concrete Cone

Important:

The surface of the cone opening must be dry and free of ice, grease and dust. The surface temperature of the sealing compound, cone and surrounding concrete must be min. + 5 $^{\circ}$ C.



Coat the cleaned pocket sparingly with the sealing compound.



Hold the concrete cone with a pair of cone pliers, and coat its tapered surface and end evenly with sealing compound.

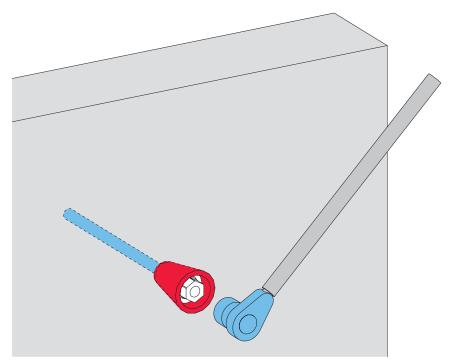


Insert the concrete cone into the pocket, and turn slightly several times to ensure that the sealing compound is evenly spread.

Removing the SK Tie Cone

The following tools are needed to remove the SK Tie Cones:

Cone	ΤοοΙ
SK Anchor Cone	Socket SW 27 – 1/2*
DW 15	item no. 029650
SK Anchor Cone	Socket Wrench SW 36
DW 20	item no. 031480
SK Anchor Cone	Socket SW 46 – 1*
DW 26	item no. 029630



Depending on the SK Tie Cone used, the Socket SW 27, 36 or 46 is required.



Tap the concrete cone flush with the cone gauge.



Scrap the surplus compound off with a filling knife.



A clean and tight tie point with the PERI Tie System.

Special application features

Waterproof concrete

Waterproof is not the same as impermeable to water

"Impermeable to water" is used to describe materials and components into which water cannot penetrate. With "waterproof" components, more water evaporates from the side facing away than penetrates the side in contact with the water.

This means

With sealing cones which are less than 50 mm in length, there is a risk of water penetrating in the vicinity of the tie point, getting round the cone and passing along the shrinkage crack around the spacer tube. For this reason, the Sealing Cones DW 15/55 DK or SK Tie Cones DW 15 should always be used for waterproof concrete.

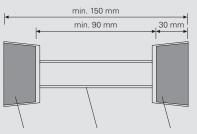
Gas-proof concrete

Gas-proof is not the same as gas-tight.

The PERI Tie Systems do not affect the diffusion resistance of concrete walls.

Fire protection

When complying with the measures represented in the drawing, the tie point created with the PERI Tie System DK or SK does not have any negative impact on Fire Resistance Class F 90 according to DIN 4102, Part 4.



Concrete Cone Spacer Tube Concrete Cone

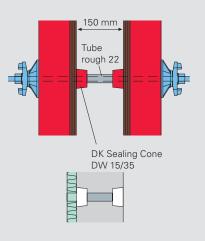
A tie point formed in this way corresponds to DIN 4102, Part 4 requirements and thus complies with Fire Resistance Class F 90 specifications. Also possible with DK Concrete Cone UNI 58/52.

If the Concrete Cone DW 15-58/30 is installed in an offset manner, the Repoxal Adhesive 031550 must be used. In that case the tie point does not comply with Fire Resistance Class F 90.

Soundproofing

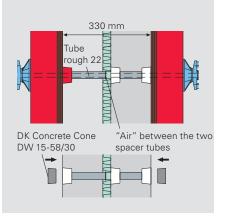
Airborne sound

Regardless of the wall thickness, the use of the DK and SK systems does not have any measurable negative influences on the airborne sound insulation of the walls. This applies to all wall thicknesses, with or without insulating board fitted.



Structure-borne sound

With cavity walls, please note that the spacer tubes are not continuous in the area of the insulation. The recommendations for preventing transmission of airborne sound in cavity walls are the same as for solid walls.



Architectural concrete

For different architectural requirements, other concrete cone variants can be used, e.g. recessed or with shadow joint (the colour of the cones may vary).

Single-sided shuttering against sheet piling

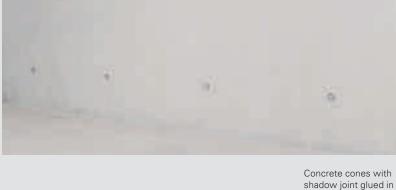
With reusable tie rod.

Version 1:



Weldable Tie DW 15, DK Cone Tie Rod, continuous item no. 031300 DK Concrete Cone UNI Lost tube, rough 58/52, item no. 031643 Version 2: With lost tie rods. Weldable Tie DW 15, SK Cone turned item no. 031300

DK Concrete Cone UNI 58/52, item no. 031643



DK Concrete Cone DW 15-58/30, item no. 031642

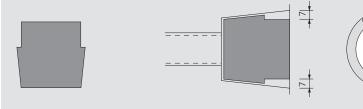


7-9

place.

Shadow joint

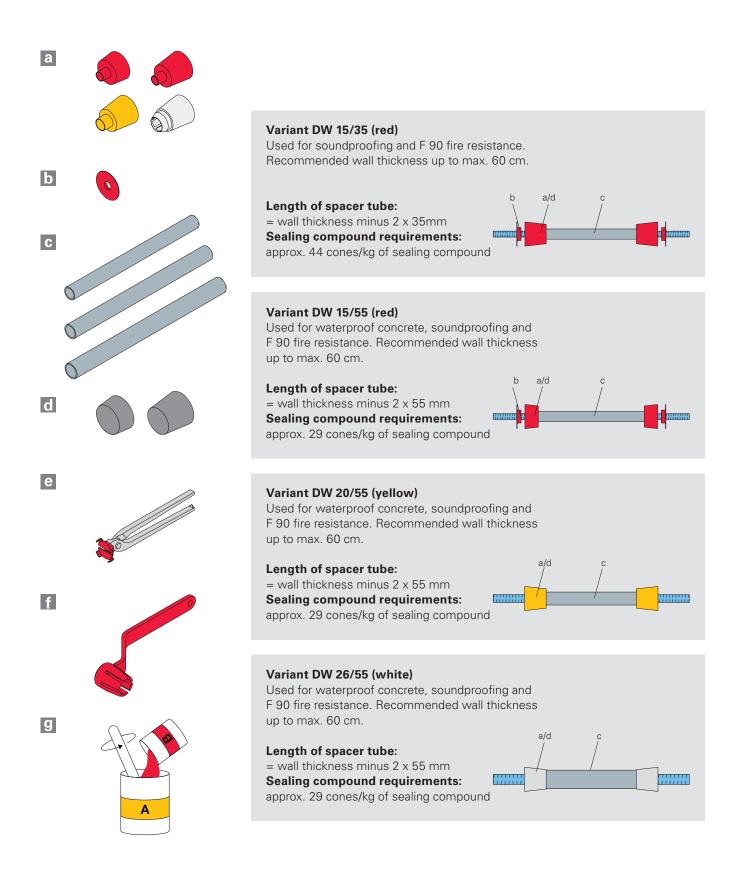
DK Concrete Cone Architectural 01 DW 15-58/52, item no. 031641





DW 15 lost

DK Sealing Cones

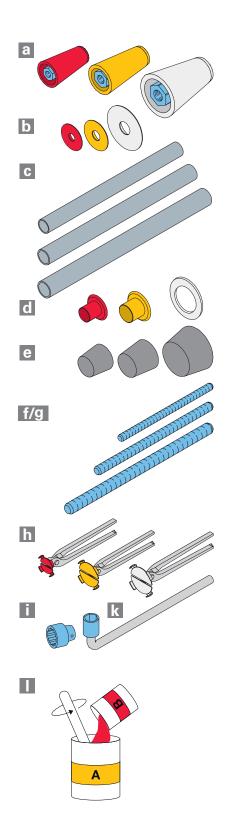


Com- po- nent	ltem no.	Designation	re-usable			
Varia	Variant DW 15/35					
а	031635	DK Sealing Cone DW 15/35	×			
b	031639	SK Sealing Ring UNI DW 15	×			
С	065027	Tube rough 22, L = 2.0 m				
d	031642	DK Concrete Cone DW 15-58/30				
е	031644	DK Cone Pliers 58	×			
f	031655	DK Cone Spanner UNI	×			
g	131709	Sealing Compound-3 / Set of 6 Tins				
Varia a	nt DW 15/5	55 DK Sealing Cone DW 15/55	×			
a b	031636					
 	065027	SK Sealing Ring UNI DW 15 Tube rough 22, L = 2.0 m	×			
	031643	DK Concrete Cone UNI 58/52				
e	031644	DK Cone Pliers 58	×			
f	031655	DK Cone Spanner UNI	×			
g	131709	Sealing Compound-3 / Set of 6 Tins				
Variant DW 20/55						
а	031637	DK Sealing Cone DW 20/55	×			
С	031626	Tube rough 28, L = 3.0 m				

С	031626	Tube rough 28, L = 3.0 m	
d	031643	DK Concrete Cone UNI 58/52	
е	031644	DK Cone Pliers 58	×
f	031655	DK Cone Spanner UNI	×
g	131709	Sealing Compound-3 / Set of 6 Tins	

Variant DW 26/55			
а	031638	DK Sealing Cone DW 26/55	×
С	031634	Tube rough 42, $L = 3.0 \text{ m}$	
d	031643	DK Concrete Cone UNI 58/52	
е	031644	DK Cone Pliers 58	×
f	031655	DK Cone Spanner UNI	×
g	131709	Sealing Compound-3 / Set of 6 Tins	

SK Anchor Cones



Variant DW 15 (red)

Used for waterproof concrete, gasproof concrete, soundproofing and F 90 fire resistance. If used without spacer tubes, still suitable for radiation-proof walls and high security areas. Recommended wall thickness from 24 cm.

Length of spacer tube: = wall thickness minus 2 x 107 mm

Length of Tie Rod DW 15:

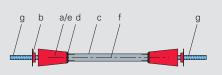
= wall thickness minus 2 x 55 mm Sealing compound requirements: approx. 29 cones/kg of sealing compound

Variant DW 20 (yellow)

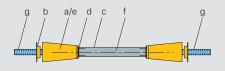
Used for waterproof concrete, gasproof concrete, soundproofing and F 90 fire resistance. If used without spacer tubes, still suitable for radiation-proof walls and high security areas. Recommended wall thickness from 30 cm. Length of spacer tube: = wall thickness minus 2 x 130 mm Length of Tie Rod DW 20: = wall thickness minus 2 x 65 mm Sealing compound requirements: approx. 22 cones/kg of sealing compound

Variant DW 26 (white)

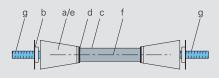
Used for waterproof concrete, gasproof concrete, soundproofing and F 90 fire resistance. If used without spacer tubes, still suitable for radiation-proof walls and high security areas. Recommended wall thickness from 35 cm. Length of spacer tube: = wall thickness minus 2 x 142 mm Length of Tie Rod DW 26: = wall thickness minus 2 x 75 mm Sealing compound requirements: approx. 13 cones/kg of sealing compound



When using the SK Sealing Ring with SK Tie Cone, the tie rod must be shortened by 1 mm at each end.



When using the SK Sealing Ring with SK Tie Cone, the tie rod must be shortened by 1.5 mm at each end.



When using the SK Sealing Ring with SK Tie Cone, the tie rod must be shortened by 2 mm at each end.

Com- po- nent	ltem no.	Designation	re-usable
Varia	nt DW 15		
а	126609	SK Anchor Cone DW 15 / 2	×
b	031639	SK Sealing Ring UNI DW 15	×
С	065027	Tube rough 22, L = 2.0 m	
d	031671	SK Tube Seal 22	
е	031643	DK Concrete Cone UNI 58/52	×
f	030030	Tie Rod DW 15, Special Length	×
g	030030	Tie Rod DW 15, Special Length	×
h	031644	DK Cone Pliers 58	×
i	029650	12-point Nut SW 27 - 1/2"	×
k	072180	Ratchet Wrench 1/2"	×
1	131709	Sealing Compound-3 / Set of 6 Tins	
Varia	nt DW 20		
а	031646	SK Anchor Cone DW 20	×
b	031648	SK Sealing Ring DW 20	×
С	031626	Tube rough 28, L = 3.0 m	
d	031672	SK Tube Seal 28	
е	031650	SK Concrete Cone DW 20-67/60	
f	030700	Tie Rod DW 20, Special Length	
g	030700	Tie Rod DW 20, Special Length	×
h	031656	SK Cone Pliers 67	×
i	031480	Socket Wrench SW 36	×

Variant DW 26			
а	031647	SK Anchor Cone DW 26	×
b	031649	SK Sealing Ring DW 26	×
С	031634	Tube rough 42, $L = 3.0 \text{ m}$	
d	126013	Seal Ring 60 x 15 x 4, EPDM	
е	031651	SK Concrete Cone DW 26-100/60	
f	030340	Tie Rod DW 26, Special Length	
g	030340	Tie Rod DW 26, Special Length	×
h	031657	SK Cone Pliers 100	×
i	029630	12-point Nut SW 46 - 1"	×
k	029610	Ratchet Wrench 1"	×
I	131709	Sealing Compound-3 / Set of 6 Tins	

1

131709

Sealing Compound-3 / Set of 6 Tins

Tie Technology DK, SK



Sewage works in Hameln, Germany.

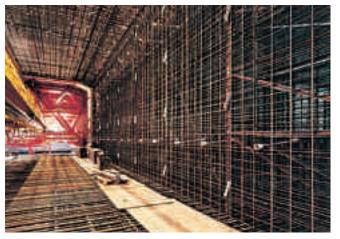


B311 Local Bypass Tunnel, Ertingen, Germany.



Other examples of completed projects:

- Käppala Sewage Works 2001, Sweden
- Izmit Sewage Works, Turkey
- Sewage works in Villach, Austria
- Elevated Tanks in Weilheim, Germany
- Gaggenau Groundwater Reservoir, Germany
- Seitschen Bridge, Germany
- Spremberg Housing Development, Germany



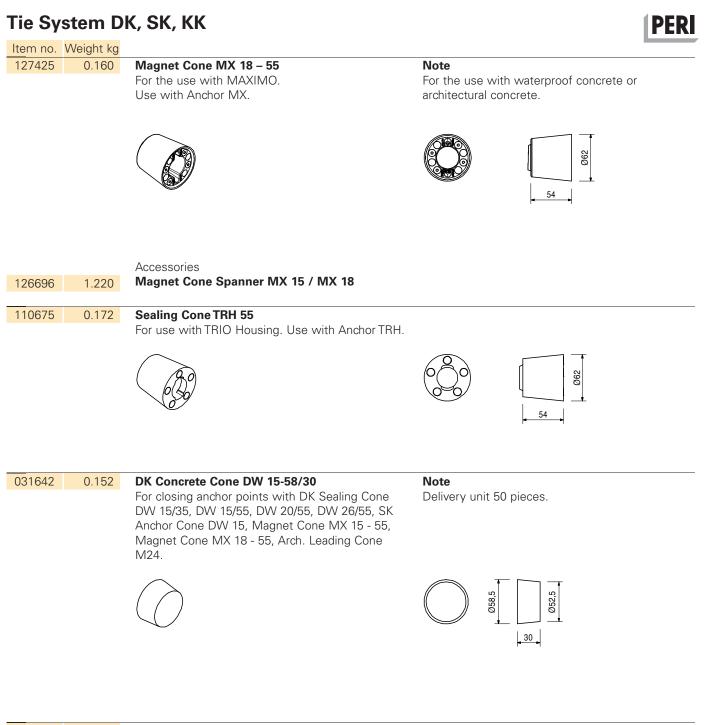
Oeresund Tunnel, from Denmark to Sweden.



Tunnel in Häggsviksleden, Sweden.

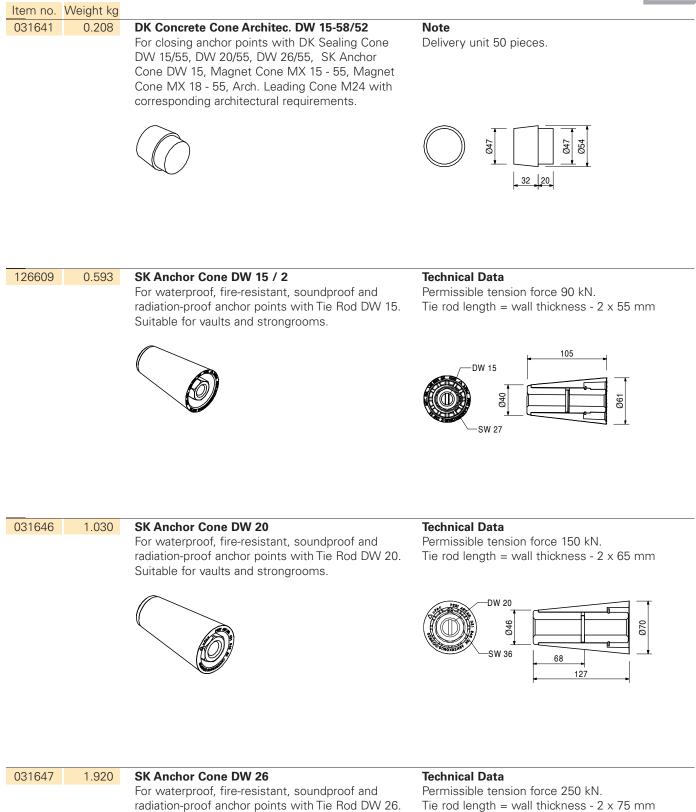
Item no. Weig	ght kg		
).043	DK Cone DW 15/35 For fire-resistant and soundproof anchor points with DW 15. Resistant to seepage. For use with Spacer Tube rough 22.	Note Delivery unit 50 pieces.
031636 C).063	DK Cone DW 15/55 For waterproof, fire-resistant and soundproof anchor points with Tie Rod DW 15. Used with Spacer Tube rough 22.	Note Delivery unit 50 pieces.
031637 C	0.055	DK Cone DW 20/55 For waterproof, fire-resistant and soundproof anchor points with Tie Rod DW 20. Use with Spacer Tube rough 28.	Note Delivery unit 50 pieces.
031638 0	0.054	DK Cone DW 26/55 For waterproof, fire-resistant and soundproof anchor points with Tie Rod DW 26. Used with Spacer Tube rough 42.	Note Delivery unit 50 pieces.
112937 0).173	Sealing Cone MX 15 – 55 For use with MAXIMO. Use with Anchor MX.	Note For use with waterproofed concrete or architectu ral concrete.
126696 1	1.220	Accessories Magnet Cone Spanner MX 15 / MX 18	

PFRI



031643	0.241	DK Concrete Cone UNI 58/52	Note
		For closing anchor points with DK Sealing Cone DW 15/55, DW 20/55, DW 26/55, SK Anchor Cone DW 15, Magnet Cone MX 15 - 55, Magnet Cone MX 18 - 55, Arch. Leading Cone M24.	Delivery unit 50 pieces.

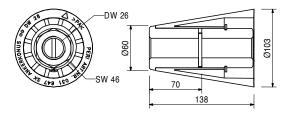
Ø48



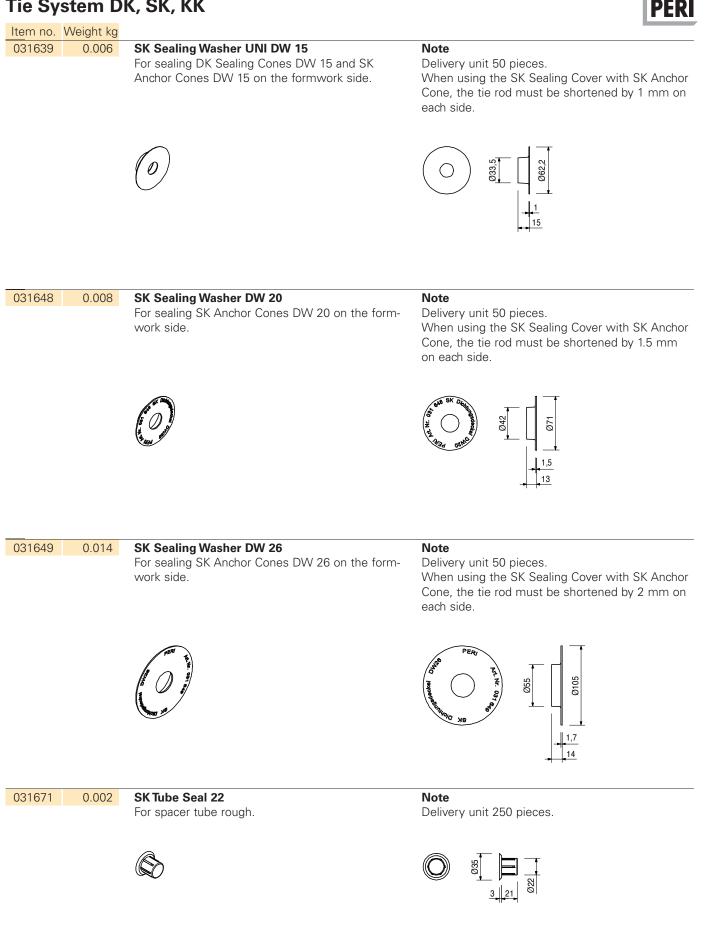


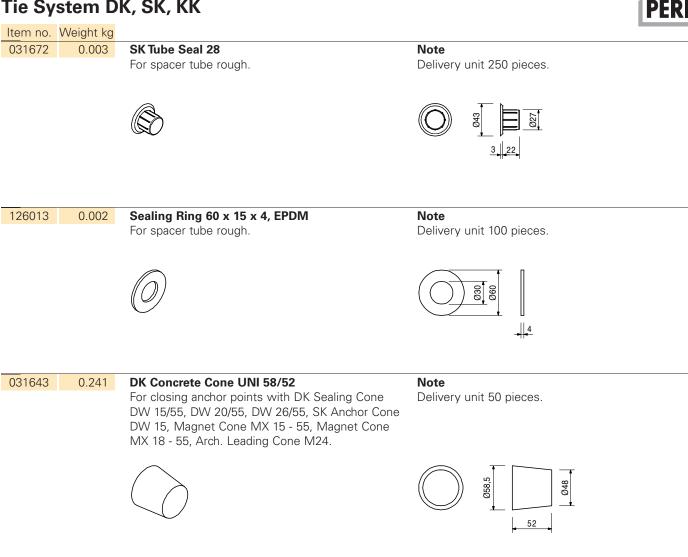
Suitable for vaults and strongrooms.

Tie rod length = wall thickness - 2 x 75 mm





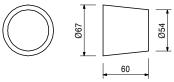




031650 0.364 SK Concrete Cone DW 20-67/60 Note For closing anchor points with SK Anchor Cone DW 20.



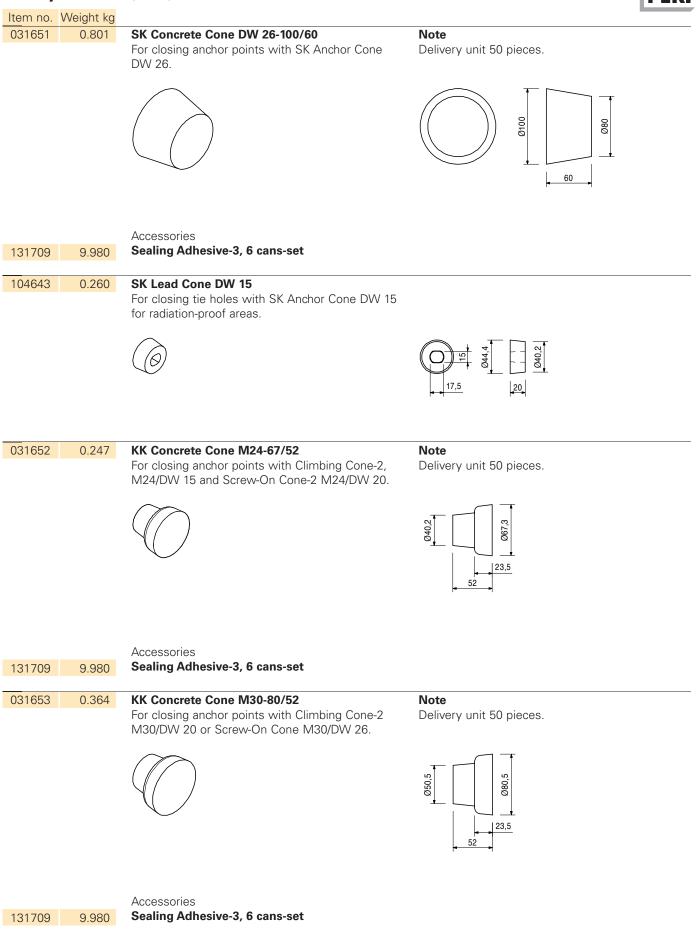
Delivery unit 50 pieces.



131709 9.980

Accessories Sealing Adhesive-3, 6 cans-set

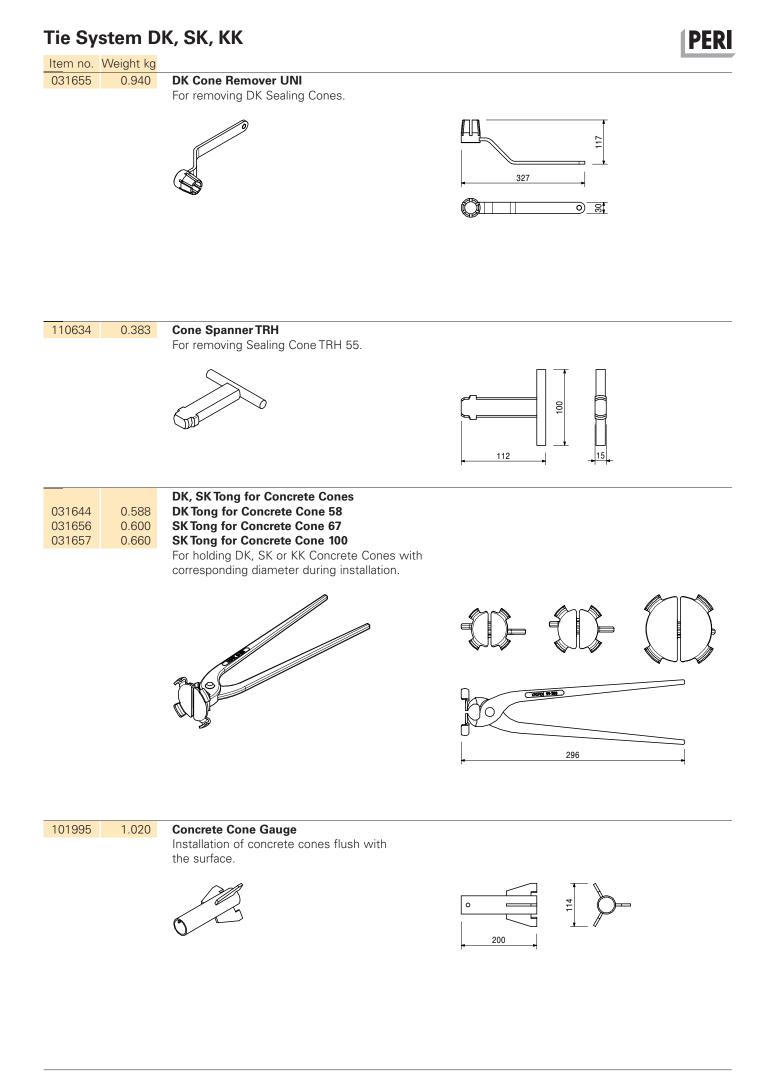


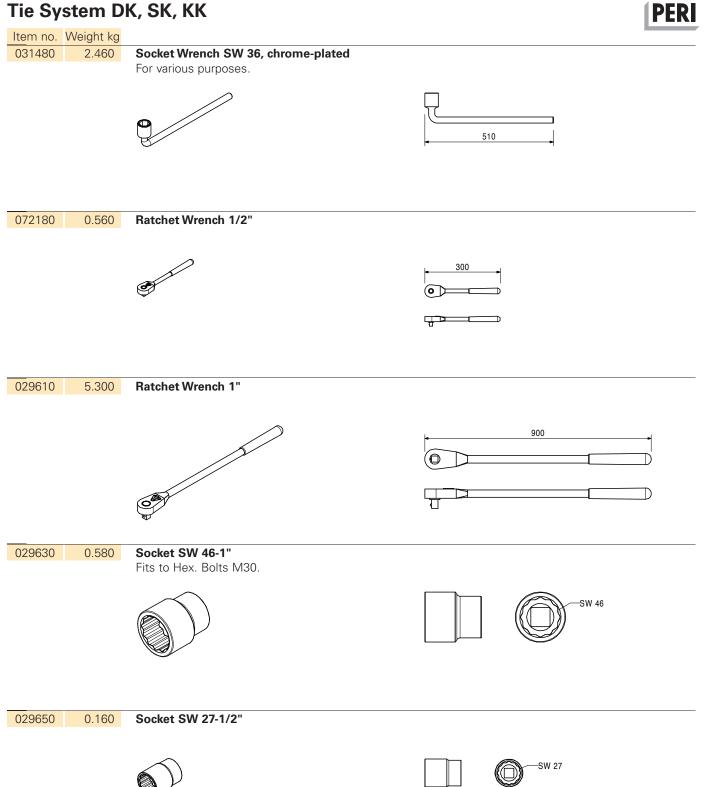


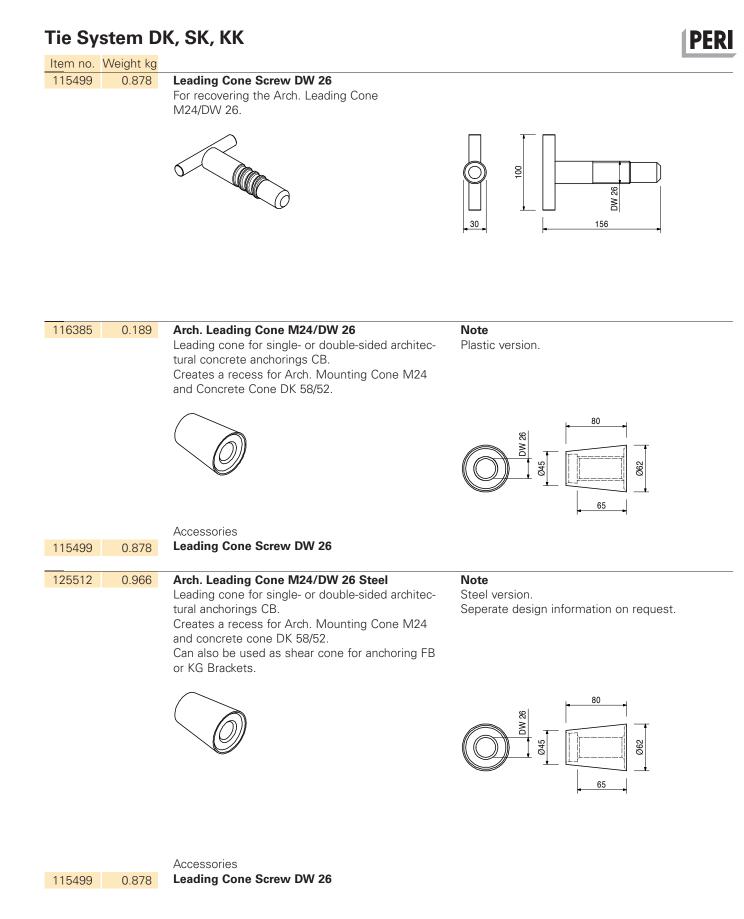
1/1/ .

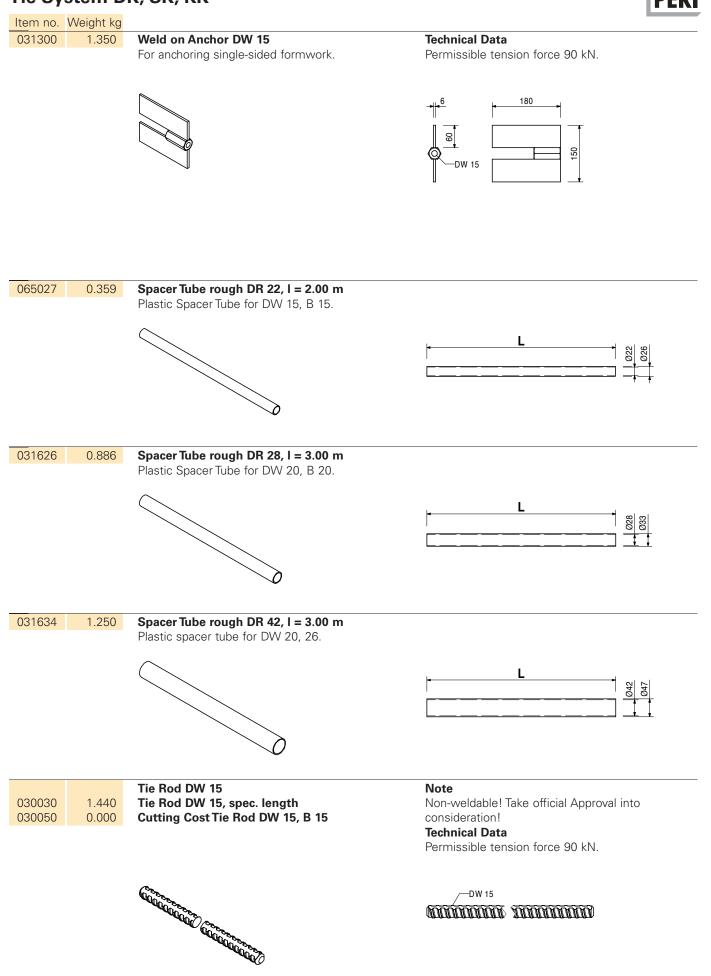


Tie System D	K, SK, KK	PERI
Item no. Weight kg 031654 0.512	KK Concrete Cone M36-90/52 For closing anchor points with Climbing Cone-2 M36/DW 26.	Note Delivery unit 50 pieces.
131709 9.980	Accessories Sealing Adhesive-3, 6 cans-set	
131709 9.980	Sealing Adhesive-3, 6 cans-set For bonding PERI concrete cones.	Note See Safety Data sheet! Consisting of: 6 x Component A, 6 x Component B
	A B	
131710 0.890	Sealing Adhesive-3 can CO-A	
131711 0.670	Sealing Adhesive-3 can CO-B	
126696 1.220	Magnet Cone Spanner MX 15 / MX 18 For dismantling of Magnet Cone MX 15 and MX 18.	

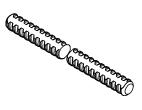


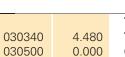






ltem no.	Weight kg		
		Tie Rod DW 20	Note
030700	2.560	Tie Rod DW 20, spec. length	Non-weldable! Take official Approval into conside-
030800	0.000	Cutting Cost Tie Rod DW 20/B 20	ration!
			Technical Data
			Permissible tension force 150 kN.
		(COOR	/—DW 20





Tie Rod DW 26 Tie Rod DW 26, spec. length Cutting Cost Tie Rod DW 26





Note

Non-weldable! Take official approval into consideration!

DFDI

Technical Data Permissible tension force 250 kN.





PERI International



North America

- CA Canada PERI Formwork Systems, Inc. www.peri.ca
- MX Mexico PERI Cimbras y Andamios, S.A. de C.V. www.peri.com.mx
- PA Panama PERI Panama Inc. www.peri.com.pa
- US USA PERI Formwork Systems, Inc. www.peri-usa.com

South America

- AR Argentina PERI S.A. www.peri.com.ar
- BR Brazil PERI Formas e Escoramentos Ltda. www.peribrasil.com.br
- CL Chile PERI Chile Ltda. www.peri.cl
- CO Colombia PERI S.A.S. www.peri.com.co
- PE Peru PERI Peruana S.A.C. www.peri.com.pe

Africa

- AO Angola Pericofragens, Lda. www.peri.pt
- DZ Algeria S.A.R.L. PERI www.peri.dz
- EG Egypt Egypt Branch Office www.peri.com.eg
- MA Morocco PERI S.A. www.peri.ma
- MZ Mozambique PERI (Pty.) Ltd. www.peri.co.mz
- NA Namibia PERI (Pty.) Ltd. www.peri.na
- NG Nigeria PERI Nigeria Ltd. www.peri.ng
- TN Tunisia PERI S.A.U. www.peri.es
- TZ Tanzania PERI Formwork and Scaffolding Ltd www.peri.co.tz
- ZA South Africa PERI Formwork Scaffolding (Pty) Ltd www.peri.co.za

Asia

IL.

- AE United Arab Emirates PERI (L.L.C.) www.peri.ae
- AZ Azerbaijan PERI Repesentative Office www.peri.com.tr
- HK Hong Kong PERI (Hong Kong) Limited www.perihk.com
- ID Indonesia PT Beton Perkasa Wijaksana www.betonperkasa.com
 - Israel PERI F.E. Ltd. www.peri.co.il
- IN India PERI (India) Pvt Ltd www.peri.in
- IR Iran PERI Pars. Ltd. www.peri.ir
- JO Jordan PERI GmbH – Jordan www.peri.com
- JP Japan PERI Japan K.K. www.peri.co.jp
- KR Korea PERI (Korea) Ltd. www.perikorea.com
 - KW Kuwait PERI Kuwait W.L.L. www.peri.com.kw

- KZ Kazakhstan TOO PERI Kazakhstan www.peri.kz
- LB Lebanon PERI Lebanon Sarl lebanon@peri.de
- MY Malaysia PERI Formwork Malaysia Sdn. Bhd. www.perimalaysia.com
- OM Oman PERI (L.L.C.) www.peri.ae
- PH Philippines PERI-Asia Philippines, INC. www.peri.com.ph
- QA Qatar PERI Qatar LLC www.peri.qa
- SA Saudi Arabia PERI Saudi Arabia Ltd. www.peri.com.sa
- SG Singapore PERI Asia Pte Ltd www.periasia.com
- TH Thailand Peri (Thailand) Co., Ltd. www.peri.co.th
- TR Turkey PERI Kalıp ve İskeleleri www.peri.com.tr
- VN Vietnam PERI ASIA PTE LTD www.peri.com.vn



Oceania

AU Australia PERI Australia Pty. Ltd. www.periaus.com.au

Europe

- AL Albania PERI Kalıp ve İskeleleri www.peri.com.tr
- AT Austria PERI Ges.mbH www.peri.at
- BA Bosnia and Herzegovina PERI oplate i skele d.o.o www.peri.com.hr
- BE Belgium PERI N.V. www.peri.be
- BG Bulgaria PERI Bulgaria EOOD www.peri.bg
- BY Belorussia IOOO PERI www.peri.by
- CH Switzerland PERI AG www.peri.ch
- CZ Czech Republic PERI spol. s r.o. www.peri.cz
- DE Germany PERI GmbH www.peri.de

- DK Denmark PERI Danmark A/S www.peri.dk
- EE Estonia PERI AS www.peri.ee
- ES Spain PERI S.A.U. www.peri.es
- FI Finland PERI Suomi Ltd. Oy www.perisuomi.fi
- FR France PERI S.A.S. www.peri.fr
- GB United Kingdom PERI Ltd. www.peri.ltd.uk
- GR Greece PERI Hellas Ltd. www.perihellas.gr
- HR Croatia PERI oplate i skele d.o.o. www.peri.com.hr
- HU Hungary PERI Kft. www.peri.hu
- IR Ireland Siteserv Access & Formwork www.siteservaccess.ie
- IS Iceland Armar ehf. www.armar.is

- IT Italy PERI S.r.I. www.peri.it
- LT Lithuania PERI UAB www.peri.lt
- LU Luxembourg N.V. PERI S.A. www.peri.lu
- LV Latvia PERI SIA www.peri-latvija.lv
- NL Netherlands PERI b.v. www.peri.nl
- NO Norway PERI Norge AS www.peri.no
- PL Poland PERI Polska Sp. z o.o. www.peri.com.pl
- PT Portugal Pericofragens Lda. www.peri.pt
- RO Romania PERI România SRL www.peri.ro
- RS Serbia PERI oplate d.o.o. www.peri.rs
- RU Russia OOO PERI www.peri.ru

- SE Sweden PERI Sverige AB www.peri.se
- SI Slovania PERI oplate i skele d.o.o www.peri.com.hr
- SK Slovakia PERI spol. s. r.o. www.peri.sk
- UA Ukraine TOW PERI www.peri.ua

The optimal System for every Project and every Requirement



Wall Formwork



Column Formwork



Slab Formwork



Climbing Systems



Bridge Formwork



Tunnel Formwork



Shoring Systems



Construction Scaffold



Facade Scaffold



Industrial Scaffold





Protection Scaffold



Safety Systems



System-Independent Accessories Se



Services



PERI GmbH Formwork Scaffolding Engineering Rudolf-Diesel-Strasse 19 89264 Weissenhorn Germany Tel. +49 (0)7309.950-0 Fax +49 (0)7309.951-0 info@peri.com www.peri.com