

P R E S T R E S S E D
C O N C R E T E
T E C H N O L O G Y



Cleaning and Maintenance of Anchor Grips



Cleaning and maintenance

Safety at work during stressing operations and a long service life of the anchor grips require a correct treatment and maintenance of the grips. Only use cleaning agents and maintenance products that have been tested and recommended by PAUL.

The maintenance work is composed of:

Cleaning, checking the further usability, lubricating.

Cleaning

Cleaning can be effected mechanically by means of brushes or chemically. Chemical cleaning is preferred in the case of heavily contaminated anchor grips.

For cleaning the grips must be disassembled and the wedges be removed. Barrels, wedges, springs and caps are cleaned separately. Wedges are generally cleaned without being disassembled.

Cleaning and maintenance intervals

After each use:

- Heavily contaminated anchor grips
- Couplers contaminated by ingress of concrete water (used directly at the end of the mould)

After every third use:

- Lightly contaminated anchor grips

Badly damaged barrels and wedges, bent, expanded or broken steel or rubber retaining rings, damaged caps are to be replaced.

Checking the further usability

After every third use the cleaned anchor grips are judged as to their further usability. For this purpose remove the steel or rubber retaining rings taking care not to bend them out of shape. Inspect the grips for damage, in particular the teeth of the anchor wedges.

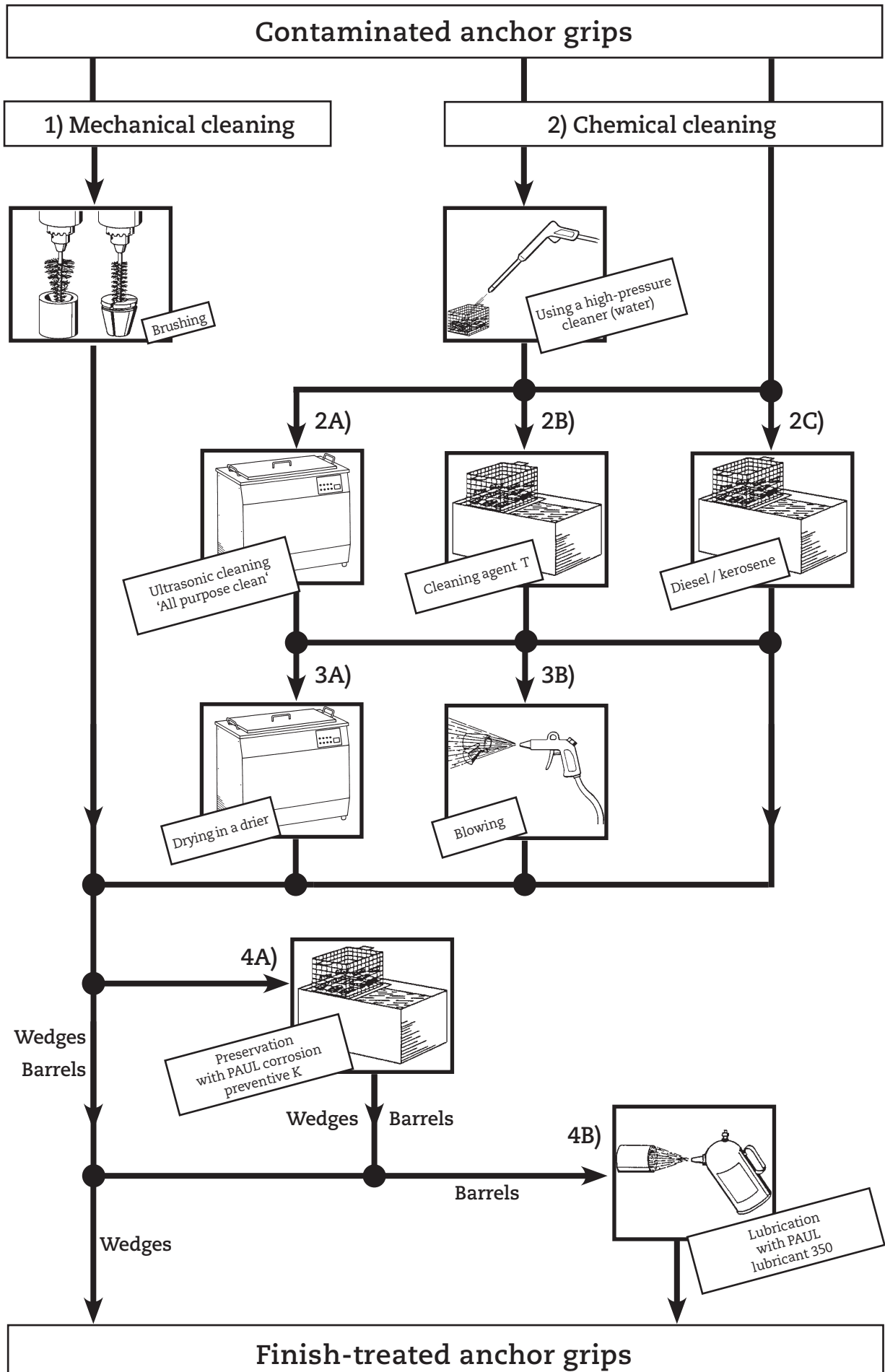
Please refer and adhere to Sheets B 441.20/1 and B 246.03/1 and the DIN 1045-3 and DIN 1045-4 standards..

Caution:

Wedges through which a prestressing steel has slipped must be eliminated immediately and the cause of the slippage be inspected.

Lubrication

Only lubricate the taper faces of the barrels using PAUL LUBRICANT 350. Lubrication should take place after each use, however, at the latest after every third use and always after cleaning.



Explanations relating to the diagram on page 3:

1) Mechanical cleaning

For cleaning the taper faces of the barrels and the teeth of the wedges manual or motorized brushes are available. After mechanical cleaning and after lubricating the barrels, the anchor grips are ready for immediate reuse or can be preserved for storage.

2) Chemical cleaning

Heavily contaminated anchor grips are generally cleaned chemically by immersing them in PAUL cleaning agent T or in a diesel/kerosene bath or by using an ultrasonic cleaning equipment. Very heavily contaminated anchor grips are first placed in a wire-lattice container and cleaned with a high-pressure cleaner with water. Chemically cleaned anchor grips can be reused or preserved and stored as soon as the cleaning agent has drained off and dried.

2A) Ultrasonic cleaning

Ultrasonic cleaning is a very efficient method for cleaning heavily contaminated grips and large quantities. The smaller cleaning device offered is capable of handling partial quantities of 5 to 10 kg, i.e. up to 100 kg of grips daily. The grips are placed in the heated ultrasonic bath for approx. 10 to 45 minutes. Thereafter the cleaning agent should be allowed to drop off before treating the grips further. The ultrasonic bath has a slightly preservative effect so that the anchor grips can be stored for several days before use without any further preservation.

The cleaning bath can be reused many times. When the cleaning effect diminishes, the cleaning agent should be disposed of through a specialised waste disposal company. Further details, i.e. operating instructions are available on request.

2B) CLEANING AGENT T

Cleaning agent T is recommended for cleaning smaller quantities. It is a hardly inflammable mineral-oil-containing concrete parting agent (flash point > 100 °C). The cleaning agent should be allowed to react for some hours up to some days. Since the agent only softens or loosens the dirt, any concrete deposits should be blown or brushed off. An additional corrosion protection is only required for a prolonged storage period. Due to the drying time of the cleaning agent T of 4 to 7 days we recommend that a drier be provided.

Cleaning can be effected with our CLEANING/CORROSION PREVENTIVE KIT.

2C) Diesel / Kerosene bath

In this case we recommend the PAUL CLEANING/CORROSION PREVENTIVE KIT. The disassembled anchor grips are immersed in diesel or kerosene for several hours up to several days. Thereafter the components should be allowed to dry for some time with the perforated box (supplied with the cleaning kit) placed onto the cleaning container.

Caution:

Diesel and kerosene (flashpoint 55-110 °C) are highly inflammable and must therefore be kept away from any open flame and must not be dried with a drier.

Diesel and kerosene emit toxic vapour. Wear protecting masks!

Explanations relating to the diagram on page 3:

3A, 3B) Blowing off, drying

To reduce the drying time and to remove loosened, softened dirt, chemically cleaned anchor grips that have been allowed to dry for at least 5 minutes can be blown off with compressed air. Wear safety goggles.

In particular, after an ultrasonic cleaning we recommend that the cleaned anchor grips be allowed to dry for 5 to 15 minutes at max. 85 °C.

4) Preservation / Lubrication

4A) Preservation

Anchor grips that will be stored for several days or weeks are to be preserved with CORROSION PREVENTIVE K using the CLEANING/CORROSION PREVENTIVE KIT. Thereafter the corrosion preventive should be allowed to drop off from the anchor grips placed in the perforated box and to dry for approx. 12 hours so that they can be lubricated before being reused.

4B) Lubrication

The inner taper faces of the barrels are sprayed with PAUL LUBRICANT 350 so as to keep the friction between wedge and barrel during stressing to a minimum and to make sure that the wedge is pulled far enough into the barrel and bites into the prestressing steel. When the lubricant has dried for at least 30 minutes the wedges will be ready for use. For applying the lubricant we recommend our spraying equipment (compressed air required) or our non-stationary, refill-type spray cans or spray bottles filled with propellant.

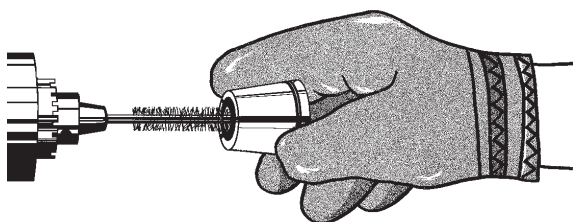
Cleaning agents and cleaning devices

Brushes

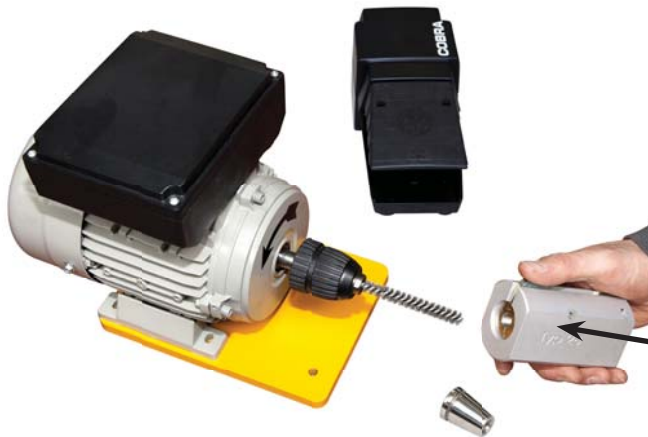
Specially designed brushes are available for cleaning the anchor wedges and barrels. The brushes are clamped into the CLEANING BRUSH DRIVE UNIT. Wearing gloves, the operator moves the wedges and barrels forth and back on the brushes. For the small wedge types we supply holders surrounding the wedges to protect the operator.

How to use the wedge or barrel cleaning brushes

By sliding the wedges or barrels several times over the brush they can be cleaned easily and quickly.



Cleaning brush drive unit



Dimensions L x W x H	300 x 160 x 250 mm
Weight	9.34 kg
Power supply	400V/50Hz
RPM	1500
Order Number	81-038.20

Wedge holder

Wedge holder

The use of a wedge holder is particularly recommended for the smaller wedge types. The wedge is slid into the holder and brushed. After brushing the wedge can be removed from the holder very conveniently. The whole cleaning operation can be carried out with one hand only.

Wedge holder	Order No.
type 14	81-038.25
type 16	81-038.26
type 16 S	81-038.30
type 22	81-038.27
type 28	81-038.28
type 30	81-038.29
type 34	81-038.32

Cleaning brushes of rolled cast steel wire

For wedges:

Discount graduation: 1/3/10/30



Suitable for wedges for wire/strand dia. mm	Brush size mm	Order No.
4-5	125 x 60 x Ø 4	81-038.15
5-6	125 x 60 x Ø 6	81-038.09
6-8	145 x 110 x Ø 8	81-038.01
8-10	115 x 80 x Ø 10	81-038.02
10-12	115 x 80 x Ø 12	81-038.03
12-14	115 x 80 x Ø 14	81-038.04
14-16	115 x 80 x Ø 16	81-038.05

For barrels:
Shank dia. 8 mm

Discount graduation: 1/3/10/30



Barrel type	Order No.
A20.5-14 to A50-38	81-038.06
A20.5-14 to A50-38 with wooden handle	81-038.10
A42-34 to A60-42 with wooden handle	81-038.07
A80-56/10 to A100-66/10	81-038.08

Ultrasonic bath

The 'm40i' bath is sufficient for cleaning anchor grips of up to 100 kg daily. For larger quantities the 'm80i' ultrasonic bath is recommended. The optional drier and wash-basin will facilitate and accelerate the cleaning operation.



Photo:
Ultrasonic cleaning devices m40i and m80i

		m40i	m80i
Volume	(ltr)	40	80
Outside dimensions	(mm)	640 x 390 x 540	760 x 460 x 720
Basket	(mm)	420 x 225 x 225	540 x 290 x 340
Ultrasonic capacity norm./max.	(W)	600/1200	1200/2400
Heating capacity	(W)	1500	2000
Power supply	(V/Hz)	230/50-60	
Connected load	(W)	2100	3200
Filling quantity	(kg)	10	20
Cleaning time per bath	(min)	10-45	10-45
Noise Level		< 71 dB (A)	< 71 dB (A)
Weight	(kg)	48	73
Order No.		81-202.20	81-202.21

Wash-basin

Cleaning agent residues are removed in the wash-basin. This is recommended when using an aggressive cleaning agent. The choice of the detergent to be used is dependent on the pre-treatment of the grips concerned.



Photo:
Cleaning system comprising:
Ultrasonic bath / wash-basin / drier

		m40ir	m80ir
Outside dimensions	(mm)	640 x 390 x 540	760 x 460 x 720
Basket	(mm)	420 x 225 x 225	540 x 290 x 340
Heating capacity	(W)	1500	2000
Power supply	(V/Hz)	230/50-60	
Connected load	(W)	1500	2000
Filling quantity	(kg)	10	20
Cleaning time per bath	(min)	1-5	1-5
Weight	(kg)	37	57
Order No.		81-202.25	81-202.28

Drier

A drier allows to dry larger quantities of grips within a short period and to treat them further immediately afterwards.



Photo:
Drier m40dr

		m40dr	m80dr
Outside dimensions	(mm)	800 x 390 x 490	1100 x 460 x 680
Basket	(mm)	420 x 225 x 225	540 x 290 x 340
Heating capacity	(W)	2000	3300
Power supply	(V/Hz)	230/50	
Max. temperature	(°C)	85	
Connected load	(W)	2200	3500
Filling quantity	(kg)	10	20
Drying time per bath	(min)	5-15	5-15
Weight	(kg)	52	65
Order No.		81-202.22	81-202.23

Basket

The ultrasonic cleaning device is supplied including basket. Drier and wash-basin are supplied without basket.

		m40 Serie	m80 Serie
Dimensions	(mm)	420 x 225 x 225	540 x 290 x 340
Order No.		20-051.14	20-051.19

Cleaning / Corrosion Preventive kit

The CLEANING/CORROSION PREVENTIVE KIT is used for cleaning purposes using CLEANING AGENT T or diesel or kerosene. It is also used for preservation using CORROSION PREVENTIVE K. The container is provided with two chambers, one for pre-cleaning and the other for final cleaning.

The dimensions of the basic container are: L x W x H = 800 x 400 x 300

The dimensions of the two perforated boxes are: L x W x H = 300 x 200 x 200

CLEANING/CORROSION PREVENTIVE KIT
complete with two perforated boxes:

Order Number 81-202.07

Perforated box:

Order Number: 81-202.10



Anchor barrel lubricating devices

To ensure the safe use of the anchor grips, the taper faces of the anchor grips must be lubricated. For this purpose we recommend our LUBRICANT 350.

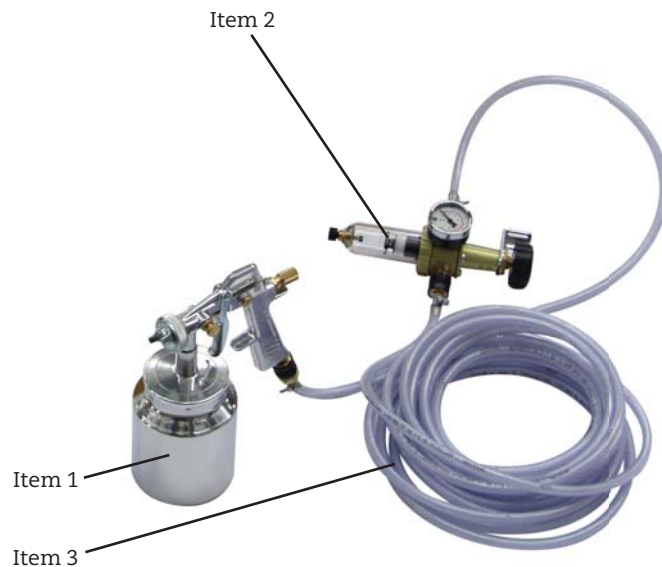
For order number and technical details, see product description.

Spraying equipment for anchor barrels

Suitable for use with PAUL LUBRICANT 350 (compressed air required)

Spraying equipment complete **Order No. 81-202.01**
 composed of: Item 1: Spray gun with pendant cup and 1.5 mm nozzle set
 Item 2: Pressure reducer with holder kit
 Item 3: 2 hoses, each 5 m long

Spare/auxiliary hose, 5 m long (item 3) **Order No. 81-202.02**
 Spare nozzle set **Order No. 81-202.03**



Spray can

refillable, non-stationary

To spray PAUL LUBRICANT 350
 Propellant = air (refillable by means of a hand pump or compressed air)
 Capacity: 0.7 ltr.

including 1 spare standard nozzle
 Spare standard nozzle

Order No. 81-202.05
Order No. 81-202.06



Description of lubricants, cleaning and corrosion preventives

LUBRICANT 350

A waxlike liquid agent in a non-aromatic special petroleum spirit that, once the solvent has evaporated, provides a colourless film that facilitates a firm grip without seizing and that provides protection against corrosion.		
Application:	Applied by spraying, brushing or dipping to the dry anchor barrels. At room temperature allow to dry for approx. 30 minutes until the solvent has evaporated. Before use, shake well. During use, provide good ventilation.	
Technical Data: Smell: Colour: Density at 20 °C, g/cm ³ : Flashpoint to DIN 51755: Application-temperature range: Friction coefficient: Drying period: Propellant:	Canister: of solvent white 0.81 30 °C -40 °C to +70 °C $\mu = 0.05$ approx. 30 min., depending on coating thickness -	Spray can: of solvent white 0.8 (active substance) flammable -40 °C to +70 °C $\mu = 0.05$ approx. 30 min., depending on coating thickness Propane/butane
Ordering data	5 ltr. canister Order No.: 25-010.52	400 ml spray can Order No. 25-010.51
Note: Danger symbol: Safety data sheet: Waste disposal key:	Inflammable Inflammable, A II. The contents can form with air an explosive, highly inflammable mixture. Keep container tightly closed! Keep off heat sources! No smoking! Must not enter sewers! Take measures against electrostatic charge! B 000.22/1 Empty canisters can be recycled. 07 06 04	Inflammable Highly inflammable liquid gas! The contents can form with air an explosive mixture. Observe protective precautions! Pressurized container. Protect against sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn. Do not spray in a flame or any incandescent material. B 000.23/1 Completely empty, depressurized can can be recycled. 07 06 04 15 01 10 16 05 04 16 05 05
Protective measures:	See label on canister or spray can.	

Ultrasonic cleaning agent

ALL PURPOSE CLEAN

Transparent, caustic liquid cleaning agent that, once the solvent has evaporated, provides light protection against corrosion.											
Application:	To be mixed with warm water in the ratio of 1 : 4 (1 portion of All Purpose Clean, 4 portions of water) and poured into the ultrasonic bath. The best cleaning power is obtained at a bath temperature of approx. 40 °C. After cleaning the cleaning agent should be allowed to drop off for some time. For this purpose the basket can be placed onto the ultrasonic bath. Thereafter the pieces should be thoroughly blown off or dried.										
Technical data:	<table border="1"> <tr> <td>State as delivered:</td> <td>Liquid</td> </tr> <tr> <td>Colour:</td> <td>Yellowish</td> </tr> <tr> <td>Smell:</td> <td>none</td> </tr> <tr> <td>pH-value:</td> <td>12.7</td> </tr> <tr> <td>Completely soluble in water</td> <td></td> </tr> </table>	State as delivered:	Liquid	Colour:	Yellowish	Smell:	none	pH-value:	12.7	Completely soluble in water	
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Colour:	Yellowish										
Smell:	none										
pH-value:	12.7										
Completely soluble in water											
Ordering data:	30 kg canister: Order No. 25-010.60										
Note:	<p>Cleaning agent to be used under a suction device or in a well ventilated room. Wear gloves to avoid skin contact as well as safety goggles.</p> <p>Disposal by a specialized waste disposal company. Addresses are available from your district administration or the classified directory.</p> <p>Also see safety data sheet B 000.26/1.</p>										

CLEANING AGENT T

Concentrated mineral-oil-containing concrete parting agent which gradually softens concrete deposits and prevents the formation of new deposits.													
Application:	<p>Components covered with concrete layers or splashes should be immersed in the cleaning agent for some hours up to some days, depending on the degree of contamination. For this purpose use the PAUL CLEANING AND CORROSION PREVENTIVE KIT (81-202.07) consisting of a container and 2 screens – optionally non-galvanized steel or plastic containers and 1 or 2 perforated boxes which can be immersed in the container filled with the cleaning agent.</p> <p>When the dirt has been removed or softened, place a sheet metal plate or screen on the cleaning container and position the perforated boxes thereon or empty them and let the cleaning agent drop off for some time.</p> <p>The cleaning agent may be used in a concentrated or diluted condition, depending on the degree of contamination involved.</p>												
Technical data:	<table border="1"> <tr> <td>State as delivered:</td> <td>liquid, ready for use</td> </tr> <tr> <td>Diluent:</td> <td>diesel oil</td> </tr> <tr> <td>Storability</td> <td>unlimited</td> </tr> <tr> <td>Toxicity:</td> <td>none</td> </tr> <tr> <td>Explosive:</td> <td>no</td> </tr> <tr> <td>Injurious vapours:</td> <td>avoid inhaling</td> </tr> </table>	State as delivered:	liquid, ready for use	Diluent:	diesel oil	Storability	unlimited	Toxicity:	none	Explosive:	no	Injurious vapours:	avoid inhaling
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Diluent:	diesel oil												
Storability	unlimited												
Toxicity:	none												
Explosive:	no												
Injurious vapours:	avoid inhaling												
Ordering data:	<p>30 ltr. canister: Order No. 25-010.54</p> <p>200 ltr. sheet metal barrel: Order No. 25-010.55</p>												
Notes:	<p>The cleaning agent T need not be particularly identified, it is not dangerous. Disposal like waste oil, i.e. charge a specialized company with the disposal.</p> <p>Waste disposal key: EAK-AS 130205 non-chlorinated, mineral oil base machinery, gear and lubricating oils.</p> <p>Also see safety data sheet B 000.21/1</p>												

CORROSION PREVENTIVE K

A mixture of aliphatic and naphthalenic hydrocarbons with aromatic compounds and solid matter to provide a corrosion-protection film - a Vaseline-wax additive combination that provides above-average corrosion protection.		
Application:	Submerge anchor grips in the undiluted medium for 2 to 5 minutes. After removal at room temperature, allow to dry for 1.5 to 3 hours. Corrosion protection is only provided once all the solvent has evaporated and so parts should only be packed once they are absolutely dry. The liquid in the bath should be replaced as soon as it becomes cloudy through the presence of contamination. Use our cleaning and corrosion preventive kit (81-202.07) or some other galvanized or stainless-steel or aluminium container. Use: See cleaning agent T	
Technical data	State as delivered: Colour: Smell: Density at 15 °C (g/cm ³): Flashpoint (°C): Spontaneous inflammability: Solubility in water:	liquid brown characteristic 0.82 75 °C (EN ISO 2592) not spontaneously inflammable non, i.e. little miscible
Ordering data:	20 l canister: Order No. 25-010.59	
Notes:	Inflammable. - Must not get into the hands of children. - Store the container in a well ventilated room, keeping it tightly closed. - Keep away from sources of ignition. Allow no smoking. - Take measures to counter electrostatic charging. The exact waste disposal key can only be determined by the waste producer by referring to the European waste catalogue (EAN/AVV). Also see safety data sheet B 000.34/1	

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Error and modification reserved.

LUBRICANT PASTE 100

Molybdenum disulphide paste, a combination of molybdenum disulphide and other solid lubricants.		
Application:	For threaded parts (taper sleeves) / clamping jaws of stressing jacks, mounting paste for threads and seals of stressing jacks. Clean sliding surfaces, apply paste with a brush or a fluff-free cloth.	
Ordering data:	250 gr. can: Order-No. 25-010.40 1000 gr. can: Order-No. 25-010.39	
Notes:	see safety data sheet B 000.27/1	

**Caution!**

when using other cleaning agents!

The use of acidic concrete solvents is forbidden and dangerous.

These solvents eat away the hardened top layer of the anchor wedges

which may lead to slippage of the prestressing steel. RISK OF FATAL INJURY!