

**COPLEY**



# Driving Results in Detergent Testing

FOR LAUNDRY, DISHWASHER & TEXTILE MANUFACTURING APPLICATIONS

2020 EDITION

# About Us

## Copley: Driving Results for Over 70 Years

Founded in 1946 in Nottingham, UK, Copley remains family owned and managed. We are recognised as a trusted provider of equipment for detergent testing applications and continue to work closely with industry groups and leading experts to bring relevant new products to market.

Committed to excellence, we aim to deliver exemplary service for an outstanding customer experience with all equipment backed by expert training and lifetime support.

We deliver detergent testing equipment with the necessary accuracy and reproducibility that our customers rely on to control product performance.

Continuous improvement is a core element of this approach and we strive to exceed the expectations of the industry, not only by enhancing equipment performance but also through unrivalled service.

These commitments are exemplified by our investment in the **ISO 9001:2015 Quality Management System** for which we have certification to the latest standard for all aspects of our business, including equipment design.

### Copley customers benefit from:

- High quality detergent testing equipment, designed, manufactured and tested in the UK
- Product lifetime support from our friendly and experienced technical support team
- First-class training and education

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# The Copley Promise



## **Innovative**

Innovative product design features ensure ease-of-use and maximum productivity by streamlining work flows.



## **Compliant**

Products are certified to quality standards ensuring data integrity.



## **Trusted**

Robust design and manufacture from a company with over 70 years' experience guarantees product reliability and longevity.

# Tergotometer

## Background: Detergent Testing

The detergent industry is highly competitive with re-formulation an ongoing, continuous activity driven by the demand for exemplary performance, coupled with the need to reduce the environmental impact of routine cleaning. Enhanced performance at lower wash temperatures and the use of more environmentally friendly ingredients are key trends. Preserving the integrity, finish and quality of delicate fabrics and items is also essential.

To support formulation, for QC and for sensitive comparative performance testing, detergent manufacturers require relevant, reproducible, cost-efficient tests that can easily be applied in the laboratory. Ultimately, the performance and impact of detergents are assessed under real-life conditions using a domestic appliance, but this can be time-consuming, costly and has several other limitations, with respect to routine use within a laboratory.



# Understanding Test Requirements

## Laundry Detergents

Containing a range of functional ingredients including surfactants, buffers, chelating agents, enzymes, polymers, fragrances and optical brighteners, laundry detergents are complex formulations.

Consumers are sensitive to both performance and price so understanding the relative benefit of incorporating what can be expensive ingredients is crucial in product development, whilst exemplary QC is essential for long term market advantage.

When assessing laundry detergent product performance, there are several factors to consider:

- Stain removal effectiveness
- Prevention of re-deposition
- Maintenance of whiteness
- Maintenance of colour
- Inhibition of dye transfer

## Dishwashing Detergents

The market for dishwashing powders, liquids, gels and tablets is equally competitive and formulations are just as complex, drawing on a range of ingredients with similar functionality, including complexing agents, surfactants, bleaching components, enzymes and wetting agents.

However, the focus of testing is slightly different with soil removal, the avoidance of re-deposition and the resulting finish (clarity and shine) the key characteristics assessed.

## Establishing a Testing Strategy

Test methods need to be practical, reliable, reproducible and sufficiently differentiating to detect superior performance and/or any failure to meet a specification.

Use of a full-scale domestic appliance to test a detergent has important limitations, including laboratory space requirements, noise and energy consumption, and low analytical throughput. There are limited opportunities to closely control test conditions and the potential for 'carryover' of soil or detergent from one test to another is a recognised issue.

## Test Equipment

The tergotometer is a simple, but representative solution that directly addresses these limitations. Consisting of a number of miniature washing stations in a single benchtop instrument, the tergotometer delivers reproducible testing under closely controlled conditions, at much higher analytical throughput than can be achieved with a standard domestic appliance.

## Test Conditions & Materials

Laundry samples with closely defined stains, pre-applied to a suitable substrate are commercially available in a range of fabrics, sizes and volumes, for many different stain types. Using such samples to standardise test conditions with respect to soil can significantly improve the repeatability of testing.

Stain samples for dishwasher detergents testing are equally accessible, typically 'baked-on' to melamine tiles (mimicking the effect of porcelain), as well as glass and stainless steel.

Beyond the issue of soil, there are several test conditions that can impact the test results including:

- Detergent concentration
- Temperature
- Water hardness, pH, bleach etc
- Washing and rinsing times
- Washing action
- The load

## Analytical Assessment

### Quantitative Analysis

Instruments for direct quantitative analysis include the colorimeter, whose relatively simple and robust construction make it ideal for QC applications. A spectrophotometer is more suited to high precision QC and research and development applications.

A product or surfactant can be considered successful when both criteria – stain removal and whiteness – have been met.

Similar methods can be applied to the testing of light duty detergents, as used in domestic dishwashers, using a suitable accessory.

### Manual Analysis

Once processed, laundry samples can be analysed manually (by eye) by comparison with a greyscale. Whiteness or yellowness indices can also be employed.

# Tergotometer: TRG 800i

## Practical, reliable and reproducible detergent performance testing

Providing a simple solution for repeatable, sensitive laundry and dishwasher detergent testing, Copley's TRG 800i offers rapid and reliable testing for formulation, QC and comparative performance testing applications.

Consisting of several miniature washing stations in a single benchtop instrument, the TRG 800i boosts analytical throughput by up to 8 times when compared with a standard domestic appliance, whilst at the same time ensuring reproducible detergent testing under closely controlled conditions.

Agitation is provided by a series of up to eight stirrers, each located in an individual vessel to produce a scaled down version of a larger machine. User control and monitoring of agitator speed, direction and vessel temperature is via the unit's intuitive touchscreen interface.



Boosts testing throughput by up to 8 times compared with conventional domestic appliances



Smaller quantities of test materials, water and detergents are required per test compared to standard domestic appliances



Precision control of test parameters for accurate and reproducible detergent testing



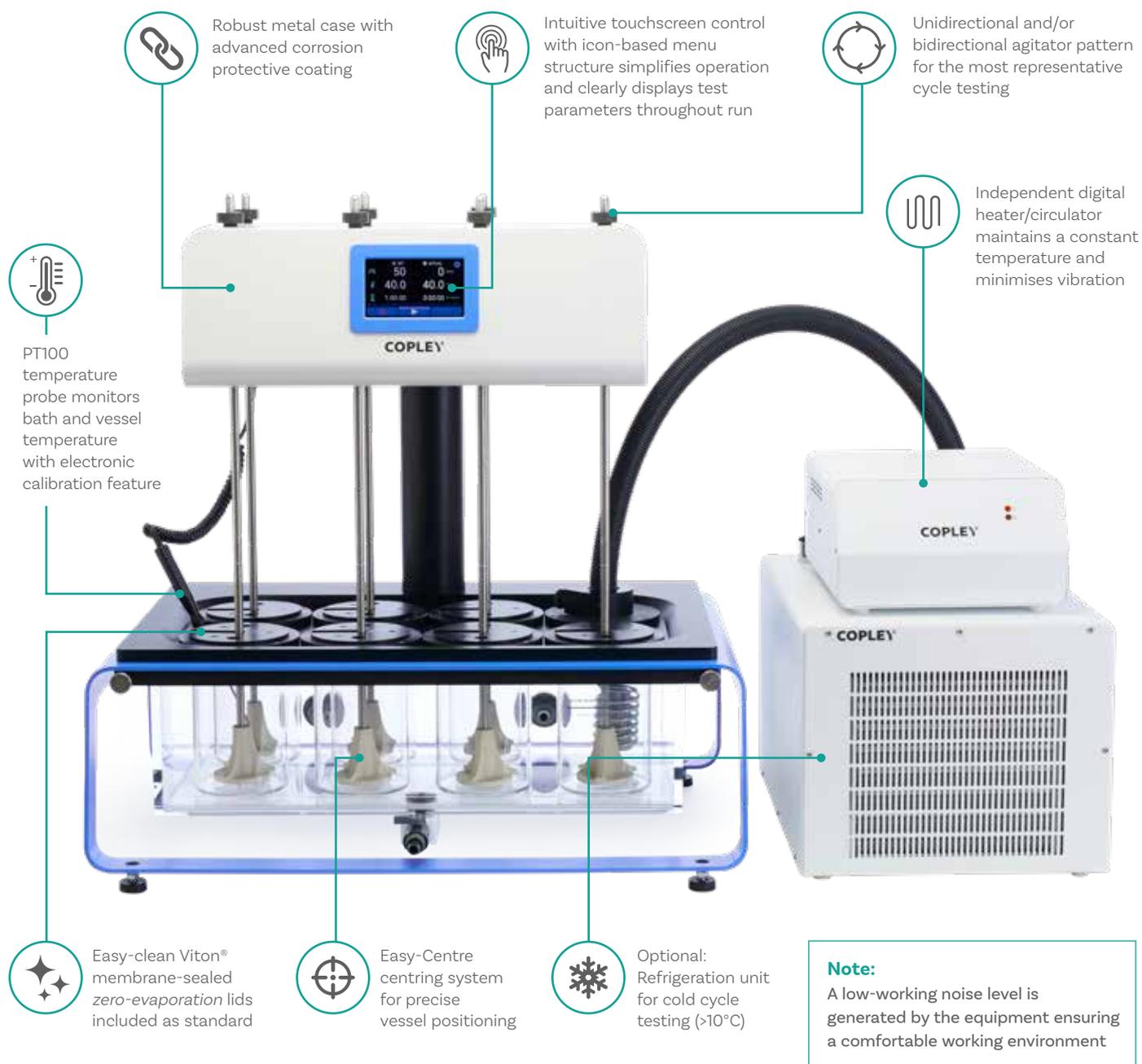
Space-saving benchtop system saves precious laboratory space



Lower energy consumption compared with standard domestic appliances



# TRG 800i Highlights



## Applications

A versatile, laboratory-scale washing simulator, the TRG 800i is ideal for:

- Evaluating the effectiveness of soap detergents etc.
- Assessing washability and colour fastness of fabrics and other materials
- Optimising washing conditions for detergents (e.g. temperature and water hardness)
- Routine screening for dirt removal
- Assessing brightening, softening and foaming

# TRG 800i: Touchscreen User Interface



## Key Features:

- **Intuitive menu structure** enables users to locate features quickly and easily
- **Easy-set** user-configurable **test parameters**:  
Speed (revolutions per minute)  
Temperature (°C)  
Test duration (HH:MM:SS)
- Status of '**Actual**' v '**Set**' test **parameters clearly displayed** throughout testing
- **Test progress bar** provides clear and constant indication of run status
- Resistive touchscreen interface can be **operated with gloves on**
- Hygienic **wipe-clean** screen
- **Passcode-protected** temperature calibration
- High productivity - **easy system set-up** and **operation** minimises training burden

**A** Setting a test parameter

**B** Setting reverse parameters

**C** Set v Actual test parameters  
(before test run)

**D** Set v Actual test parameters (during  
test run, with test progress bar)

**E** Settings menu

**F** Passcode-protected temperature  
calibration process

**G** Temperature calibration

**H** Report output settings menu

**I** Motor speed (RPM) verification



## Reporting

Extensive data output options are available as standard, including direct reporting to a printer or PC.

### Reported parameters

- **Speed (revolutions per minute)**

Set  
Average  
Maximum  
Minimum



- **Temperature (°C)**

Set  
Average  
Maximum  
Minimum



- **Test Duration (HH:MM:SS)**

Set  
Actual



- **Calibration Data**

Calibration date  
Temperature calibrated at (°C)

## TRG 800i: Technical Specifications

|                                     |   |  |
|-------------------------------------|---|--|
| <b>User Interface</b>               | Resistive touchscreen   |  |
| <b>Test Stations</b>                | 8 (or 7 when optional Refrigeration Unit used)  |  |
| <b>Test Station Sample Capacity</b> | <b>Dishwasher Detergent</b><br>Up to 48 pre-stained samples                             | <b>Laundry Detergent</b><br>Up to 96 pre-stained samples |
| <b>Agitator Speed Range</b>         | 20 - 220 rpm  |  |
| <b>Agitator Directional Pattern</b> | Unidirectional<br>Bidirectional (10 - 99 revolutions in either direction)               |  |
| <b>Heater Temperature Range</b>     | Ambient - 70°C (10°C - 70°C with optional Refrigeration Unit)                           |  |
| <b>Heater</b>                       | Independent external digital heater/circulator  |  |
| <b>Vessel Size</b>                  | 1000 mL   |  |
| <b>Test Run Time</b>                | Up to 99 hours, 59 minutes, 59 seconds  |  |
| <b>Alarm(s)</b>                     | End of testing (audible)  |  |
| <b>Data Output</b>                  | RS 232<br>USB A (for connection with a USB printer)<br>USB B (for connection with a PC) |  |
| <b>Unit Dimensions</b>              | Main unit:  | 728 x 490 x 772 mm (w x d x h)                           |
|                                     | Heater:   | 260 x 330 x 150 mm (w x d x h)                           |
|                                     | Refrigeration Unit:   | 350 x 470 x 300 mm (w x d x h)                           |

## Temperature Calibration



### Single-point electronic temperature calibration.

Calibration of the TRGi Series temperature probe is simple, through the use of an electronic calibration key and passcode-protected calibration menu designed to guide users through the process without fuss.

The latest temperature probe calibration information is stored and available to print/export when convenient to the user.

## TRG 800i

| Cat. No.           | Description   |
|--------------------|---|
| <b>6431</b>        | Tergotometer Model TRG 800i                             |
| <b>6432</b>        | Refrigeration Unit (Ambient to 10 degrees C) -230V/50hz |
| <b>6432-110/60</b> | Refrigeration Unit (Ambient to 10 degrees C) -110V/60Hz |
| <b>1209</b>        | Electronic Temperature Calibration Key                  |

## Refrigeration Unit

To support the testing of detergents designed to work at cooler temperatures, Copley offers an optional refrigeration unit (ambient down to 10 degrees C).

### TRG 800i

| Cat. No.           | Description   |
|--------------------|---|
| <b>6432</b>        | Refrigeration Unit (Ambient to 10 degrees C) -230V/50hz |
| <b>6432-110/60</b> | Refrigeration Unit (Ambient to 10 degrees C) -110V/60Hz |

### Note:

Use of the refrigeration unit reduces the number of usable test stations to seven.



## Laundry Detergent Testing

The TRG 800i is supplied with resin paddles as standard. Accepting up to 12, 5 cm x 5 cm or 6, 8 cm x 8 cm swatches, the TRG 800i can test between 48 or 96 individual textile swatches simultaneously (42 or 84 where refrigeration unit used).

A wide range of standardised pre-soiled test fabrics of suitable dimensions are available from the Center for Testmaterials B.V. ([www.cftbv.nl](http://www.cftbv.nl)).

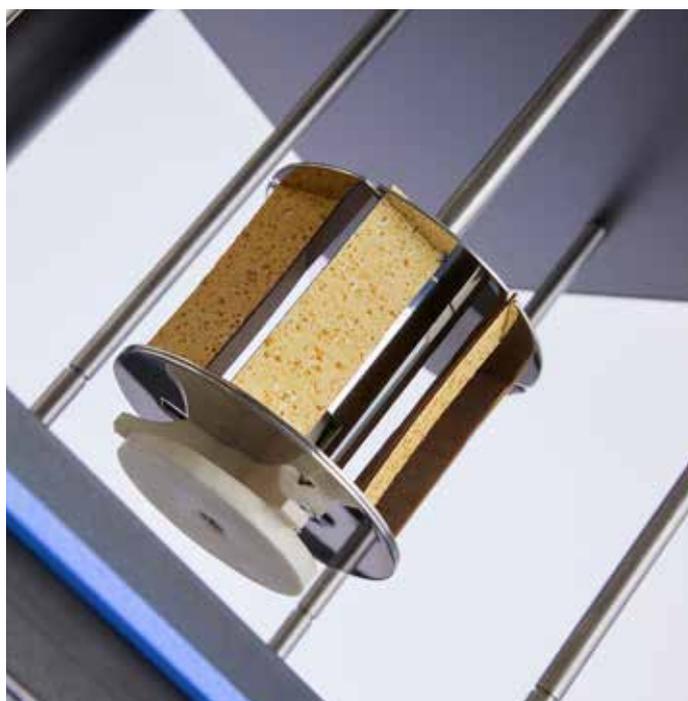


## Dishwasher Detergent Testing

Dishwasher detergents can be tested using a special accessory affixed to the conventional agitator in each tergotometer vessel.

Each accessory holds up to six pre-stained sample tiles (7.5cm x 2.5cm) mounted at an angle close to the side of the test vessel and held in position by a suitable O-ring. A total of 48 samples can be processed simultaneously (42 where the refrigeration unit is used).

Pre-stained tiles are available from the Center for Testmaterials B.V. ([www.cftbv.nl](http://www.cftbv.nl)) to customer selection (e.g. crème brûlée, egg yolk, shepherd's pie, spaghetti bolognese).



### Dishwasher Accessories

| Cat. No. | Description                                 |
|----------|---|
| 6408     | Dishwasher Slide Accessory for Tergotometer |
| 6409     | Pack of 10 O-Rings (spare)                  |
| 6410     | Pack of 60 Glass Slides (spare)             |

### TRG 800i Accessories & Spares

| Cat. No. | Description   |
|----------|---|
| 6404     | Set of 8 Stainless Steel Paddles (option)                     |
| 6404A    | Set of 8 SS Paddles with holes for fabric attachment (option) |
| 6405     | Vessel, Glass, Flat Bottomed, 1000 mL with "Easy-Centre"      |
| 6406     | Vessel, Stainless Steel, 1000 mL with "Easy-Centre" (option)  |
| 6437     | Stainless Steel Bath for TRG 800i (optional)                  |



# Services

Copley offers a comprehensive range of services from bespoke product design to installation, expert training and technical support, optimising all aspects of detergent testing from start to finish.

## Design



Our design and development teams have many years' experience working closely with diverse industries to help develop their ideas for solving problems.

Whether you have a longstanding problem, one that has been created by the introduction of a new process, or an idea for a new product, or even a bespoke design that you need manufacturing, we would be delighted to hear from you.

## Servicing



We understand how important it is that your equipment operates consistently throughout every test run, every day of the week. With the Copley range of detergent testing equipment, you're opting not only for exemplary performance, but also quality, reliability and compliance. To keep your instruments operating in peak condition and to

ensure they are properly calibrated, Copley offers a range of comprehensive servicing options giving owners peace of mind.

We offer a broad range of both in-house and on-site service packages tailored to customers' specific needs. All our servicing packages follow well documented maintenance and calibration procedures.

# Training

Copley training courses are interactive, lecture and exercise-based courses provided by experts in the field who can share their in-depth knowledge of evolving technologies and quality standards.

Our range of courses can be tailored to the needs of the user, from novice to experienced analyst, covering a narrow or broad range of subjects and can be conducted on-site or at our purpose-built training facility in Nottingham, UK. Training certificates are also supplied for users' training records.

Specially qualified trainers are able to put together bespoke packages for small or large groups, with typical training programs on topics including:

- Audit of current system set-up and procedures (on-site training only)
- Training of users in operation of the equipment supplied
- Troubleshooting, questions and answers

- ✓ **Highly experienced trainers**
- ✓ **Bespoke training programs**
- ✓ **On-site training available**
- ✓ **Certification provided**

**Please contact us to find out more about our range of training packages.**

Contact us at: [sales@copleyscientific.co.uk](mailto:sales@copleyscientific.co.uk)

or call: +44 (0)115 961 6229

# Support

Buy with confidence from Copley. When you purchase equipment from us, you not only get outstanding instrumentation but also a complete customer care package which extends from the start of the sales process through to installation, training, after-sales support and beyond.



With a global network of experienced and knowledgeable distributors you can rest assured that, wherever you may be, there is support every step of the way.

# COPLEY

## Austria, France, Germany and Switzerland

### Copley Scientific AG

Erlenstrasse 27  
Postfach 152  
CH-4106 Therwil  
Switzerland

☎ +41 (0)61 725 25 35

📠 +41 (0)61 721 31 87

✉ sales@copleyscientific.ch

🌐 copleyscientific.com

## UK, Ireland and International Sales

### Copley Scientific Limited

Colwick Quays Business Park, Road No.2  
Nottingham, NG4 2JY  
United Kingdom

☎ +44 (0)115 961 6229

📠 +44 (0)115 961 7637

✉ sales@copleyscientific.co.uk

🌐 copleyscientific.com



Certificate Number 7391  
ISO 9001