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## 1 GENERAL

### 1.1 INTRODUCTION

#### 1.1.1 Scope

- 1 This Section specifies the requirements for glass, plastic, glazing related materials and glazing accessories. Glazing products specified apply to factory or field glazed items.
- 2 The purpose of QCS is to provide as a general technical guide for acceptable construction work practices in the State of Qatar, considering this, any technology or material or specification or standard that is not mentioned in this section, modification shall be subject to approval in the light of the introduction of QCS (00-02).
- 3 Related Sections are as follows:

Section 15	Thermal Insulation
Section 17	Metalwork
Section 18	Carpentry, Joinery and Ironmongery
Section 24	Finishes to Buildings
Section 27	External Works to Buildings

#### 1.1.2 References

- 1 The following standards are adopted and/or referred to in this Section:

ASTM C1036.....	Standard Specification for Flat Glass
ASTM C1048.....	Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
ASTM C1172 .....	Standard Specification for Laminated Architectural Flat Glass.
ASTM C1376.....	Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass
ASTM E998. ....	Standard Test Method for Structural Performance of Architectural Glass Products Under the Influence of Uniform Static Loads.
ASTM F2813 .....	Standard Specification for Glass Used as a Horizontal Surface in Desks and Tables.
ASTM F3006 .....	Standard Specification for Ball Drop Impact Resistance of Laminated Architectural Flat Glazing.
BS 544.....	Specification for linseed oil putty for use in wooden frames
BS 952.....	Glass for glazing; (BS 952-1 Glass for glazing – Classification; BS 952-2 Glass for glazing - Terminology for work on glass)
BS 1494.....	Specification for fixing accessories for building purposes
BS 2571.....	Specification for general-purpose flexible PVC compounds for moulding and extrusion
BS 5051.....	Security glazing; (BS 5051-1 Bullet-resistant glazing - Specification for glazing for interior use; BS 5051-2 Security glazing - Specification for bullet-resistant glazing for exterior use; ISO 16935 Glass in building — Bullet-resistant security glazing — Test and classification; EN 1063 Glass in building - Security glazing - Testing and classification of resistance against bullet attack)
BS 5357.....	Code of practice for installation and application of security glazing.

- BS 5516.....Patent glazing and sloping glazing for buildings; (BS 5516-1 Patent glazing and sloping glazing for buildings - Code of practice for design and installation of sloping and vertical patent glazing; BS 5516-2 Patent glazing and sloping glazing for buildings - Code of practice for sloping glazing)
- BS 5544.....Specification for anti-bandit glazing (glazing resistant to manual attack); (ISO 16936-1 Glass in building — Forced-entry security glazing — Part 1: Test and classification by repetitive ball drop; ISO 16936-2 Glass in building - Forced-entry security glazing — Part 2: Test and classification by repetitive impact of a hammer and axe at room temperature; ISO 16936-3 Glass in building — Forced-entry security glazing — Part 3: Test and classification by manual attack; EN 356 Glass in building - Security glazing - Testing and classification of resistance against manual attack )
- BS 5588.....Fire precautions in the design, construction and use of buildings; (BS 9999 Fire safety in the design, management and use of buildings. Code of practice)
- BS 5713.....Specification for hermetically sealed flat double glazing units
- BS 6206.....Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings; (ISO 12540 Glass in building — Tempered soda lime silicate safety glass; ISO 20657 Glass in building — Heat soaked tempered soda lime silicate safety glass)
- BS 6262.....Glazing for buildings.
- BS 8000.....Workmanship on construction sites
- EN 572 .....Glass in building - Basic soda-lime silicate glass products
- EN 1096 .....Glass in building - Coated glass.
- EN 1279 .....Glass in Building - Insulating glass units.
- EN 12150 .....Glass in building - Thermally toughened soda lime silicate safety glass.
- EN 12488 .....Glass in building - Glazing recommendations - Assembly principles for vertical and sloping glazing.
- EN 12600 .....Glass in building - Pendulum test - Impact test method and classification for flat glass.
- EN 13022 .....Glass in building - Structural sealant glazing
- EN 15434 .....Glass in building. Product standard for structural and/or ultra-violet resistant sealant (for use with structural sealant glazing and/or insulating glass units with exposed seals); (EN 15434 Bonding sealants).
- EN 15651 .....Sealants for non-structural use in joints in buildings and pedestrian walkways.
- EN 16477 .....Glass in building - Painted glass for internal use.
- ISO 10077 .....Thermal performance of windows, doors and shutters — Calculation of thermal transmittance.
- ISO 12543 .....Glass in building — Laminated glass and laminated safety glass.
- ISO 21005 .....Ships and marine technology — Thermally toughened safety glass panes for windows and side scuttles.
- ISO 28278 .....Glass in building — Glass products for structural sealant glazing.

ISO 52022 .....Energy performance of buildings — Thermal, solar and daylight properties of building components and elements.

### 1.1.3 Labels

- 1 Temporary labels are to be provided on each pane of glass or plastic material identifying manufacturer or brand and glass type, quality and nominal thickness. Temporary labels shall remain intact until the Engineer approves the pane.
- 2 Permanent labels in accordance with BS 952 and the manufacturer's standard label are to be provided on the following:
  - (a) tempered glass panes
  - (b) laminated glass panes
  - (c) organic coated glass panes
  - (d) bullet resistive glass or plastic panes in accordance with BS 5051, BS 5357, and BS 5544
- 3 The label shall be located in the corner for each pane.

### 1.1.4 Submittals

- 1 Samples not less than 150 mm square shall be submitted for approval by the Engineer for all types of panes to be used in the Works.
- 2 Manufacturer's certificates for glazing to be used in the Works are to be provided as follows:
  - (a) certificates stating that tempered glass, laminated glass, organic coated glass, and wire glass meet the requirements for safety glazing material as specified in BS 5357
  - (b) certified test report stating that bullet resistive material meets the test requirements of BS 5051
  - (c) certificates stating the following characteristics of the glass:
    - (i) visible light transmittance
    - (ii) visible light reflectance
    - (iii) shading coefficient
    - (iv) winter U-value
    - (v) summer U-value
    - (vi) k-value
    - (vii) relative heat gain
    - (viii) any other characteristic as required by the Project Documentation or as requested by the Engineer.
- 3 Manufacturer's guarantees are to be provided by the Contractor for the following:
  - (a) guarantee bullet resistive plastic material to remain visibly clear without discoloration for 10 years
  - (b) guarantee insulating glass units to remain sealed for 10 years
  - (c) guarantee laminated glass units to remain laminated for 5 years
  - (d) guarantee polycarbonate to remain clear and ultraviolet light stabilised for 5 years
  - (e) guarantee insulating plastic to not have more than 6 % decrease in light transmission and be ultraviolet light stabilised for 10 years.

- 4 Manufacturer's literature and data is to be submitted to the Engineer for the following:
- (a) glass, for each type required
  - (b) plastic glazing materials, for each type required
  - (c) distance setting and location blocks
  - (d) elastic compound for metal sash glazing
  - (e) putty, for wood sash glazing
  - (f) glazing cushions
  - (g) sealing compounds
  - (h) transparent (one-way vision glass) mirrors
  - (i) gaskets
  - (j) any other component or material if asked for in the Project Documentation.
- 5 Storage for all glass to be used in the Works is to be in a shaded and ventilated area and to be protected from dirt and accidental damage. Care is to be taken to prevent the accumulation of water between the sheets and any stacked glass that show signs of dampness are to be separated and dried.

END OF PART