

VSP Vacuum Leak Test

in accordance to DIN EN 1593



2013

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Delivery time:

Approx. 4-5 weeks, depending on the kind of vacuum box. Please ask for delivery times for each vacuum box separately.

Leak detection with VSP-leak detection units and vacuum boxes

Using the bubble test procedure according to DIN EN 1593, vacuum leak detection units of the VSP series allow a fast and safe leak testing of the welding seams of containers, pipes and many other welded structures. With this testing method even castings can be checked for continuous discontinuities (leaks, porosity).

The leak detection method with VSP-units is used e.g. prior to a compression trial. They are also used instead of a compression trial, if the latter can be executed only with unrealistically high effort or if the compression trial gives only limited satisfying results (e.g. when testing parts which are thin walled compared to its measurements).

VSP leak detection units and vacuum boxes are used for leak testing especially in cases when the test piece is accessible only from one side or if it is an open construction (such as the bottom of tanks or collecting basins).

When using VSP-units, the area to be tested (the welding seam or the casting surface) is moistened with a foam-forming inspection material, e.g. MR® 99 Leak detection spray. Soap water should not be used for leak detection.

Then the area is covered with a vacuum box adapted to the test area. The vacuum box is connected to the leak detection unit by a vacuum hose and is evacuated very quickly.

Under the inspection glass of the evacuated vacuum box foam shows up where air flows through continuous discontinuities. This method allows easy location of possible leakages to be corrected or repaired.

Under practical test conditions, the realizable leak detection limit of the bubble test procedure is approx. between 10^{-5} and 10^{-4} Pa x m³/s (10^{-4} to 10^{-3} mbar x l/s).

To ensure that even tiny leaks become visible the vacuum under the box must be maintained for at least 30 s.

VSP-Leak detection units

Technical description:

VSP-Leak detection units have proven their worth especially because of their robust structure and suitability for use on construction sites. They offer custom-made solutions adjusted to the customer's requirements and fields of application.

Low maintenance, self-lubricating vacuum pump with a high suction power built in a stable welded steel tube framework with two carrying handles, equipped with vacuum meter, vacuum regulation valve, air filter, dirt filter, water separator, splash-proof protective motor switch as well as 3 m cable.

Apart from the offered pumps we deliver oil-lubricated or maintenance-free vacuum pumps for special needs up to 63 m³. Prices on request.

Leak detection unit VSP 1TS

Suction power (at 100 kPa) approx.	8 m ³ /h
End vacuum, controllable, up to approx.	15 kPa (150 mbar)
Corresp. negative pressure up to approx.	-85 kPa (-850 mbar)
Mains supply	230 V/50 Hz
Power draw	0,37 kW
Measurements (B x T x H) approx.	440 x 200 x 400 mm
Weight approx.	19 kg



50 001 01

Leak detection unit VSP 2TS

Suction power (at 100 kPa) approx.	10 m ³ /h
End vacuum, controllable, up to at least approx.	15 kPa (150 mbar)
Corresp. negative pressure up to approx.	-85 kPa (-850 mbar)
Mains supply	230 V/50 Hz
Power draw	0,37 kW
Measurements (B x T x H) approx.	480 x 360 x 310 mm
Weight approx.	25 kg



50 001 02

Spare parts and accessories

Wearing part set VSP 1 TS Pump (slide, seal, filter)	50 002 01
Wearing part set VSP 2 TS Pump (slide, seal, filter)	50 002 02
Vacuum-manometer for VSP1 TS Ø 63 mm	50 003 00
Vacuum-manometer for VSP2 TS Ø 63 mm	50 003 01
Vacuum Manometer for Vacuum Boxes Ø 40 mm	50 003 02
Polish and Maintenance set for Vacuum Boxes	50 003 06
Repair Set for VSP Vacuum Box (incl. foam rubber and adhesive)	50 000 10
Y-piece with adaptor coupling for 2 inspection stations	50 003 11
Adaptor coupling – set for VSP Vacuum Boxes with ½" vacuum hose	50 003 12
Vacuum-spiral-hose ½", price per meter	50 003 04

Length max. 50m **, price per meter **) Preferential length 10 m, 25 m, 50 m



50 003 10



50 003 11



50 003 12



VSP-Vacuum boxes

consist of an approx. 100 mm wide break-proof sight glass made of highly transparent, flexible plastic, which is equipped with a special soft rubber seal. The vacuum box is evacuated by a freely swivelling valve, which seals in any orientation. The valve has a conical adapter for the ½" vacuum hose. Economic length lies between 500 and 700 mm. Other lengths are available on request. All VSP-Vacuum boxes comes along with a Manometer.



Butt seam-vacuum box

Economic length lies between 500 and 700 mm.



approx. 500 mm
approx. 600 mm
approx. 750 mm
Special sizes



51 000 50
51 000 60
51 000 75
51 000 01

Overlap fillet weld-vacuum box

Economic length lies between 500 and 700 m



Step height 6 mm

for plate thickness approx. 3-9 mm

Length approx. 500 mm

approx. 600 mm
approx. 750 mm
Special sizes



52 006 50
52 006 60
52 006 70
52 006 01

Step height 8 mm

for plate thickness approx. 5-11 mm

Length approx. 500 mm

approx. 600 mm
approx. 750 mm
Special sizes

52 008 50
52 008 60
52 008 70
52 008 01

Step height 10 mm

for plate thickness approx. 7-13 mm

Length approx. 500 mm

approx. 600 mm
approx. 750 mm
Special sizes

52 010 50
52 010 60
52 010 70
52 010 01

90°-fillet weld-vacuum box
(straight design for box shaped containers)



Length approx. 500 mm 53 000 50
 approx. 600 mm 53 000 60
 Special size 53 000 01

Miniature-90°-fillet weld-vacuum box incl. reducing adapter
(straight design for box shaped containers)

Special design for testing the 90° edges of collecting basins according to the German „GefStoffVO“ for dangerous liquids (for basin heights > approx. 40 mm)



Length approx. 250 mm 53 001 25
 Special sizes 53 001 01

270°-fillet weld-vacuum box

2 x approx. 100 mm wide, roof-similar construction with rounded edges for testing the outer 90° edge



Length approx. 500 mm 54 001 5

3x90°-edge weld-vacuum box

For testing the inner 3x90° edge seams



Edge length 3 x approx. 270 mm 55 001 27

Miniature-3x90°-edge weld-vacuum box incl. incl. reducing adapter

Special design for testing the inner 90° edges of collecting basins according to the German „GefStoffVO“ for dangerous liquids (for basin heights ≥ approx. 40 mm)



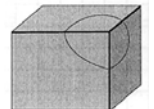
Edge length 3 x approx. 60 mm 55 002 06

3x270°-edge weld-vacuum box

For testing the outer 3x270° edge seams



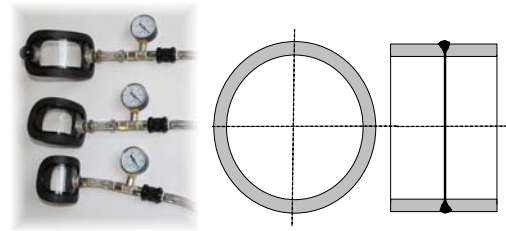
56 001 10



90° fillet weld and edge weld vacuum boxes with other requested measurements and / or other geometries (e.g. shafts) as well as vacuum boxes for corners and edges with completely varying angles

Vacuum boxes for testing butt welded circumferential seams

In the miniature-version the sight glass preformed at nominal size covers two diameter ranges; i.e. it is expansible to the next higher diameter range.



(Miniature-) circumferential seam-vacuum box (DN 25) incl. reducing adapter

for leak testing of surfaces with curvature diameter approx. 33.7 mm, length of vacuum box approx. 100 mm

57 00025

(Miniature-) circumferential seam-vacuum box (DN 32) incl. reducing adapter

for leak testing of surfaces with curvature diameter approx. 41 mm, length of vacuum box approx. 110 mm

57 000 32

(Miniature-) circumferential seam-vacuum box (DN 40) incl. reducing adapter

for leak testing of surfaces with curvature diameter approx. 48.3 mm, length of vacuum box approx. 120 mm

57 000 40

(Miniature-) circumferential seam-vacuum box (DN 50) incl. reducing adapter

for leak testing of surfaces with curvature diameter approx. 60.3 mm, length of vacuum box approx. 135 mm

57 000 50

(Miniature-) circumferential seam-vacuum box (DN 65) incl. reducing adapter

for leak testing of surfaces with curvature diameter approx. 76.1 mm, length of vacuum box approx. 150 mm

57 000 65

(Miniature-) circumferential seam-vacuum box (DN 80) incl. reducing adapter

For leak testing of surfaces with curvature diameter approx. 88.9 mm, length of vacuum box approx. 170 mm

57 000 80

(Miniature-) circumferential seam-vacuum box (DN 100) incl. reducing adapter

for leak testing of surfaces with curvature diameter approx. 114.3 mm, length of vacuum box approx. 195 mm

57 001 00





Circumferential seam-vacuum box (DN 125)

for leak testing of surfaces with curvature diameter approx. 139.7 mm,
length of vacuum box approx. 220 mm

57 001 25

Circumferential seam-vacuum box (DN 150)

for leak testing of surfaces with curvature diameter approx. 168.3 mm,
length of vacuum box approx. 260 mm

57 001 50

Circumferential seam-vacuum box (DN 200)

for leak testing of surfaces with curvature diameter approx. 291.1 mm,
length of vacuum box approx. 370 mm (testing range 1/4 of circle)

57 002 00

Circumferential seam-vacuum box (DN 250)

for leak testing of surfaces with curvature diameter approx. 273 mm,
length of vacuum box approx. 400 mm (testing range 1/4 of circle)

57 002 50

Circumferential seam-vacuum box (DN 300)

for leak testing of surfaces with curvature diameter approx. 323.9 mm,
length of vacuum box approx. 440 mm (testing range 1/4 of circle)

57 003 00

Circumferential seam-vacuum box (DN 350)

for leak testing of surfaces with curvature diameter approx. 355.6 mm,
length of vacuum box approx. 460 mm (testing range 1/4 of circle)

57 003 50

Circumferential seam-vacuum box (DN 400)

for leak testing of surfaces with curvature diameter approx. 406.4 mm,
length of vacuum box approx. 500 mm (testing range 1/4 of circle)

57 004 00

Circumferential seam-vacuum box (DN 450)

for leak testing of surfaces with curvature diameter approx. 457 mm,
length of vacuum box approx. 540 mm (testing range 1/4 of circle)

57 004 50

Circumferential seam-vacuum box (DN 500)

for leak testing of surfaces with curvature diameter approx. 508 mm,
length of vacuum box approx. 570 mm (testing range 1/4 of circle)

57 005 00

Circumferential seam-vacuum box (DN 550)

for leak testing of surfaces with curvature diameter approx. 559 mm,
length of vacuum box approx. 610 mm (testing range 1/4 of circle)

57 005 50

Circumferential seam-vacuum box (DN 600)

for leak testing of surfaces with curvature diameter approx. 610 mm,
length of vacuum box approx. 650 mm (testing range 1/4 of circle) 57 006 00

Circumferential seam-vacuum box (DN 700)

for leak testing of surfaces with curvature diameter approx. 711 mm,
length of vacuum box approx. 730 mm (testing range 1/4 of circle) 57 007 00

Circumferential seam-vacuum box (DN 800)

for leak testing of surfaces with curvature diameter approx. 813 mm,
length of vacuum box approx. 670 mm (testing range 1/5 of circle) 57 008 00

Circumferential seam-vacuum box (DN 900)

for leak testing of surfaces with curvature diameter approx. 914 mm,
length of vacuum box approx. 730 mm (testing range 1/5 of circle) 57 009 00

Circumferential seam-vacuum box (DN 1000)

for leak testing of surfaces with curvature diameter approx. 1.016 mm,
length of vacuum box approx. 680 mm (testing range 1/6 of circle) 57 010 00

Circumferential seam-vacuum box (DN 1100)

for leak testing of surfaces with curvature diameter approx. 1.118 mm,
length of vacuum box approx. 730 mm (testing range 1/6 of circle) 57 011 00

Circumferential seam-vacuum box (DN 1200)

for leak testing of surfaces with curvature diameter approx. 1.219 mm,
length of vacuum box approx. 690 mm (testing range 1/7 of circle) 57 012 00

Circumferential seam-vacuum box (DN 1300)

for leak testing of surfaces with curvature diameter approx. 1.321 mm,
length of vacuum box approx. 730 mm (testing range 1/7 of circle) 57 013 00

Circumferential seam-vacuum box (DN 1400)

for leak testing of surfaces with curvature diameter approx. 1.422 mm,
length of vacuum box approx. 730 mm (testing range 1/7 of circle) 57 014 00

Circumferential seam-vacuum box (DN 1500)

for leak testing of surfaces with curvature diameter approx. 1.524 mm,
length of vacuum box approx. 730 mm (testing range 1/8 of circle) 57 015 00

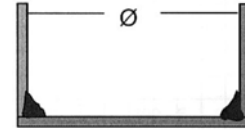
Circumferential seam-vacuum box (DN 1600)

for leak testing of surfaces with curvature diameter approx. 1.626 mm,
length of vacuum box approx. 770 mm (testing range 1/8 of circle) 57 016 00

The mentioned testing range includes an overlapping of bordering testing ranges of at least 50-60 mm (see EN 1593).

Vacuum boxes for testing circumferential fillet welds

The vacuum boxes are customs-made for the resp. container diameter at an economical length of 500 – 750 mm.



90°-circumferential fillet welds-vacuum boxes (D= 2.250 mm)

for (inner) diameter approx. 2.000 - 2.600 mm
length of vacuum box approx. 500 mm

58 022 50

90°-circumferential fillet welds-vacuum boxes (D= 2.800 mm)

for (inner) diameter approx. 2.500 - 3.200 mm
length of vacuum box approx. 500 mm

58 028 00

90°-circumferential fillet welds-vacuum boxes (D= 3.450 mm)

for (inner) diameter approx. 3.100 - 3.850 mm
length of vacuum box approx. 600 mm

58 034 50

90°-circumferential fillet welds-vacuum boxes (D= 4.050 mm)

for (inner) diameter approx. 3.600 - 4.600 mm
length of vacuum box approx. 600 mm

58 040 50

90°-circumferential fillet welds-vacuum boxes (D= 4.900 mm)

for (inner) diameter approx. 4.250 - 5.850 mm
length of vacuum box approx. 600 mm

58 049 00

90°-circumferential fillet welds-vacuum boxes (D= 6.500 mm)

for (inner) diameter approx. 5.400 - 8.300 mm
length of vacuum box approx. 700 mm

58 065 00

90°-circumferential fillet welds-vacuum boxes (D= 8.750 mm)

for tank diameter approx. 6.800 - 12.500 mm
length of vacuum box approx. 700 mm

58 087 50

90°-circumferential fillet welds-vacuum boxes (D= 15.000 mm)

for (inner) diameter from approx. 10.000 mm
length of vacuum box approx. 700 mm

58 150 00

90°-circumferential fillet welds-vacuum boxes for tank floors less than 2.000 mm Ø as well as circumferential fillet welds-vacuum boxes for other geometries and at the same time angles possibly deviating from 90°

Vacuum boxes for special test requirements



Round vacuum boxes

diameter approx. 125 mm	59 125 01
diameter approx. 200 mm	59 200 01
diameter approx. 250 mm	59 250 01
diameter approx. 300 mm	59 300 01
diameter approx. 400 mm	59 400 01

Square and angular vacuum boxes with rounded edges

(Edge radius approx. 50 mm)

approx. 200 x 300 mm	59 200 02
approx. 400 x 400 mm	59 400 02

Round, square or angular vacuum boxes with other measurements

Highly flexible, special vacuum boxes

Vacuum boxes with an extremely highly flexible sight glass for adaptation to geometries with curved surfaces with more than one curvature axes, measurements approx. 100 x 150 mm and bigger.

Specially designed vacuum boxes

For many test requirements which are not mentioned here, e.g. for leak testing of overlapping round seams (sleeves), connecting piece seams and many other special geometries, vacuum boxes have already been designed, or may be designed according to a sample or drawing.



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