

# Furnace Tracker<sup>®</sup> TB4626 and TB4633



## High-temperature Thermal Barriers for Vacuum Furnaces

### USER GUIDE

**D**ATAPAQ<sup>®</sup> 4600 series thermal barriers are built specifically for high-temperature operation in vacuum furnaces, undergoing repeated heating and cooling cycles up to 1,200°C/2,190°F.

*The system is intended for use in a vacuum or in inert atmospheres. It may be used also in a normal combustion furnace, but its thermal duration will then be dramatically reduced. In case of doubt, contact Datapaq.*

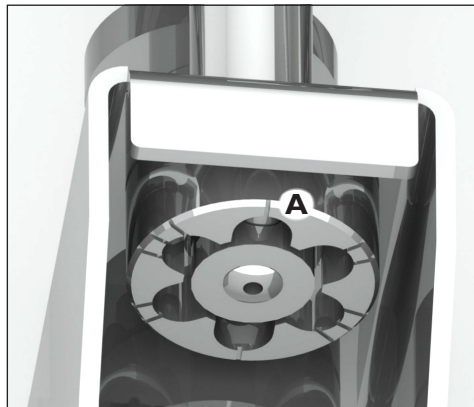
*For the latest information on the barriers' thermal performance, see the relevant datasheet available from Datapaq.*

#### **Before Use**

Before using the thermal barrier for a survey, it should be fully assembled (barrier and heatsink, but no logger), then heated in a conventional furnace at 400°C/752°F for 5 hours to dry out any residual moisture from the insulation material. On taking it out of the furnace, remove the lid immediately and leave the barrier to cool to ambient temperature. If subsequently stored in a dry environment or in a vacuum bag it is unlikely that this process will have to be repeated. However, if a vacuum proves difficult to achieve within the furnace during a survey, this may be due to excessive moisture in the barrier's insulation, and pre-firing should be carried out again.

#### **Assembling the Barrier**

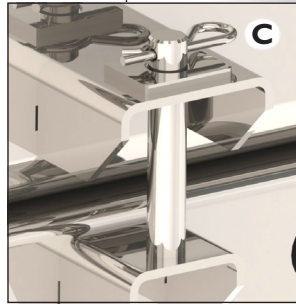
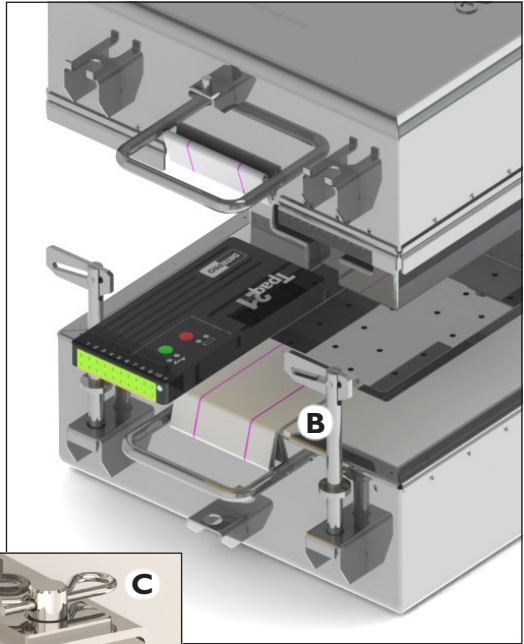
The pre-tensioners on all four of the **lid's catches** should be at the same setting to ensure alignment. There are three settings, marked I, II and III on the face of the tensioner (**A**). When new, the setting should be I, but adjustment will be required with repeated



heat-cycling as shrinkage occurs in the insulation.

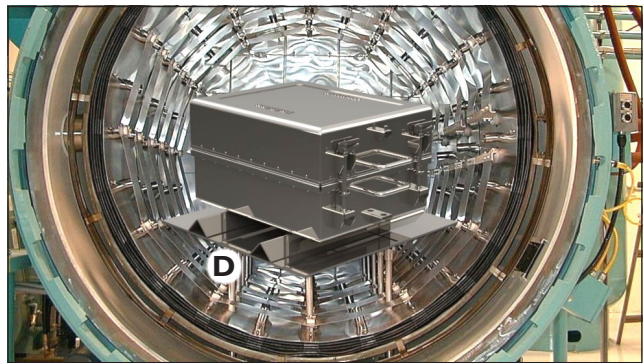
Push each taper-catch (**B**) fully to the left to engage it, to the right to release.

If a gas quench is used in the vacuum furnace, **quench-deflectors** must be fitted to the lid and base of the thermal barrier to protect it from uneven cooling which could cause distortion in the structure. Where possible during a survey, always use the lowest permitted quench pressures as this will prolong the life of the barrier. The barriers' maximum pressure rating is 6 bar. Ensure that the top and bottom quench-deflectors are secured with their washers and R-clips (**C**).



## Use in the Vacuum Furnace

If the barrier is to sit on a solid layer of ceramic (or steel, etc.) rather than on the open mesh of a product basket, place supports (e.g. two lengths of angle-iron) beneath the barrier (**D**) so that heating and cooling occur evenly.



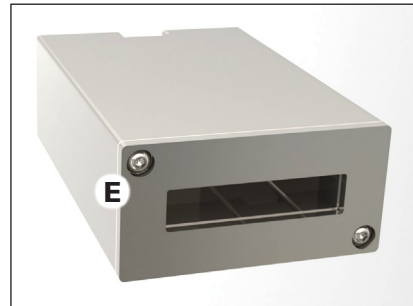
## Removing the Logger

The logger must be removed as soon as possible after the barrier has exited the furnace. Do not leave the logger in a closed thermal barrier or it will overheat. Follow the procedure below.

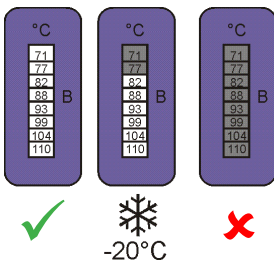
1. Immediately after the thermal barrier exits the furnace, place it on supports (e.g. angle-iron) and release the lid's taper-catches; this may require a soft-faced hammer.
2. Remove the lid, using a hoist if possible; wear heat-resistant gloves. Remove the logger from the heatsink.
3. Remove the heatsink from the thermal barrier and cool for 12 hours (if repeated surveys are required within a short period, obtain a second heatsink). Place the barrier lid on supports, and cool for 6 hours.

## After Each Survey

- Inspect the barrier's metalwork for distortion.
- Check that all pop-rivets remain in place, and replace if necessary.
- When high quench pressures are used, small amounts of dust may collect in the barrier's logger cavity; this is normal.
- Check regularly that the Allen bolts (E) securing the front face of the heatsink are tight.



## Exceeding Specified Thermal Duration



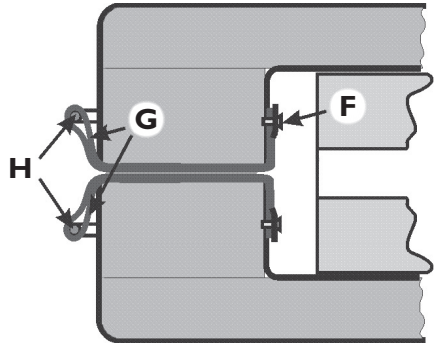
The temperature-indicator labels on the heatsink show the temperature reached during the process. Should the heatsink exceed 77°C/170°F (the non-reversible color of the labels will show this), the heatsink should be frozen at a temperature of -20°C/-4°F for 24 hours, and then left to return to room temperature.

## Storage and Maintenance

**Store the thermal barrier** in a dry environment or in a vacuum bag. This should avoid the need for a separate firing to dry out the insulation material (see p. 1).

The Mullite fiber **thermocouple wear-strips** in the base and lid of the barrier can be replaced by the user as follows.

1. Undo the screws retaining the bracket that secures the wear-strip inside the barrier (**F**).
2. Remove the old wear-strip (**G**).
3. Thread the new wear-strip over the small-diameter bar outside the barrier (**H**), and over the face of the inside insulation.
4. Fasten the ends of the new wear-strip with the bracket and screws (**F**).



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