

Operating Instructions

VETTER Leak Sealers



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1. Introduction

The precondition for the safe use and the defect-free operation of Vetter Leaking Seals is the knowledge and the observance of this operating manual as well as the safety instructions.

DIN 7716 is to be adhered to in cases of long-term storage.



In addition to this, the pertinent work protection regulations, work safety regulations and accident prevention regulations are to be observed the same as the generally recognized technology laws.

The operating instructions given here are to be regarded as part of the product and are to be kept for the complete life duration of the product. In case the product should be passed on to a successive user then the operating instructions must also be included.

1.1 Symbols used



This symbol means that there is imminent danger. If it is not avoided then death or serious injury will result.



This symbol means that there is a possible dangerous situation. If it is not avoided then death or serious injury could result.



This symbol means that there is possibly a dangerous situation. If it is not avoided then light injuries or slight injuries could result.



This symbol means that there is the possibility of damage being caused. If it is not avoided then the product or something else in its vicinity could be damaged.

1.2 Correct handling and usage

Depending on the application, Vetter leak sealers must only be used with compressed air and only inflated to the corresponding pressure with original inflation fittings.

They are exclusively used for sealing leaks on containers and pipes.

Incorrect application of Vetter leak sealers includes the following:

- ✓ Incorrect use, operation or maintenance of leak sealers.
- ✓ Use of the leak sealers with defective safety devices or inflation fittings which have been either incorrectly installed or are non-functional.
- ✓ Non-observance of the instructions contained in the operating instructions with respect to storage, operation and maintenance of the leak sealers.
- ✓ Insufficient monitoring of accessory parts which are subject to wear.
- ✓ Incorrectly carried out maintenance work.

The following also belong to correct application:

- ✓ Observance of all information contained in these operating instructions.
- ✓ Compliance to the periods for maintenance and care contained in the Chapter "Maintenance and Care".

2. Safety instructions

The use of Vetter Leak Sealers is made under the precondition that there is a knowledge of this application and that the operating instructions are observed.

2.1 General information

The observance of all pertinent regulations with respect to work protection, safety and accident prevention (e.g. DGUV) as well as generally recognized technological regulations is a precondition.

Leak sealers must be tested before application to see whether they are resistant against hazardous materials. For this, refer to the resistance chart!

The PVC acid protection cover for the leak sealing bag offers increased protection against acid spray.

Observe the pertinent regulations concerning handling with dangerous liquids.

Protection equipment, such as protection clothing, gloves, helmet, face and eye protection, breathing protection and inherent protection, are to be used onsite depending on the degree of danger and the situation.

 **DANGER**

 **DANGER**

 **DANGER**

 **WARNING**

 **WARNING**

 **WARNING**

2.2 Information concerning the dangers

Danger of explosion! If there are inflammable liquid or gas leaks it is imperative that sparks be avoided by fixtures and fittings.

Vetter Leak Sealers must only be filled when in the correctly tensioned condition. Only fill the leak sealers until the leak is sealed (max. operating pressure 1.5 bar and 12 bar). Any additional filling of the leak sealer can damage the pipe or the tank by built up pressures

A leak in a tank or container is a weak point. Therefore avoid any additional damage by filling the leak sealer so that no more liquid or gas escapes. This can be the case at a point lower than the maximum permissible operating pressure.

2.3 Warning information

The leak sealers and the accessories are to be inspected for perfect condition before and after use. Damaged seals or seals and accessories which are functionally limited present a source of danger and must not be used!

All controllers are equipped with a safety valve that corresponds to the maximum permitted operation pressure for leak sealers. These safety valves will blow when the maximum operating pressure is exceeded.

The tolerance for the opening and closing of the safety valves must be a maximum of $\pm 10\%$. The set pressure must not be changed. Should the seal on the upper part of the valve be removed then safe operation can no longer be guaranteed. The safety valve must be exchanged. The permitted input pressure at the controller must not be exceeded (marked on the input coupling).

Before application of the leak sealer, cover sharp edges and/or pointed positions in the area of the leak by using dimensioned sealing plates. In doing this you avoid damage to the leak sealers as well as the unintended escape of dangerous liquids and gases.

3. Operation of the Leak Sealers

This chapter gives you information about which sources of compressed air you are able to use with Vetter leak sealers.

When using leak sealers observe the corresponding pressure stage.



3.1 Operation with controllers, inflation hose and compressed air bottle

As an example the following pictures present the sequence of events for leak sealing bags 1.5 bar. Corresponding leak sealers and accessories must be used for other pressures and other sources of air. Before inflation, the leak sealing bags must be correctly and safely tensioned with tension belts on the leak position. To do this, refer to Chapter 4.3 "Handling the tension ratchet".



Leak sealing bag

- ✓ Step 1
Connect the leak sealing bag LD 50/30 S 1.5 bar with guide slots to the inflation hose.

Inflation hose

- ✓ Step 2
Connect the inflation hose to the controller.

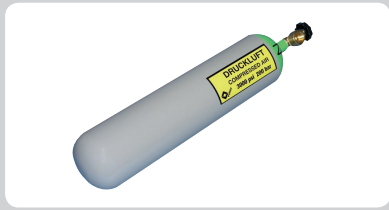
Controller

- ✓ Step 3
Connect the connection hose of the pressure regulator to the input coupling of the controller. It is imperative that the permitted input pressure of the controller be observed when doing this.

Pressure regulator

- ✓ Step 4
Screw the pressure regulator into the valve on the compressed air bottle.





Compressed air bottle

3.2 Operation of the controller, inflation hose and other sources of compressed air

Observe the maximum input pressures of the controllers for the various pressures (refer to the table below).



Applied pressure	Maximum input pressure of the controller
0.5 bar	2 bar
1.0 bar	2 bar
1.5 bar	2 bar
2.5 bar	4 bar
12.0 bar	14 bar

Adapters contained in the adapter kit

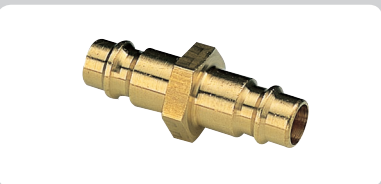
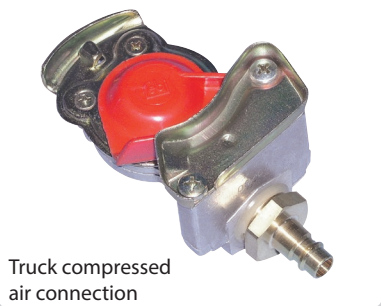
The adapter kit contains adapters for the following sources of compressed air:

Truck compressed air connection with blind coupling

Close the control line to the blind coupling.

The tyre inflation connection must be secured with a safety valve as a standard.

The control line is to be connected with the blind coupling. The truck must be secured by brake holding blocks so that it does not roll away.



Local compressed air network

Connection to the outlet coupling of a compressed air network.

Series connected pressure regulator, max input pressure of 16 bar

If the output pressure of the compressed air network exceeds the permitted inflation pressure of the controller then the adapter must be exchanged for a series connected pressure regulator.

Truck tyre valve

Used for inflating with a normal hand pump or foot pump.

Truck tyre valve connection

For tapping off air from the spare tyre.

Adapter for construction site compressor

Adapter for portable compressor

Air supply hose, 10 m with blocking valve

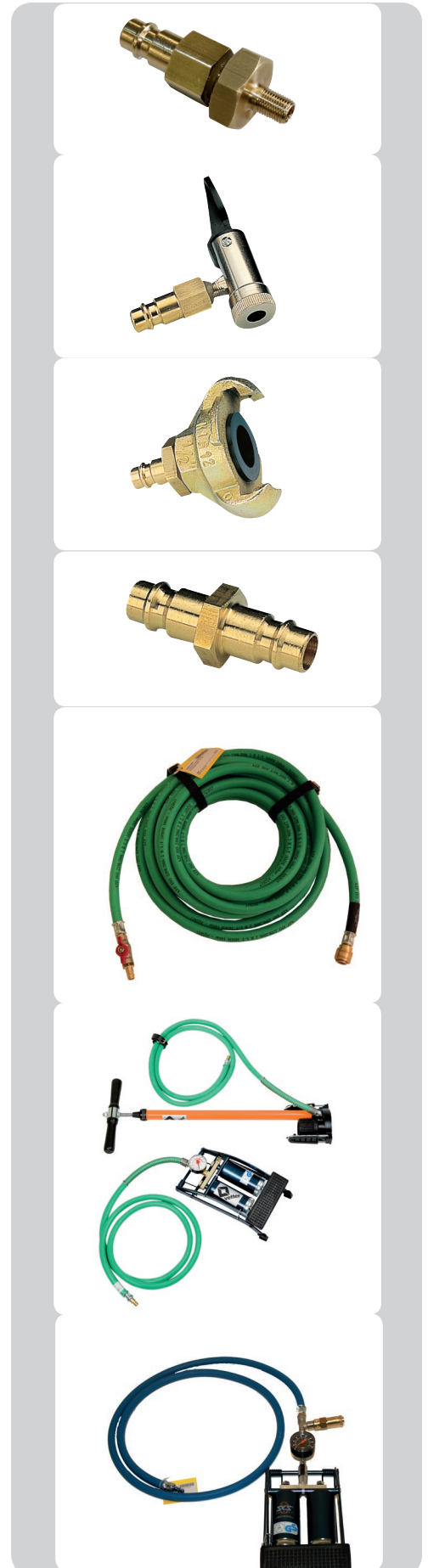
The air supply hose with blocking valve can be used as an extension between air source and the controller.

3.3 Operation with hand pump and foot air pump

Hand pump or foot pump for connection to the input coupling of a controller via a 2 m connection hose.

3.4 Operation with foot air pump having safety valve and manometer

Foot air pump 1.5 bar with safety valve and manometer and 2 m connection hose for inflation of leak sealing bags.





The simplified illustrations show only one tension belt!

4. Application of Leak Sealers

This chapter gives you information about how Vetter leak sealers are used.

When using leak sealers, observe the safety instructions in Chapter 2 as well as the pertinent regulations for work protection and safety, accident prevention regulations (e.g. DGUV) and the general rules for technology.



4.1 Use of the acid protection covering

The special design of the acid protection covering permits storing the ready-for-use leak sealing bag including the tension belts on the emergency vehicle.

- ✓ Route **both** tension belts through the belt bushing slots or the swivel eyes.
- ✓ The bag is stored in the acid protection covering, possibly with an upholstery plate underneath, and secured with a Velcro fastener. Please note that the valve connection should lie in the flap!
- ✓ The tension belts are accommodated in the upper Velcro-fastener pocket.

4.2 Preparing for operation

Wear the required protective gear and clothing suitable for the task.

- ✓ Select and put on the personal protective equipment corresponding to the degree of danger.
- ✓ Mark the work area.
- ✓ Ensure that only authorized persons are in the work area / area of danger.
- ✓ Select the leak sealing bag/leak sealer according to the requirements.
- ✓ In doing this observe the resistance chart and material resistance chart.
- ✓ Check the leak sealing bag/the leak sealer and the accessories to be used for completeness and for any forms of damage.
- ✓ Damaged leak sealing bags/leak sealers and accessories must not be used!
- ✓ Inflation hose and controller must already be connected to the leak sealing bag/leak sealer.
- ✓ Place the tension belts around the tank/container.
- ✓ Loosely close the leak position with the sealing bag / leak sealer.

- ✓ Tension the leak sealer with the tension belts.
- ✓ Make certain that there is nobody within the area of danger.
- ✓ Inflate the leak sealer from a safe position until the leak is sealed.

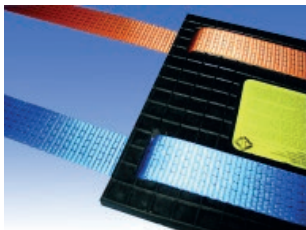
Danger of explosion! If there are inflammable liquid or gas leaks it is imperative that sparks be avoided by fixtures and fittings.

Vetter sealing must only be filled when in the correctly tensioned condition. Only fill the leak sealing until the leak is sealed (max. operating pressure 1.5 bar and 12 bar). Any additional filling of the leak sealer can damage the pipe or the tank by built up pressures.

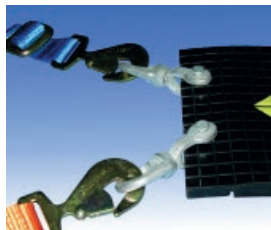
A leak in a container or pipe is a weak point. Therefore avoid any additional damage by filling the leak sealer so that no more liquid or gas escapes. This can be the case at a point lower than the maximum permissible operating pressure.

Before application of the leak sealer, cover sharp edges and/or pointed positions in the area of the leak by using dimensioned sealing plates. In doing this you avoid damage to the leak sealers as well as unintended escape of dangerous liquids and gases.

The Vetter Leak Sealing Bags LD 50/30 come in two different versions each having different tensioning possibilities available.

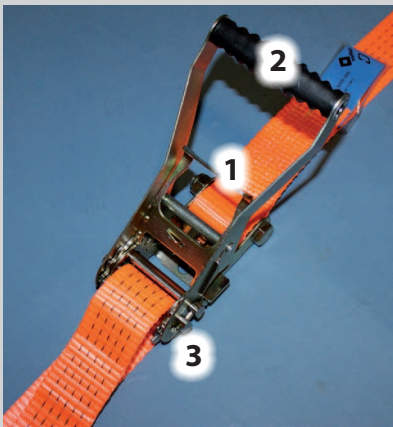


Leak sealing bags with guide slots



Leak sealing bags with rotating lugs





4.3 Handling the tension ratchet

Threading the belt

With the ratchet closed, quickly pull the locked function slide (1) in order to move the ratchet lever (2). Thread the end of the belt into an appropriate position in the slot shaft (3) and pull until the belt is tensioned.

Tensioning the belt

By moving the ratchet lever, ratchet until the required, or maximum, belt tension is obtained. In doing this there must be at least 1.5 turns on the slot shaft.

Closing the ratchet

After this, pull the function slid and swing the ratchet lever into the locking position until the slid is able to lock into the securing groove.

Opening the ratchet

Before opening the ratchet it is imperative to ensure that the leak sealing bag is not under pressure because when opening the ratchet, the belt is suddenly released.

When opening the ratchet, the function slid is to be pulled and the ratchet lever is to be swung approximately 180° to the end stop in order to let the slide lock into the last possible position. The slot shaft is now no longer locked. The belt can now be uncoiled and taken out.

The tie-down straps used in the Vetter systems do not have any specifications on the standard manual force (SHF) and standard tension force (STF) because here they are only being used as strap-ping lashes and not for lashing down the load (load restraints).

5. Maintenance and care

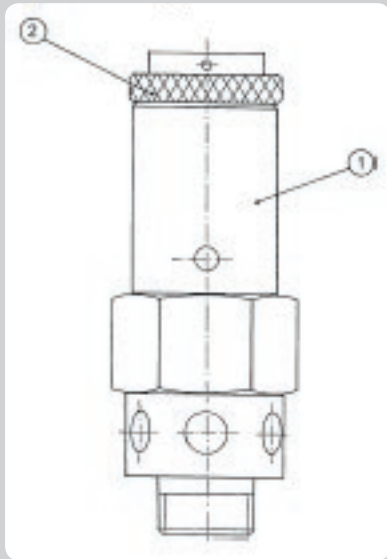
This chapter gives information about care of Vetter leak sealers and which maintenance intervals are to be observed.

5.1 Maintenance intervals

A function test of the safety valve must only be carried out without the leak sealers. Over-pressure area! A function test of the safety valve with leak sealers can cause leak sealers to burst.

When?	What?	What to do?
After each operation	Leak sealers and accessories	<p>Carry out a check for completeness, perfect condition and function.</p> <p>Carry out a visual check and function check.</p> <p>Clean the leak sealers with warm water, neutral cleaning agent and, if necessary, with a cleaning brush.</p> <p>Finally, dry at room temperature.</p>
	Acid protection cover	Dispose and replace if necessary.
At least once every year	Controller	<p>Carry out a visual check and function check.</p> <p>Test the function capability of the couplings, nipple, manometer and safety valve.</p>
At least once every year	Inflation hose	<p>Carry out a visual check and function check.</p> <p>Test the function capability and the sealing of the connection nipple and the couplings</p>
At least once every year	Leak sealers	<p>Carry out a visual check and function check.</p> <p>Test the function capability of the connection coupling.</p> <p>Check for tears and/or cuts, abrasions, changes to the surface caused by chemical effects.</p>

CAUTION



5.2 Safety valve blow-through

If a safety valve blows too early due to foreign body penetration, open the blowing device (2) by turning counter-clockwise and blow through.

If the foreign body is not removed by doing this, then the complete upper part of the valve is to be unscrewed

- ✓ To do this, place the pipe pliers at the height (1).
- ✓ After unscrewing, carefully take out the valve ball and remove the foreign body from the sealing plate.
- ✓ Screw on the upper part of the valve again and check for perfect operation.
- ✓ Changes to the set pressure must not be made.
- ✓ If the seal on the upper part of the valve is removed then perfect function can no longer be guaranteed. The safety valve is then to be sent back to the manufacturer.
- ✓ With icing caused by high humidity and low temperatures, it is possible to use a normal defrosting spray..

5.3 Visual test of the safety valve

Safety valves are sealed.

If the seal on the upper part of the valve is removed then perfect function can no longer be guaranteed. The safety valve must be exchanged.

- ✓ Seal exists and is undamaged.

Old safety valves had customs seals

New safety valves have seal plates



6. Vetter High Pressure Leak Sealing System

6.1 Description



The high pressure leak sealing system consists of one or three sealing hoses, depending on the version. This is intended for sealing T-pieces, pipe bends or problematic connection supports.

Additional sealing plates made of different materials (NBR, EPDM, glass fibre reinforced plastic) produce a higher resistance.

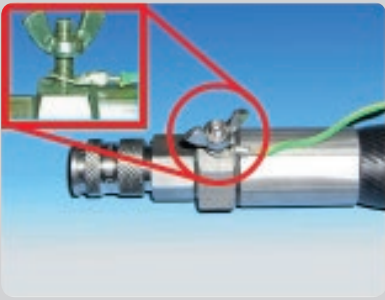
6.2 Safety instructions

Observe the pertinent regulations for work safety. Danger of explosion! If there are inflammable liquid or gas leaks it is imperative that sparks be avoided by fixtures and fittings.

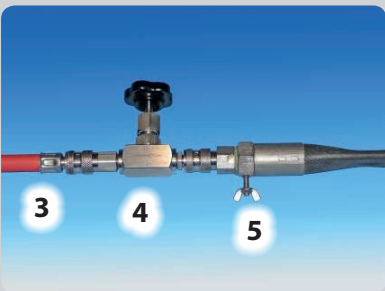
6.3 Ground connection

- ✓ The inflation valve as well as couplings and joints on the sealing hoses and on the inflation hose are made of stainless steel.
- ✓ The sealing hoses are conductive and equipped with a grounding device on both sides.
- ✓ Fix the ground cable onto the grounding device attached to the sealing hose.
- ✓ Secure the ground cable hand-tight using the wing nut.
- ✓ Before use, check to see whether the high pressure leak sealing system is resistant against hazardous materials.
- ✓ Wear specified protective clothing necessary for operation





Different ball valve!



6.4 Operation instructions

- ✓ Select the sealing hose most suitable for the leak, respectively lay a sealing plate (EODM, NBR, glass fibre reinforced plastic) underneath.
- ✓ Entwine the pipe to be sealed so that the first point of the sealing hose completely covers the leak position.
- ✓ Feed through, as shown below, one layer under the sealing hose.

After this connect the inflation device as follows:

- ✓ Connect the pressure regulator to the compressed air bottle.
 - ✓ Close the outlet valve (1) by turning clockwise.
 - ✓ Open the valve on the bottle (2) slowly.
 - ✓ The pre-pressure manometer indicates the pressure in the bottle (3).
 - ✓ Adjust the backpressure on the regulator (4) to a maximum of 14 bar.
 - ✓ The reduced pressure is indicated on the backpressure manometer (5).
-
- ✓ Connect the ventilation valve (1) to the connection hose (2) of the pressure regulator.
 - ✓ Connect the ventilation valve (1) to the red inflation hose (3).
 - ✓ Close the ventilation valve!
 - ✓ Connect the red inflation hose (3) to the closed inflation valve (4) and couple to the sealing hose (5).
 - ✓ In order to inflate the sealing hose, open the outlet valve on the pressure regulator by turning counter-clockwise.
 - ✓ Now carefully open the inflation valve and inflate the sealing hose until the damaged point is just sealed.
 - ✓ Close the inflation valve.
 - ✓ In order to remove the inflation device, close the outlet valve on the pressure regulator and open the ventilation valve. The inflation hose, which is now not under pressure, can be uncoupled from the inflation valve without any difficulty.
 - ✓ The connected high pressure leak sealing system is to be continually monitored.
 - ✓ The damaged pipeline can now be switched off without difficulty and can be repaired after emptying.

6.5 Technical data High Pressure Leak Sealing System

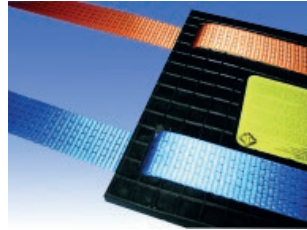
		Sealing hose 1,500 mm	Sealing hose 2,500 mm	Sealing hose 3,500 mm
Art. No.		1500015901	1500016001	1500016101
Max. operating pressure	bar	14	14	14
	psi	203	203	203
Air requirement at 14 bar	Liter	11.1	20.0	27.9
	cu. ft.	0.4	0.7	1.0
Temperature	°C	-30/+80	-30/+80	-30/+80
	°F	-22/+176	-22/+176	-22/+176
Approximate weight	kg	1.1	1.4	1.8
	lbs	2.5	3	3.9

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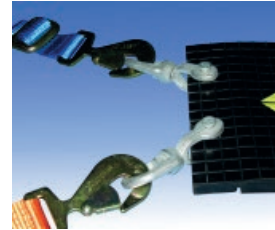
7. Vetter Leak Sealing Bags

7.1 Leak Sealing Bag LD 50/30 1.5 bar

The Vetter Leak Sealing Bag LD 50/30 1.5 bar is available in two versions each having different tensioning possibilities.



Leak sealing bags with guide slots



Leak sealing bags with rotating lugs

The Vetter leak sealing bags 1.5 bar can be used on containers and tanks for sealing of leaks.

- ✓ Connect the inflation hose to the connection coupling of the selected leak sealing bag 1.5 bar and to the nipple of the foot air pump 1.5 bar.
- ✓ Air supply can be made by a hand air pump or foot air pump, pressure regulator and compressed air bottle or by local compressed air lines, respectively by tapping off air from a truck compressed air brake device.
- ✓ Place or move the leak sealing bag to the selected position and inflate until the leak is sealed and that no liquid or gas escapes.

7.2 Leak Sealing Bag LD 50/30 S 12 bar with belt guide slots

The Vetter Leak Sealing Bag LD 50/30 S 12 bar is used for sealing thick-walled containers. The tension belts are designed for a tensile strength of 5000 kg.

The leak sealing bag LD 50/30 S 12 bar must not be used on plastic containers. Plastic containers can be pressed in and damaged.

The leak sealing bag LD 50/30 S 12 bar is only to be used on metal containers which permit loading of 10 kg/m².

- ✓ Connect the inflation hose to the connection coupling of the leak sealing bag 12 bar and to the output coupling of the controller. Place the belts around the container and tension them.
- ✓ The air supply can be made by a pressure regulator and compressed air bottle or by a local compressed air line or by tapping off air from a truck compressed air brake device.
- ✓ Place or move the leak sealing bag to the selected position and inflate until the leak is sealed and that no liquid or gas escapes.



CAUTION

7.3 Leak Sealing Bag LD 110/60 S XL 1.5 bar with belt guiding slots

The Vetter Leak Sealing Bag LD 110/60 S XL 1.5 bar is intended for sealing large leaks. The tension belts are extremely tear resistant.

- ✓ Connect the inflation hose to the connection coupling of the leak sealing bag and to the output nipple of the controller.
- ✓ Place the belts around the container and tension them.
- ✓ The air supply can be made by a pressure regulator and compressed air bottle or by a local compressed air line, respectively by tapping air from the compressed air brake device on a truck.
- ✓ Place or move the leak sealing bag to the selected position and inflate until the leak is sealed and that no liquid or gas escapes.
- ✓ Further inflation of the leak sealers can damage the pipe or the container due to pressure build-up.



7.4 Leak Draining Bag DLD 50/30

With the leak draining bag, the leak is sealed and simultaneously the liquid drained away by a drain chamber.

The sealed area around the drain chamber is blown up so that the liquid can be reliably drained away.

- ✓ Position a collection container for the liquid to be drained. Place the outlet hose into the collection container.
- ✓ Connect the outlet hose to the ball valve and then connect this to the leak draining bag.
- ✓ Connect the inflation hose to the connection coupling of the leak sealing bag and to the foot air pump.
- ✓ Place the belts around the container and tension them.
- ✓ Position or move the leak draining bag to the selected point and inflate it.



7.5 Technical Data Leak Sealing Bags

		LD 50/30 S	LD 50/30 W
Art. No.		1500005401	1500005102
Size (L x W x H)	cm	61.5 x 30 x 2	61.5 x 30 x 2
	inch	24 x 12 x 0.8	24 x 12 x 0.8
Sealing area	cm	50 x 30	50 x 30
	inch	20 x 12	20 x 12
Max. operating pressure	bar	1.5	1.5
	psi	21.75	21.75
Test pressure	bar	1.95	1.95
	psi	28.5	28.5
Sealing pressure	m WS	14	14
	psi	20.3	20.3
Air requirement at 1.5 bar	Liter	17.5	17.5
	cu. ft.	0.6	0.6
Weight of individual bag, approx.	kg	4.3	6.9
	lbs	9.5	15.2
Weight of set, approx.	kg	29	31.7
	lbs	64	69.9

		LD 50/30 S 12 bar	LD 110/60 S XL	DLD 50/30
Art. No.		1500011402	1500014500	1500006001
Size (L x W x H)	cm	61.5 x 30 x 2	110 x 60 x 2	62 x 30 x 6
	inch	24 x 12 x 0.8	43 x 24 x 2.7	24 x 12 x 2.4
Sealing area	cm	50 x 30	86 x 57	50 x 30
	inch	20 x 12	34 x 22	20 x 12
Drain space	cm			40 x 20 x 3.5
	inch			16 x 8 x 1.4
Max. operating pressure	bar	12	1.5	1.5
	psi	174	21.75	21.75
Test pressure	bar	18	1.95	1.95
	psi	261	28.5	28.5
Sealing pressure	m WS		14	10
	psi		20.3	14.5
Air requirement	Liter	154	190	2.8
	cu. ft.	5.4	6.7	0.1
Weight of individual bag, approx.	kg	4.6	16	8.2
	lbs	10.1	35.3	18.1
Weight of set, approx.	kg	21.9	39.5	31.9
	lbs	48.3	87.1	70.3

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8. Vetter Mini-Leak Sealing Bags

8.1 Description

The mini leak sealing bags can be used for sealing leaks on small containers, pipes, hooped drums and on containers having diameters from 10 cm to 90 cm. The metal-free tension belts have Velcro connections enabling fast attachment and tensioning of the mini-leak sealing bags.

Mini-leak sealing bags are delivered and stored in a transportation case.

- ✓ Select the largest possible bag according to the size of the leak and the size of the container to be sealed.
- ✓ Connect the inflation hose of the foot air pump to the connection coupling of the selected mini-leak sealing bag.
- ✓ Prepare the tension belts.
- ✓ Press the bag centrically onto the leak and place the belt under tension around the container and over the mini-leak sealing bag.
- ✓ Press the Velcro connection over the area.
- ✓ The tension belts can be connected together to achieve greater length and bridge greater container diameters.
- ✓ When using LDK 10/25 or LDK 20/20 it may be necessary to use the tension belts in pairs running parallel to each other.
- ✓ After correct tensioning, mini-leak sealing bags can be inflated.
- ✓ Inflate the mini-leak sealing bag with the foot air pump (5 to 15 strokes are sufficient) until the leak is sealed and no liquid or gas escapes.
- ✓ After emptying the container, empty the mini-leak sealing bag and release the tension belts.



8.2 Technical data of the Mini-Leak Sealing Bags

		LDK 10/10	LDK 10/25	LDK 20/20
Art. No.		1500008300	1500008500	1500008600
Size (L x W x H)	cm	15 x 15 x 1.2*	5 x 31 x 1.2*	25 x 25 x 1.2*
	inch	6 x 6 x 0.5	16 x 12 x 0.5	10 x 10 x 0.5
Sealing area	cm	9.5 x 9.5	9.5 x 25.5	19.5 x 19.5
	inch	3.7 x 3.7	3.7 x 10	7.7 x 7.7
Max. operating pressure	bar	1.5	1.5	1.5
	psi	21.75	21.75	21.75
Test pressure	bar	1.95	1.95	1.95
	psi	28.5	28.5	28.5
Sealing pressure	m WS	14	14	14
	psi	20.3	20.3	20.3
Nominal capacity	l	0.3	0.5	2
	cu.ft.	0.01	0.02	0.07
Air requirement at 1.5 bar	l	0.8	1.3	5
	cu.ft.	0.03	0.05	0.18
Weight of individual bag, approx.	kg	0.5	0.8	1.1
	lbs	1.1	1.8	2.4

* in the valve area +6 mm / 2.36 inches; Weight of kit: approximately 10.4 kg / 23 lbs

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9. Vetter Flange Draining Bag

9.1 Description

The flange draining bag is used in all areas where it is not possible to seal a leak using the normal leak sealing bag. Using the gas and liquid sealed zip connection the flange draining bag can be quickly closed.

The gel plates contained in the delivery package are fixed onto the pipe under the inflatable collar. They smooth out any unevenness which may exist on the surface of the pipe.

Inflating the collars produces a drainage space. After bag inflation, the hazardous material can be drained via the stainless steel ball valve and the acid outlet hose.

- ✓ Place the collection container to where the hazardous material is to be drained.
- ✓ Lay the flange drainage bag around the leak point and close it with the zip.
- ✓ Connect the inflation hose of the foot air pump with the connection coupling on the collar of the flange drainage bag.
- ✓ Inflate the flange drainage bag with the foot air pump at each collar until the leak is sealed and no liquid escapes.
- ✓ Connect the acid outlet hose to the ball valve of the flange drainage bag.
- ✓ Open the ball valve in order to drain the hazardous material into the collection container.



9.2 Technical data of the flange drainage bags

		DN 50	DN 80	DN 100
Art. No.		1500006600	1500019200	1500023400
External size	cm	Ø 21	Ø 21	Ø 25
	inch	Ø 8.3	Ø 8.3	Ø 9.8
Length	cm	90	90	92
	inch	35	35	36
Maximum operating pressure	bar	1.5	1.5	1.5
	psi	21.75	21.75	21.75
Test pressure	bar	1.95	1.95	1.95
	psi	28.5	28.5	28.5
Sealing pressure	m WS	10	10	10
	psi	14.5	14.5	14.5
Nominal capacity	l	0.5	0.5	0.5
	cu.ft.	0.02	0.02	0.02
Air requirement at 1.5 bar	l	1.25	1.25	1.25
	cu.ft.	0.1	0.1	0.1
Weight of individual bag, approx.	kg	3.1	3.1	3.5
	lbs	6.8	6.8	7.7
Weight of kit, approx.	kg	19.0	19.0	19.6
	lbs	41.9	41.9	43.2

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10. Vetter Vacuum Leak Draining Bag

10.1 Vacuum Leak Draining Bag DLD 50 VAC

The Vetter vacuum leak draining bag DLD 50 VAC enables beltless sealing of leaks on tank wagons and tanker trucks as well as large containers and tanks. The vacuum leak draining bag DLD 50 simultaneously seals leaks and drains the liquid(s) into a collection tank via the drainage chamber.

10.2 Safety instructions

Observe the pertinent regulations when handling dangerous liquids. Danger of explosion! If there are inflammable liquid or gas leaks it is imperative that sparks be avoided by fixtures and fittings.

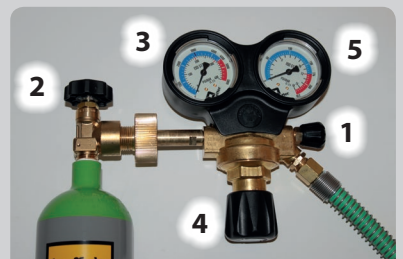
- ✓ Before operation check to see if the vacuum leak sealing bag is resistant against the hazardous material (refer to the resistance chart).
- ✓ Wear the specified protective clothing required for operation.
- ✓ The sealing of the vacuum leak draining bag is dependent on the condition of the tank wall. Therefore under certain conditions it is necessary to permanently renew the vacuum.
- ✓ Therefore take care of a sufficient and permanent air supply.
- ✓ It is therefore necessary to use the Vetter adapter 12 bar (Art. No. 1600015400) for operation with compressed air bottles.

10.3 Application instructions

- ✓ Connect the pressure regulator to the compressed air bottle.
- ✓ Close the outlet valve (1) by turning clockwise.
- ✓ Open the valve on the bottle (2) slowly.
- ✓ Pre-pressure manometer indicates the pressure in the bottle (3).
- ✓ Adjust the back-pressure to 6 bar using the adjustment lever (4).
- ✓ The reduced pressure is indicated on the back-pressure manometer (5).
- ✓ The vacuum leak draining bag can only be used on areas having only a slight curvature and a smooth structure.
- ✓ The container surface must be clean.



 **DANGER**



- ✓ The vacuum leak sealing bag must only be used with tested, original Vetter fittings.
- ✓ The following information only relates to application of compressed air coming from the compressed air bottle 200 bar or 300 bar.
- ✓ The backpressure of the pressure regulator must be set to at least 2 bar.
- ✓ Observe the indication on the manometer.
- ✓ Join the connection hose of the pressure regulator to the vacuum jet, if necessary extend it with the air supply hose (10 m, green, accessory).
- ✓ Press the plug-in nipple into the coupling until you feel it lock in.
- ✓ Insert and lock the vacuum nozzle with ventilation hose to the vacuum connection of the bag.
- ✓ Couple the stainless steel ball valve with the outlet hose to the vacuum leak draining bag and open the ball valve.
- ✓ Prepare the collection container.
- ✓ Open the blocking valve of the pressure regulator and the vacuum connection until the air can be heard to flow through.
- ✓ Press the vacuum leak draining bag onto the container wall so that the drainage chamber is centred over the leak position (observe the drain chamber size of 200 mm).
- ✓ The complete outside rubber lip of the bag must be positioned on the container wall.
- ✓ With curved containers, the vacuum leak draining bag must also be pressed using four hands.
- ✓ Continually observe the under-pressure manometer and the vacuum leak draining bag. Do not interrupt the air flow.
- ✓ The liquid is diverted into a collection container via the ball valve.
- ✓ The ventilation hose of the vacuum jet must also terminate in a container in order to reliably drain any liquid remaining within the vacuum chamber.

A leak in a container or tank is a weak point. Therefore avoid any additional damage by filling the leak sealer so that no more liquid or gas escapes. This can be the case at a point lower than the maximum permissible operating pressure.

- ✓ The attached vacuum leak draining bag is to be continually monitored.
- ✓ Always make certain that there is sufficient air.
- ✓ After termination of operation, the air supply only needs to be closed (close the output valve on the pressure regulator).
- ✓ After releasing the vacuum, the bag is detached from the wall of the tank.
- ✓ Do not let the bag fall otherwise this could damage it.

Example of the air requirement

Compressed air bottle 6 l/300 bar

Input pressure	Vacuum	Operational time
2 bar	0.15 bar	20 min
3 bar	0.25 bar	14 min
4 bar	0.38 bar	10 min

Minimum power of the compressor: 200 l / min. at 4 bar

- ✓ Use a Y-distributor with additional air-supply hose or dual connector when using a number of compressed air bottles.
- ✓ The vacuum power of the bag can also be increased before operation by wetting the sealing lip with soap or water.

10.4 After operation

- ✓ Check the bag and accessories after each operation to ensure completeness and perfect condition.
- ✓ If necessary, clean the bag and accessories with warm soapy water and then with clear water.
- ✓ Dry the bag and accessories at normal room temperature.
- ✓ Inspect for tears, cuts or punctures.
- ✓ Inspect the suction cups for damage, especially in the edge area.
- ✓ Inspect the controller for any damage and test the safety valve to ensure perfect activation.

10.5 Technical data of Vacuum Leak Draining Bag

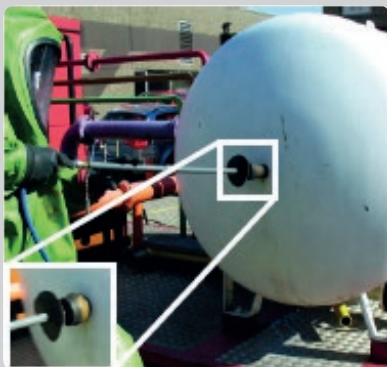
DLD 50 VAC		
Art. No.		1500007501
Size	cm	Ø 50
	inch	Ø 19.7
Draining space	cm	Ø 20
	inch	Ø 7.9
Operating pressure vacuum generator	bar	6
	psi	87
Vacuum	bar	0.45
	psi	6.5
Air requirement	Liter/Min.	200
	cu. ft./min.	7
Weight of individual bag, approx.	kg	5.2
	lbs	11.5
Weight of kit, approx.	kg	15.5
	lbs	34.2

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11. Vetter Leak Sealing Lance



Kit for leak sealing lance with foot air pump



With the Vetter leak sealing lance, cracks (15 - 60 mm long) and holes (30 - 90 mm diameter) on storage containers, tank trucks and tank wagons can be quickly sealed by one person. There are wedge bags and cone bags available for this purpose.

Air inflation is made with a foot air pump. A blocking valve avoids drops in pressure and air losses at the coupling of the source. The lance enables a certain distance to be maintained from the danger zone.

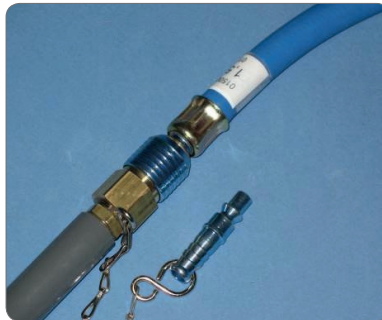
- ✓ Connect the lance to the corresponding bag.
- ✓ Connect the inflation hose of the foot air pump to the connection coupling of the lance.
- ✓ Position the bag with the lance into the leak.

- ✓ From a safe distance, inflate the bag using the foot air pump until the leak is sealed and no liquid escapes.
- ✓ After inflation, close the leak sealing lance with the blocking valve.

11.1 Application instructions

Inflation with the foot air pump

- ✓ Press the nipple of the foot air pump connection hose into the lance coupling until you feel it lock in.



- ✓ Position the wedge bag or cone bag into the leak.



- ✓ Using the foot air pump inflate the wedge bag or cone bag until the leak is sealed (maximum operating pressure 1.5 bar).
- ✓ Close the blocking valve after inflation.

Safety against over-inflation

With both inflation versions, a safety valve integrated into the foot air pump or in the inflator avoids over-inflation of the wedge bag or cone bag when the maximum operating pressure of 1.5 bar is exceeded.



Foot air pump with safety valve

- ✓ Sharp-edged leak openings could cause damage to the wedge bags and cone bags.

After use

- ✓ After using the wedge bag or cone bag deflate via the blow-out device of the safety valve on the foot air pump.
- ✓ To do this turn the blow-out device counter-clockwise at the head of the safety valve.
- ✓ Clean and/or decontaminate, respectively dispose, of the wedge bag or cone bag and carry out the routine according to the pertinent disposal regulations for the corresponding material.
- ✓ With recognizable damage, the wedge bag or cone bag must not be used again.

11.2 Technical data of the Leak Sealing Lance

		Wedge bag 6	Wedge bag 8	Wedge bag 11	Cone bag 7
Art. No.		1500009800	1500010000	1500010100	1500010200
Size (L* x W x H)	cm	23 x 6 x 5	23 x 8 x 5.5	23 x 11 x 7	23 x Ø 7
	inch	9 x 2.4 x 2	9 x 3 x 2.2	9 x 4.3 x 2.8	9 x Ø 2.8
Maximum operating pressure	bar	1.5	1.5	1.5	1.5
	psi	21.75	21.75	21.75	21.75
Test pressure	bar	1.95	1.95	1.95	1.95
	psi	28.5	28.5	28.5	28.5
Nominal capacity	l	0.6	1.4	3.1	1.2
	cu.ft.	0.02	0.05	0.11	0.04
Air requirement at 1.5 bar	l	1.5	3.5	7.8	3
	cu.ft.	0.05	0.12	0.28	0.11
Approximate weight	kg	0.2	0.3	0.4	0.2
	lbs	0.4	0.7	0.9	0.4

* in the valve area: Length (L) + 6 cm / 2.36 inches

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12. Vetter Leak Sealing Bandages

Suddenly occurring pipe defects can be quickly sealed using the Vetter Leak Sealing bandages.

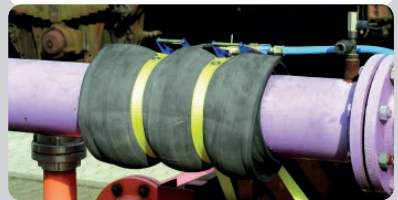
The bandages seal leaks on pipes and round containers having a diameter of 5 – 48 cm. Long cracks can also be sealed by positioning the bandages lengthways and securing them with square-shaped timber and a ratchet belt.

- ✓ Apply the bandage around the leak position on the pipe, respectively container.
- ✓ Fix the bandage by tightly tensioning the ratchet belt.
- ✓ Connect the inflation hose of the foot air pump with the connection coupling of the bandage.
- ✓ Inflate the bandage with the foot air pump until the leak is sealed and no liquid is able to escape.

12.1 Technical data

		LB 5-20	LB 20-48	LB 5-20 XL
Art. No.		1500013900	1500014000	1500018200
Size	cm	98 x 21	177 x 21	100 x 40
	inch	38.6 x 8.3	69.9 x 8.3	39.4 x 15.7
Sealing area	cm	19 wide	19 wide	38 wide
	inch	7.5 wide	7.5 wide	15 wide
Maximum operating pressure	bar	1.5	1.5	1.5
	psi	21.75	21.75	21.75
Test pressure	bar	1.95	1.95	1.95
	psi	28.5	28.5	28.5
Sealing pressure	m WC	14	14	14
	psi	20.3	20.3	20.3
Nominal capacity	l	9	16	30
	cu.ft.	0.3	0.6	1
Air requirement	l	22.5	40	75
	cu.ft.	0.8	1.4	2.7
Approximate weight	kg	2.3	4	5.5
	lbs	5	8.8	12.3

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13. Vetter Pipe Sealing Sleeves

Description

With the Vetter pipe sealing sleeves small cracks and holes in pipelines (diameter 1/2" to 4") can be quickly sealed mechanically with a maximum counter-pressure of 16 bar.

- ✓ Place the inside sealing next to the leak.
- ✓ Place the sealing sleeve over it.
- ✓ Screw the hexagonal screws so that the pipe sealing sleeve can be moved over the leak.
- ✓ Seal the pipe sealing sleeve by tightening the hexagonal screws.

13.1 Technical data Pipe Sealing Sleeves

		1/2"	3/4"	1"
Art. No.		1500002301	1500002401	1500002501
Nominal size	mm	21.3	26.9	33.7
	inch	0.8	1.1	1.3
for diameter	DN	15	20	25
Size (L x W x H)	mm	133 x 73 x 40	133 x 80 x 50	133 x 90 x 55
	inch	5.2 x 2.9 x 1.6	5.2 x 3.1 x 2	5.2 x 3.5 x 2.2
Weight, approx.	kg	1.5	1.7	1.8
	lbs	3.3	3.7	4

		1 1/4"	1 1/2"	2"
Art. No.		1500002601	1500002701	1500002801
Nominal size	mm	42.4	48.3	60.3
	inch	1.7	1.9	2.4
for diameter	DN	32	40	50
Size (L x W x H)	mm	133 x 105 x 52	133 x 110 x 52	133 x 125 x 80
	inch	5.2 x 4.1 x 2	5.2 x 4.3 x 2	5.2 x 4.9 x 3.1
Weight, approx.	kg	2.1	2.3	2.4
	lbs	4.6	5.1	5.3

		2 1/2"	3"	4"
Art. No.		1500002901	1500003201	1500003301
Nominal size	mm	76.1	88.9	114.3
	inch	3	3.5	4.5
for diameter	DN	65	80	100
Size (L x W x H)	mm	133 x 135 x 100	133 x 138 x 110	135 x 190 x 142
	inch	5.2 x 5.3 x 3.9	5.2 x 5.4 x 4.3	5.3 x 7.5 x 5.6
Weight, approx.	kg	3.6	3.6	4
	lbs	7.9	7.9	8.8

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14. Vetter Sealing Paste

14.1 Description

Use the leak sealing paste to quickly and reliably seal difficult to access leaks on even the smallest valve collars and flanges in pipeline systems and vessels such as drums and containers.

This paste is a general-purpose product for immediately sealing leaks with fluid chemicals and is ideal for temporary immediate measures. The seal can be used for several hours up to days.

It can also be used on slightly rusty, greasy or dirty substrates.

The leak sealing paste is water soluble, so it is not suitable for sealing water leaks.

- ✓ Uniformly press the leak sealing paste firmly into the leak with a spatula, starting above the leak. Subsequently carefully glue the leak with a generous amount of paste by carefully pressing it and smoothing it on.
Protect the seal from weather effects.



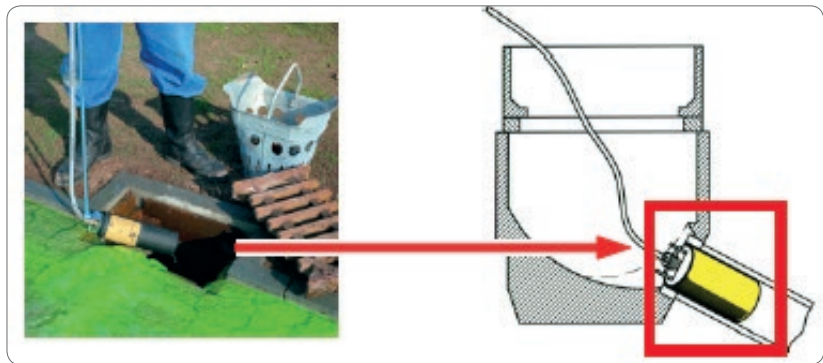


15. Vetter Gully Sealing Bags

15.1 Vetter Universal Gully Sealing Bags

With the Vetter Gully Sealing Bags outlets in road gullies can be quickly sealed when liquids dangerous for the environment threaten to flow into the sewer network. A guiding rod enables accurate positioning of the sealing bag. The inlet can then be used as a pump sump.

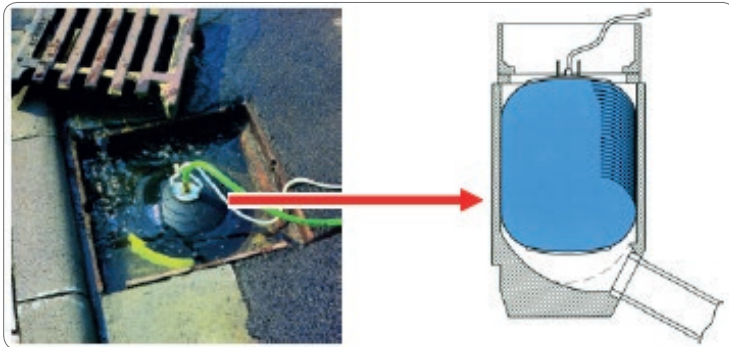
The Universal Gully Sealing Bag can be used up to a counter-pressure of 10 m water column.



- ✓ Connect the integrated inflation hose to the foot air pump or controller 2.5 bar.
- ✓ Position the guiding rod onto the sealing bag.
- ✓ Position the sealing bag with guiding rod into the outlet and secure the working line.
- ✓ Inflate the sealing bag with air.

15.2 Compact Gully Sealing Bags

Sewer channel inlets can be quickly sealed with the Vetter Compact Sealing Bag when liquids dangerous for the environment threaten to flow into the sewer network.



- ✓ Firstly remove the cover of the gully and then withdraw the dirt collection filter which may be situated underneath.
- ✓ Connect the inflation fitting and safety fitting to the compressed air bottle.
- ✓ Couple the quick connection coupling of the bag inflation hose to the nipple of the inflation fitting and safety fitting.
- ✓ Lower the Compact Gully Sealing Bag with inflation hose into the open gully using the securing line so that the centre of the bag is situated in the round area of the inlet; if necessary, firstly inflate the bag slightly until it has a cylindrical shape.
- ✓ Slowly open the compressed air bottle by turning the hand wheel.
- ✓ Monitor the maximum operating pressure of the bag on the manometer.
- ✓ As soon as the bag is positioned in the round area of the inlet and seals (at a maximum of 0.5 bar) close the compressed air bottle by turning the hand wheel to the stop.
- ✓ Place the bottle with inflation fitting outside the area of the liquid and, if necessary, seal the next gully with another bag.
- ✓ After bag operation, deflate and withdraw it from the gully using the securing line.
- ✓ Clean the bag and accessories and inspect for possible damage. Rub the bag over with talcum powder and roll it up starting from the bottom to the top. Close the safety valve.
- ✓ Determine the pressure reserve remaining in the bottle and, if necessary, have the bottle refilled.
- ✓ Connect the refilled bottle again to the inflation fitting and safety fitting.
- ✓ Pack the complete connected Compact Gully sealing Bag system (bag, inflation hose, inflation fitting and safety fitting, compressed air bottle) into the transport case.



15.3 Technical data Gully Sealing Bags

		Universal Gully Leak Sealing Bag 10-15	Universal Gully Leak Sealing Bag 15-30	Compact Gully Leak Sealing Bag 30-50	Compact Gully Leak Sealing Bag 50-80
Art. No.		1470000200	1470001300	1460000101	1460001400
Gully outlet. min. - max	cm	10 - 15	15 - 30	30 - 50	50 - 80
	inch	4 - 6	6 - 12	12 - 20	20 - 32
Operating pres- sure	bar	2.5	2.5	0.5	0.5
	psi	36.25	36.25	7.25	7.25
Test pressure	bar	3.25	3.25	0.65	0.65
	psi	47.1	47.1	9.4	9.4
Test counter- pressure	m WS	10	10	2	2
	psi	14.5	14.5	2.9	2.9
Cylinder length	cm	25	35	41	41
	inch	9.8	13.8	16	16
Total length	cm	28.5	39	46	46
	inch	11.2	15.4	18.1	18.1
Diameter	cm	9	14.5	29.5	45
	inch	3.5	5.7	11.6	17.7
Nominal content	l	3.7	14.3	85	284
	cu.ft.	0.13	0.5	3	10
Air requirement at 0.5/2.5 bar	l	13	50	128	426
	cu.ft.	0.5	1.8	4.5	15
Approximate weight	kg	1.5	2.2	3.7	8.3
	lbs	3.3	4.9	8.2	18.3
Approximate weight (kit)	kg	13	18	11.7	-
	lbs	28.7	39.7	25.8	-

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16. List for temperature resistances and materials

16.1 Material list

Products	Material	Base material	Production
Flange drainage bag	CR	CR	Hot vulcanised
Leak sealing bandages	CR	Nylon cord	Hot vulcanised
Leak sealing bags	CR	Nylon cord/Aramid	Hot vulcanised
Leak sealing lance	NR	Nylon cord	Hot vulcanised
Mini-leak sealing bag	CR	Nylon cord	Hot vulcanised
Vacuum leak draining bag	NR	Nylon cord	Hot vulcanised
High Pressure Leak Sealing System	NBR	NBR	-
Acid protection cover	PVC	Polyester	-
Gully leak sealing bag	CR	Nylon cord	Hot vulcanised
GFRP articles	GFK	Fibre glass mats	-
Inflation hoses and air supply hoses	EPDM	Polyester	-

16.2 Temperature resistance

Products	Cold resistance	Cold flexible	Heat resistance long period	Heat resistance short period
Hot vulcanised	-40 °C	-20 °C	+90 °C	+115 °C
High Pressure Leak Sealing System	-30 °C			+80 °C
Rubber hoses	-40 °C	-30 °C	+90 °C	
Controller	-20 °C		+55 °C	
Packing bag, Packing covers, acid protection covers	-20 °C		+50 °C	

16.3 Resistance chart

Description of material	Material					
	CR	NR	GFK	PVC	EPDM	NBR
Acetone	o	+	-	-	-	-
Acetylene	+	+	+	o	-	+
Alum watery	+	+	+	+	-	n.d.
Aluminum chloride	+	+	+	o	+	+
Aniline	-	n.d.	o	-	n.d.	-
ASTM-Oil 1	o	-	+	n.d.	-	+
Petrol	o	-	+	-	n.d.	o
Benzene	-	-	o	-	-	-
Boric acid	+	+	n.d.	+	+	+
Bromine (moist)	-	-	o	-	-	-
Butyric acid	-	-	n.d.	o	n.d.	-
Chlorine gas (moist)	-	-	+	-	n.d.	-
Chorine, wet	o	-	+	n.d.	o	-
Diesel fuel	o	-	n.d.	o	-	o
Iron chloride	+	+	+	+	+	+
Crude oil	o	-	+	o	-	+
Acetic acid	o	+	+	o	o	+
Fatty acid	+	o	+	n.d.	-	o
Formaldehyde	+	+	+	n.d.	+	+
Glucose	+	+	+	+	+	o
Heating oil	+	-	+	+	-	o
Potassium chloride	+	+	+	o	+	o
Calcium chloride	+	+	+	o	+	o
Calcium nitrate	+	+	n.d.	n.d.	+	n.d.
Carbon dioxide	+	+	+	+	+	+
Carbon monoxide	+	+	n.d.	-	+	+
Copper sulphate	+	+	+	o	+	+
Adhesive	+	+	+	n.d.	+	+
Methyl chloride	-	-	n.d.	o	o	-
Sea water	+	+	+	o	n.d.	+
Mineral oil	+	-	+	+	-	+
Sodium carbonate	+	+	+	-	-	+
Ozone	+	-	+	n.d.	+	o
Paraffin	+	-	+	n.d.	-	o
Perchloric acid	o	n.d.	n.d.	n.d.	+	o
Phenol (watery)	-	-	o	-	+	-
Phosphoric acid (consentrated)	-	-	n.d.	+	-	+
Mercury	+	+	+	o	+	n.d.
Nitric acid (fuming)	-	-	n.d.	+	-	-
Sulphur dioxide (dry)	-	o	n.d.	o	n.d.	o
Sulphuric acid (50%)	+	-	+	o	-	+
Nitrogen	+	+	n.d.	n.d.	+	o
Carbon tetrachloride	-	-	n.d.	o	-	o
Animal fat	+	-	n.d.	n.d.	+	o
Toluene	-	-	o	-	-	-

+ resistant 0 conditionally resistant - non-resistant n.d. no details

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