Starna Scientific
The Spectroscopy Specialists

Cell/Cuvettes for all
Spectrophotometer
Fluorimeter and
Laser applications

Starna scientific

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 to10 x 105Pa (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

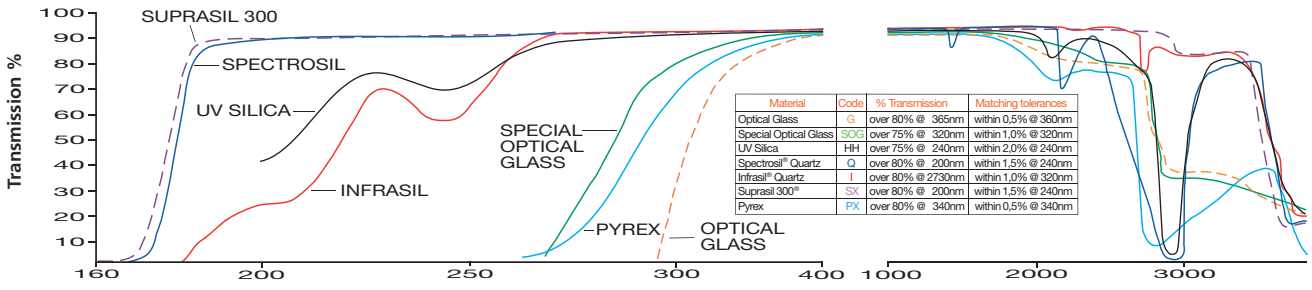
Standard window thickness is 1.25mm, polished to better than 4 Newton Fringes per centimetre in the viewing area, typically flat to better than 1 micron (0.001mm) over the window area.

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



Material	Code	% Transmission	Matching tolerances
Optical Glass	G	over 80% @ 365nm	within 0,5% @ 360nm
Special Optical Glass	SOG	over 75% @ 320nm	within 1,0% @ 320nm
UV Silica	HH	over 75% @ 240nm	within 2,0% @ 240nm
Spectrosil® Quartz	Q	over 80% @ 200nm	within 1,5% @ 240nm
Infrasil® Quartz	I	over 80% @ 2730nm	within 1,0% @ 320nm
Suprasil 300®	SX	over 80% @ 200nm	within 1,5% @ 240nm
Pyrex	PX	over 80% @ 340nm	within 0,5% @ 340nm

Registered Trade Marks: INFRASIL® & SUPRASIL 300® Heraeus Quarzglas GmbH, Hanau Germany.
SPECTROSIL®, Vitreosil® & TSC3® Heraeus Quartz UK Ltd, Wallsend, England. BOROFLOAT® Corning Glass Works, U.S.A.

The above information illustrates the approximate transmission ranges of the guaranteed materials used in the production of Starna cells. The spectra does not take into account reflective losses from optical window surfaces which may vary depending on the material measured, resulting in actual measured transmission between 80%T and 90%T. Windows are normally 1.25mm thick and therefore the absorption of the windows themselves can be disregarded for normal analytical purposes.

Contents

Absorption cells 27
Accessories 28
- Caps
- Cell holders
- Cell spacers
- Funnels
- Lids
- Magnetic stir bars
- Mirror coatings
- Quartz block inserts
- Stoppers

Anærobic cells 12
Aspiration cells, micro and semi-micro 18
CD matching 4
Cell matching 4 & 2
Cell specifications 2
Cell stirrer (Spinette) 30
Colorimeter cells 27
Connector fittings 29
Constant temperature cells 25
Cube cells 23
Cylindrical cells 10
- Constant temperature 25
- Short path 10
- Short path, micro 10
- Standard 10
- Large diameter 10
- With tube 10
- With graded seal 11

Demountable cells, short path length 13
Dissolution cell construction 16
Divided cells 23
Dual path length cells 23
Dye laser cells 26
Flow cells 14-20
- Dissolution cells 15-17
- Fittings 29
- Fluorimeter 24
- Fluorimeter HPLC 24
- HPLC 18
- Short path 14 & 17
- Short path, demountable 14
- In-line and Microscope analysis, in line 13-14
- Standard & Semi-micro 15
- Sub-micro 16
- Sub-micro, de-bubbler 19
- Ultra-micro 19 & 20
- Long aperture 15 - 17
- Round aperture 19 & 20
- Wide aperture 15 - 17
- Medium aperture 15 & 16

Fluorescence reference materials 30
Fluorimeter cells 21 - 25
- Standard rectangular 21
- Micro & semi-micro, with & without stopper 21 & 22
- Micro cell adaptors - FCAs 21
- Sub-micro 22
- Flow cells, all types 14 & 24
- Triangular open top/stopper 23
- Constant temperature 25

Gel boat cells 27
Magnetic stirring cells 26
Micro cells / Micro Cells short with lid or stopper 7
Micro cells self-masking with lid or stopper 7
Mixing cells 23
NIST traceable certified reference materials 30
Polarimeter cells 26
Quartz/Borofloat graded seals fused to cells 11
Rectangular cells with small screw caps 12
Reference materials, liquid and glass 30
Refractometer cells 25
Screw cap & septum cap cells GL14 12
Semi-micro cells with lid or stopper 6
Semi-micro cells self-masking with lid or stopper 6
Semi Micro cells short 6
Semi Micro cells short, self-masking 6
Small screw cap & septum cap cells 12
Standard rectangular cells with lid or stopper 5
Sub-micro cells with lid or vaned stopper 8
Sub-micro and multi-micro cells short 8
Sub-micro cells, low headspace 9
Sub-micro cells with stopper 9
Suction cells 18
Tandem cells 23
Terms of sale 30
Transmission specifications 2-4
Ultra-micro cells 9
Ultra-micro lens cell 9 & 23
UHV cells with stopcock 11
Z Height dimension 4

How to order

Essential ordering information is shown under the **Blue column headings** throughout the catalogue. Detail shown under the black headings is additional descriptive and dimensional information and need not be included.

eg. to order Type **1/I/10** (Standard Rectangular, Infrasil,10mm Path length)

Type No.	Window Materials	Path Length	Internal Width	External L	External W	External H	Nominal Vol. ml
1	G, SOG, PX, HH, Q, I, SX	10	10	12.5	12.5	45	3.500

eg. to order Type **19.01/Q/1/Z8.5** (Ultra-micro, Spectrosil, 1mm path length, 8.5mm Z dimension)

Type No.	Window Materials	Path Length	Z Height	Sample chamber W	Sample chamber H	External L	External W	External H	Nominal Vol. ml
19.01	SOG, Q	1	8.5, 15, 20	5	1	12.5	12.5	40.5	0.0050

Material specifications

Starna Scientific offer the following window materials: Optical Glass (G), Special Optical Glass (SOG), & Borofloat® (PX) for the Visible range; UV Silica Quartz(HH) for UV; Spectrosil® Quartz (Q) or equivalentfor FarUV & Visible, Infrasil® Quartz (I) or equivalent for UV through Near Infra-red (IR); Suprasil 300® Quartz (SX) or equivalent for FarUV through Near IR

If a specific window material is required and is not shown in this catalogue please contact us for availability. The following table shows the Usable Range (UR) and the range over which the transmission guaranteed better than 80%.

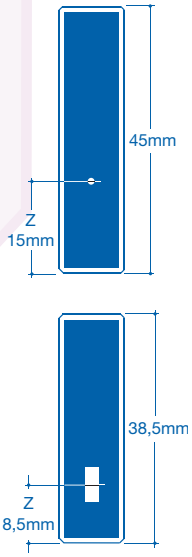
Material		UR From	>80% From Nm
Optical Glass	G	334 nm	360 through 2500 nm
Special Optical Glass	SOG	320 nm	320 through 2500 nm
Borofloat	PX	325 nm	330 through 2500 nm
UV Silica	HH	220 nm	260 through 2500 nm
Spectrosil® Quartz	Q	190 nm	200 through 2500 nm
Infrasil®	I	220 nm	220 through 3800 nm
Suprasil 300® Quartz	SX	190 nm	200 through 3500 nm

For fluorescent applications Spectrosil® is the recommended window material, as it does not exhibit any background fluorescence. Some other materials, especially glass and lower grades of quartz may have some background fluorescence.

The meticulous care taken in the quality of the polishing and unique construction of regular Starna® quartz fluorescent cells brings them within tolerances which are sufficiently stringent for them to be used in laser applications. These techniques are particularly relevant in the manufacture of much larger Ultra High Vacuum (UHV) cells.

Z Height dimension - IMPORTANT!

The 'Z' height is the distance from the bottom of the cell holder cavity to the centre of the incident light beam profile, which can be round, rectangular or curved. For the most efficient use of energy and sample volume the sample chamber aperture should ideally encompass the light beam with a small extra margin to avoid beam clipping.



The 'Z' height of the cell, the distance from the centre of the cell sample chamber aperture to the base of the cell, should match to that of the instrument.

Manufacturers have generally designed their instruments with 'Z' dimensions ranging from 5 to 20mm with 8.5 or 15mm being the most popular.

Choosing the correct cell 'Z' height is very important when the aperture in the cell is very small, as in sub-micro cells and micro flow cells.

The standard 'Z' heights for any cell, where this information is critical, are shown in a separate column in the information tables, headed 'Z' Height. Other 'Z' dimensions can be supplied on request.
The correct 'Z' height should be added to the part number e.g. if 8.5mm is required it should be shown as follows 73.4/SOG/10/Z8.5. As a double check at the time of ordering, it is beneficial to state the instrument make and model number for which the cell is required.

ALL dimensions stated in this catalogue are in millimetres unless otherwise indicated

Cell matching

Modern production and fusing techniques, together with consistent raw materials, have virtually eliminated the need for transmission matching in regular standard high grade quartz cells.

The extremely accurate physical path length tolerances used in production, stated on page 2, are essential especially on very short path lengths, for instance in dissolution measurements where multiple short path length cells may be used. Such flow cells Types 73, 74, 75, 583, 584 and 585 each have a unique fully traceable serial number engraved on the window. Cells with path lengths less than 0.5mm are measured using an interference method both before and after final fusing to provide a path length uncertainty calculation better than 0.2 microns (0.0002 mm). A certificate of path length and full production traceability can be provided for each individual cell on request, for a small additional charge.

Cells manufactured for **Circular Dichroism(CD)** must have strain-free oriented windows and the complete cell carefully annealed. This process incurs an additional charge for each cell. Cells required for **CD** must have this suffix **CD** added to the part number e.g. 34/Q/50/CD.

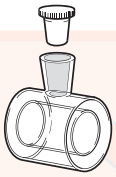
When cells matched for transmission are required, mainly but not exclusively for less consistent materials such as Glass and Special Optical Glass where transmission characteristics from melt to melt differ, each measured cell is given a match code relative to its transmission at a given wavelength as measured on a spectrophotometer. The transmission matching tolerances at measured wavelengths are shown as follows:

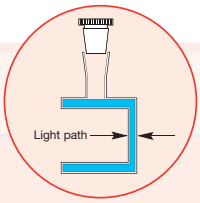
Window Material	Matching Tolerance	Measured at Wavelength
Optical Glass	0.5%	350nm
Special Optical Glass	1.0%	320nm
Borofloat	1.0%	320nm
UV Silica	1.5%	240nm
Spectrosil® Quartz	1.5%	200nm
Infrasil® Quartz	1.5%	240nm
Suprasil 300®	1.5%	240nm

The matching codes are only of real value when comparing new cells as transmission characteristics change during use because of surface contamination or wear due to cleaning processes. Therefore a brand new cell may not identically match an older used cell of the same match code.

Type 31. Cylindrical. Short path length

- Two polished windows.
- Closed by PTFE stopper, providing a liquid-tight seal.


31/Q/1

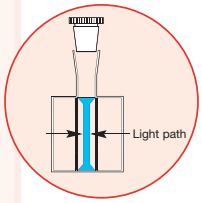


Type No.	Window Materials	Path Length	Internal Dia.	External Dia.	L	Nominal Vol. ml
31	Q, I, SX	0.01	15	22	22.5	2.15
31	Q, I, SX	0.05	15	22	22.5	2.15
31	Q, I, SX	0.10	15	22	22.5	2.15
31	Q, I, SX	0.20	15	22	22.5	2.18
31	Q, I, SX	0.50	15	22	22.5	2.22
31	Q, I, SX	1	15	22	22.5	2.31
31	Q, I, SX	2	15	22	22.5	2.49
31	Q, I, SX	5	15	22	22.5	3.02

Type 31/B. Cylindrical. Short path length, micro.

- Reduced sample volume.
- Two polished windows.
- Two filling ports, closed by two PTFE stoppers, providing a liquid-tight seal.


31/B/Q/1



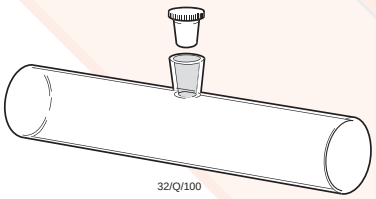
Type No.	Window Materials	Path Length	Internal Dia.	External Dia.	L	Nominal Vol. ml
31/B	Q	0.01	13	22	22.5	0.140
31/B	Q	0.05	13	22	22.5	0.151
31/B	Q	0.10	13	22	22.5	0.165
31/B	Q	0.20	13	22	22.5	0.194
31/B	Q	0.50	13	22	22.5	0.278
31/B	Q	1	13	22	22.5	0.420
31/B	Q	2	13	22	22.5	0.703
31/B	Q	5	13	22	22.5	1.552

Type 32. Cylindrical. Standard

- Two polished windows.
- Closed by a single PTFE stopper, providing a liquid-tight seal.


32/Q/1

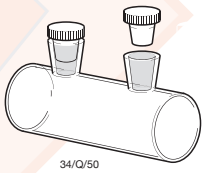

32/Q/5

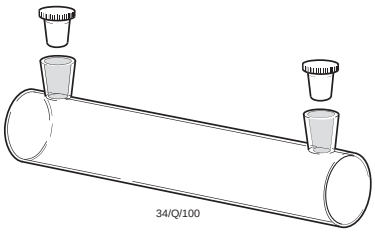

32/Q/100

Type No.	Window Materials	Path Length	Internal Dia.	External Dia.	L	Nominal Vol. ml
32	SOG, PX, Q, I, SX	1	19	22	3.5	0.28
32	SOG, PX, Q, I, SX	2	19	22	4.5	0.56
32	SOG, PX, Q, I, SX	5	19	22	7.5	1.40
32	SOG, PX, Q, I, SX	10	19	22	12.5	2.80
32	SOG, PX, Q, I, SX	20	19	22	22.5	5.60
32	SOG, PX, Q, I, SX	50	19	22	52.5	14.10
32	SOG, PX, Q, I, SX	100	19	22	102.5	28.20

Type 34. Cylindrical. Standard

- Two polished windows.
- Closed by two PTFE stoppers, providing a liquid-tight seal.

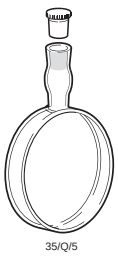

34/Q/50

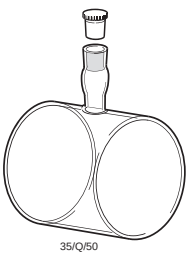

34/Q/100

Type No.	Window Materials	Path Length	Internal Dia.	External Dia.	L	Nominal Vol. ml
34.4	Q	100	4	6	102.5	1.30
34.8	Q	100	8	10	102.5	5.10
34.10	Q	100	10	12	102.5	7.86
34.12	Q	100	12	14	102.5	11.35
34	SOG, PX, Q, I, SX	50	19	22	52.5	14.10
34	SOG, PX, Q, I, SX	100	19	22	102.5	28.20
34	Q	200	19	22	202.5	56.40

Type 35. Cylindrical. Large diameter

- Two polished windows.
- Closed by PTFE stopper(s), providing a liquid-tight seal.

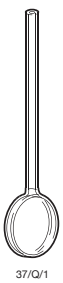

35/Q/5

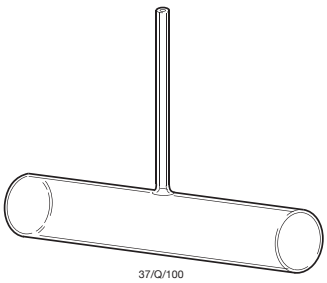

35/Q/50

Type No.	Window Materials	Path Length	Internal Dia.	External Dia.	L	Nominal Vol. ml
35	SOG, PX, Q, I	2	47	50	4.5	3.40
35	SOG, PX, Q, I	5	47	50	7.5	8.50
35	SOG, PX, Q, I	10	47	50	12.5	17.00
35	SOG, PX, Q, I	20	47	50	22.5	35.00
35	SOG, PX, Q, I	50	47	50	52.5	86.00
35	Q	100	47	50	102.5	172.00

Type 37. Cylindrical with tube

- Two polished windows.
- Tube material the same as cell body.
- Available on request with restriction for easy seal.


37/Q/1

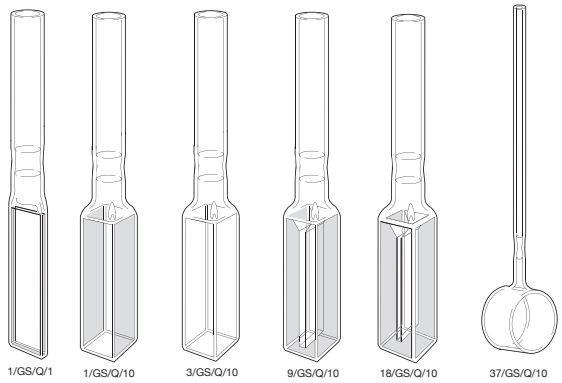

37/Q/100

Type No.	Window Materials	Path Length	Int. Dia.	Ext. Dia.	L	Tube ID.	Tube OD.	Tube L	Nominal Vol. ml
37	SOG, PX, Q, I, SX	1	19	22	3.5	2	4	70	0.28
37	SOG, PX, Q, I, SX	2	19	22	4.5	2	4	70	0.56
37	SOG, PX, Q, I, SX	5	19	22	7.5	2	4	70	1.40
37	SOG, PX, Q, I, SX	10	19	22	12.5	2	4	70	2.80
37	SOG, PX, Q, I, SX	20	19	22	22.5	2	4	70	5.60
37	SOG, PX, Q, I, SX	50	19	22	52.5	2	4	70	14.10
37	SOG, PX, Q, I, SX	100	19	22	102.5	2	4	70	28.20

G = Optical Glass 334-2500nm SOG = Special Optical Glass 320-2500nm PX = Borosilicate 325-2500nm HH = UV Silica 220-2500nm
Q = Far UV Quartz 170-2700nm I = Near Infra-Red Quartz 220-3800nm SX = Far UV to Near IR Quartz (Water free) 170-3500nm

Rectangular & Cylindrical with Quartz to Borofloat graded seal (GS)

- Quartz to borofloat graded seal fully fused to cell.
- Different diameters and lengths of graded seals can be supplied on request.



Rectangular & Cylindrical with straight tube (SBT)

- Quartz tube fully fused to quartz cell.
- Borofloat tube fully fused to borofloat cell
- Different diameters & lengths of straight bore tube can be supplied on request.

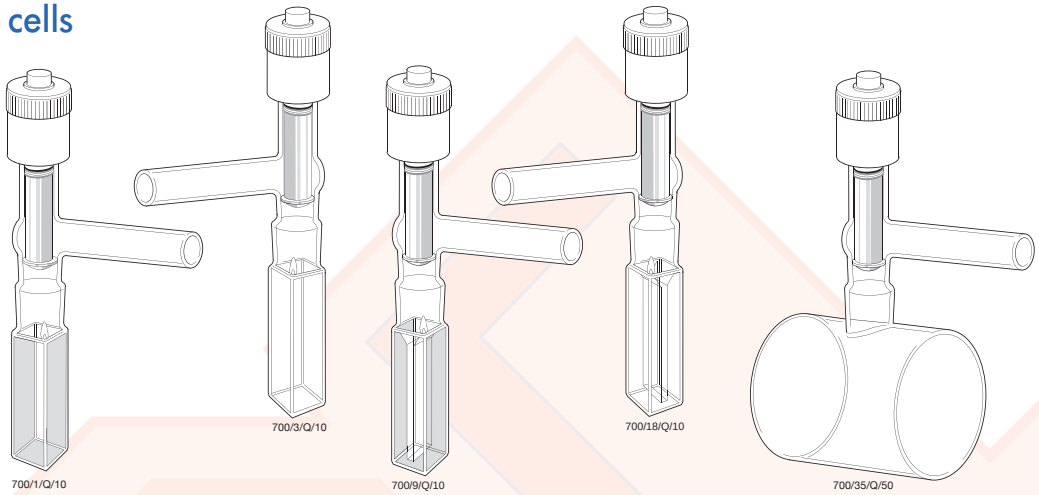
Rectangular for Low Temperature (HLT/GS) with Quartz to Borofloat graded seal

- 2mm thick walls.
- Fully fused 'welded' joints.
- Quartz to borofloat graded seal

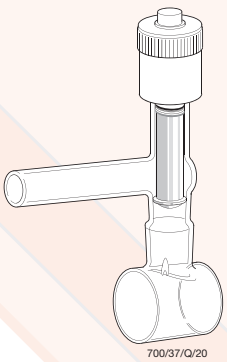
Type No.	Window Materials	Path Length	Internal Width	Internal Dia.	External L	External W	External H	External D	Tube ID.	Tube OD.	Tube L	Nominal Vol. ml	Remarks
1/GS or SBT	Q, I	1	10		3.5	12.5	115		8	10	70	0.40	Macro/Standard rectangular
1/GS or SBT	Q, I	2	10		4.5	12.5	115		8	10	70	0.70	Macro/Standard rectangular
1/GS or SBT	Q, I	5	10		7.5	12.5	115		8	10	70	1.70	Macro/Standard rectangular
1/GS or SBT	Q, I	10	10		12.5	12.5	115		8	10	70	3.50	Macro/Standard rectangular
3/GS or SBT	Q, I	10	10		12.5	12.5	115		8	10	70	3.50	Fluorimeter
9/GS or SBT	Q, I	10			12.5	12.5	115		8	10	70	1.40	Semi-micro
18/GS or SBT	Q, I	10			12.5	12.5	115		8	10	70	0.70	Micro
37/GS	Q, I	1		19	3.5			22	2	4	70	0.28	Cylindrical
37/GS	Q, I	2		19	4.5			22	2	4	70	0.56	Cylindrical
37/GS	Q, I	5		19	7.5			22	2	4	70	1.40	Cylindrical
37/GS	Q, I	10		19	12.5			22	2	4	70	2.80	Cylindrical
37/GS	Q, I	20		19	22.5			22	2	4	70	5.60	Cylindrical
37/GS	Q, I	50		19	52.5			22	2	4	70	14.00	Cylindrical
37/GS	Q, I	100		19	102.5			22	2	4	70	28.00	Cylindrical
1/HLT/GS	Q	10	8.5	10	12.5		115		8	10	70	3.5	Macro/Standard rectangular
3/HLT/GS	Q	10	8.5	10	12.5		115		8	10	70	3.5	Fluorimeter

Type 700. UHV Stopcock cells

- High vacuum patented stopcock.
- All cells will withstand evacuation $<10^{-11}$ Tor.
- PTFE threaded.
- Can be fused to most quartz cells.
- Stopcock itself can withstand pressure up to 5 bar (5×10^5 Pa).
- For cell pressure guidance; please enquire.

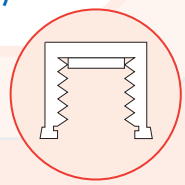


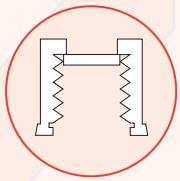
Type No.	Window Material	Path Length	External L	External W	External H	Side arm ID.	Side arm OD.	Side arm Length	Remarks
700/1	Q	10	12.5	12.5	≈135/150	10	13	50	Type 1 Macro
700/3	Q	10	12.5	12.5	≈135/150	10	13	50	Type 3 Fluorimeter
700/9	Q	10	12.5	12.5	≈135/150	10	13	50	Type 9 Semi micro
700/18	Q	10	12.5	12.5	≈135/150	10	13	50	Type 18 Micro
700/32	Q	10	22.5	22Ø	≈135/150	10	13	50	Type 32 Cylindrical
700/32	Q	20	22.5	22Ø	≈135/150	10	13	50	Type 32 Cylindrical
700/32	Q	40	42.5	22Ø	≈135/150	10	13	50	Type 32 Cylindrical
700/32	Q	50	52.5	22Ø	≈135/150	10	13	50	Type 32 Cylindrical
700/32	Q	100	102.5	22Ø	≈135/150	10	13	50	Type 32 Cylindrical
700/35	Q	50	52.5	50Ø	≈135/150	10	13	50	Type 35 Cylindrical
700/35	Q	100	102.5	50Ø	≈135/150	10	13	50	Type 35 Cylindrical

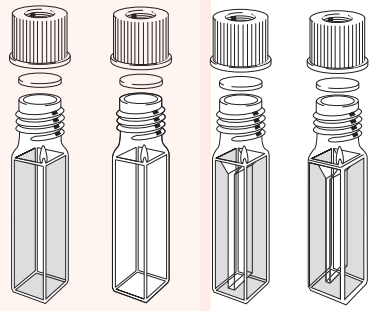


Rectangular Anærobic with screw cap (GL14)

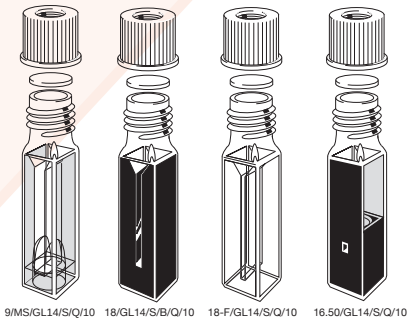
- Closed by screw cap or septum cap.
- **GL14/C** closed cap.
- **GL14/S** septum cap to allow filling, extraction or gas flow with syringe needle(s) through the silicone seal.
- Septum aperture diameter 9mm.
- Cap withstands pressure up to 5×10^5 Pa (5 bar).
- **GL14** can be fused to most rectangular and cylindrical cells with either one or two ports. Particularly suitable for stopping evaporation in cells used for stirring eg. **9/MS/GL14/Q/10**.


Plain cap GL14/C


Septum cap GL14/S


1/GL14/S/Q/10 3/GL14/S/Q/10 9/GL14/S/Q/10 18/GL14/S/Q/10

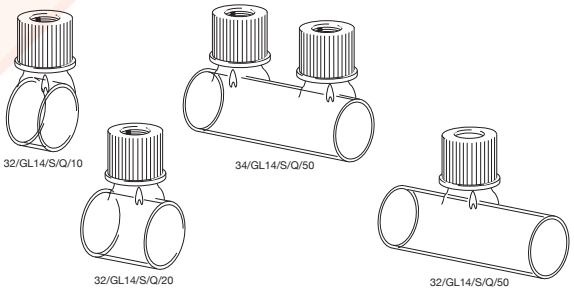
Type No.	Window Materials	Path Length	Internal Width	External L	W	H	Nominal Vol. ml	Remarks
1/GL14	SOG, Q, I	1	10	3.5	12.5	66	0.400	Macro/Rectangular
1/GL14	SOG, Q, I	2	10	4.5	12.5	66	0.800	Macro/Rectangular
1/GL14	SOG, Q, I	5	10	7.5	12.5	66	1.600	Macro/Rectangular
1/GL14	SOG, Q, I	10	10	12.5	12.5	66	3.500	Macro/Rectangular
9/GL14	SOG, Q, I	10	4	12.5	12.5	66	1.400	Semi-micro
9/B/GL14	Q, I	10	4	12.5	12.5	66	1.400	Semi-micro. Self masking
18/GL14	SOG, Q, I	10	2	12.5	12.5	66	0.700	Micro
18/B/GL14	Q, I	10	2	12.5	12.5	66	0.700	Micro. Self masking
3/GL14	SOG, Q, I	10	10	12.5	12.5	66	3.500	Fluorimeter
9-F/GL14	Q	10	4	12.5	12.5	66	1.400	Semi-micro. Fluorescent
18-F/GL14	Q	10	4	12.5	12.5	66	0.700	Micro. Fluorescent
16. **/GL14	Q	10	4	12.5	12.5	66	**all volumes	Sub-micro.
16. **-F/GL14	Q	10	4	12.5	12.5	66	**all volumes	Sub-micro.


9/MS/GL14/S/Q/10 18/GL14/S/B/Q/10 18-F/GL14/S/Q/10 16.50/GL14/S/Q/10

Cylindrical Anærobic with screw cap(s) (GL14)

- **GL14** can be fused to most cylindrical cells with either one or two ports.

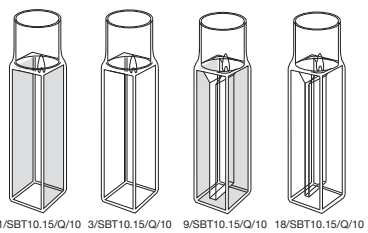
Type No.	Window Materials	Path Length	External Length	Internal Diameter	Nominal Vol. ml
32/GL14	SOG, PX, Q, I, SX	10	12.5	19	2.800
32/GL14	SOG, PX, Q, I, SX	20	22.5	19	5.600
32/GL14	SOG, PX, Q, I, SX	50	52.5	19	14.100
32/GL14	SOG, PX, Q, I, SX	100	102.5	19	28.200
34/GL14	SOG, PX, Q, I	50	52.5	19	14.100
34/GL14	SOG, PX, Q, I	100	102.5	19	28.200


32/GL14/S/Q/10 34/GL14/S/Q/50 32/GL14/S/Q/20 32/GL14/S/Q/50

Rectangular Anærobic for use with rubber septa seal

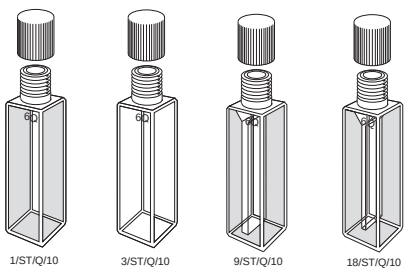
- **SBT10.15** tops suitable for rubber septa seal for Anærobic environments. Tubing 15mm long, 10mm I.D.

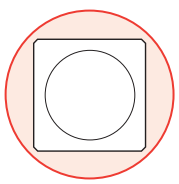
Type No.	Window Materials	Path Length	Internal Width	External L	W	H	Tube D.	O.D.	L	Nominal Vol. ml	Remarks
1/SBT10.15	Q, I	10	10	12.5	12.5	59	10	13	15	3.500	Macro/Standard rectangular
3/SBT10.15	Q, I	10	10	12.5	12.5	59	10	13	15	3.500	Fluorimeter
9/SBT10.15	Q, I	10	4	12.5	12.5	59	10	13	15	1.400	Semi-micro
18/SBT10.15	Q, I	10	2	12.5	12.5	59	10	13	15	0.700	Micro


1/SBT10.15/Q/10 3/SBT10.15/Q/10 9/SBT10.15/Q/10 18/SBT10.15/Q/10

Rectangular with small screw cap (ST)

- Closed with screw cap, with or without septum aperture.
- Outside diameter of cap is less than the cross-section of the cell.
- Septum aperture diameter - 6mm.
- **ST/C** closed cap.
- **ST/S** septum cap to allow filling, extraction or gas flow with syringe needle(s) through silicone seal which has a PTFE face.


1/ST/Q/10 3/ST/Q/10 9/ST/Q/10 18/ST/Q/10


Top view

Type No.	Window Materials	Path Length	Internal Width	External L	W	H	Nominal Vol. ml	Remarks
1/ST	Q, I	10	10	12.5	12.5	58	3.500	Macro/Standard rectangular
1.30/ST	Q	10	10	12.5	12.5	43	2.800	For Reference Adaptor Plate
3/ST	Q, I	10	10	12.5	12.5	58	3.500	Fluorimeter
9/ST	Q, I	10	4	12.5	12.5	58	1.400	Semi-micro
18/ST	Q, I	10	2	12.5	12.5	58	0.700	Micro

G = Optical Glass 334-2500nm SOG = Special Optical Glass 320-2500nm PX = Borosilicate 325-2500nm HH = UV Silica 220-2500nm
Q = Far UV Quartz 170-2700nm I = Near Infra-Red Quartz 220-3800nm SX = Far UV to Near IR Quartz (Water free) 170-3500nm

Instrument validation

NIST Traceable Glass & Liquid References

*__Starna__ are a world leading manufacturer and supplier of **Certified Reference Materials [CRMs]** for UV, Visible and Near Infrared photometer applications. All CRMs are manufactured to **ISO 17025 & ISO Guide 34** in the **Starna UKAS accredited laboratory.**

*__Starna__ CRMs meet all current international regulatory validation requirements for UV, Visible and Near Infrared spectrophotometer instruments.

*Glass filter CRMs are manufactured to the exacting standards required by **National Metrology Institutes [NMIs].**

*All Starna liquid references are heat fusion-sealed, eliminating both contamination and leakage issues. Starna has forty years experience in the production of heat fusion - sealed references.

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*__Re-calibration service__ with a guaranteed five working day turn-round is available from the Starna Calibration Laboratory, for all references. Some third party references can also be certified to ISO 17025 standard.

Below are some typical set designations to meet various regulatory requirements.

Full details of all references are available from Starna.

European Pharmacopoeia - RM-0660HLKCTX
Potassium Dichromate 60 & 600mg/l, Holmium Perchlorate, Potassium Chloride, Toluene/Hexane

Full Pharmacopoeia - RM-0660HLKCSITX
Potassium Dichromate 60 & 600mg/l, Holmium Perchlorate, Potassium Chloride, Sodium Iodide, Toluene/Hexane

United States Pharmacopoeia (USP) - RM-06HLKITX
Potassium Dichromate 60mg/l, Holmium Perchlorate, Potassium Iodide, Toluene/Hexane

RM-06 Potassium Dichromate 60mg/l

RM-HL Holmium Perchlorate

RM-1N2N3N Neutral Density Filter 10, 20 & 30%T

RM-N1N35N Neutral Density Filter 1, 3 & 50%T

RM-NIR TS5 Reference

Absorbance & Linearity | Wavelength | Stray Light | Instrument Resolution

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Starna® Spectrophotometer and Fluorimeter cells are warranted to meet the specifications shown on page 2 of this catalogue and be equal to or better than the dimensional tolerance for each cell listed. Stringent quality control is exercised throughout production with only guaranteed and brand named raw materials used, so that cells will perform to the highest specification for any given design.

Any goods to be returned under warranty require a Return of Merchandise Authorisation (RMA) number, which can be obtained by calling our Customer Service Department.

We reserve the right to change the design or specification of any product without prior notification.

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Technical staff are available to assist in the selection of cell material or physical configuration to satisfy individual applications.

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Stock items

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Any item temporarily out of stock will be back ordered to our own production facility and shipped at the earliest possible opportunity unless otherwise instructed.

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