

# OPERATING MANUAL

iina11e1-a (0604)



Catalog No.  
551-005

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# TC1000

test chamber for hermetically sealed  
parts

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## 0.1 Imprint

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 Germany

## 0.2 About these instructions

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These instructions are intended for users of the TC1000.

The aim of the instructions is to provide you with a rapid introduction to assembly and operation of the test chamber.

The structure of the instructions enables you to read the instructions from start to finish, or only the sections relevant to you if you are already familiar with the unit. In this case, a glossary is also available at the end of the document.

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# 1 Test chamber TC1000

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The TC1000 is a small vacuum chamber which allows you to carry out leak tests on sealed, small solid bodies. These include e.g. quartzes, relays, sensors, ICs and LEDs.

You can easily mount the test chamber on the leak detectors UL1000 and UL1000 Fab. It does not occupy much space thanks to its small size.

The test procedure for the test chamber is very easy in conjunction with the INFICON leak detectors. The test proceeds for the most part automatically.

You place the components in the test chamber and the process is activated by closing the cover. Two large red and green light emitting diodes show you the results of the test.

The procedure for dynamic calibration enables rapid and reliable testing of the components.

## 1.1 Explanation of terms and symbols

---

### Auto leak test

Refers to the operating mode of the leak detector UL1000 or UL1000 Fab, which enables hermetically sealed components to be tested for leakproofness.

### Dynamic calibration

The rise in a leakage rate signal is compared with the rise in the test leakage signal. Increasing leakage rates can therefore be detected more rapidly.

Calibration and measurement have the same endurance. So the signals of the underground that arouse because of a gas occupation of the surface can be better suppressed.

### ESD

Abbreviation for *electrostatic discharge*.

### ESD mat

An ESD mat on the leak detector prevents electrostatic charges from discharging e.g. onto components placed on it. The charge is removed via the mat.



### (Coffee cup)

Indicates the button for the pause function.



*Warning triangle*

Indicates a upcoming warning message which you can see by pressing the button.

## 1.2 *Technical data*

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|                   |                             |
|-------------------|-----------------------------|
| Diameter          | 130 mm                      |
| Depth             | 40 mm                       |
| Volume            | approx. 430 cm <sup>3</sup> |
| Weight            | 2.7 kg                      |
| Connecting flange | DN 25 KF                    |

## 2 Structure of the TC1000

### 2.1 The test chamber

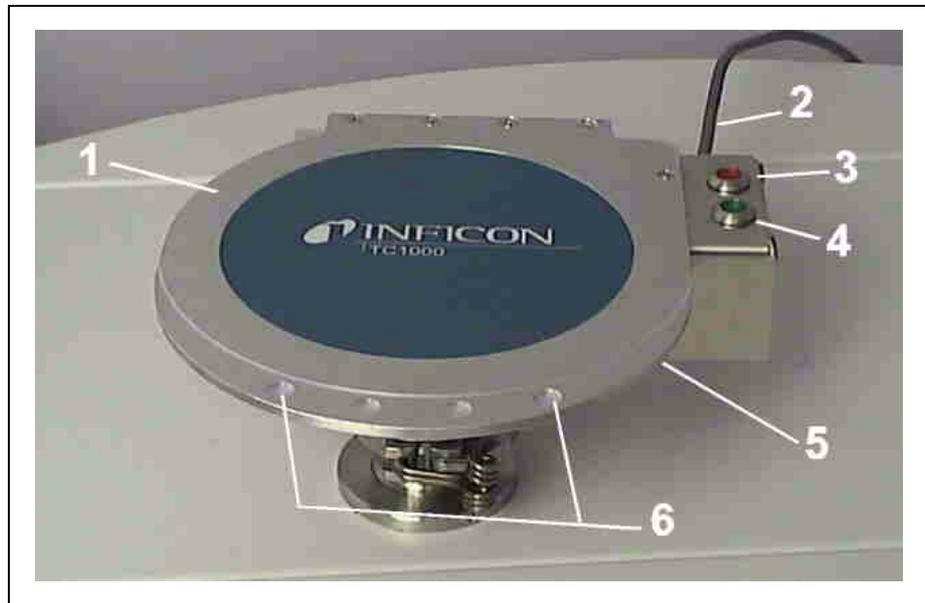


Abb. 2-1 The closed test chamber

| Item | Description  |  |
|------|--|--|
| 1    | Cover  | The cover of the test chamber has a floating mounting. It rests securely on the sealing lock.  |
| 2    | Connecting cable   | The electrical connection to the leak detector.  |
| 3    | Red light emitting diode                                 | The red light emitting diode lights up if a leak is verified which is greater than the trigger threshold set.  |
| 4    | Green light emitting diode                               | The green light emitting diode lights up if a leak is verified which is less than the trigger threshold set.   |
| 5    | ESD bracelet connection on the right of the test chamber | You can connect the ESD bracelet to this pushbutton. Potential static charges are discharged via a ESD bracelet. This prevents the components you are testing from becoming damaged. |
| 6    | Handle area  | Hold the cover here for opening and closing.   |

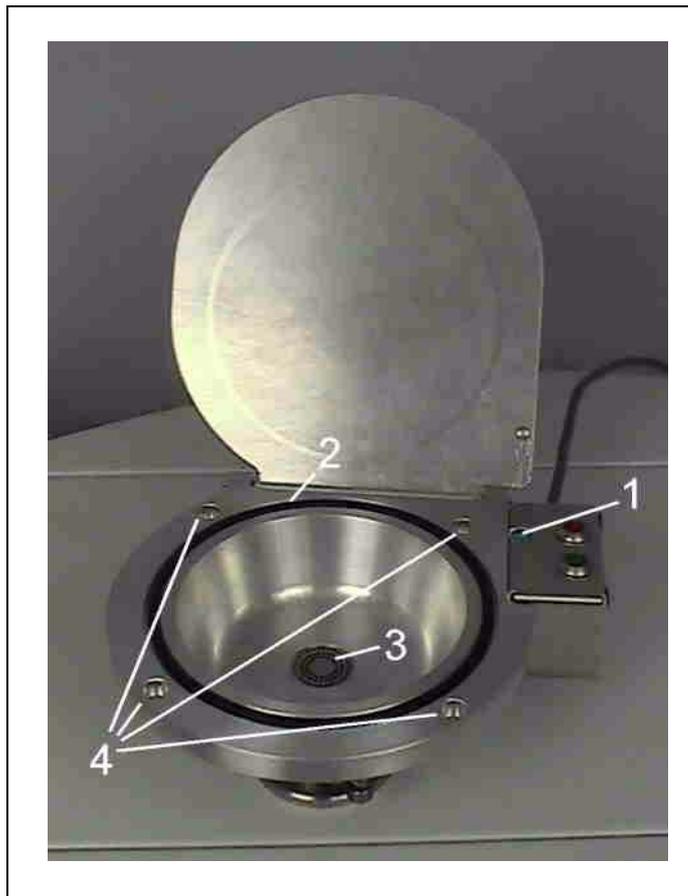


Abb. 2-2 The open test chamber

| Item | Description      |  |
|------|------------------|--|
| 1    | Proximity switch | If you close the cover, you activate the evacuation process via the proximity switch.          |
| 2    | O-ring           | The sealing ring seals the test chamber against the cover and can easily be replaced.          |
| 3    | Screen           | The screen prevents components from falling into the connecting flange.                        |
| 4    | Bore holes       | You can fasten the test chamber on a work table. The bore holes are already provided for this. |

## 2.2 The test chamber on the leak detector

The test chamber can preferably be operated on the INFICON leak detectors UL1000 or UL1000 Fab (software version 4.0 or higher).

In the following we describe use of the test chamber on a UL1000 Fab.



Fig. 2-3 Mounted on the leak detector

The test chamber is mounted on the leak detector with a tightening ring  
 You can find the instructions for this in Section 3.1.2.1, Removal.

## 2.3 The test leak adapter



Abb. 2-4

If you carry out an external calibration, you will need an adapter cable and a test leak, e.g. leak test TL7.

Section 3.1.2.4, Calibrating the leak detector describes how to calibrate the leak detector.

## 2.4 Scope of supply

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The delivery comprises:

- the test chamber TC1000,
- an ESD bracelet,
- the operating instructions for the unit (iina11d1)

## 2.5 Accessories

---

|   | Catalogue number |
|---|------------------|
| • ESD mat   | 551-002          |
| • Test leak adapter   | 200 00 1797      |
| • Test leak TL 7 (leakage rate in the range $10^{-7}$ mbar l/s) | 14210            |
| • Test leak TL 8 (leakage rate in the range $10^{-8}$ mbar l/s) | 16557            |
| • Test leak TL 8 with DKD calibration                           | 15593            |
| • Test leak TL 9 (leakage rate in the range $10^{-9}$ mbar l/s) | 14408            |

## 3 Operating the TC1000

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### 3.1 Starting up the TC1000

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#### 3.1.1 Unpacking

---

- 1 Now remove the plastic casing in which the TC1000 and accessories are packed.
- 2 Check the delivery for completeness. The scope of supply are listed in Section 2.4.
- 3 Keep the plastic casing and packaging so that you can store the test chamber in it during periods when you are not using the test chamber.

#### 3.1.2 Starting up

---

##### 3.1.2.1 Mount the test chamber

---

- 1 Place the test chamber on the inlet flange of the leak detector.



Fig. 3-1

| Item | Description     |
|------|-----------------|
| 1    | TC1000          |
| 2    | Centerring ring |
| 3    | Flange          |

- 2 Connect the test chamber to the leak detector by mounting a tightening ring.



Fig. 3-2

The test chamber is mounted on the unit. You can now establish the electrical connection between the test chamber and the leak detector.

- 3 Connect the cable to the Accessories socket of the leak detector UL1000 or UL1000 Fab.



Fig. 3-3

- 4 Call up the Auto Leak Test submenu in order to start the automatic test sequence. You can find further information on the Auto Leak Test operating mode in Section [3.1.2.2](#).

### 3.1.2.2 *Setting the Auto Leak Test operating mode*

---

- 1 Switch on the leak detector.
- 2 Press the Menu button.  
The Display main menu appears on the screen of the leak detector.

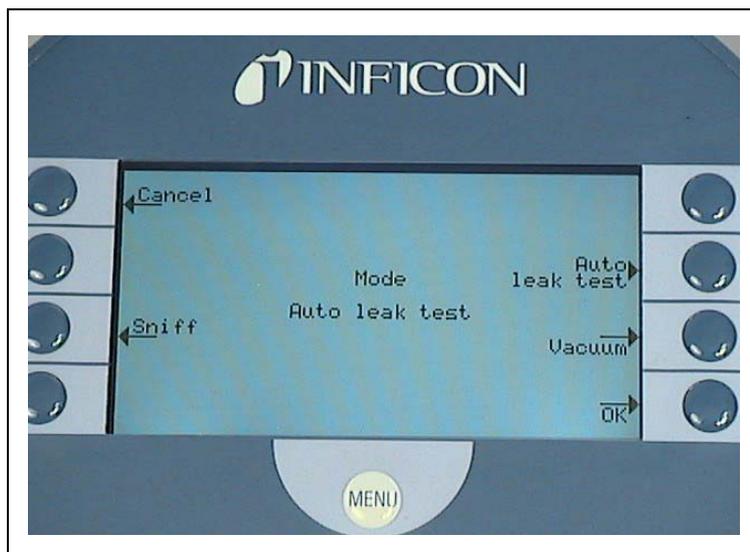


Fig. 3-4

- 3** Press the following buttons in the correct sequence in order to prepare the leak detector for operation of the test chamber.

MAIN MENU → MODE → AUTO LEAK TEST → OK

When first setting the Auto Leak Test operating mode, the leak detector refers to the menu AUTO LEAK TEST SETTINGS.

- 4** If you set the default settings (OK), you will be taken to operation. If you abort the process (Cancel), you will leave the operating mode again at this point.

### 3.1.2.3 Setting the test chamber for the test

- 1** When the leak detector is not set to AUTO LEAK TEST menu please press the following buttons in succession:

MENU → SETTINGS → VACUUM SETTINGS → AUTO LEAK TEST SETTINGS

- 2** The Auto Leak Test Settings menu now appears.

To be able to work in measuring mode, you need to set at least the measuring time and the rejection rate.

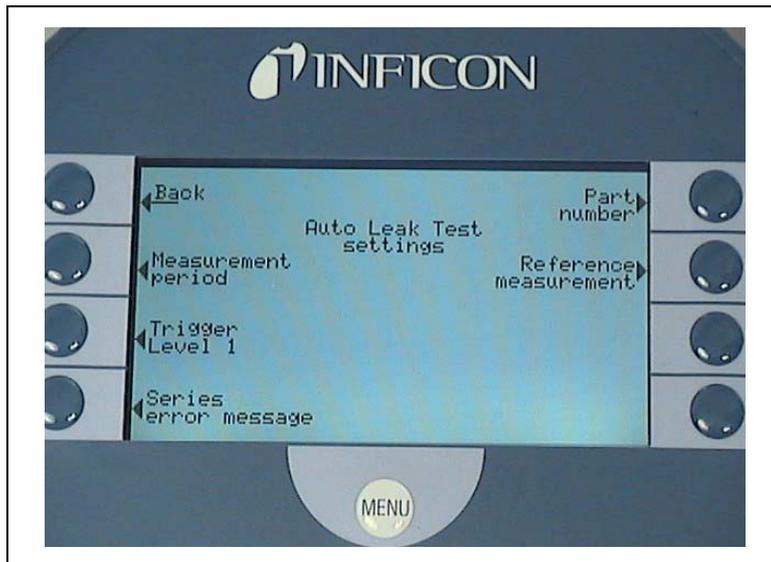


Fig. 3-5

- 3** Now set the measuring time and rejection rate:

*Setting the measuring time:*

- 1** Press the Measuring Time button.
- 2** Set the measuring time you require and confirm with OK.

*Setting the rejection rate:*

- 3** Press the Trigger Level button
- 4** Set the leakage rate you require and confirm with OK.

You can find more detailed information on setting the test chamber for the test in Section 3.2.

#### 3.1.2.4 **Calibrating the leak detector**

Please calibrate the leak detector every now and then. Especially when it did not run for a longer time.

When you set or change the measuring time the leak detector requests you to calibrate.

*Calibrating with the internal test leak:*

- 1** Press the CAL button.  
You have now started the calibration.
- 2** Follow the instructions on the display.

*Calibrating with the external test leak:*

- 1** Connect a test leak with manual valve to the adapter cover.  
Open the cover of the test chamber for this and place the adapter cover on it.

- 2 Press the CAL button.  
You have now started the calibration.
- 3 Follow the instructions on the display.

### 3.1.2.5 Measuring mode

- 1 Place the component in the test chamber.
- 2 Close the cover of the test chamber.

The test mode is automatically started.

The device ends the test after the set measuring time has expired:

If the unit has completed the test, it indicates whether the component has passed the test (PASS) or whether leaks are present in the components (FAIL).

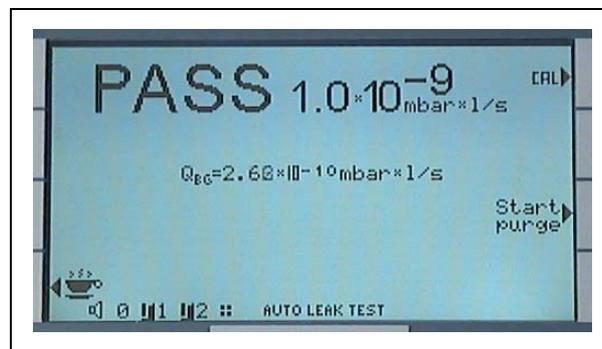


Fig. 3-6 Trigger level set to  $1 \times 10^{-9}$ , no leak found



Fig. 3-7 Trigger level set to  $1 \times 10^{-9}$ , a leak found

### 3.1.2.6 Cancelling the test mode

- 1 Press the STOP button.  
The leak detector interrupts the test mode.  
The leak detector does not show any result.

### 3.1.2.7 Interrupting and restarting the test mode

- 1 Press the button next to the pictogram of the coffee cup.

The leak detector is now in an operation-ready state.

- 2 Press the Restart button.  
The operation is started again.

### 3.1.2.8 Shutting down

---

- 1 Ventilate the test chamber and
- 2 press the mains switch.  
This switches off the leak detector.

*Notice* We recommend to evacuate the test chamber before you switch off the leak detector. So you can avoid defilement.

If the test chamber is to remain depressurised after switching off the leak detector:

- 1 Press the Coffee Cup button.

### 3.1.3 Removal

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You can remove the test chamber if you have switched off the leak detector.

- 1 Loosen the tightening ring.
- 2 Take the test chamber off the flange and remove the o-ring.

You can find photographs, in reverse order, in Section [3.1.2.1](#), [Mount the test chamber](#).

### 3.1.4 Packing

---

- 1 Take out the cardboard box with the padding paper which was provided with the test chamber.
- 2 Pack the TC1000 and accessories in the plastic casing.
- 3 Place the TC1000 in the padded cardboard box.

## 3.2 Settings in the Auto Leak Test menu

---

You can access the AUTO LEAK TEST SETTINGS menu at any time from the measuring mode.

MAIN MENU → SETTINGS → VACUUM SETTINGS → AUTO LEAK TEST SETTINGS

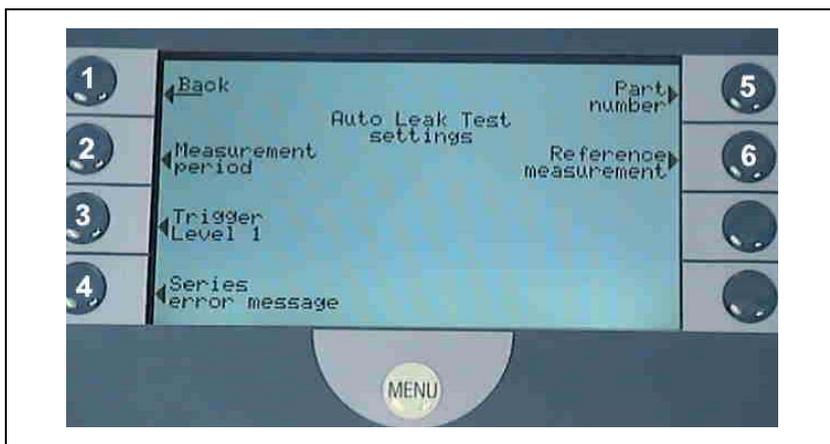


Fig. 3-8

Several settings are available for selection.

| Item | Description          | Item | Description           |
|------|----------------------|------|-----------------------|
| 1    | Back                 | 5    | Part number           |
| 2    | Measuring time       | 6    | Reference measurement |
| 3    | Trigger level 1      |      |                       |
| 4    | Serial error message |      |                       |

- 1 Select the setting you require and confirm with OK. The display then jumps back to the superior menu.

### 3.2.1 Setting the measuring time

- 1 Proceed as follows in the menu so as to be able to set the measuring time:  
MAIN MENU → SETTINGS → VACUUM SETTINGS → AUTO LEAK TEST SETTINGS → MEASURING TIME
- 2 Enter the required measuring time.  
A measurement lasts between 1 second and 30 minutes, depending on how you have previously set the leak detector.  
The measurement depends on three factors: the volume of the test chamber, the volume of the components being tested and the rejection leakage rate (trigger level).  
If you change the measuring time, the unit could require a calibration.  
You can find further information at [3.1.2.4, Calibrating the leak detector](#).

#### Examples of settings for time

The INFICON test chamber was used with a content of 430 cm<sup>3</sup> for the settings in these examples.

| Rejection rate | Measuring time (recommended) |
|----------------|------------------------------|
| 10E-5          | 2 seconds                    |
| 10E-6          | 2 seconds                    |
| 10E-7          | 2 seconds                    |

| Rejection rate | Measuring time (recommended) |
|----------------|------------------------------|
| 10E-8          | >5 seconds                   |
| 10E-9          | >10 seconds*                 |

\* We recommend an external calibration with a test leak TL9 (10E-9).

You have now specified the measuring time.

### 3.2.2 Setting the verification limit (Trigger level 1)

---

**1** Proceed as follows in the menu so as to be able to set the verification limit:  
 MAIN MENU → SETTINGS → VACUUM SETTINGS → AUTO LEAK TEST SETTINGS → TRIGGER LEVEL 1

**2** Enter the required verification time.

**3** Press the button OK.

To test components, the verification limit (trigger level) can be set from 10E-1 to 10E-9 mbar l/s.

You have now specified the verification limit.

### 3.2.3 Serial errors when testing

---

**1** Proceed as follows in the menu in order to test the measuring accuracy:

MAIN MENU → SETTINGS → VACUUM SETTINGS → AUTO LEAK TEST SETTINGS → SERIAL ERROR MESSAGE

You can specify the number of leaking components occurring in succession during a test after which a serial error message is indicated by the leak detector.

**2** You can select between 1 to 9 messages with defective components or deactivate the function.

You can typically enter the number 3.

The leak detector identifies 3 components in succession as defective in the following tests.

**3** The leak detector prompts you to do a reference measurement.

You can find more detailed information in Section [3.2.5](#).

### 3.2.4 Counting tested components

---

**1** Proceed as follows in the menu in order to give a number to the components you are testing.

MAIN MENU → SETTINGS → VACUUM SETTINGS → AUTO LEAK TEST SETTINGS → PART NUMBER

**2** Enter the number of the first component. Afterwards the unit automatically counts up the number of tested components.

The unit then counts the tested components and displays the result.

### 3.2.5 Reducing the helium substrate (reference measurement)

---

The leak detector responds to helium. This is to verify the helium which emerges from openings in the components. After a series of tests, there might be so much helium in the unit that the leak detector responds to this with an error message. It does not then verify the helium which emerges from the component, but instead the helium which is located in the unit for other reasons.

- 1 Proceed as follows in the menu in order to reduce the helium substrate:

MAIN MENU → SETTINGS → VACUUM SETTINGS → AUTO LEAK TEST SETTINGS → REFERENCE TEST

After a series error message has come up you can start the reference measurement from the stand by display. Press the button reference measurement.

- 2 Follow the instructions on the display
- 3 and press the OK button.

The leak detector pumps the test chamber 3 times empty and then ventilates again each time. The unit is calibrated internally.

After the reference test, the leak detector measures the helium substrate and subtracts the value from the measurements which are carried out.

## 3.3 Maintenance schedule

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The test chamber does not require maintenance.

### O-ring

Check occasionally whether the o-ring is damaged. If necessary, replace it.

### Cleaning

- 1 Clean the test chamber with alcohol.
- 2 Pump the chamber 3 to 4 times after the cleaning. In this way you can remove residual vapours from the surface.

## 3.4 Displaying and reading out the warning table

---

A warning triangle appears on the display if faults occur.

If you wish to read out the fault display,

- 1 press the button next to it.
- 2 Follow the instructions to rectify the warning.



## 4 Further documents

### 4.1 Replacement parts list

|                                     |             |
|-------------------------------------|-------------|
| Replacement part                    | Part number |
| O-ring (set of 5 items)             | 200 00 1793 |
| Proximity switch                    | 200 00 1794 |
| Electrics box with proximity switch | 200 00 1795 |
| Hinge and protective grating set    | 200 00 1796 |

### 4.2 Decontamination declaration

**INFICON**

**Declaration of Contamination**

The service, repair, and/or disposal of vacuum equipment and components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay.  
This declaration may only be completed (in block letters) and signed by authorized and qualified staff.

**1 Description of product**  
Type \_\_\_\_\_  
Article Number \_\_\_\_\_  
Serial Number \_\_\_\_\_

**2 Reason for return**  
\_\_\_\_\_

**3 Operating fluid(s) used (Must be drained before shipping.)**  
\_\_\_\_\_

**4 Process related contamination of product:**

|                          |   |  |
|--------------------------|---|--|
| toxic                    | no <input type="checkbox"/> 1) / yes <input type="checkbox"/> |  |
| caustic                  | no <input type="checkbox"/> 1) / yes <input type="checkbox"/> |  |
| biological hazard        | no <input type="checkbox"/> / yes <input type="checkbox"/> 2) |  |
| explosive                | no <input type="checkbox"/> / yes <input type="checkbox"/> 2) |  |
| radioactive              | no <input type="checkbox"/> / yes <input type="checkbox"/> 2) |  |
| other harmful substances | no <input type="checkbox"/> 1) / yes <input type="checkbox"/> |  |

1) or not containing any amount of hazardous residues that exceed the permissible exposure limits



2) Products thus contaminated will not be accepted without written evidence of decontamination!

The product is free of any substances which are damaging to health  yes

**5 Harmful substances, gases and/or by-products**  
Please list all substances, gases, and by-products which the product may have come into contact with:

| Trade product name | Chemical name (or symbol) | Precautions associated with substance | Action if human contact |
|--------------------|---------------------------|---------------------------------------|-------------------------|
|                    |                           |                                       |                         |
|                    |                           |                                       |                         |
|                    |                           |                                       |                         |
|                    |                           |                                       |                         |

**6 Legally binding declaration:**  
I/we hereby declare that the information on this form is complete and accurate and that I/we will assume any further costs that may arise. The contaminated product will be dispatched in accordance with the applicable regulations.

Organization/company \_\_\_\_\_  
 Address \_\_\_\_\_ Post code, place \_\_\_\_\_  
 Phone \_\_\_\_\_ Fax \_\_\_\_\_  
 Email \_\_\_\_\_  
 Name \_\_\_\_\_

Date and legally binding signature \_\_\_\_\_ Company stamp \_\_\_\_\_

This form can be downloaded from our website.      Copies: Original for addressee - 1 copy for accompanying documents - 1 copy for file of sender

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Fig. 4-1



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