



SAS Manhole Lifting System

PFEIFER



Efficient and flexible transport of manholes



Advantages in use

- Attachment bolt cannot be lost
- No foreseeable mistakes
- Optimum range of products for all practically relevant applications



Advantages in installation

- Simple fastening in the formwork
- No additional reinforcement for the anchor



Advantages in purchasing

- Small, optimised range of products
- Cost-effective system
- In stock – ready for shipping



Advantages in quality

- DIN ISO 9001 certification
- Continuous production control
- Conforms to the machine directive and the technical rules
- Complete instructions for installation and use



PFEIFER SAS Manhole Lifting System

Item no. 05.059

Item no. 05.060

Item no. 05.061



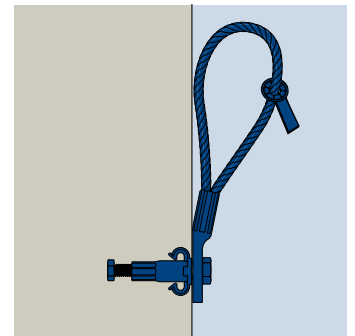
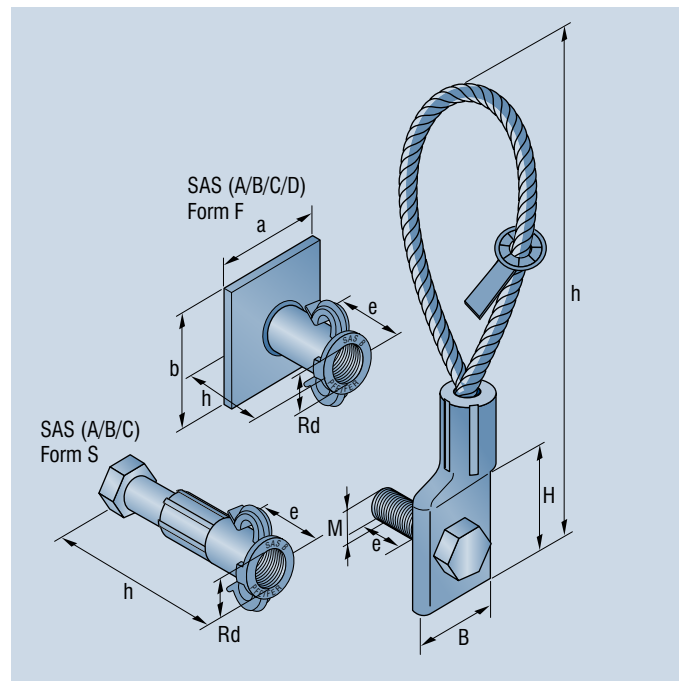
PFEIFER

Manhole lifting anchor system
SAS manhole lifting system

PFEIFER SAS Manhole Lifting System consisting of PFEIFER SAS lifting anchor, PFEIFER SAS lifting loop and PFEIFER SAS data clip for lifting and moving pipe and manhole items.

Materials:

Special quality high grade precision steel tube
Flexible steel cable
High-strength bolts
Flat material



PFEIFER SAS lifting loop

Reference no.	Type	Size	Thread	Dimensions in mm				Packing unit	Weight kg/ packing unit
				H	B	h	e		
05.059.182	SAS	V	M12	30	24.5	180	21.0	100	19.0
05.059.142	SAS	A	M14	40	29.5	210	23.5	50	9.0
05.059.162	SAS	B	M16	55	37.5	280	26.5	50	20.0
05.059.242	SAS	C	M24	65	55.2	330	39.0	25	25.0
05.059.302	SAS	D	M30	80	65.5	390	52.0	10	18.0

PFEIFER SAS Lifting anchor

Reference no.	Type	Size	Form	Thread	Dimensions in mm				Packing unit	Weight kg/ packing unit
					h	a	b	e		
05.061.123.076	SAS	V	S	Rd12	76	—	—	22	100	4.7
05.060.143.075	SAS	A	S	Rd14	75	—	—	25	100	8.0
05.061.143.060	SAS	A	F	Rd14	60	60	60	25	100	20.0
05.060.163.095	SAS	B	S	Rd16	95	—	—	27	100	20.0
05.061.163.070	SAS	B	F	Rd16	70	60	60	27	100	25.0
05.060.243.110	SAS	C	S	Rd24	110	—	—	43	50	39.0
05.061.243.070	SAS	C	F	Rd24	70	130	130	43	50	62.5
05.061.303.120	SAS	D	F	Rd30	120	100	80	56	25	23.75

SAS data clip

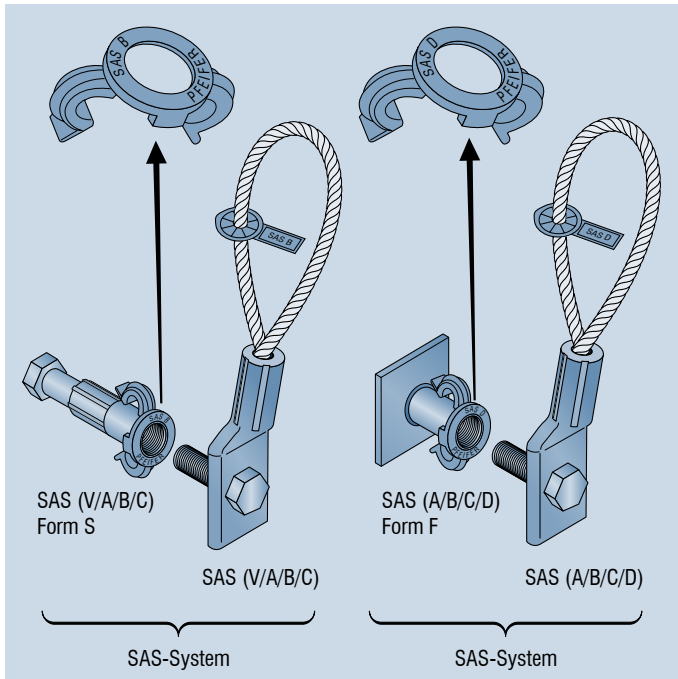
Reference no.	Type	Size	Colour
05.220.012.050	SAS	V	Traffic green
05.220.014.010	SAS	A	Light blue
05.220.016.020	SAS	B	Beige
05.220.024.040	SAS	C	Grey-white
05.220.030.052	SAS	D	Magenta

i M connection bolts and Rd lifting anchors are matched to each other.

i The PFEIFER SAS 8.8 connecting bolt is supplied pre-assembled to the PFEIFER SAS lifting loop 8.8 and is not available separately.

Instructions for the installation and use of the PFEIFER SAS Manhole Lifting System

System



The PFEIFER SAS Manhole Lifting System consists of the SAS lifting anchors, lifting loops and data clips.

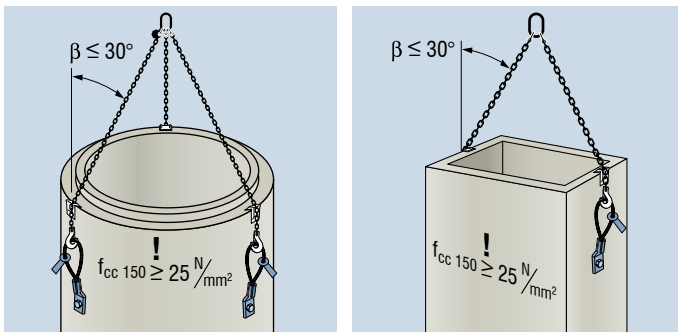
Warning: The use of accessories that are not part of this system, in particular products of other manufacturers, can result in parts falling down and causing injury or death. Use the PFEIFER SAS Manhole Lifting System only as a complete system!

Safety

All necessary operating coefficients have been taken into account in accordance with the machine directive (2006/42/EC).

- Safety against metallic failure: $\gamma_s = 3.0$
- Safety against wire rope failure: $\gamma_s = 4.0$
- Safety against concrete failure: $\gamma_c = 2.5$ (with coefficient 1.2 for the manufacturer's QM system in the precast plant)
with effect coefficient on the load side: $\gamma_c = 1.3$

Use



The PFEIFER SAS Manhole Lifting System is for attaching and lifting pipe and manhole items of standard concrete with a cube strength $f_{cc\ 150}$ of at least 25 N/mm².

Always attach the PFEIFER SAS Manhole Lifting System to the outside of the manhole, to avoid axial tensile force in the anchor.

Notice: Only use the system if you are trained in safe handling. If you have any doubts about the safe state of the system, the question of usability must be assessed by a suitably qualified person.

Warning: Previous use such as lashing can lead to early damage to the PFEIFER SAS Manhole Lifting System, resulting in a possible hazard of injury or death to persons. Use the PFEIFER SAS Manhole Lifting System only for transporting pipe and manhole elements!

Warning: Use of the anchor by untrained personnel results in the risk of incorrect use and the risk of items falling down, causing injury or death to persons. Use only trained personnel.

Dimensioning

Table 1: Tightening torque and permissible resistance

Type	Size	Tightening torque T_{inst} Nm	Permissible resistance R_{perm} [kN] at $f_{cc,150} \geq 25 \text{ N/mm}^2$	
			Form S	Form F
SAS	V	20 – 30	5	–
SAS	A	40 – 50	10	10
SAS	B	50 – 70	20	20
SAS	C	70 – 90	40	24.5
SAS	D	100 – 120	–	52

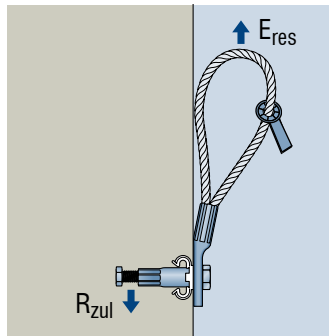
Use an engineering calculation to determine the acting loads, e.g. as in the general technical introduction for PFEIFER lifting anchor systems.

! Notice: Take note of the “general technical introduction for PFEIFER lifting anchor systems”.

The minimum reinforcement is to be arranged as area reinforcement or upper and lower hoop reinforcement in accordance with Table 2.

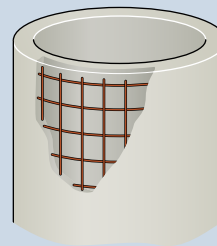
Table 2: Minimum reinforcement

Type	Size	area of reinforcement		reinforcement bars	
		Form	centered	Form	top and bottom
SAS	V	S	188 mm ² /m	–	–
SAS	A	S	188 mm ² /m	F	2 \varnothing 8 mm
SAS	B	S	188 mm ² /m	F	2 \varnothing 10 mm
SAS	C	S	257 mm ² /m	F	2 \varnothing 12 mm
SAS	D	F	257 mm ² /m	–	–

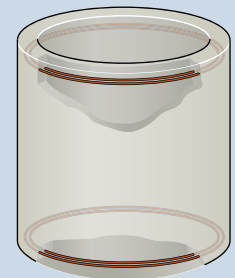


! Resulting stress \leq permitted resistance (Table 1)
 $E_{res} \leq R_{perm}$

Area reinforcement

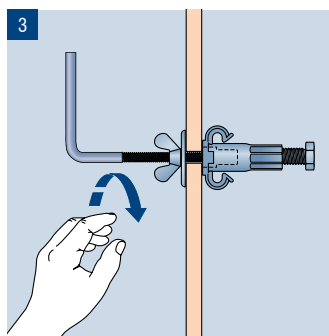
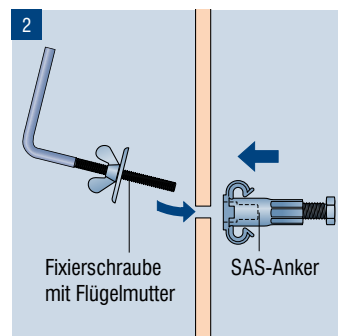
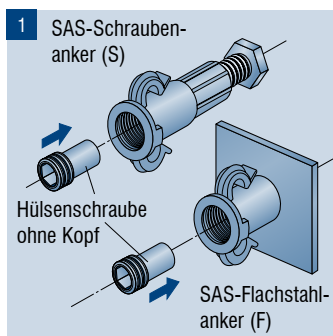


reinforcement bars



Installation

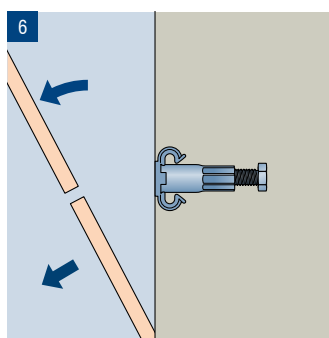
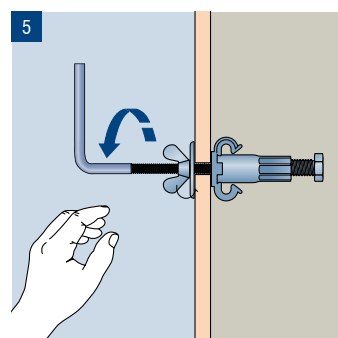
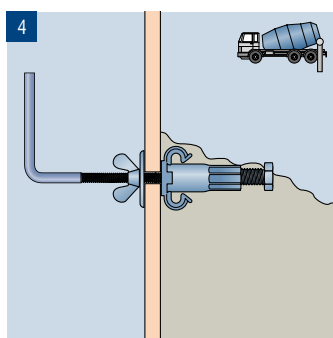
For safe attachment of the lifting anchor to the formwork, use the sleeve bolt and the fixing bolt. Making the wing nut hand-tight will avoid the anchor coming loose during concreting.



PFEIFER fixing screw

Reference no.	Thread size M	To fit fixing bolt
05.206.063	M 6	M 12
05.206.083	M 8	M 14/16
05.206.103	M 10	M 24/30

For weight and dimensions refer to the thread system data sheet p. 48.

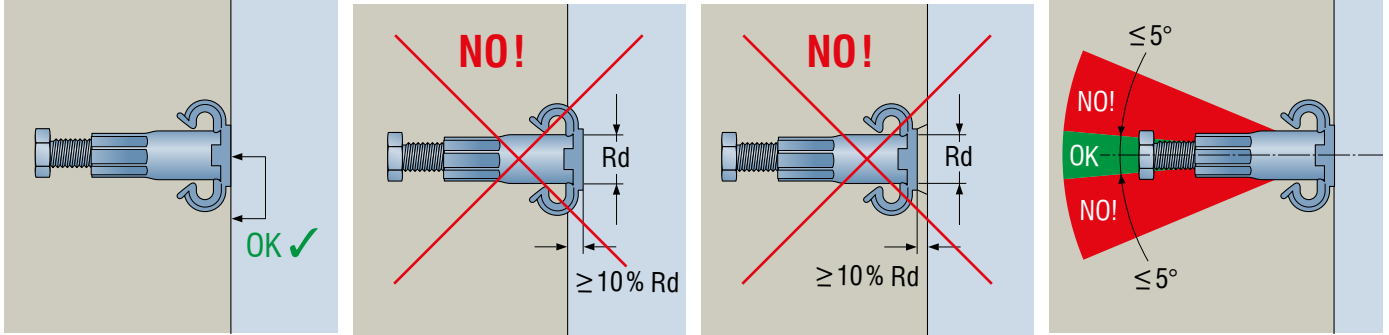


PFEIFER fixing bolt

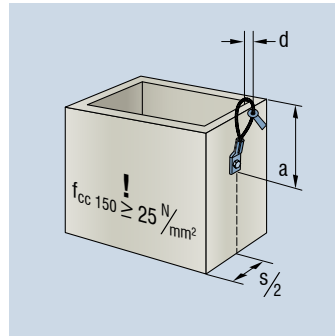
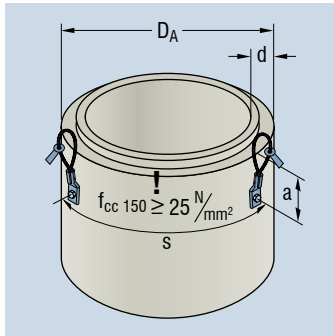
Reference no.	Thread size M	fits size
05.211.123	M 12	V
05.211.143	M 14	A
05.211.163	M 16	B
05.211.243	M 24	C
05.211.303	M 30	D

For weight and dimensions refer to the thread system data sheet p. 49.

Installation tolerances



Caution: Incorrect positions and faulty installation of the anchor can lead to early failure and falling down - danger of death! Attach the anchor flush and at right-angles.



Notice: The anchor must always be attached higher than the centre of gravity because otherwise the element can tip over during transport.

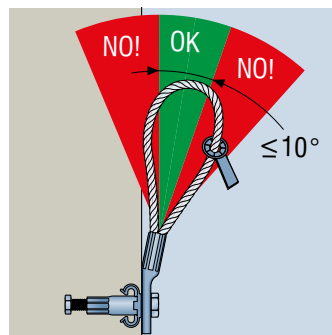
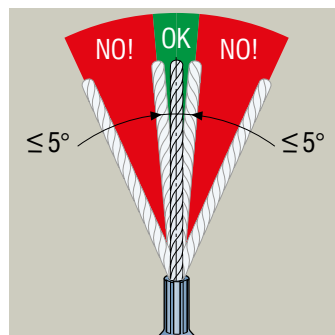
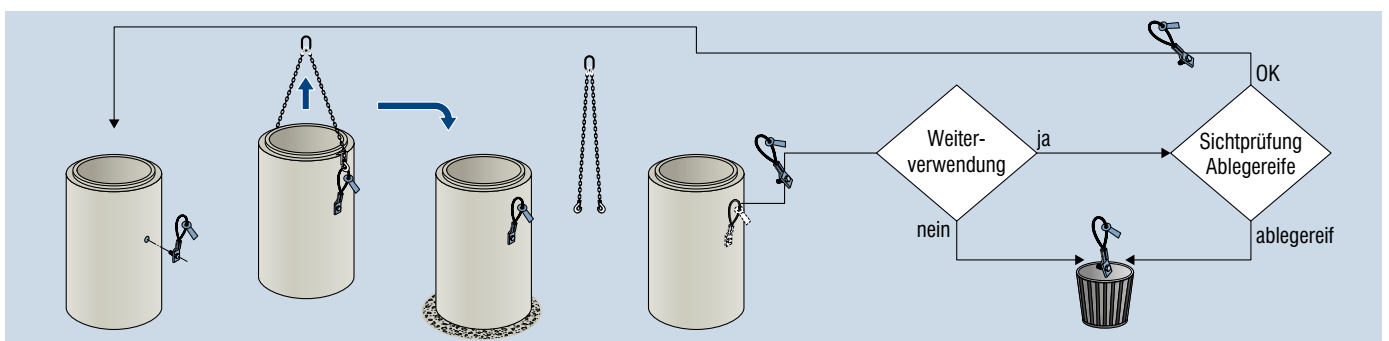
Table 3: Minimum dimensions

Type	Size	Minimum outer dia. D_A [mm]	Minimum wall thickness d [mm]	Minimum distance from edge a [mm]	Minimum inter-mediate distance s [mm]
Form S					
SAS	V	1240	120	215	–
SAS	A	800	100	400	800
SAS	B	1000	120	500	1000
SAS	C	2000	150	700	1400
Form F					
SAS	A	800	90	400	1200
SAS	B	1000	100	500	1500
SAS	C	2500	100	600	1800
SAS	D	2000	150	1000	2000



Notice: To achieve the stated load bearing capacity, comply with the minimum dimensions as in Table 3 and a concrete cube strength of at least $25\ \text{N/mm}^2$.

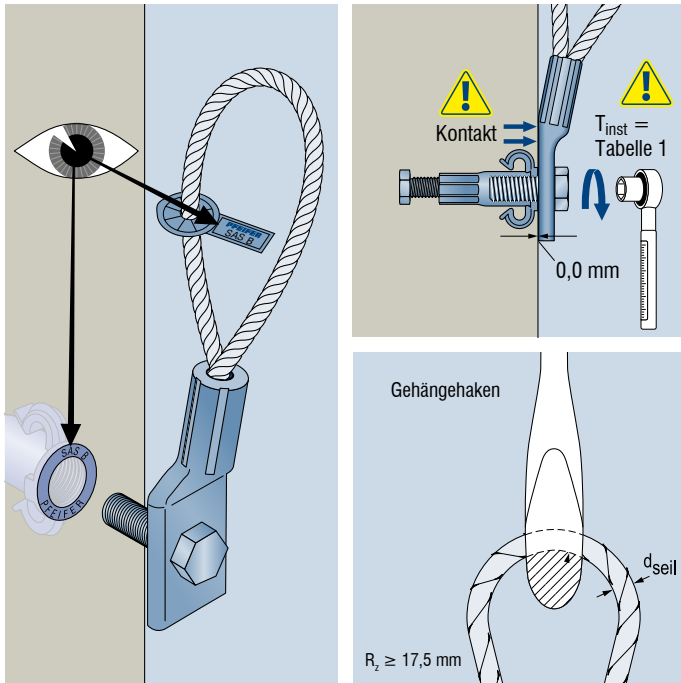
Use



Warning: Loading the lifting device beyond the permitted angle may lead to premature failure of the anchor. Risk of falling, danger to life.

Apply loads only in the direction of the loop and parallel to the concrete surface.

Use

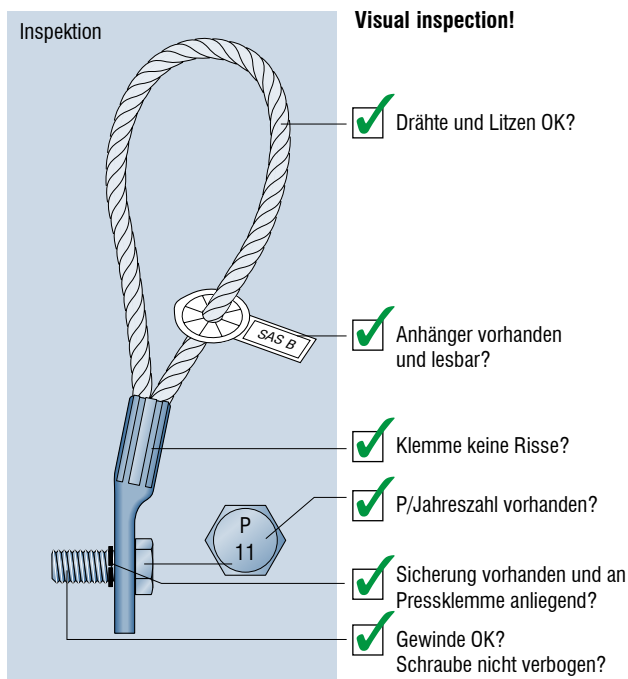


The lifting loop must be in contact with the concrete. Tighten the connecting bolt to the torque given in Table 1.

Warning: If the deflection radius of the hook is too small, the lifting device can fail even at the rated load. This is a hazard to life. Only attach hooks with a deflection radius at least as large as the cable diameter.

Check the system consistency by inspecting the data clip of the lifting anchor and the lifting capacity tag of the lifting loop.

Original inspection and discarding time



! The SAS lifting loops must be examined by an authorised expert according to the specified criteria (see illustration: 'Inspection') before using for the first time, at least once a year and after special occurrences. The parts must be metallically pure for this. Repairs are not permissible.

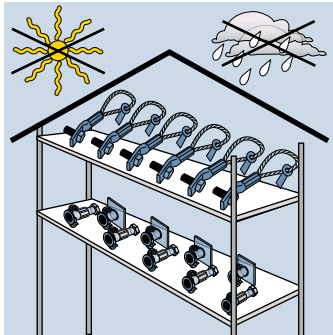
! **Notice:** In the case of repeated use, a visual inspection is necessary before each use.

PFEIFER SAS lifting loops may no longer be used if the following types of damage occur:

- Breakage of 4 wires over a rope length of 3x the rope diameter or an entire strand
- 3 adjacent wire breaks in outer wires in a strand
- Crushing of the wire rope
- Deformation or damage to the rope or the tapped socket
- Heavy wear
- Corrosion pits
- Connection between wire rope and ferrule loosened or detached
- defective fuse

Warning: Disassembly or exchanging parts of the system is not permissible. This can lead to the failure of the system – mortal danger! Use the lifting loop only in the as-new undamaged state.

Storage



! **Notice:** Store the SAS system components dry and protected. There is a risk of corrosion if there are large changes of temperature, wetness (humidity) or any influence from acids, road salt or sea water.



EC declaration of conformity according to the EC machinery directive 2006/42/EC, appendix II 1A

The manufacturer **PFEIFER SEIL- UND HEBETECHNIK GMBH**
DR.-KARL-LENZ-STRASSE 66
D-87700 MEMMINGEN

declares that the following lifting device according to article 2 d) with the product designation

PFEIFER SAS Manhole Lifting System
(PFEIFER SAS lifting anchor,
PFEIFER SAS lifting loop,
PFEIFER SAS data clip)

in the sizes: **V (Form S), A, B, C, D (Form F) and A, B, C (Form S)**

conforms to the regulations contained in the directives listed below on account of its design and construction
– EC machinery directive 2006/42/EC

Applied harmonised standards

– DIN EN ISO 14121-1:2007-12
Safety of machinery – Risk assessment – Part 1: General principles

Other applied standards or specifications

– BGR 106:1992-04 “Safety rules for anchors and systems for the lifting of precast concrete parts”, issued by the Association of German Employer’s Liability Insurance Carriers, “Construction” Technical Committee.

The person responsible for the creation and maintenance of the technical documentation is

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PFEIFER Seil- und Hebetchnik GmbH
Memmingen, 20.02.2015

ppa. Dipl.-Ing. Matthias Kintscher
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i. V. Dipl.-Ing. Christoph Neef
Manager, Development Connecting
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Enquiry

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Geschäftsbereich BAUTECHNIK
Postfach 1754 · D-87687 Memmingen

Fax
08331-937342

Building project

SENDER'S DETAILS

Company
Street
Town/Postcode
Contact name
Tel.
Email

PFEIFER SAS Manhole Lifting System

PFEIFER SAS Manhole Lifting System



Item	Quantity	Reference no.	Type	Size/form	Unit price in EUR	Total price per item in EUR

Please take into account the **packing units**.

This order is based on the General Terms of Sales and Delivery of the PFEIFER company, of which you are aware.

Total **EUR**
plus packing and shipping costs

Delivery address _____
(state only if _____
different from the _____
ordering address) _____

Date and signature



PFEIFER

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