

# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

|   |   |   |
|---|---|---|
|  <p>Accredited to<br/>ISO/IEC 17025:2005</p> | <b>Glass Technology Services Ltd</b><br><br><b>Issue No: 046    Issue date: 01 September 2018</b> |   |
|   | <b>9 Churchill Way</b><br><b>Chapelton</b><br><b>Sheffield</b><br><b>S35 2PY</b>                  | <b>Contact: Heather Marsh</b><br><b>Tel: +44 (0)114 290 1801</b><br><b>Fax: +44 (0)114 290 1851</b><br><b>E-Mail: h.marsh@britglass.co.uk</b><br><b>Website: www.glass-ts.com</b> |
| <b>Testing performed by the Organisation at the locations specified below</b>   |   |   |

### Locations covered by the organisation and their relevant activities

#### Laboratory locations:

| Location details  |  | Activity   | Location code |
|---|--|--|---------------|
| <b>Address</b><br>Glass Technology Services Ltd<br>9 Churchill Way<br>Chapelton<br>Sheffield<br>S35 2PY | <b>Local contact</b><br>Heather Marsh<br><br>Tel: +44 (0)114 290 1801<br>Fax: +44 (0)114 290 1851<br>Email: h.marsh@britglass.co.uk<br>Website: www.glass-ts.com | Glass and Glass Products<br>Analysis<br><br>Environmental Sampling/<br>Testing | A             |

#### Site activities performed away from the locations listed above:

| Location details   |   | Activity                | Location code |
|--|---|-------------------------|---------------|
| <b>Address</b><br>Customers sites requiring Stack<br>Emissions Testing | <b>Local contact</b><br>Heather Marsh<br><br>Tel: +44 (0)114 290 1801<br>Fax: +44 (0)114 290 1851 | Stack Emissions Testing | B             |



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DETAIL OF ACCREDITATION

| Materials/Products tested               | Type of test/Properties measured/Range of measurement            | Standard specifications/ Equipment/Techniques used   | Location Code |
|---|--|--|---------------|
| GLASS and GLASS PRODUCTS                | <u>Chemical Tests</u>  |  |               |
|   | Lead<br>Cadmium  | Documented In-House Method QP11<br>using atomic absorption spectrometry and atomic emission spectroscopy   | A             |
|   | Lead and Cadmium Leaching  | Documented In-House Method QP16<br>using atomic absorption spectrometry and ICP-OES techniques based on<br>ISO 7086-1:2000<br>ISO 7086-2:2000<br>BS 6748:1986 + A1:2011<br>BS EN 1388-2:1996<br>ASTM C927-80(2014)<br>AOAC - 973.32 (2004) | A             |
|   | Elemental/oxide analysis   | Documented In-House Method QP08<br>using XRF techniques  | A             |
|   | Loss on drying and Loss on Ignition                              | Documented In-House Method QP10  | A             |
|   | Hydrolytic resistance of glass containers for pharmaceutical use | Documented In-House Method QP15<br>based on<br>USP35 – NF30 1 <sup>st</sup> Supplement Section 660<br>European Pharmacopoeia Ph.Eur. Ed 6.8 method 3.2.1 (2010)<br>British Pharmacopoeia BP BP-Vol V - Appendix XIX B (2012)               | A             |
| Identification and comparative analysis | Documented In-House Method QP07<br>using SEM Techniques          | A  |               |



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|--|--|--|---------------|
| GLASS and GLASS PRODUCTS (cont'd)  | <u>Chemical Tests</u> (cont'd)   |  |               |
| GLASS AND SAND   | Iron<br>Chromium   | Documented In-House Method QP14<br>using UV-Visible light spectrometry       | A             |
| GLASS MAKING MINERALS (eg sand, limestone, dolomite, cullet, feldspar, blast furnace slag, nepheline syenite, synthetic diopside, alumina and alumino-silicate refractories) | Sodium Oxide (Na <sub>2</sub> O)<br>Magnesium Oxide (MgO)<br>Aluminium Oxide (Al <sub>2</sub> O <sub>3</sub> )<br>Silica (SiO <sub>2</sub> )<br>Phosphorus Pentoxide (P <sub>2</sub> O <sub>5</sub> )<br>Potassium Oxide (K <sub>2</sub> O)<br>Calcium Oxide (CaO)<br>Titanium Dioxide (TiO <sub>2</sub> )<br>Manganese Oxide (MnO)<br>Chromium (III) Oxide (Cr <sub>2</sub> O <sub>3</sub> )<br>Strontium Oxide (SrO)<br>Iron (III) Oxide (Fe <sub>2</sub> O <sub>3</sub> )<br>Barium Oxide (BaO) | Documented In-House Method QP09<br>using X-ray fluorescence techniques (XRF) | A             |
| GLASS PRODUCTS   | <u>Dimensional Tests</u>   |  |               |
|  | Length (to ± 0.001 mm)<br>Diameter (to ± 0.001 mm)<br>(Range 0 to 100 mm)<br>Angle (to ± 0.05°)<br>(Range 0 to 90°)  | Documented In-House Method QP32<br>using optical profile methods             | A             |
|  | Length (to ± 0.01 mm)<br>Diameter (to ± 0.051 mm)<br>(Range 1 to 150 mm)   | Documented In-House Method QP02  | A             |
|  | Digital depth gauge  | Documented In-House Method QP02  | A             |
|  | Volumetric capacity  | Documented In-House Method QP48<br>based on<br>TEC6 (1994)                   | A             |
|  | Verticality  | Documented In-House Method QP49<br>based on<br>BS EN 29008:1994              | A             |



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|-----------------------------------|---|---|---------------|
| GLASS and GLASS PRODUCTS (cont'd) | <u>Dimensional Tests</u> (cont'd)                           |   |               |
|                                   | Hall effect thickness gauge                                 | Documented In-House Method QP02 - Appendix 1E based on Instruction Manual, Sections 910 - 198E and 213A | A             |
|                                   | <u>Physical Tests</u>                                       |   |               |
|                                   | Thermal shock   | Documented In-House Method QP33 based on BS EN 1183:1997 ASTM C149-14 BS EN ISO 7459 (2004)             | A             |
|                                   | Strain characteristics                                      | Documented In-House Method QP17 based on ASTM C148-14 using a fluorescent intensity >1300 lux           | A             |
|                                   | Glass failure analysis                                      | Documented In-House Method QP18   | A             |
|                                   | Fragment analysis of glass                                  | Documented In-House Method QP21   | A             |
|                                   | <u>Determination of absorption and transmittance values</u> | Documented In-House Method QP72 using spectrophotometric techniques in the range 180 – 3000nm           | A             |
| Sodium Carbonate                  | <u>Total alkalinity</u>                                     | BS 6070-1:1981(2017)<br>ISO 740:1976  | A             |



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|-----------------------------------|--|---|--|---|
| GLASS and GLASS PRODUCTS (cont'd) | <u>Mechanical Tests</u>                                    |   |  |   |
|                                   | Compression Testing  | Documented In-House Method QP39   | A  |   |
|                                   | Impact testing of glass                                    | Documented In-House Method QP19   | A  |   |
|                                   | Pressure testing of glass                                  | Documented In-House Method QP20 based on ASTM C147-86(2015)                               | A  |   |
| GLASS/NON POROUS MATERIAL         | <u>Physical Tests</u>                                      |   |  |   |
|                                   | Density  | Documented In-House Method QP66 based on ASTM C693-93(2013)                               | A  |   |
| GLASS AND GLASS PRODUCTS          | <u>Chemical Tests</u>                                      |   |  |   |
|                                   | Road marking materials: glass beads and premix glass beads | Resistance to the effects of: water, hydrochloric acid, calcium chloride, sodium sulphide | Documented In-House Method QP30 based on BS EN 1423:2012:Annex B                           | A |
|                                   |  | Determination of the presence of moisture-proof coating                                   | Documented In-House Method QP30 based on BS EN 1423:2012:Annex E                           | A |
|                                   |  | Determination of Arsenic<br>Lead<br>Antimony  | Documented In-House Method QP30 in accordance with BS EN 1423:2012 Annex I.1 using ICP-OES | A |



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|---|---|---|---------------|
| GLASS AND GLASS PRODUCTS<br>Road marking materials:<br>glass beads and premix<br>glass beads (cont'd) | <u>Physical Tests</u>                                   |   |               |
|   | Granulometry  | BS EN 1423:2012 Section 4.1.3<br>Annex C (Except clause C.8)<br>BS EN 1424:1998 Section 4.1<br>Except imperfection - gas<br>inclusion (refer to BS EN 1423<br>clause C.8) | A             |
|   | Refractive Index  | Documented In-House Method<br>QP30<br>based on<br>BS EN 1423:2012 Annex A   | A             |
|   | Maximum weighted percentage<br>of defective glass beads | BS EN 1423:2012 Annex C<br>BS EN 1423:2012 Annex D  | A             |
|   | Bead quality  | Documented In-House Method<br>QP30<br>based on<br>BS EN 1423:2012 Annex D   | A             |



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| STACK EMISSIONS                          | <u>Physical Testing</u>  |  |               |
| Filter papers and rinse solutions        | Weighing of Particulate Matter   | Documented In-House Method QP40<br>BS EN 13284-1:2002<br>BS ISO 9096:2003  | A             |
| Testing of Stack emissions to Atmosphere | <u>Sampling with subsequent analysis by an ISO/IEC 17025 Accredited Laboratory</u> | National, European, International and Environment Agency specified standards including MIDs and Documented In-House work instructions to meet the requirements of the Environment Agency (MCERTS) Performance Standard and DD CEN/TS 15675:2007 and BS EN 15259:2007 |               |
|  | Total Particulate Matter   | Documented In-House Method QP40<br>BS EN 13284-1:2002  | B             |
|  | Hydrogen Chloride  | Documented In-House Method QP43<br>BS EN 1911:2010   | B             |
|  | Hydrogen Fluoride  | Documented In-House Method QP44<br>BS ISO 15713:2006   | B             |
|  | Sulphur dioxide  | Documented In-House Method QP53<br>BS EN 14791:2005  | B             |
|  | Metals (excluding mercury)   | Documented In-House Method QP50<br>BS EN 14385:2004  | B             |
|  | Ammonia  | Documented In-House Method QP60<br>BS EN 14791:2005  | B             |



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| Materials/Products tested                         | Type of test/Properties measured/Range of measurement                 | Standard specifications/ Equipment/Techniques used   | Location Code |
|---|---|--|---------------|
| Testing of Stack emissions to Atmosphere (cont'd) | <u>Sampling and On-Line analysis</u>                                  | National, European, International and Environment Agency specified standards including MIDs and Documented In-House work instructions to meet the requirements of the Environment Agency (MCERTS) Performance Standard and DD CEN/TS 15675:2007 and BS EN 15259:2007 |               |
|   | Pressure<br>Temperature<br>Velocity<br>(point velocity method)        | Documented In-House Method QP71<br>BS EN ISO 16911-1:2013 using differential pressure device (pitot tube) method   | B             |
|   | Water Vapour  | BS EN 14790:2005 (QP52)  | B             |
|   | Oxygen*   | Documented In-House Method QP55<br>BS EN 14789:2005<br>Validated Electrochemical cell or Paramagnetic analyser   | B             |
|   | Carbon Monoxide*  | Documented In-House Method QP62<br>BS EN 15058:2006<br>NDIR Analyser   | B             |
|   | Sulphur Dioxide*  | Documented In-House Method QP59<br>EA TGN M21<br>NDIR Analyser   | B             |
|   | Total Gaseous Organic Carbon* (TOC/VOC)<br>(0-1000mg/m <sup>3</sup> ) | Documented In-House Method QP63<br>BS EN 12619:2013<br>FID analyser  | B             |





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| Testing of Stack emissions to Atmosphere (cont'd) | <u>Sampling and On-Line Analysis (cont'd)</u><br><br>Oxides of Nitrogen (Nitrogen Oxide only)* | National, European, International and Environment Agency specified standards including MIDs and Documented In-House work instructions to meet the requirements of the Environment Agency (MCERTS) Performance Standard and DD CEN/TS 15675:2007 and BS EN 15259:2007<br><br>Documented In-House Method QP54<br>BS EN 14792:2005<br>Validated NDIR Analyser | B             |
| END   |  |  |               |

\* - The scale range of the analyser used for this test must be that detailed on its current MCERTS certificate or a range validated by the organisation to meet MCERTS requirements.