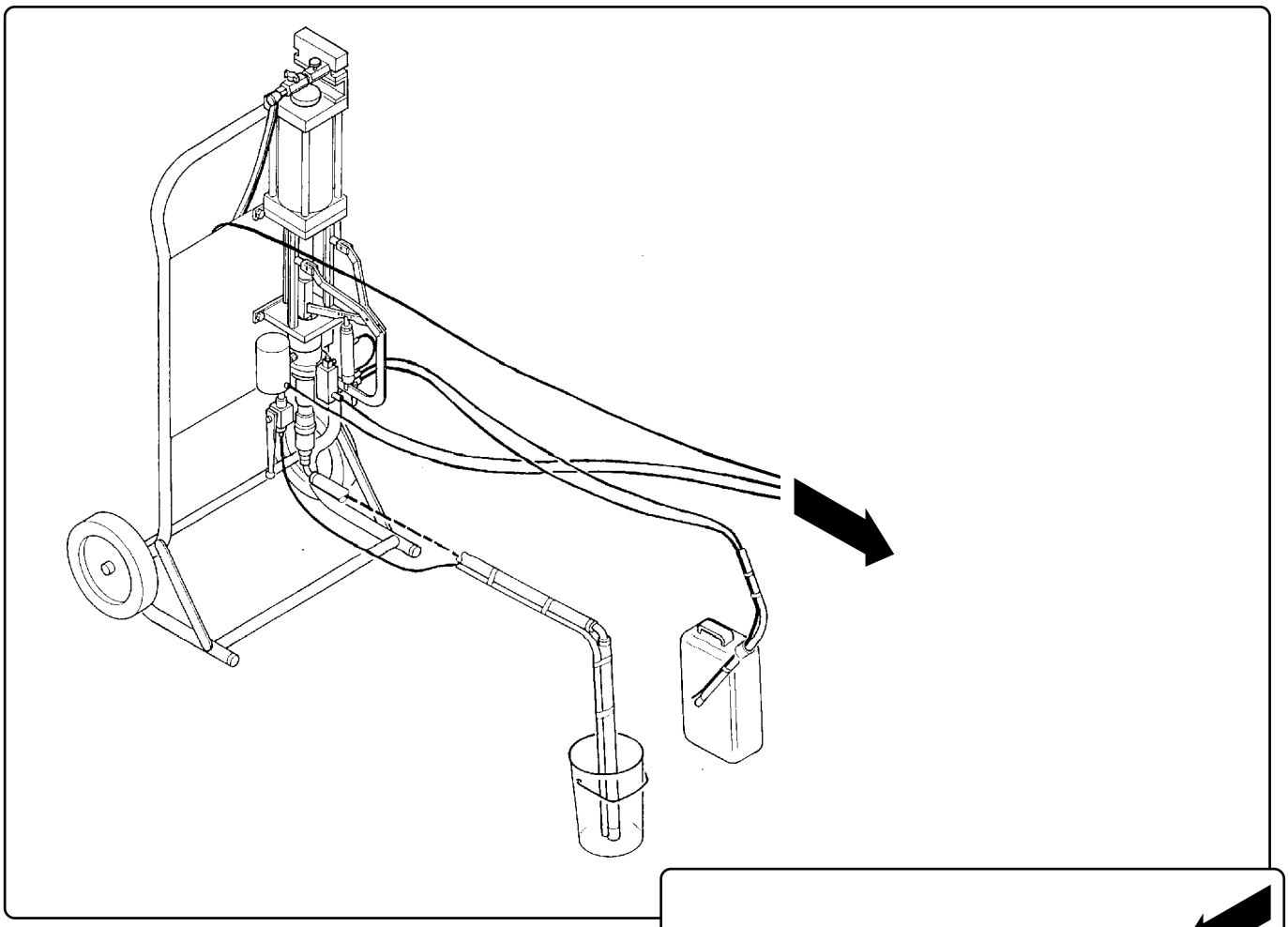
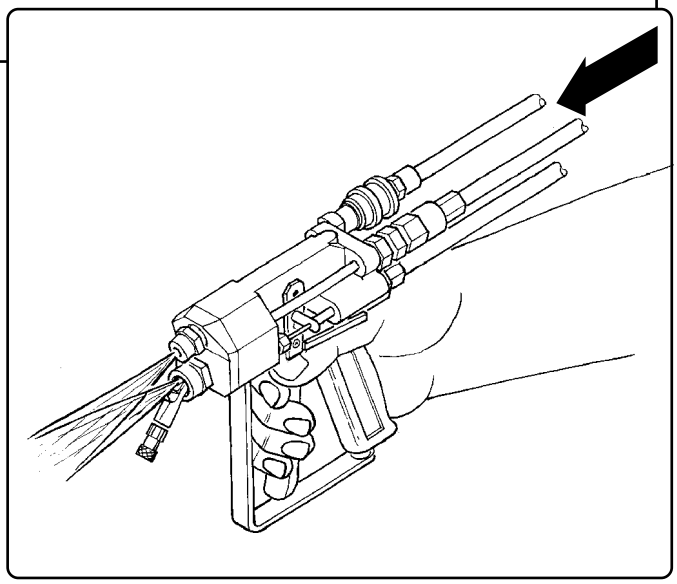
WOLFANGEL®

GFK-Technologie

INSTRUCTIONS FOR USE OF GELCOAT EQUIPMENT

- **First-Read the instructions**
- **Then-Display them in the workplace**





⚠ Only trained personnel should use this equipment ⚠

CONTENTS

Technische Daten

Machine type ..... **RW Gelcoat Airless Spraying Plant**
Transportation ..... **sack barrow**
Dimensions (length, breadth, height) .. **600mm x 350mm x 1100mm**
Weight **400N**
Power ..... **compressed air**
Maximum air intake pressure ..... **16 bar**
Maximum operating pressure **8bar**
Power A-Pumpe ..... **air motor Ø100 x 120**
- output volume ..... 44ccm / DH
- theoretical pressure ratio 40:1
- dosing control ..... pressure governor and nozzle

Power B-Pumpe ..... **fan lever (dosing lever) for pump combination**
- output volume ..... variable 0,4 - 1,1ccm / DH
- dosing control ..... fan lever adjustment
- type / means of mixing ..... external mixing

Manufacturing tools ..... **RW-High Pressure Spray Gun**

Hose attachment
- A component ..... HD DN 06N
- B component ..... HD DN 02VA
- compressed air hose ..... PA 12 smooth

In general

Congratulations
on purchasing WOLFANGEL gelcoat spraying plant.
You have chosen well. Installation, operation and care are simple.

Please read these operating instructions before use. You will find here everything you need to know to ensure trouble-free use of this equipment.

Guarantee

WOLFANGEL offers a 12 month guarantee for all products sold under the trademark WOLFANGEL provided:

- defects or resulting damages are repaired by WOLFANGEL.
- due note has been taken of these operating instructions.
- due note has been taken of any other instructions and directions which are relevant to work with this equipment.

If these conditions are met, WOLFANGEL will repair or exchange free of charge all damaged or defective parts which should be sent, carriage paid, direct to WOLFANGEL or to a WOLFANGEL Customer Service department.

The guarantee does not cover damage and wear and tear which result from:

- misuse
- abrasion
- corrosion
- negligence
- misadventure
- installation of parts not supplied by WOLFANGEL
- incorrect assembly
- treatment of the equipment which impairs normal working

Please communicate claims as soon as the fault has been established.

Always give us:

✏ **the serial number.**
✏ **the order number.**
✏ **an accurate description of the problem**

If a defect occurs within the guarantee period which cannot be attributed to faulty production methods or material, we will make an appropriate adjustment to the invoice to cover the repair work.

⚠ Only use original replacement parts

- **Replacement parts which have not been supplied by us have not been tested by us.**
  - Such replacement parts (or accessories) may alter the characteristics of the spraying plant.
  - Safety may also be impaired.
  - We do not accept blame for any damage that arises from the use of non-genuine replacement parts.
- **Original and non-original parts often have different specifications.**
  - We always offer replacement parts which conform to the latest regulations.

After-sales service

Our Customer Service Department will help with any questions or orders.

Telephone, fax or write to us at:

RW Rolf Wolfangel GmbH
FRP - Special tools and machines
Roentgenstrasse 31
✉ **D - 71254 Ditzingen / Heimerdingen**
☎ **(49) 07152 / 51071**
(49) 07152 / 58195

LIMITS OF APPLICATION

WOLFANGEL Gelcoat Spraying Equipment is manufactured according to current technology and recognised technical safety regulations.
If used improperly there is nethertheless danger to life and limb of the user, a third party or property.
Therefore only use the equipment:

- **in good working order,**
- **paying due attention to safety,**
- **paying due attention to danger**

WOLFANGEL Gelcoat Spraying Equipment is designed exclusively for work with:

- **sprayable polyester resin**
- **organic peroxide (suitable for resin)**
- **cleaning agent (acetone etc.**

for the production of **GRP parts**
(working temperature from 18^{0}C - 40^{0}C)

Any use not listed above is not considered appropriate. **The manufacturer/supplier is not responsible for any damage resulting from misuse, which is at the user´s risk.**

Limits of application include:

- **taking due note of these instructions for use**

Before working with the Gelcoat Spraying Equipment, check without fail that:

- **materials are adjusted one after the other**
- **operating pressures are correct**

SAFETY AND ACCIDENT PREVENTION

SOLVENTS / CHEMICALS

We do not produce or sell any solvents or chemicals for use with this equipment. We therefore accept no responsibility for their effects.

A number of solvents and substances are specified (UP, PU, EP, MEKP, Isocyanate etc.)

Demand all available information on the substances concerned from the manufacturer/supplier, particularly with regard to:

- **handling,**
- **compatibility with the packing and metal used in the equipment.**

A safety data sheet, which can be obtained from your supplier, has been drawn up for the solvent. (Ref. EN 52 9007)

- **it describes special precautions and preventative measures**
- **take note of the recommendations contained in it.**

This equipment may contain galvanised or aluminium parts.
Halogenised hydrocarbon can react with these parts under certain conditions.
Then can lead to danger of explosion.
Obtain information from your substance manufacturer/ supplier.

You should also take into account possible danger due to:

- **poisonous spray mist,**
- **fire,**
- **explosion,**
- **reaction time after mixing,**
- **toxic effects of the manufactured material or its components on humans, animals and plants.**

Obtain relevant information from your substance manufacturer / supplier.
The hardener is caustic!

HYGIENE AT WORK

The manufacturer´s safety data sheet normally gives information on preventive measures as regards hygiene which are relevant to a particular manufacturing substance.

- **Respect this!**
- **Respect also general rules of hygiene.**
- **Ensure adequate ventilation.**

NOISE LEVEL

The noise level is under 78 dB.
No Noise protection is necessary.

CARE

Dispose of waste is accordance with the stipulations of the responsible controlling authority.

FURTHER SAFETY MEASURES

High hydraulic pressures prevail within the plant when:

- **the pressured supply to the pump is uninterrupted,**
- **pressure build-ups are not released (by operating the spray-gun or via the release valve)**

The high-pressure jet from the spray-gun **nozzle can pierce the skin should it come into contact with the body. This can lead to serious injury.**

The high exit velocity of material from the nozzle can generate a static electrical charge and result in sparking.
This leads to danger of fire and explosion.
You should therefore always observe the following safety measures:

- Never point the spray-gun towards yourself or others.
- Never place hand or fingers over the nozzlet.
- Make safe the spray-gun when not in user.
- Never exceed the recommended operating pressure of the plant or its individual components (spray-gun, hose, pump etc.).
- Never operate the plant with the safety cover removed.
- Before carrying out repairs, first switch off the compressed air and discharge the pressure build-up via the spray-gun or release valve.

The pressure hoses can become leaky due to abrasion, cracking, mishandling, etc.
Therefor:

- Never attemp to seal hose leaks with the body, sticky tape or other expedient.
- Never patch hoses.
- Leaky hoses should always be replaced.

Take care when unscrewing hoses. A blocked lead can contain material which is still at high pressure.
Therefore:

- **Reduce pressure via the pressure discharge valve before disconnecting hose and spray-gun.**
- **Discharge all static electricity by touching plant components to earth.**
- **Use the lowest possible pressure when cleaning. Keep the spray-gun close to an earthed waste bucket whilst cleaning.**
- **If the plant is altered, the model label must be changed**
- **Always set right immediately anything which may affect safety.**
- **Take note of general legal and other obligatory requirements regarding accident prevention and care of the environment.**
- **Anybody who is instructed to operate the appliance either for work or to service, maintain or repair the plant etc. must read and understand the whole Operating Instructions document, paying particular attention to the chapter on Safety and Accident Prevention.**
- **We recommend you demand written confirmation that this has been done.**
- **Check occasionally that personnel are operating with due regard to safety, and are observing the instructions and directions in the Operating Instructions. We recommend 1/2 yearly training.**
- **Pay attention to all safety instructions.**
- **All safety instructions must always be available to inspect.**
- **Only use the machine if all protective equipment, detachable protective equipment, emergency equipment etc. is available and in working order.**
- **Reinforce precautions via company instructions.**

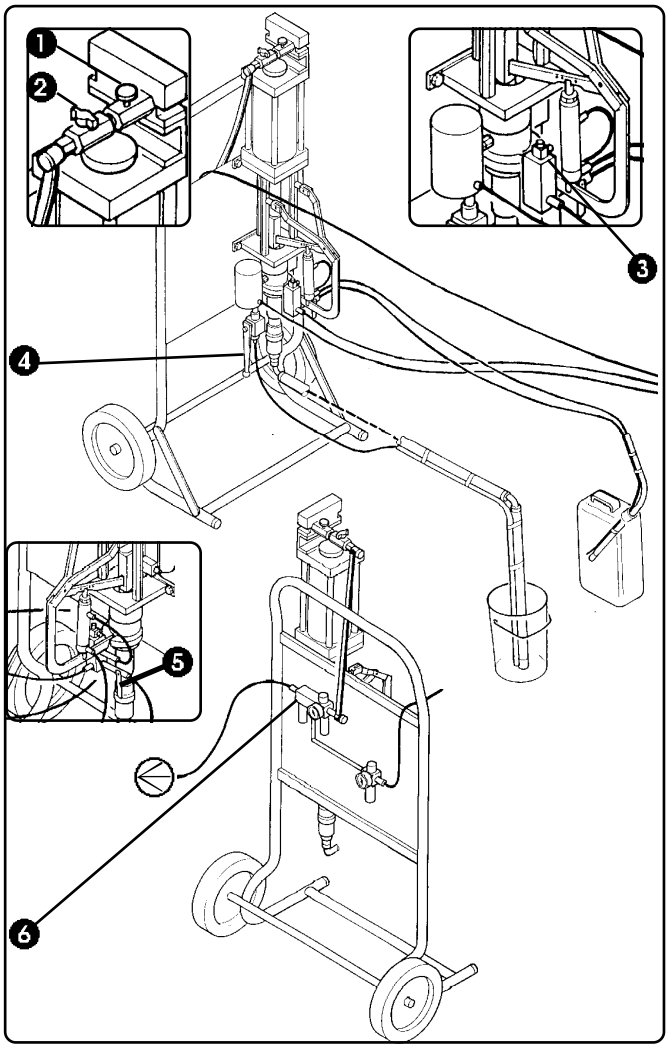
Our recommendation:
All technical equipment should be checked for safe working by a competent person at regulate intervals.

PRESSURE CERTIFICATE FOR HOSES

Hose type	**1004 KF**	**1006 KF**	**1010 KF**
Nominal size	**4**	**6**	**10**
Test pressure	**1500 bar**	**1240 bar**	**980 bar**
Max. working pressure -dynamic	375bar	310bar	240bar
-static	600bar	495bar	285bar
Test pressure	**1500bar**	**1240bar**	**960bar**
Test time	**1 minute**	**1 minute**	**1 minute**

The hoses listed in the table on the left have been subjected to a definitive pressure test by our supplier.

SAFETY ARRANGEMENTS

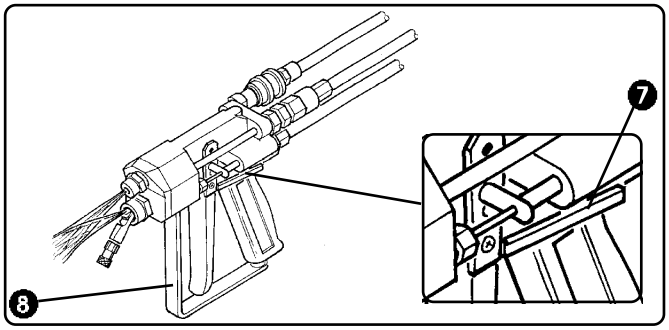


1 Air vent stopcock for air motor
2 Stopcock for air motor

3 Pressure release valve for hardener
4 Return stopcock for gelcoat

5 Return stopcock for hardener

6 Rapid coupling to disconnect from compressed air network



7 Safety lever secures trigger
8 Guard ensures against accidental use of trigger

ACCESSORIES

- **1 - litre Special Lubricating Oil for the pump rinse pocket**
- **1 - service instructions**
- **1 - spare parts list**

OPERATION

- Use the spray-gun to spray a mixture of hardener / atomiser - air (high ratio) and gelcoat (low ratio;adjustable) onto the mould.

The materials are propelled through the hose to the spray-gun by means of compressed air, specifically through the:

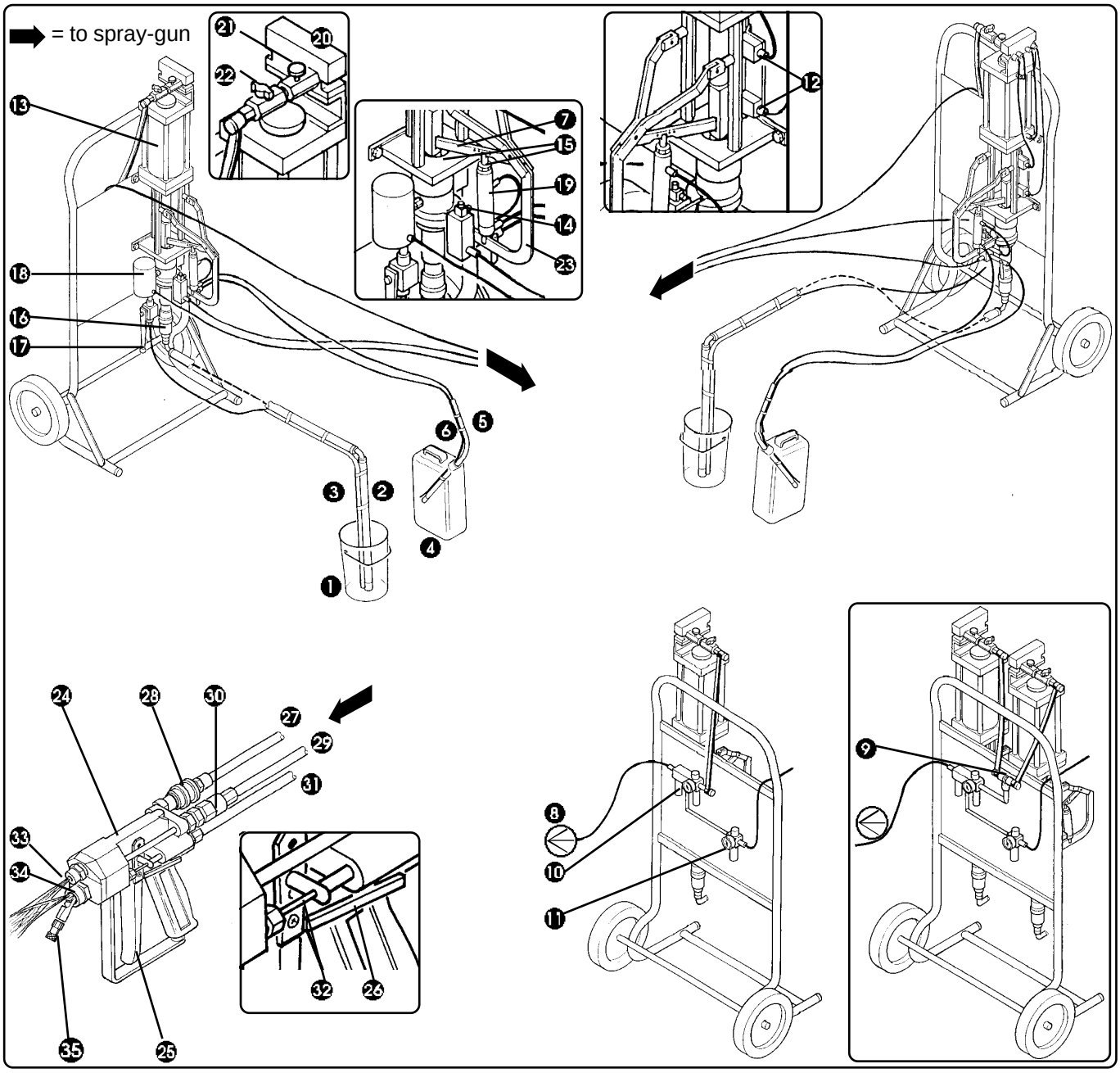
- **large pump for A-component (resin) and the**
- **small pump for B-component (hardener)**

The fan (dosing lever) couples 'A' and 'B' pumps mechanically. (Pump combination)

Advantage: Faulty mixing is excluded because both pumps open and close simultaneously.

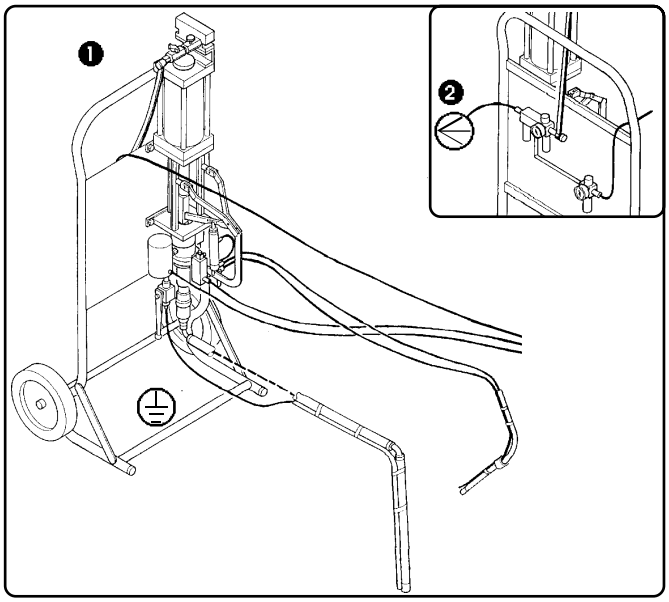
- When storing the fan lever, the mix ratio of resin / hardener can be adjusted.

A compressed air cylinder (air motor) is the power source for the pump combination.
(Compressed air supply from your compressed air network)



1. **Gelcoat bucket** (30 Lt / original container)
2. **Gelcoat suction tube**
3. **Gelcoat return hose**
4. **Hardener container** (Hobbock / original container)
5. **Hardener suction tube**
6. **Hardener return hose**
7. **Dosing lever for hardener**
8. **Connection to compressed air network** ⊖
   with rapid coupling and water extractor
9. **Branching** (when there are 2 air motors)
10. **Pressure gauge for air motor** (adjustable pressure)
    with compressed air oil reservoir
11. **Pressure gauge for atomised air** (adjustable pressure)
12. **Control valve** for ON / OFF switch (5/2 way valve)
    of air motor piston
13. **Air motor**
14. **Pressure release valve** for hardener
15. **Rinse pocket for special lubricant** to reduce abrasion
16. **A-pump for gelcoat**
17. **Return stopcock** for gelcoat
18. **High pressure filter** for gelcoat
19. **B-pumpe** for hardener
20. **Switch-over valve** (5 / 2 way valve; ON/OFF switch)
21. **Outlet valve** for air motor
22. **Stopcock** for air motor
23. **Pump combination**
24. **Spray-gun**
25. **Trigger**
26. **Safety lever -** safeguards the trigger
27. **Gelcoat (in)** - (black hose)
28. **High pressure connection**
29. **Hardener (In)** - (VA texture / high pressure hose)
30. **VA fine filter**
31. **Atomised air (In) - red PA hose**
32. **Nozzle needle (2 x left & right)**
33. **Nozzle for hardener / atomised air mixture (Out)**
34. **Nozzle for gelcoat (Out)**
35. **Vario nozzle**

DELIVERY AND INSTALLATION



The gelcoat spraying plant is delivered ready to connect. It only remains to:

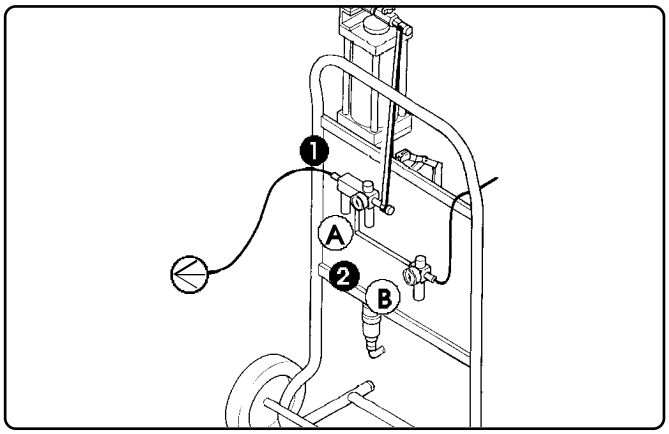
1. **put the equipment in place and**
2. **connect it to the compressed air network ⊖.**

⏚ **Be sure to earth the equipment!**
(To protect against static charge)

⚠ Ensure adequate ventilation/extraction
Also consider regulations covering the maximum concentration of fumes in the workplace, and the measurement and evaluation of this.

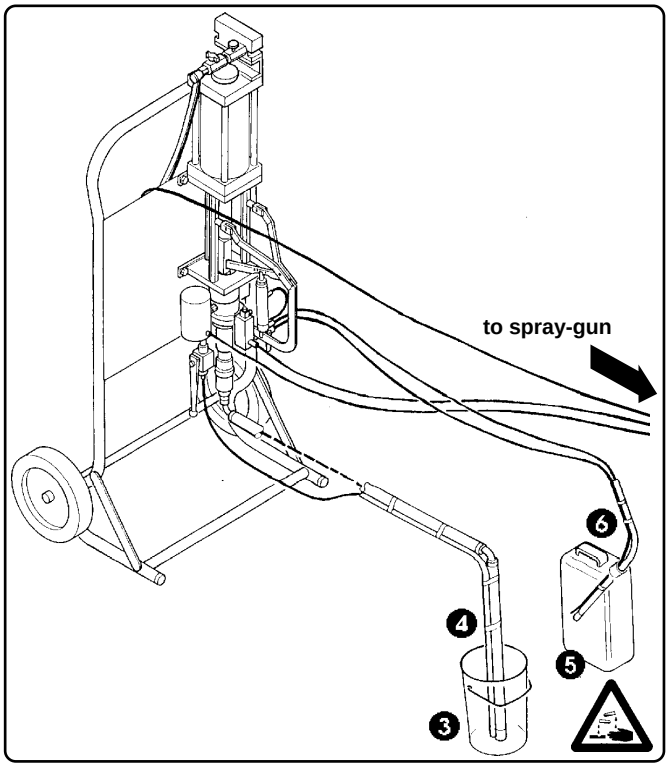
⚠ Prevent/avoid body contact with the work materials.

STARTING UP



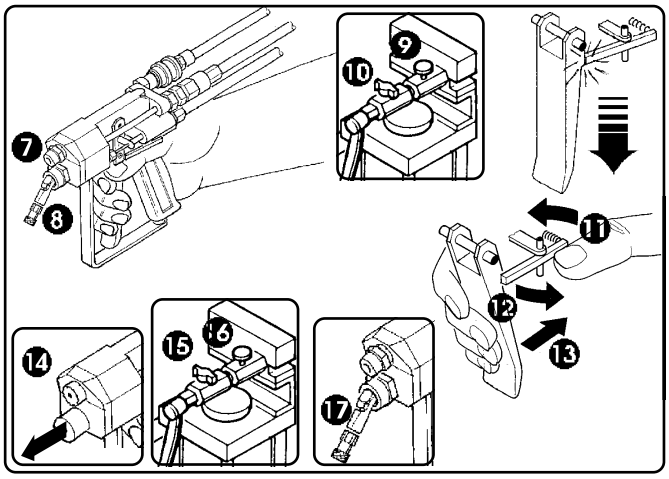
⚠ **Check without fail that all hoses are firmly attached and leak-free!**

1. **Connect compressed air**
2. **Set working pressure**
   Ⓐ - resin pump -------- 6 - 8 bar, (air motor)
   Ⓑ - atomiser ---------- 1 - 4 bar.



3. **Set up gelcoat bucket** (original container)
4. **Place hardener suction tube in gelcoat bucket** (black hose)
5. **Set up hardener container** (original / Hobbok)
5. **Place suction tube in container opening** (clear hose)

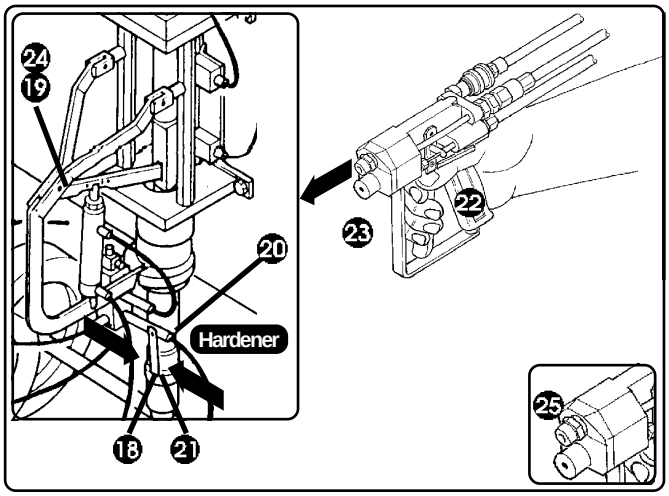
Care!Hardener is caustic!



7 **Unscrew nozzle**
8 **Unscrew vario-nozzle and atomiser hood / cover**
9 **Open air vent**
10 **Open stopcock**
11 12 **Secure trigger with thumb**
13 **Squezze trigger**
14 **...until gelcoat comes out**

⚠ **Direct spray-gun nozzle into a waste bucket!**

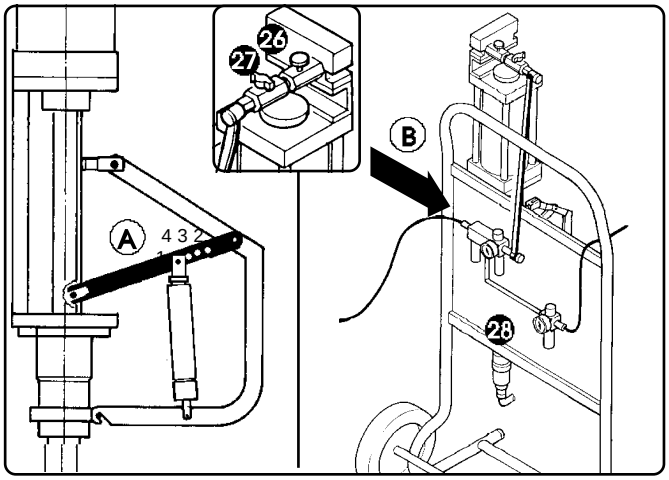
15 **Close stopcock**
16 **Close air vent**
17 **Screw nozzle back into place**

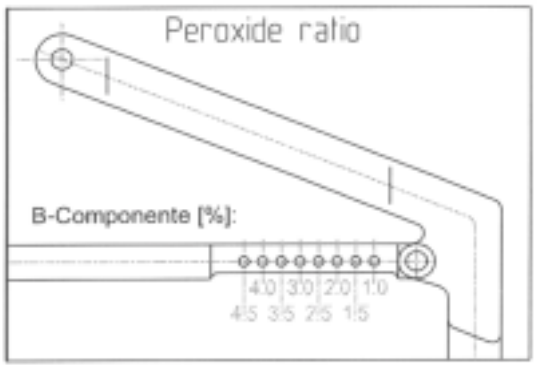


18 **Open return stopcock on distributor**
19 **Remove hardener unit and set hardener pump in motion by hand...**
20 **... until hardener appears at return stopcock** (clear hose)
21 **Close return stopcock**
22 **Secure trigger and squeeze...**
23 **... until hardener comes out bubble-free**

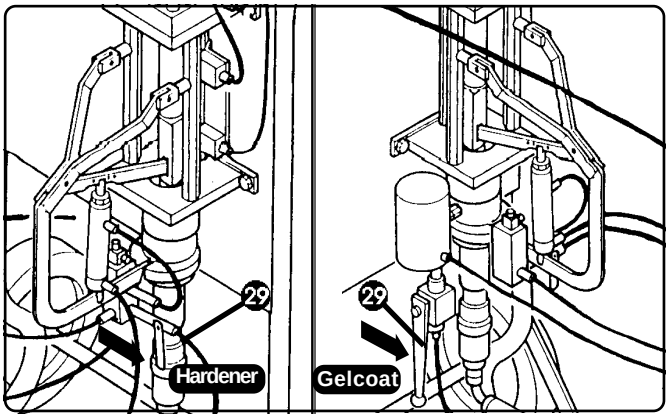
⚠ **Direct spry-gun nozzle into a waste bucket!**

24 **Remove hardener unit again**
25 **Screw vario-nozzle and atomiser back in place**





⚠ For gelcoat-application do not use more than 2%.



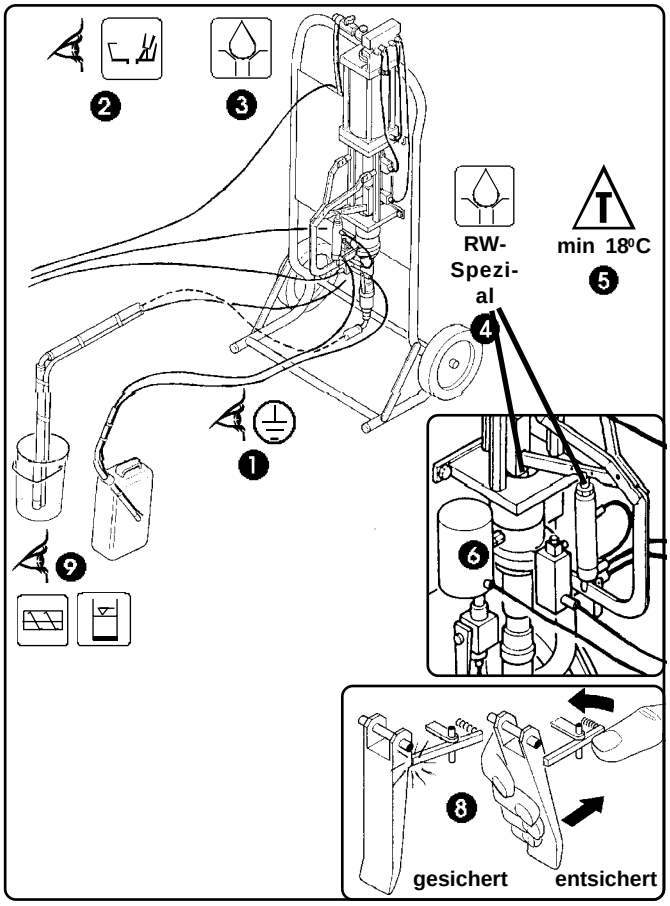
Synchronise resin pump and atomiser successively

26 **Open air vent**
27 **Open stopcock**
28 **Switch on atomiser**

29 **Lever of return stopcock closed** (low pressure) **when return hoses are full**

The equipment is now ready!

BEFORE STARTING WORK



❶ **Check that:**
- Static has been discharged from the equipment
- Static has been discharged from the object to be sprayed

❷ **Clean the equipment and check for leaks**

❸ **Grease the pumps and the spray-gun**
Grease the pump rinse pocket with RW

❹ **Special Greasing Agent**

❺ **Set up the pump in a place where the temperature does not drop below 18°C**

❻ **Check outlet valve and outlet distributor (if present) and close**

❼ **Check spray-gun filter and filter on outlet distributor (if present) for cleanliness**

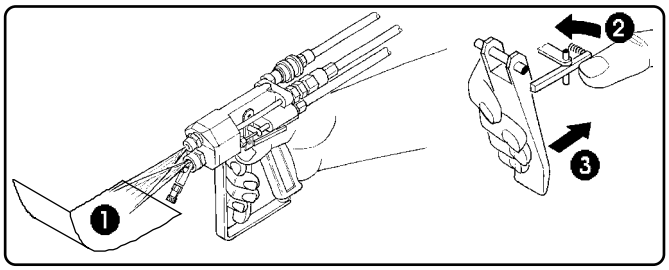
❽ **Check spray-gun:**
- Is safety lever in working order?
- Is trigger in working order?

❾ **Check material containers:**
- Is material correctly mixed?
- Are containers sufficiently full?

⚠ **Ensure that pumps, hoses and spray-gun are kept clean!**

This guarantees the long life of the equipment!

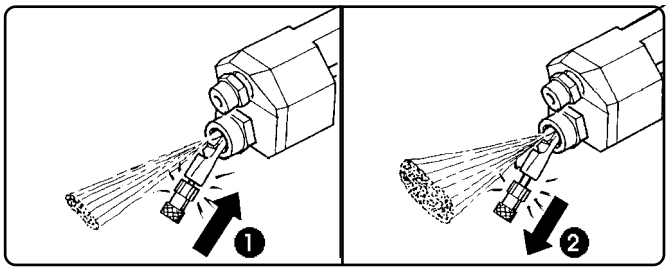
DURING WORK



❶ **Point nozzle towards the object to be sprayed**

❷ **Secure trigger with thumb**

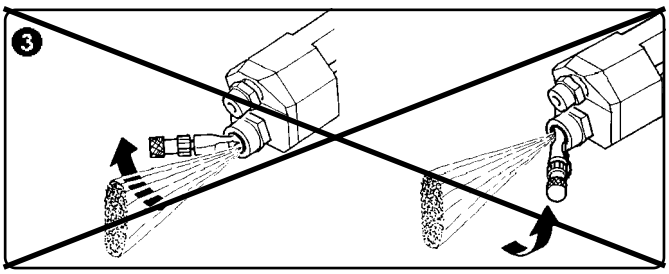
❸ **Squeeze trigger**



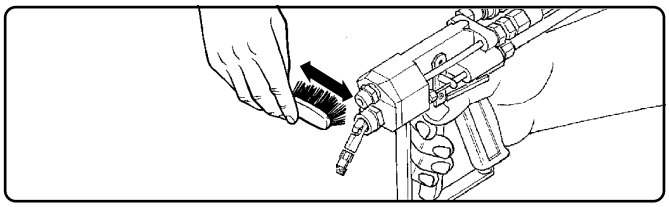
Adjust Vario Nozzle (gelcoat nozzle)

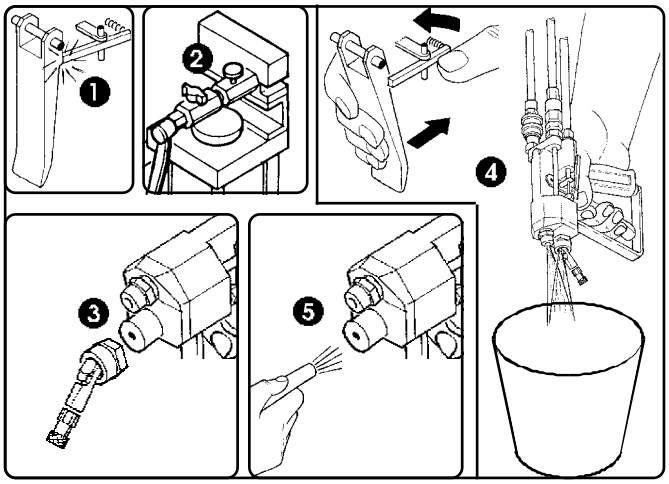
❶ **Turn nut fully in (➡): narrow jet**

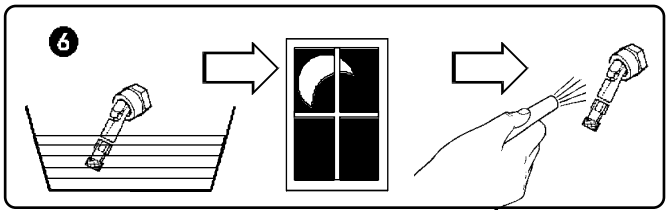
❷ **Turn nut fully out (⬅): broad jet**



❸ **Wrong!**
Gelcoat and hardener not fully mixed







Cleaning the spray-gun

⚠ Prevent any obstruction of the nozzle whilst working

- **Clean the nozzle successively with brush and solvent**

If nozzle is blocked:

1. **Secure spray-gun** (with safety lever)**.**
2. **Switch off air motor** (close air valve)**.**
3. **Dismantle the nozzle and clean with solvent**
4. **Release pressure in spray-gun**
   - **secure spray-gun**
   - **squeeze trigger**
   - **direct spray-gun into a bucket**
5. **Blow out spray-gun**
   - **always from the front and at a maximum of 2 bar**

Wear safety goggles

Wear gloves

If the blockage cannot be blown out:

6. **Soak the relevant part in solvent overnight**
   - **Thereafter blow out again**

⚠ Protect hard metal parts from damage!

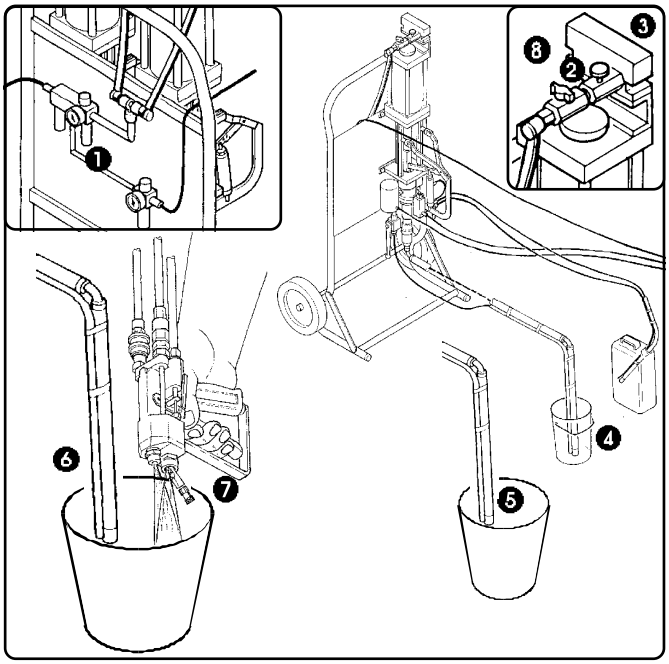
Cleaning the plant

Frequency of cleaning the plant depends on

- **the manufacturing material used and the**
- **general work conditions**

The cleaning programme should suit your production conditions,eg:

- **daily when using quick-drying or hydrous materials**
- **less often under other conditions**



⚠ Always clean:

- **before changing materials**
- **if you use other solvents when changing materials**
- **at the weekend**
- **before a long shut-down** (e.g. company´s annual closure)

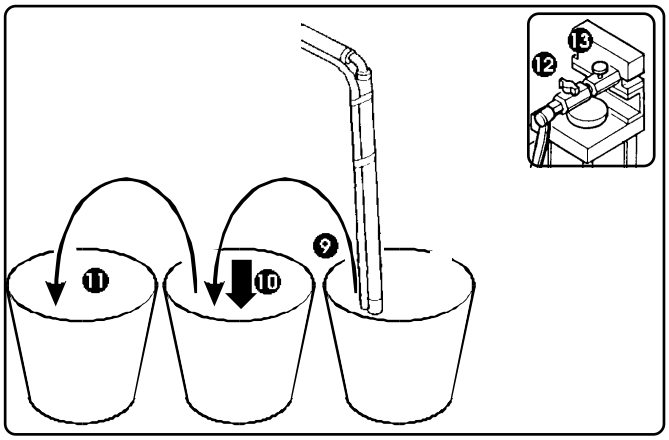
This will ensure the long life of your equipment!

1. **Reduce spray-gun pressure to ca. 1.5 bar or the minimum**
2. **Switch off air motor** (close air valve)
3. **Remove filter and place in solvent**
4. **Take suction tube out of container**
5. **Pump equipment free of material** (e.g.into a bucket)

Now allow solvent to circulate through the equipment whilst:

6. **Placing suction tube in bucket of solvent**
7. **Holding spray-gun nozzle in same bucket**
8. **Switching on air motor** (air valve open)**.**

SERVICING



Allow solvent to circulate for a few minutes.
Then:

- ❾ **Take suction tube out of bucket**
- ❿ **Pump equipment free of solvent**
- ⓫ **Replace suction tube in clean solvent**

Rinse equipment through again (repeat ❻ **-** ❿) **until clean solvent flows out of the spray-gun nozzle.**

- ⓬ **Switch off pump** (close air valve)
- ⓭ **Release pressure**

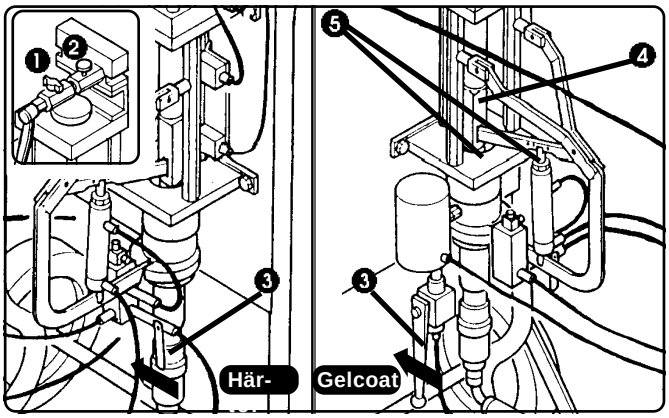
Allow equipment to stand filled with solvent

- ⓮ **Remove spray-gun nozzle and filter, clean in solvent and blow out with air**
- ⓯ **Pump out solvent before starting up the equipment**
- ⓰ **Place filter in outlet distributor** (if present)
- ⓱ **Switch on the pump and let the production material circulate through the equipment for a short time**
- ⓲ **Replace the nozzle**

⚠ **Never rinse onto the floor!**

- **The cleaning agent must be collected in a suitable container**
- **Dirty solvent can be reclaimed via distillation and reused**
  WOLFANGEL can supply suitable distillation equipment

ON FINISHING WORK



- ❶ **Close the stopcock**
- ❷ **Close the ventilation stopcock**
- ❸ **Open lever on return stopcock**
- ❹ **Piston rod should be kept in bottom position**
- ❺ **Always top up the pump´s rinse pocket with RW Special Greasing Agent**

⚠ **If the plant is to remain unused for any lenght of time (weeks/months):**

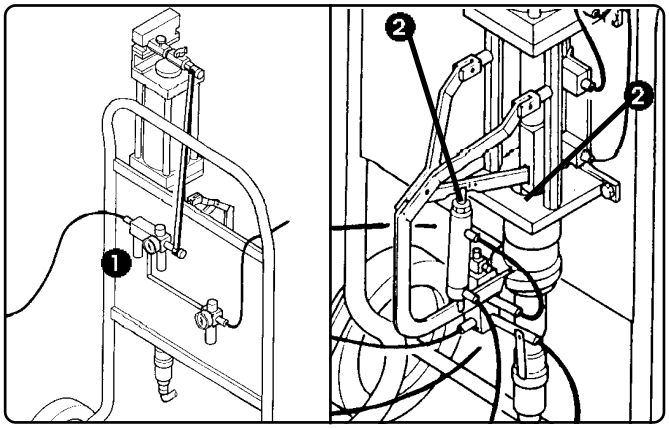
- **Thoroughly clean the resin system with solvent**
- **Fill the system with a 50 : 50 mixture of solvent :**

This ensures trouble-free starting-up after a long shutdown!

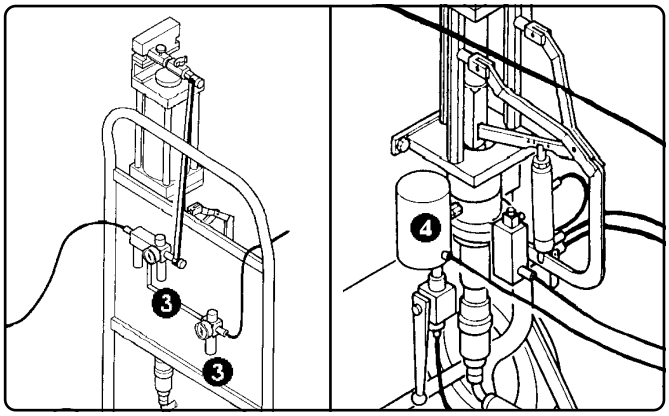
Before undertaking maintenance work, first disconnect compressed air supply, release pressure and drain any remaining material:
+ via the spray-gun or
+ via the air vent

Wear safety goggles

The gelcoat spraying equipment requires little maintenance. Observe the following directions and you will have lenghty enjoyment of your equipment.
Daily



❶ **Empty water separator**
❷ **Check rinse pocket and refill with special greasing agent** (supplied) **to reduce abrasion**



When necessary

❸ **Refill compressed air oil***
(Öil level visible in inspection window)
***obtainable from youroil supplier**

❹ **Clean high pressure filter**

On replacement of parts or
at the weekend or
before a long shutdown:

- **Clean the equipment**

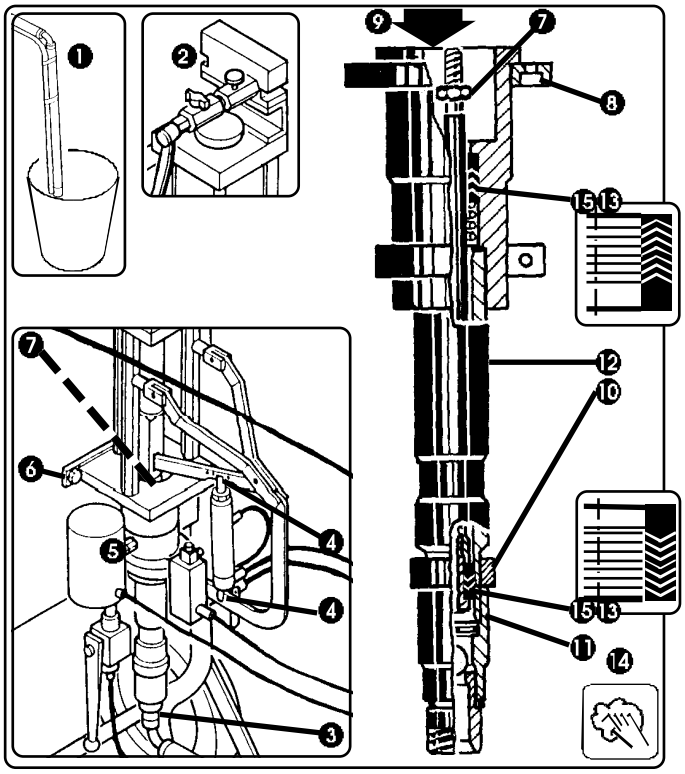
Always keep the equipment clean!

Then it will function trouble-free for years!

REPAIR AND CHANGING PARTS

■This workshould only be carried out by experienced personnel

> ⚠ **Before undertaking repair work, first disconnect compressed air supply, release pressure and drain any remaining material:**
> **+ via the spray-gun or**
> **+ via the air vent**

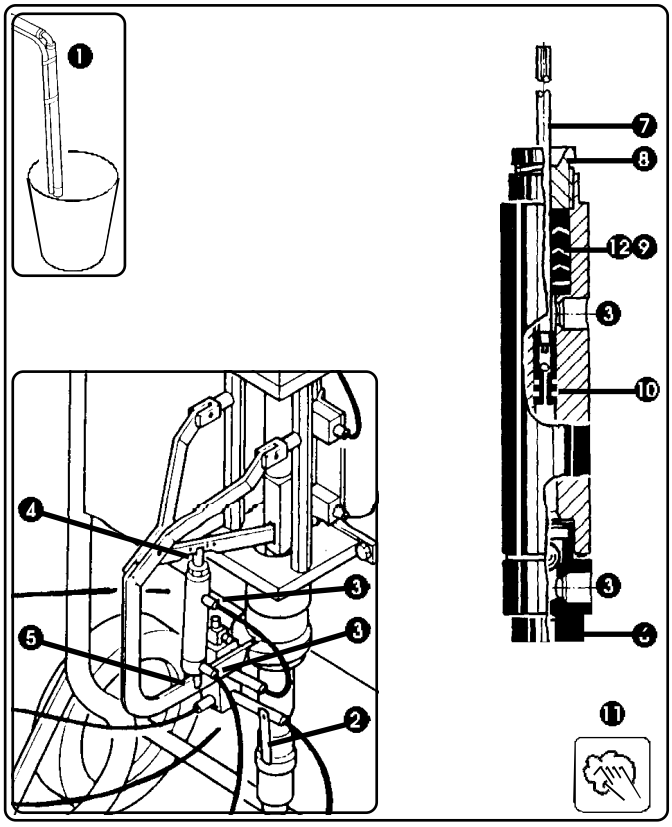


Changing the packing on 44ccm material pump

- If the pump is no longer running smoothly, and/or
- If material is coming out of the flask and packing:

1. **Pump out the material system**
2. **Disconnect compressed air supply from compressed air cylinder**
3. **Loosen** (illegible) **screw**
4. **Remove hardener unit**
5. (completely illegible)
6. **Seperate pump combination from equipment and fix in a vice**
7. **Loosen counter nut on the piston rod**
8. **Loosen starting ring**
9. **Unscrew pump coupling and fix in a vice**
10. **Loosen bottom valve counter nut**
11. **Unscrew bottom valve body**
12. **Screw out pressure body and push out piston rod**
13. **Remove old, compressed matter**
14. **Clean the part**
15. **Fit new packing set**
16. **Reassemble in reverse order**

> ⚠ ■ **Be careful with packing!**
> ■ **Clean and grease the thread!**



Changing the packing on Hardener Pump HP06

- If the pump is no longer running smoothly, and/or
- If material is coming out of flask and packing:

1. **Pump out the material system**
2. **Release pressure via pressure discharge stopcock**
3. **Loosen all hose connections**
4. **Disconnect upper part of piston rod from fork-shaped piece**
5. **Loosen pump from holder**
6. **Loosen bottom valve**
7. **Push out piston rod towards bottom**
8. **Remove upper part of pump**
9. **Remove upper packing set (4 parts)**
10. **Remove packing ring from piston rod**
11. **Clean all parts**
12. **Fit new packing set**
13. **Reassemble in reverse order**

> ⚠ ■ **Be careful with packing!**
> ■ **Clean and grease the thread!**

CORRECTING PROBLEMS (FAULT-FINDING LIST)

Problem	Reason	Action
Pump not working	● Air supply insufficient or hose blocked	● Increase supply Clean hose Check atmospheric pressure
	● Atmospheric pressure in-sufficient or air valve closed/ blocked	● Increase atmospheric press-ure, clean blocked hose or valve
	● Air / material valve or gasket damaged	● Replace valve or gasket
	● Material container empty	● Fill or rinse out.
Pump working, but quantity of material produced too scanty on both strokes	● Air supply insufficient or hose blocked	● Increase supply Clean hose Check atmospheric pressure
	● Material connnection / valve/ spray-gun etc.blocked	● Clean with cleansing agent
	● Material container empty	● Fill or rinse out
	● Air / material valve or gasket worn or damaged	● Replace valve or gasket
	● Packing nut loose or packing damaged	● Tighten packing nut or replace packing
	● Dried material on piston rod	● Clean pump with cleansing agent. Always support from lowest connection point
Pump working, but quantity of material produced too scanty on upward stroke	● Air / material valve or gasket worn or damaged	● Replace valve or gasket
	● Bottom valve dirty	● Clean with cleansing agent and check
Pump working, but quantity of material produced too scanty on upward stroke	● Air / material valve or gasket worn or damaged	● Replace valve or gasket
	● Piston valve dirty	● Clean with cleaner, WOLFANGEL-service if necessary
Asymmetrical working	● Material container empty	● Fill or rinse
	● Material inlet valve open or dirty	● Clean with cleansing agent WOLFANGEL-service if necessary
	● Material flask or packing open or worn	● Clean with cleansing agent WOLFANGEL-service if necessary
Spray form / shape untidy	● Nozzle worn	● Change nozzle
Spray jet forms 'waist'	● Pressure too low ● Material too viscous ● Nozzle too big	● Increase pressure ● Thin material ● Change nozzle