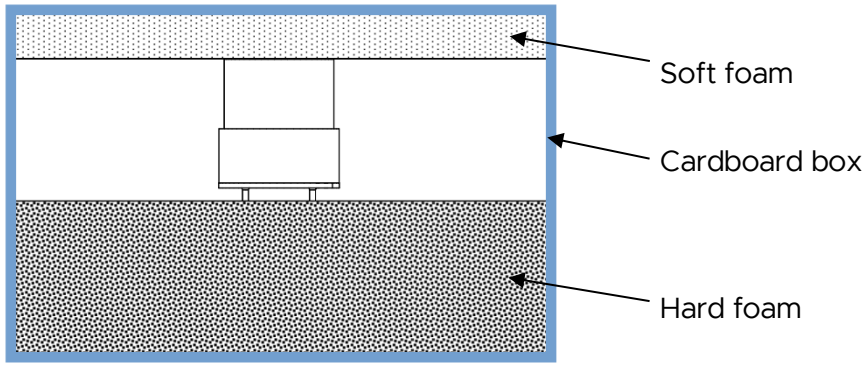
# Handling instructions for TO emitters

## Transportation and Electrostatic Discharge Protection

Our products comply with the normal requirements for electronic components regarding transportation and storage. Protect the components especially against exceptional mechanical loads or harmful, particularly corrosive gases or vapors.

Infrasolid's emitters are shipped in ESD-safe packing (**Figs. 1, 2**), which contains two types of foam. We recommend Transporting and storing the emitters in the original box until processing.



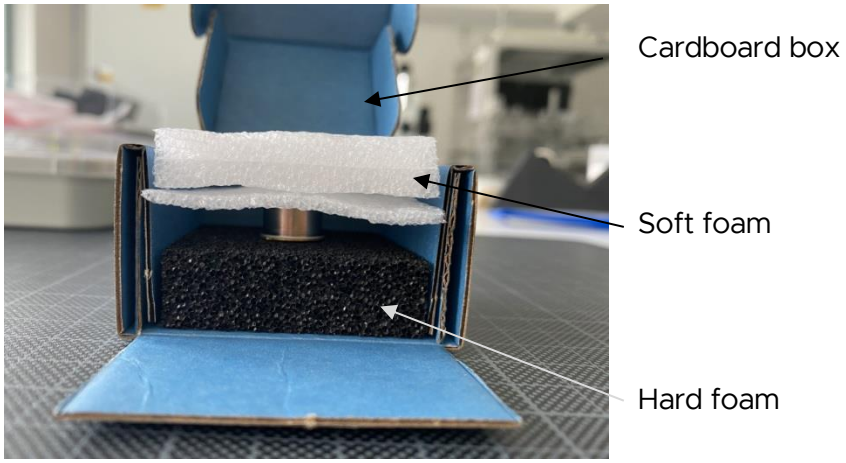




**Fig. 1:** Side view of ESD-safe packing of TO-emitters consisting of a cardboard box with hard foam, Infrasolid's TO-emitter and soft foam.

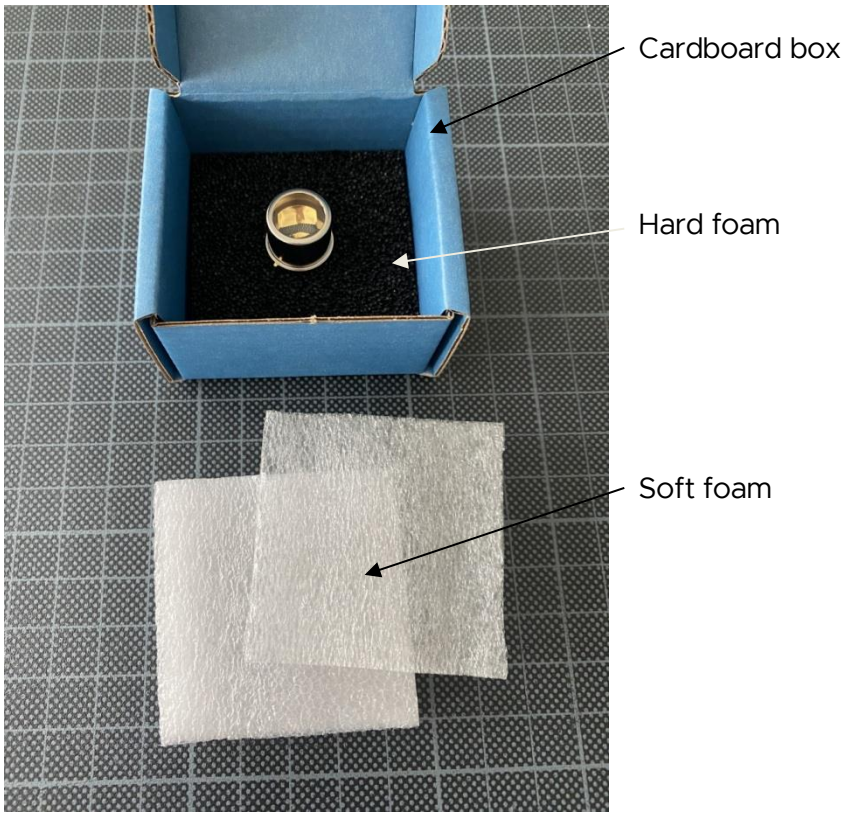



**Fig. 2:** Top view of ESD-safe packing of TO-emitters consisting of a cardboard box with hard foam, Infrasolid's TO-emitter and soft foam.

## Handling

Note the following when handling the product and also after installing into a device.

### (1) Basic precautions

- Protective gloves made of nitrile rubber (0.11 mm) are required. Use of a laboratory coat is suggested.
- When touching the product, it is recommended to wear gloves or use tweezers. Touching the product with bare hands may cause degradation in characteristics, problems with solder wettability, and plating corrosion.
- Special care must be taken with open emitters to ensure that the filament is not damaged. Do not touch the heating filament with hand or tweezers.
- Perform work in a clean place.
- Avoid skin contact. Protect against physical damage and avoid generating dust.

The above information is believed to be correct but does not purport to be all inclusive and must be used only as a guide.

### (2) Dust, contamination and scratch countermeasures

- Optical characteristics may deteriorate if dust, stain, or scratches are on the window material. Dust, stain, or scratches on the window material can degrade light transmittance.

- To prevent scratches and cracks on the window material, do not apply strong friction, shock, or pressure. Avoid sharp or hard objects from making contact with the window material.
- Emitters with window only: use an air blower to remove dust adhering to the window material. Do not use an air blower to clean open emitters.
- If oil, grease, or other substances, that cannot be removed with an air blower, adheres to the window material, gently wipe it away with a cotton swab moistened with ethyl alcohol and the like to prevent the window from being scratched (**Fig. 3**). Rubbing strongly or wiping the same section over and over will cause scratches and degrade the optical characteristics or the reliability.
- Do not rub the window material with a dry cloth or cotton swab. Doing so may cause scratches resulting in malfunctions.
- Take precautions to protect the window material from stain or scratches when packing or shipping equipment, in which the product is installed.

### (3) Cleaning of emitter windows

Avoid cleaning with solvent as much as possible. If you must, note the following points.

- Use alcohol solvents such as ethyl alcohol.
- Check that there is no problem with the cleaning method by experimenting in advance.
- Gently wipe stain off from the window material using a cotton swab moistened with ethyl alcohol or the like (**Fig. 3**).
- Do not use ultrasonic cleaning or steam cleaning as it may cause critical damage to the product.

### (4) Vibration, shock, and stress

- All TO emitters comply with the following standards:
  - JESD22-B103 (vibration, log. sweep 20…2000 Hz, peak 20 m/s$^2$, X/Y/Z direction)
  - JESD22-B110 (drop test, 5000 m/s$^2$, 6 directions).
- If the product is subjected to prolonged vibration or frequent or severe impact beyond these standards, it may damage the emitters and the infrared window.

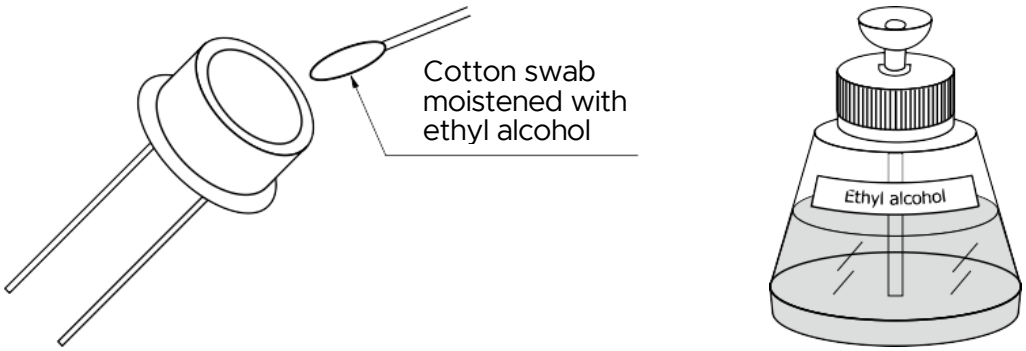
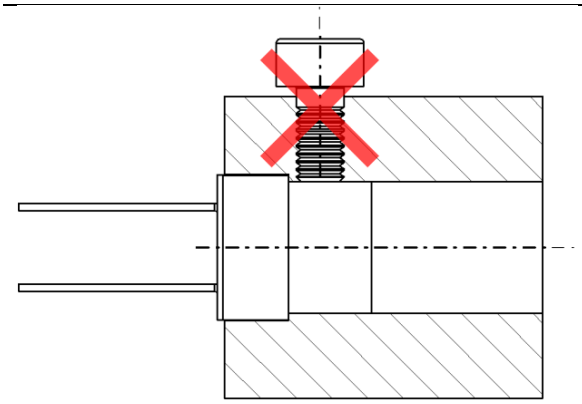
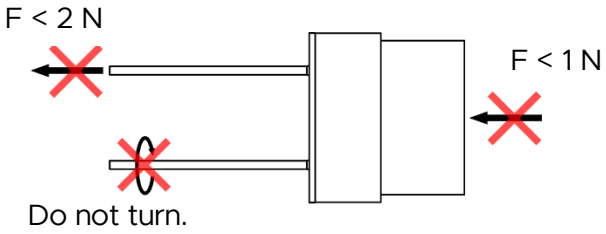
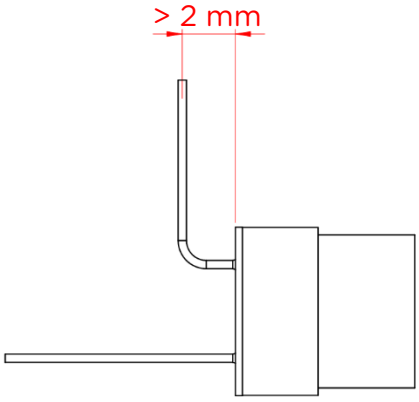



**Fig. 3:** Gently wipe stain off from the window material using a cotton swab moistened with ethyl alcohol or the like.

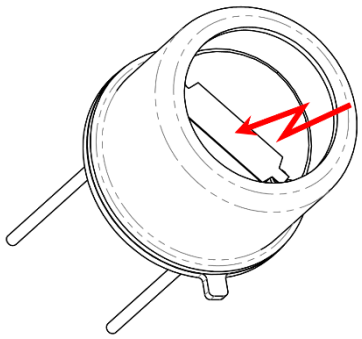
## Limits of mechanical stress (see Tab. 1)

- Do not fasten the cap with screws.
- Do not turn or bend the header pins.
- Do not pull the pins with more than 2 N.
- Do not press the cap with more than 1 N.
- Do not bend the straight header pins more than 10°.
- Use pliers to bend the header pins more than 10° at a minimum distance of 2 mm from the header.
- Open emitters:
  - Do not touch the filament.
  - Do not use an air blower to remove dust.

**Tab. 1:** What to avoid in handling of TO emitters.

| | |
|---|---|
|  | Do not fasten the cap with screws. |
|  | Do not pull the pins with more than 2 N.<br>Do not press the cap with more than 1 N.<br>Do not turn the header pins. |
|  | Do not bend the header pins by hand, because the glass enclosure may be damaged, resulting in leakage.<br>Use pliers to bend the header pins instead.<br>The distance between the bending point and the header must be greater than 2 mm. |

**Tab. 1 (continued):** What to avoid in handling of TO emitters.

| | |
|---|---|
|  | Open emitters:<br>• Do not touch the filament.<br>• Do not use an air blower to remove dust. |

## Storage

Be sure to strictly comply with the storage conditions described in the delivery specification sheet, instruction manual, or the like.

- STORAGE PRECAUTIONS: Keep away from foodstuffs. Keep away from acids and strong bases.
- Avoid wetting, harmful gas, or dirt, or storage in a place with sudden temperature changes.
- Do not lay a heavy object or load on the product or the package.
- When storing the products after transferring them into another case, use a case that is difficult to be charged with static electricity.
- If the product is stored in a poor environment (conditions exceeding the recommended storage conditions in **Tab. 2**), the solderability may lower or electrical characteristics may decrease. When the storage conditions are described in the datasheet, delivery specification sheet, or the like, be sure to comply with them.
- High humidity damages electronic components. For this reason, our products should not be exposed to any extreme humidity, particularly in combination with high temperatures. Store the emitters dry and at normal room temperature. Provided that our products are delivered in moisture protected packaging, they should not get damaged.

**Tab. 2:** Recommended storage conditions

| Parameter | Storage conditions |
|---|---|
| Product not packed in moisture- proof bag | Temperature: 15 °C to 35 °C<br>Humidity: 30% to 75% |

## Soldering instructions

Overheating and inadequate heat sinking during soldering can damage the emitter!

Use only manual soldering considering the following instructions:

- It is not absolutely necessary, but a grounded soldering iron with an insulation resistance of 10 MΩ or more is recommended to avoid electrostatic charges
- Use temperature-controlled soldering irons.
- Use the maximum soldering times for the given maximum soldering temperatures *T* and the distance *L* between the soldered joint and the TO base plate shown in **Tab. 3** and **Fig. 4**.
- Do not allow the soldering iron to come into direct contact with parts other than the electrodes of the product. Direct contact of the TO package or the infrared window/filter with the soldering iron may cause mechanical or optical damage.
- Use non-cleaning solder or rosin type flux. The use of fluxes with relatively high acid or alkali content or inorganic fluxes can lead to corrosion at the connections.
- Use a heat sink to dissipate heat.

**Tab. 3:** Recommended maximum soldering times for the given maximum soldering temperatures *T* and the distance *L* between the soldered joint and the TO base plate.

| **Temperature *T*** | **Distance *L*** | | |
|---|---|---|---|
| | **2 mm** | **5 mm** | **8 mm** |
| 245 °C | 6 s | 10 s | 14 s |
| 265 °C | 5 s | 8 s | 11 s |
| 300 °C | 3 s | 5 s | 7 s |

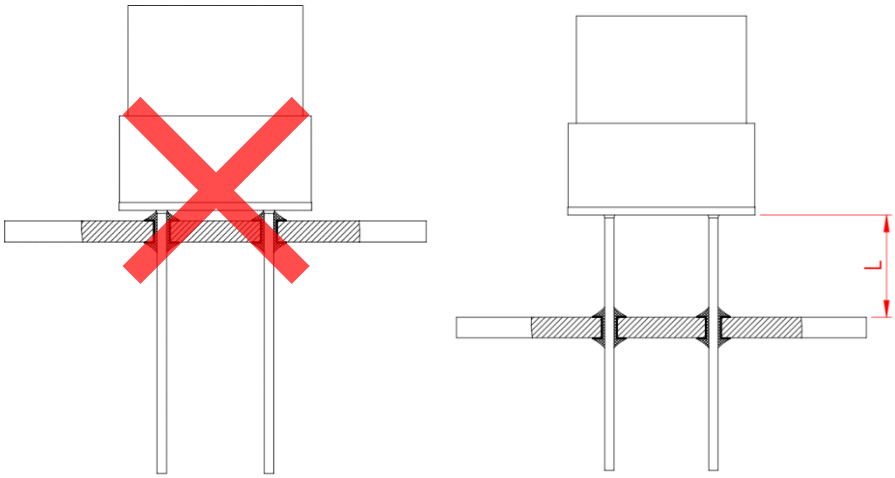



**Fig. 4:** Use the minimum distance *L* between TO base plate and soldered joints from **Tab. 3**.