

# THERMOCOUPLE CLAMPING SYSTEMS

## for Lyophilizer Shelf Uniformity Testing

### INTRODUCTION:

The Test Solutions Thermocouple Clamping System (TCS) is designed to minimise the temperature variation between thermocouples typically associated with thermocouple preparation, placement in the required location and holding on the shelf, eliminating the test method from being a factor in determining a lyophilizer shelf temperature uniformity distribution.



### KEY ADVANTAGES:

Using a unique combination of a thermocouple holding system, a compressible clamp and a placement tool, the TCS offers the following key advantages:

#### SAFE

- No need for operators to insert themselves into the Lyophilizer chamber or to place their hands between shelves for thermocouple placement.

#### ACCURATE

- Test method variation of 0,35°C between thermocouples

#### RELIABLE & REPEATABLE

- Identical test setup for each thermocouple removing operator variability associated with thermocouple preparation and placement.
- Precise thermocouple placement on the Lyophilizer shelf.
- Uniform thermocouple holding pressure with no lifting of thermocouple during testing.
- Total repeatability from test to test.

#### EFFICIENT

- Rapid operator setup & removal.
- No residues to remove from shelf.

#### VERSATILE

- Allows testing under vacuum for actual production conditions.
- Allows thermocouples to be held for steam sterilisation.

# BULKHEAD FITTING

## For Connecting Test Wiring To Equipment

### INTRODUCTION

The Test Solutions Thermocouple Bulkhead Fitting System (BFS) is designed to ensure the leak tight connection of test wiring to environmental chambers. Including lyophilizers, autoclaves and dry head ovens & vessels.



### KEY ADVANTAGES

The BFS offers the following key advantages:

- A large number of test wires can be accommodated in a small fitting (up to 40 thermocouples through a 75mm diameter sanitary fittings).
- Totally repeatable set up from test to test.
- Rapid operator setup & removal
- Operates from full vacuum to 90psi

