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# KOWOVAC V

## KOWOVAC V Leak Test System according to EN 1593, ASTM E515



Vacuum leak testing with bubble testing method

# KOWOVAC Vacuum leak test systems

## Generals about vacuum leak testing with KOWOVAC

KOWOVAC vacuum leak testing systems allow a quick and safe leak test of welding seams in tanks, pipelines, and many other welding structures.

Also, castings can be inspected for cracks and porosity, if going through complete wall thickness. So called "bubble testing" method can be performed according to EN 1593 and ASTM E515 .

Leak testing with KOWOVAC systems is performed before or instead a hydraulic pressure test if this can be done only with high expenses or if a pressure test cannot give reliable result because of too thin wall thickness.

KOWOVAC V systems and vacuum boxes are especially used for leak testing in cases where structures are accessible only from one side (tank floors) or for testing of open structures (storage tanks).

With the KOWOVAC V used method of leak testing a foaming agent is sprayed onto the test area of a welding seam or a casting part. Especially suitable for such a foaming agent is the G-FLEX leak finder – soap water should not be used for this application.

After applying the foaming agent the test area is covered with a vacuum box, fitted to the geometry of the structure, which must be tested. This vacuum box is connected with a vacuum hose to KOWOVAC V unit. After opening the valve - which is automatically done by pressing the box onto the test area - the volume under the vacuum box is evacuated within a few seconds. If there is a defect within the vacuum box, a foam hat is built up quickly, because of the streaming in air through this defect. Leaks can be determined with this method easily.

Detection limits of this method under practical testing conditions are between 0.0001 and 0.001 mbar l / s.

For safe detection of even small defects the vacuum underneath the box must be sustained for at least 30 seconds.

## G-FLEX Leak Test Solutions

All G-FLEX products are tested and registered by the German DVGW according to DIN 30 657 and can be used for all test pieces and with all gases.

### G-FLEX Leak Finder - for all test purposes

Bottle with pump sprayer, 500 ml

60 00511

Cubitainer, 5 l

60 00303

Cubitainer, 10 l

60 00304

Applying bottle with pump sprayer, empty, 500 ml

60 25101

### G-FLEX Leak Finder ice-proof - for low temperatures to -15°C

Aerosol can, 400 ml, without CKW

60 00121

### G-FLEX Leak Finder foam - for special tests (higher contrast, vertical use)

Aerosol can, 400 ml, without CKW

60 00101



## KOWOVAC Accessories

Vacuum hose, steel spiral re-inforced, Ø 13 mm (1/2 in)

60 70407



## KOWOVAC Vacuum boxes

Highly limp, flexible plastics is used for the break-proof inspection pane. For best sealing on nearly all surfaces the pane is edged with a highly flexible gasket of a special soft rubber mixture. For evacuating the box a 360° rotatable vacuum valve with connection for the Ø 13 mm (1/2 inch) vacuum hose is used. By pressing down the box onto the test piece at the handles – one handle is the vacuum valve – the valve is opened and testing starts.

### KOWOVAC Vacuum boxes for testing butt weld seams - 180° (i.e. tank floor)

Dimensions: inspection pane 75 x (length - 50) mm, total 120 x length x 30 mm, in-side 20 mm heigh, rubber gasket 20 x 30 mm

Vacuum Box MINI, butt weld seam, length 200 mm (8 in)

60 70397

Vacuum Box MINI, butt weld seam, length 300 mm (12 in)

60 70398

Vacuum Box, butt weld seam, length 400 mm (16 in)

60 70399

Vacuum Box, butt weld seam, length 500 mm (20 in)

60 70401

**Vacuum Box, butt weld seam, length 600 mm (24 in)**

**60 70400**

Vacuum Box, butt weld seam, length 750 mm (30 in)

60 70402



### KOWOVAC Vacuum boxes for testing lap fillet weld seams - 180° (i.e. tank floor)

Dimensions: inspection pane 75 x (length - 50) mm, total 120 x length x 30 mm, in-side 20 mm heigh, rubber gasket 20 x 30 mm

Vacuum Box, lap fillet weld seam, step 3 to 9 mm, length 500 mm (20 in)

60 70391

**Vacuum Box, lap fillet weld seam, step 3 to 9 mm, length 600 mm (24 in)**

**60 70393**

Vacuum Box, lap fillet weld seam, step 3 to 9 mm, length 750 mm (30 in)

60 70394

Vacuum Box, lap fillet weld seam, step 5 to 11 mm, length 500 mm (20 in)

60 70387

**Vacuum Box, lap fillet weld seam, step 5 to 11 mm, length 600 mm (24 in)**

**60 70388**

Vacuum Box, lap fillet weld seam, step 5 to 11 mm, length 750 mm (30 in)

60 70389

Vacuum Box, lap fillet weld seam, step 7 to 13 mm, length 500 mm (20 in)

60 70419

**Vacuum Box, lap fillet weld seam, step 7 to 13 mm, length 600 mm (24 in)**

**60 70421**

Vacuum Box, lap fillet weld seam, step 7 to 13 mm, length 750 mm (30 in)

60 70420

Vacuum Box, lap fillet weld seam, step 8 to 16 mm, length 500 mm (20 in)

60 70415

Vacuum Box, lap fillet weld seam, step 8 to 16 mm, length 750 mm (20 in)

60 70414



### KOWOVAC Vacuum boxes for testing butt weld seams - 180° - out-side (i.e. tubes, tanks)

Dimensions: inspection pane 75 x (length - 50) mm, total 120 x length x 30 mm , in-side 20 mm heigh , rubber gasket 20 x 30 mm

Vacuum Box MINI, round butt weld seam, Ø 25, length 100 mm ( 4 in)	60 70503
Vacuum Box MINI, round butt weld seam, Ø 32, length 110 mm ( 4 in)	60 70504
Vacuum Box MINI, round butt weld seam, Ø 40, length 120 mm ( 5 in)	60 70505
Vacuum Box MINI, round butt weld seam, Ø 50, length 135 mm ( 5 in)	60 70506
Vacuum Box MINI, round butt weld seam, Ø 65, length 150 mm ( 6 in)	60 70507
Vacuum Box MINI, round butt weld seam, Ø 80, length 170 mm ( 7 in)	60 70508
Vacuum Box MINI, round butt weld seam, Ø 100, length 195 mm ( 8 in)	60 70509
Vacuum Box, round butt weld seam, Ø 125, length 220 mm ( 9 in)	60 70510
Vacuum Box, round butt weld seam, Ø 150, length 260 mm (10 in)	60 70511
Vacuum Box, round butt weld seam, Ø 200, length 370 mm (15 in)	60 70512
Vacuum Box, round butt weld seam, Ø 250, length 400 mm (16 in)	60 70513
Vacuum Box, round butt weld seam, Ø 300, length 440 mm (17 in)	60 70514
Vacuum Box, round butt weld seam, Ø 350, length 460 mm (18 in)	60 70515
Vacuum Box, round butt weld seam, Ø 400, length 500 mm (20 in)	60 70516
Vacuum Box, round butt weld seam, Ø 450, length 540 mm (21 in)	60 70529
Vacuum Box, round butt weld seam, Ø 500, length 570 mm (23 in)	60 70517
Vacuum Box, round butt weld seam, Ø 550, length 610 mm (24 in)	60 70530
Vacuum Box, round butt weld seam, Ø 600, length 650 mm (26 in)	60 70518
Vacuum Box, round butt weld seam, Ø 700, length 740 mm (29 in)	60 70519
Vacuum Box, round butt weld seam, Ø 800, length 730 mm (29 in)	60 70520
Vacuum Box, round butt weld seam, Ø 900, length 730 mm (29 in)	60 70521
Vacuum Box, round butt weld seam, Ø 1000, length 730 mm (29 in)	60 70522
Vacuum Box, round butt weld seam, Ø 1100, length 750 mm (30 in)	60 70523
Vacuum Box, round butt weld seam, Ø 1200, length 750 mm (30 in)	60 70524
Vacuum Box, round butt weld seam, out-side, Ø 1300, length 750 mm (30 inches)	60 70525
Vacuum Box, round butt weld seam, out-side, Ø 1400, length 750 mm (30 inches)	60 70526
Vacuum Box, round butt weld seam, out-side, Ø 1500, length 750 mm (30 inches)	60 70527
Vacuum Box, round butt weld seam, out-side, Ø 1600, length 750 mm (30 inches)	60 70528



### KOWOVAC Vacuum boxes for testing 90° / 270° fillet weld seams (edges and corners)

Dimensions: inspection pane 70 x (length - 50) mm, total 130 x length x 30 mm , in-side 20 mm heigh , rubber gasket 25 x 35 mm

Vacuum Box MINI, fillet weld seam, 90°, in-side, length 250 mm (10 in)	60 70426
Vacuum Box, fillet weld seam, 90°, in-side, length 400 mm (16 in)	60 70395
Vacuum Box, fillet weld seam, 90°, in-side, length 500 mm (20 in)	60 70403
<b>Vacuum Box, fillet weld seam, 90°, in-side, length 600 mm (24 in)</b>	<b>60 70396</b>
Vacuum Box, fillet weld seam, 90°, in-side, length 750 mm (30 in)	60 70404

#### Vacuum Box, round fillet weld seam, 90°, in-side (tank floor /-wall)

DN 2250, Ø 2000 to 2600 mm, length 500 mm (20 in)	60 70428
DN 2800, Ø 2600 to 3200 mm, length 500 mm (20 in)	60 70430
DN 3450, Ø 3100 to 3800 mm, length 600 mm (24 in)	60 70432
DN 4050, Ø 3600 to 4600 mm, length 600 mm (24 in)	60 70436
DN 4900, Ø 4200 to 5800 mm, length 600 mm (24 in)	60 70439
DN 6500, Ø 5400 to 8300 mm, length 700 mm (28 in)	60 70416
DN 8750, Ø 8000 to 10500 mm, length 700 mm (28 in)	60 70417
DN 15000, Ø from 10000 mm, length 700 mm (28 in)	60 70418

#### Vacuum Box, fillet weld seam, 270°, out-side, length 500 mm (20 in)

Vacuum Box MINI, fillet weld corner, 3 x 90°, in-side, edge length 100 / 60 mm	60 70427
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#### Vacuum Box, fillet weld corner, 3 x 90°, in-side, edge length 300 / 230 mm

#### Vacuum Box, fillet weld corner, 3 x 270°, out-side, edge length 270 mm

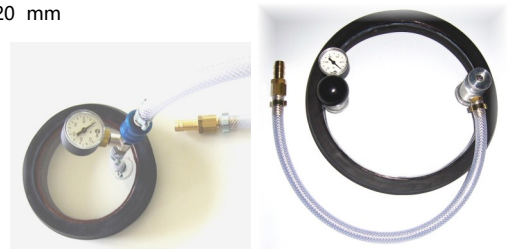


### KOWOVAC Vacuum Boxes for special testing purposes

Dimensions: inspection pane Ø - 40) mm, total Ø x 30 mm , in-side 20 mm heigh , rubber gasket 20 mm

Vacuum Box for castings, Ø 125 mm (5 in)	1 handle	60 70531
Vacuum Box for castings, Ø 250 mm (10 in)	2 handles	60 70532
Vacuum Box for castings, Ø 400 mm (16 in)	2 handles, 3 supports	60 70533
Vacuum Box for castings, 200 x 300 mm ( 8 / 12 in)	2 handles, 1 support	60 70534
Vacuum Box for castings, 400 x 400 mm (16 / 16 in)	2 handles, 4 supports	60 70535
Vacuum Box, high flexible, 100 x 150 mm (4 / 6 in)		60 70539

Inspection pane is especially high flexible for fitting onto vaulted surfaces





### KOWOVAC V Leak test units with vacuum pump

The complete KOWOVAC leak test unit comprising of vacuum pump with vacuum control valve, vacuum gauge, dust-/ liquid separator, splash proof switch and oil-resistant power cable, are built into a sturdy stainless-steel frame.

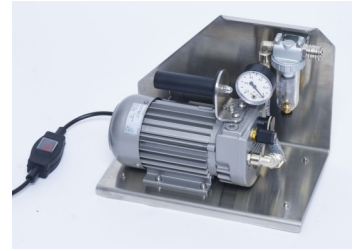
The oil-free (dry running) and air-cooled rotary vane vacuum pumps are maintenance friendly since the vanes are made from highly wear resistant carbon.

#### KOWOVAC VE.8 Leak test unit

60 70540

Economic, very light weight version for normal application, indoor use only – for one operator. Small dust-/ liquid separator, cable 3 m long.

Suction air rate (at 1000 mbar)	8.0 m <sup>3</sup> / h (9.1 m <sup>3</sup> / h)
Vacuum pressure / Pressure absolute, max.	850 / 150 mbar (12 / 2 psi)
Electrical connection	230 V / 50 Hz (60 Hz)
Electrical power	0.35 kW (0.42 kW)
Dimensions (WxDxH)	360 x 210 x 260 mm (14.2 / 8.3 / 10.2 inches)
Weight	15 kg (33 lbs)



#### KOWOVAC V1.8 Leak test unit

60 70550

Standard, light weight version for normal application, outdoor use – for one operator. Large dust-/ liquid separator, cable 3 m long.

Suction air rate (at 1000 mbar)	8.0 m <sup>3</sup> / h (9.1 m <sup>3</sup> / h)
Vacuum pressure / Pressure absolute, max.	850 / 150 mbar (12 / 2 psi)
Electrical connection	230 V / 50 Hz (60 Hz)
Electrical power	0.35 kW (0.42 kW)
Dimensions (WxDxH)	370 x 310 x 320 mm (14.5 / 12.2 / 12.6 inches)
Weight	17 kg (38 lbs)



#### KOWOVAC V2.10 Leak test unit

60 70560

Power version for fast inspection, outdoor use – for one operator. Large dust-/ liquid separator, cable 5 m long.

Suction air rate (at 1000 mbar)	10.0 m <sup>3</sup> / h (12.0 m <sup>3</sup> / h)
Vacuum pressure / Pressure absolute, max.	850 / 150 mbar (12 / 2 psi)
Electrical connection	230 V / 50 Hz (60 Hz)
Electrical power	0.37 kW (0.44 kW)
Dimensions (WxDxH)	490 x 360 x 440 mm (19.3 / 14.2 / 17.3 inches)
Weight	26 kg (57 lbs)



#### KOWOVAC V2.16 Leak test unit

60 70570

High power version for fast inspection, outdoor use – two operators. Large dust-/ liquid separator, cable 5 m long.

Suction air rate (at 1000 mbar)	16.0 m <sup>3</sup> / h (19.0 m <sup>3</sup> / h)
Vacuum pressure / Pressure absolute, max.	850 / 150 mbar (12 / 2 psi)
Electrical connection	230 V / 50 Hz (60 Hz)
Electrical power	0.55 kW (0.66 kW)
Dimensions (WxDxH)	490 x 360 x 440 mm (19.3 / 14.2 / 17.3 inches)
Weight	32 kg (70 lbs)



#### KOWOVAC Ejector unit

60 70900

The KOWOVAC Ejector carried by the inspector with a harness at the right hip is connected with a hose for compressed air and a vacuum hose to the vacuum box. The ejector is maintenance free and a large silencer reduces the noise of the out streaming compressed air at the back of the inspector.

Suction power (at 5 bar operating pressure)	12.9 m <sup>3</sup> / h (215 l/min)
Vacuum pressure / Pressure absolute, max.	800 / 200 mbar (11.5 / 3.0 psi)
Operating pressure (compressed air, required)	4 ... 6 bar
Air consumption (compressed air)	28.8 m <sup>3</sup> /h (480 l/min)
Dimensions (WxDxH)	280 x 80 x 110 mm (11.0 / 3.1 / 4.3 inches)
Weight ejector / with harness and hoses	1.0 kg (2 lbs) / 2.5 kg (5 lbs)

