# STARNA

The Spectroscopy Specialists

**Quartz and Glass Cells for:**

**Spectrophotometers**
**Fluorometers**
**Colorimeters**
**Laser Applications**


# 2018

## Catalog and Price List

# about Starna Cells, Inc....

The origin of the optical skills available from **Starna,** formed in 1971, can be traced back to the earlier part of the 20th century. Utilizing their optical expertise, the founders of the original company manufactured specialized optics and, during the early 1950s, had already developed the technique necessary for manufacturing the first *fully fused* form of spectrophotometer cells.

As a wholly owned subsidiary of the **Starna** international group of companies, Starna Cells provides many instrument manufacturers with specialized optical components and other private labeled products, including the Starna® brand of high quality spectrophotometer cells, accessories and the extensive range of NIST Traceable Reference Materials.

Starna products are distributed worldwide through the Starna network to instrument manufacturers, distributors and direct to end users. A dedicated technical applications and development team is ready to answer questions.

# Cell Construction Specifications

All the cells Starna manufactures, unless specifically designed otherwise, are assembled using a fully fused method. This technique, pioneered and perfected by Starna, ensures that cells are fused into a single homogeneous unit by heat alone, using no intermediate adhesives. The cells achieve maximum physical strength as well as being unaffected by solvents.

All cells are carefully annealed to remove any residual strain left from the fusing process and, with few exceptions, can be used safely with pressure differentials of up to three atmospheres.

## General Specifications:

| | |
|---|---|
| Windows parallel to: | better than 3 minutes of arc |
| Window flatness to: | less than 4 Newton fringes |
| Window polish: | 60/40 scratch/dig |
| Window thickness: | 1.25mm |

| Material- | Path lengths | Tolerance |
|---|---|---|
| Glass | up to 20mm | +/- 0.1mm |
| Glass | 30 to 100mm | +/- 0.2mm |
| Special Optical Glass | up to 20mm | +/- 0.01mm |
| Special Optical Glass | 30 to 100mm | +/- 0.02mm |
| Quartz | up to 0.05mm | +/- 0.002mm |
| Quartz | 0.1 to 0.4mm | +/- 0.005mm |
| Quartz | 0.5 to 20mm | +/- 0.01mm |
| Quartz | 40 to 100mm | +/- 0.02mm |

The cells can be used with most solvents and acidic solutions. Acids such as HF should be avoided as they will attack the quartz itself while most other acids will not affect the cells. Strongly basic solutions (pH 9.0 and above) will etch the surface of the windows and shorten the useful life of the cells.

Note: Dimensions and specifications may change without notice.

# Material Specifications

Starna offers five window materials, Optical Glass, Special Optical Glass and Pyrex® for the visible range, Spectrosil® Quartz for the far UV range and Infrasil® Quartz or equivalent for the near infrared. If a material required is not shown in this catalog, please contact us for availability. All materials used to construct the cells are suitable for use in the following wavelength range:

| | |
|---|---|
| **Optical Glass** | **334 through 2500 nm** |
| **Special Optical Glass** | **320 through 2500 nm** |
| **Pyrex®** | **320 through 2500 nm** |
| **Spectrosil® Quartz** | **170 through 2700 nm** |
| **Infrasil®** | **220 through 3800 nm** |

For fluorescent applications, Spectrosil® is recommended as it does not exhibit any background fluorescence. Some other materials, especially glass and lower grades of quartz may have some background fluorescence. Standard window thickness is 1.25mm, polished to a flatness tolerance of better than 4 Newton Fringes per centimeter in the viewing area. They are typically flat to better than 1 micron (0.001mm) over the whole window area. The scratch and dig specification for surface polish is 60/40. The meticulous care taken in the preparation and construction of regular quartz fluorescent cells allows for normal tolerances to be sufficiently stringent for use in laser applications.

# Cell Matching

The high degree of accuracy maintained during production ensures a standard path length tolerance of +/- 0.01mm. The tolerance maintained for parallelism of the windows is better than 3 minutes of arc, therefore quartz cells vary little in transmission values. Slight differences in the transmission of new glass cells are due to variations in raw material transmission characteristics. The transmission of matched cells is measured and each cell is given a match code. These codes are only of real value when comparing new cells because the transmission characteristics may change as surface contamination or deterioration occurs during normal use. Thus, a new cell of a particular match code will not necessarily match an older cell of the same match code.

Cells which are commonly used (eg. 1-Q-10) are normally supplied from stock in unlimited quantities of the same match code. The less commonly used cells can usually be supplied in matched sets of two or four. In the case of Tablet Dissolution flow cells, matched sets of eight or more can be supplied.

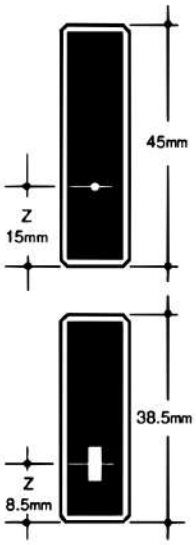
| Window Material | Matching Tolerance | Measured at Wavelength |
|---|---|---|
| Optical Glass | 0.5 % | 350 nm |
| Special Optical Glass | 1.0 % | 320 nm |
| Spectrosil Quartz | 1.5 % | 200 nm |
| Infrasil Quartz | 1.5 % | 240 nm |

## 'Z' Dimension for small volumes

The 'Z' dimension is the distance from the base of a cell to the center of the sample chamber window. The 'Z' dimension is very important for small volume cells of any design, where the sample compartment cross section dimension is very small. The correct 'Z' dimension should be added to the part number for small volume cells

**'Z' Dimension per Instrument**

| *Manufacturer:* | *'Z' Dimension:* |
|---|---|
| Agilent® | 15 mm |
| Beckman® | 8.5 mm |
| Bio-Rad® | 8.5 mm |
| Eppendorf® | 8.5 mm |
| GBC® | 15 mm |
| Hewlett Packard® | 15 mm |
| Hitachi® | varies by instrument |
| Jasco® | 11 mm |
| Ocean Optics® | 15 mm |
| Perkin-Elmer® | 15 mm |
| Pharmacia® | 15 mm |
| Shimadzu® | 15 mm |
| StellarNet® | 15 mm |
| Thermo Spectronic® | 8.5 and 15 mm |
| Turner® | 8.5 mm |
| Varian® | 20 mm |




**How to determine 'Z' Dimension:**

1) Cut a piece of paper 12mm x 100mm
2) Punch a hole with a pen 15mm from one end and 8.5mm from the other end
3) Put your instrument in %T at about 535nm.
4) Place the paper in the cell holder and see which hole transmits light through the hole.
5) If neither transmits light, cut another piece of paper and try other dimensions from the end of the paper.

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