

Introduction to Starna®

The wide variety of Starna® products in this catalogue are manufactured in the Starna Scientific Ltd (formerly Optiglass Ltd) factory founded in 1964, whose lineage of optical expertise is traceable to the early part of the last century.

Starna Scientific is the manufacturing division of the international group of Starna® companies, who have a recognised world-wide reputation for quality, service, innovation and co-operation in the production and supply of spectrophotometer cells, optical components and certified reference materials.

During the 1950s, the founding members of the company developed and perfected the technique of fully fusing optically polished component parts by heat alone, without distortion. This major advance transformed the design and production of spectrophotometer cells and associated products. Continual development and improvement is reflected in the high quality world class Starna® products.

All manufacturing processes are carried out in an ISO 9000 certified production facility, from design and development of product to customised production machinery. The unique blend of skills including: cutting, slicing, grinding, polishing, conventional drilling, ultrasonic drilling and fusing as well as metallic, multi-layer and anti-reflection coating in one of many coating plants, achieves a complete vertically integrated manufacturing process.

During manufacture of all component parts, special care is taken to avoid contamination by the use of stringent cleaning processes. Together with mandatory inspection procedures these stringent cleaning processes ensure all products leave the factory in a pristine contamination-free condition, with an unconditional guarantee against faulty workmanship. This special treatment of cells together with internally profiled cells reduces bubble adhesion, particularly important in flow cell applications. In addition to the ISO 9001 certified manufacturing facility, the Starna Reference Material Calibration Laboratory which has been UKAS accredited to ISO 17025 since 2001, also achieved ISO guide 34 in 2006, the highest level of accreditation, recognised world-wide. The unique combination of manufacturing, application and laboratory skills, permits full traceability throughout the whole production process, making Starna Scientific a unique partner to instrument manufacturers, dealers and retail customers worldwide who require completely independent guaranteed validation reference materials for analytical equipment.

Cell specifications

Starna spectrophotometer cells and other quartz and glass assemblies, unless precluded by design, are assembled using a fully fused method of construction. This technique, pioneered and used by Starna Scientific since the mid 1950s, ensures that cells are fused into a single homogeneous entity using heat alone, without intermediate bonding materials. All cells are then carefully annealed to remove any residual strain from the fusing process. This ensures maximum physical strength as well as resistance to solvents. With few exceptions, most cells can be used safely with pressure differentials of up to 3 x 10⁵Pa (3 Bar) and some up to 10x10⁵Pa (10 Bar).

General specifications

Windows parallel to: better than 3 minutes of arc
 Window flatness to: better than 4 Newton fringes
 Window polish, standard: 60/40 scratch/dig
 Window polish, laser: 20/10 scratch/dig

Material	Path lengths	Tolerance
Glass	less than 10mm	± 0.02mm
Glass	10 to 30mm	± 0.1mm
Glass	40 to 100mm	± 0.2mm
Special Optical Glass	up to 20mm	± 0.01mm
Special Optical Glass	30 to 100mm	± 0.02mm
Quartz	0.01 to 0.05mm	± 0.002mm
Quartz	0.1 to 0.4mm	± 0.005mm
Quartz	0.5 to 30mm	± 0.01mm
Quartz	40 to 100mm	± 0.02mm

Standard window thickness is 1.25mm, polished to better than 4 Newton Fringes per centimetre in the viewing area, typically flat to better than 1 micron (0.001mm) over the window area. Although cells can be used with most solvents and acidic solutions, fluorinated acids such as Hydrofluoric Acid (HF) in all concentrations should be avoided as they will attack the quartz itself. Strong basic solutions (pH 9.0 and above) will also degrade the surface of the windows and shorten the useful life of the cells.

Flow cells with path lengths of less than 0.5mm are measured by an interference method both before and after final fusing. Calculation on this measurement provides an uncertainty of path length better than 0.2 microns (0.0002mm). Path length certification can be supplied for individual cells for a small additional charge. This should be requested at the time of ordering.

Water absorption band OH content ppm (mg/g) Infrasil ≤ 8, Suprasil 300 ≤ 1.

Window material transmission properties

