



Prequalification Document



“Quality means doing it right when no one is looking.”

Technical Consultants to the Flat Glass and Associated Industries.

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A Member of the Links Group of Companies



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Technical Consultants to the Flat Glass and Associated Industries

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A member of the



Glass and Glazing Federation

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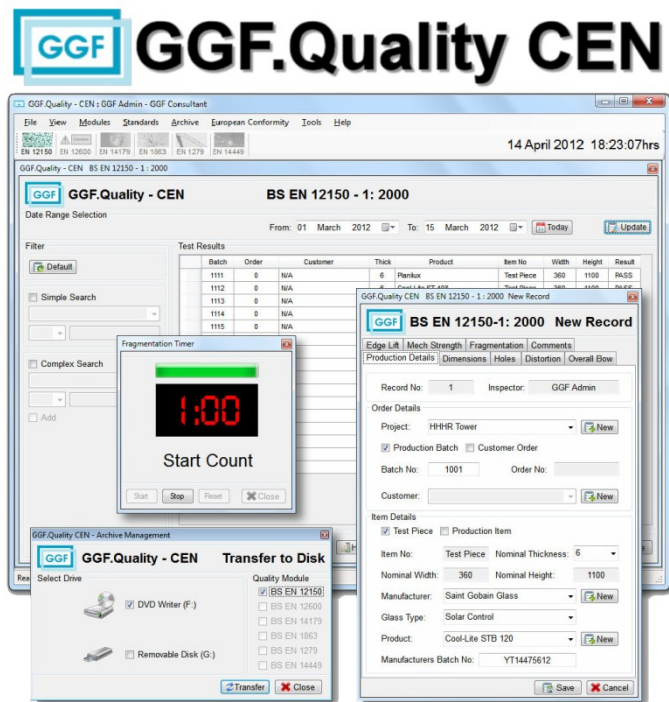
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1. Introduction

Based in the United Arab Emirates as a hub to the rest of the world, RNG Consultancy provides advice, guidance and support to developers, clients, architects, consultants, main contractors, facade manufactures, and glass processors on many aspects of the flat glass and associated industries.

2. Products – GGF.Quality CEN

RNG Consultancy is the developer of GGF.Quality CEN in partnership with the Glass and Glazing Federation. The software is a modular based total quality solution and factory production control (FPC) system which assists in the control, continuous surveillance and improvement of product(s) and production processes. The software will guide you through the requirements and the preparation of documentation required to achieve the CE Mark and is built with individual quality modules that allow you to tailor the package to suite your individual company needs. The modules assist in the collection, calculation and storage of quality data taken against any given production batch or customer order that can be allocated against a project, if required. All data is tested against the latest quality standards to ensure conformity of product and raise issues that may have occurred in the production process.



The application has been developed for Glass Manufacturers, Coating Manufacturers and Glass Processors.

2.1 Available modules

No.	Module	Glass in Building - Description
1	EN 12150-1: 2012	Thermally toughened soda lime silicate safety glass Part 1: Definition and description.
	EN 12150-2: 2004	Thermally toughened soda lime silicate safety glass. Part 2: Evaluation of conformity/Product standard.
2	EN 1863-1: 2000	Heat Strengthened soda lime silicate glass. Part 1: Definition and description.
	EN 1863-2: 2004	Heat Strengthened soda lime silicate glass. Part 2: Evaluation of conformity/Product standard.
3	EN 14179-1: 2005	Heat soaked thermally toughened soda lime silicate safety glass. Part 1: Definition and description.
	EN 14179-1: 2005	Heat soaked thermally toughened soda lime silicate safety glass. Part 2: Evaluation of conformity/Product standard.

2.2 Modules under Development

No.	Module	Glass in Building - Description
	EN 1279-1: 2012	Insulating Glass Units. Part 1: Generalities, dimensional tolerances and rules for the system description.
	EN 1279-2: 2004	Insulating Glass Units. Part 2: Long term test method and requirements for moisture penetration.
4	EN 1279-3: 2000	Insulating Glass Units. Part 3: Long term test method and requirements for gas leakage rate and for gas concentration tolerances.
	EN 1279-4: 2004	Insulating Glass Units. Part 4: Methods of test for the physical attributes of edge seals.
	EN 1279-5: 2005	Insulating Glass Units. Part 5: Evaluation of conformity / Product standard.
5	EN 14449: 2004	Laminated Glass and Laminated Safety Glass: Evaluation of conformity / Product standard.
6	EN 12600: 2002	Pendulum test: Impact test method and classification for flat glass.

3. Services - Consultancy

With more than twenty years experience within the flat glass industry, RNG Consultancy specializes in the following areas:

- ✚ 088000 Glazing Specification preparation.
- ✚ Developer, client, architect, consultant, main contractor and facade manufacturer support.
- ✚ Independent quality, installation and failure assessment.
- ✚ Implementation of ISO, CEN and ASTM quality management systems and standards.
- ✚ Quality control audit and assessment.
- ✚ Implementation of factory production controls in preparation of CE accreditation.
- ✚ Project Management.
- ✚ New facility start up, including design, preparation and implementation.
- ✚ Existing facility re-design and expansion.
- ✚ Tempering and Heat Strengthening setup, audit, training and diagnostics.
- ✚ Production auditing and "Lean" manufacturing methods.
- ✚ Operational production software setup, implementation and training.
- ✚ Employee training and assessment.
- ✚ Factory Production Control Audit: Construction Products Regulation – Glass and Glazing Federation.
- ✚ Heat Soak Oven Calibration to EN 14179-1: 2005 – Glass and Glazing Federation.
- ✚ Impact Test Rig Calibration to EN 12600: 2002 – Glass and Glazing Federation.

RNG Consultancy is able to offer a wealth of knowledge and experience on all aspects of glass processing, quality management, control and assessment, product specification in accordance with Architect, Consultant, Client and Government Legislation. RNG Consultancy is also regarded as leading experts in the field of glass toughening (tempering), heat strengthening and heat soak testing. Coming from the processing and capital equipment sectors of the industry, we understand the constraints and properties of the material concerned and can support, guide and advise where necessary, enabling all parties to meet their design goals.

3.1 Architects, Consultants and Main Contractors.

RNG Consultancy provides technical assistance to architects, consultants and main contractors on many aspects of glass intended to be used in buildings and construction works. Our services include.

- ✚ Quality, installation and failure assessment in accordance with relevant international quality standards and project specification.
- ✚ Façade, glass manufacturer and glass processor liaison.
- ✚ Glass possessor evaluation in accordance with ISO 9001, CEN, manufacturer and specification requirements.
- ✚ Product assessment in accordance with specified quality standards including BS, CEN, ISO and ASTM.
- ✚ Project specific factory production control implementation and continuous surveillance program.

3.2 Facade Manufacturers.

RNG Consultancy can give the facade manufacturer technical support and assistance on many aspects of glass intended to be used in buildings and construction works. The services we offer include.

- ✚ Architect, consultant and main contractor liaison.
- ✚ Glass possessor evaluation in accordance with ISO 9001, CEN, manufacturer and specification requirements.
- ✚ Product assessment in accordance with specified quality standards including BS, CEN, ISO and ASTM.
- ✚ Quality, installation and failure assessment in accordance with relevant international quality standards.
- ✚ Critical glazing recommendation in accordance with BS 6262-4
- ✚ Solar control.
- ✚ Value engineering.

With the current speed of high performance spectrally selective glass products entering the market place, it is becoming a major priority to the façade industry that the quality of the products leaving the glass processor are at a level that exceeds the minimum requirements specified in the relevant international quality standards. RNG Consultancy can audit, assess, recommend and implement the required factory production controls (FPC) that are necessary to produce the required product at an elevated quality level consistently. It is always recommended that a continuous surveillance program is introduced for the period of the project.

3.3 Independent Third Party Quality and Failure Assessment

Construction phase failures, in-service failures and quality problems are an issue for all concerned. RNG Consultancy can provide that piece of mind in determining the root cause and providing advice on the best course of action to rectify the issues. Our services include but are not limited to:

- ✚ Spontaneous failure analysis.
- ✚ Laminate glass quality assessment (i.e. delamination)
- ✚ Optical distortion (i.e. roller wave)
- ✚ Insulated Glazing Unit quality, including solar coating quality assessment.
- ✚ Toughened / Heat Strengthened glass quality assessment.
- ✚ Human impact performance safety analysis to BS6262-4: 2005.
- ✚ Heat Soak Test compliance in accordance with EN 14179-1: 2005.

3.4 Glass Processors - New Facility Setup.

Setting up a new facility can be a daunting task. RNG Consultancy can assist to help make the process as streamlined as possible. There are many task that need to be addressed, the following a just a few examples.

- ✚ Final layout preparation and drawings.
- ✚ Factory preparation planning and design.
- ✚ Documented production and maintenance procedures.
- ✚ Manufacturer liaison.
- ✚ Machinery installation management.

3.5 Glass Processors - Tempering, Heat Strengthening and Heat Soak Testing.

It has been said within the industry that the tempering process is a black art. Allow RNG Consultancy to show you that this is not true. Good tempering and heat strengthening can be achieved with knowledge and experience. We can support you with the following.

- ✚ Furnace installation management.
- ✚ Product setup.
- ✚ Production audit.
- ✚ Operator training.
- ✚ Furnace and product diagnostics
- ✚ Heat soak oven calibration to EN 14179-1: 2005 in partnership with the Glass and Glazing Federation.
- ✚ Impact test rig calibration to EN 12600: 2002 in partnership with the Glass and Glazing Federation.

3.6 Glass Processors – International Quality Standards.

With an extensive knowledge of international quality standards, we can assist with the implementation and testing for the following:

- ✚ British Standards (BS)
- ✚ European (hEN's)
- ✚ International Standards Organization (ISO)
- ✚ **American Society for Testing and Materials (ASTM)**

3.7 Glass Processors - Factory Production Controls for CE preparation.

In preparation of achieving CE accreditation we assist in the development of factory production control procedures (FPC). The areas that we cover include.

- ✚ Document Control.
- ✚ Customer requirements and contracts.
- ✚ Purchasing.
- ✚ Review of product specification.
- ✚ Production action on non-conforming material.

- ✚ Inspection and in process testing.
- ✚ Required equipment.
- ✚ Storage, handling, packaging and transportation.
- ✚ Records.
- ✚ Complaints.
- ✚ Corrective / preventive action.
- ✚ Training and competence.
- ✚ Factory production control documentation and forms.

We can also assist in the preparation of the products required for initial type testing.

3.8 Glass Processors - Operational Software.

The operational software is the nerve centre of any facility. We can assist in making the right choice and support your business through the implementation process. The areas that we cover include.

- ✚ Assessment of business requirements.
- ✚ Choosing the right package.
- ✚ Building the product database.
- ✚ Procedures and documentation.
- ✚ Training.

4. Organization

RNG Consultancy is owned and operated by Richard Gulliver, Managing Director and Technical Consultant.

5. Quality Policy

RNG Consultancy, engaged in the business of providing services related to technical advice, project management and other allied services in the field of architectural flat glass, commits itself to satisfying the needs and expectations of its customers and clients by continually improving the quality of the customer experience during all phases of the service delivery process.

RNG Consultancy has a continuing commitment to the following:

- ✚ Swift response to client needs.
- ✚ Accuracy and reliability of information of data supplied.
- ✚ IT and other technology is progressively integrated and adopted to improve upon the service provision processes.
- ✚ Adherence to quality procedures and established parameters.
- ✚ Promotion of ethical conduct, adherence to legal requirements and good business practices.
- ✚ Continual improvement.



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6. Glass and Glazing Federation

The Glass and Glazing Federation (GGF) represents companies who make, supply or fit, glass and glass related products in the UK and internationally. The GGF is recognized by government and plays a large part in the setting of new standards and regulations. The GGF exists to promote its members, industry best practice and helps set the highest technical standards in Glass. The Federation is also the voice of the industry in local and federal government helping shape and influence policy and legislation. As well as offering an array of benefits to its members, the GGF guides and protects clients when buying glass or glazing products and services.

The GGF is a brand that is recognized internationally as the industry authority. This authority has been built up over many years representing members in industry debates. The position as industry authority is underpinned by the exceptional technical team at the GGF who set the benchmark for technical standards within the industry.

RNG Consultancy is an active member of the GGF through its role on the regional executive committee, holding the position of M.E.N.A Region Chair. Richard Gulliver is also a representative technical consultant for and on behalf of the GGF.

7. Curriculum Vitae – Richard Gulliver



Curriculum Vitae

Name:	Richard Gulliver.	Nationality:	British.
Role:	Technical Consultant.	Location:	Dubai, United Arab Emirates.
Industry:	Flat glass industry.	Email:	richard@rng-consultancy.com

As a technical consultant to the flat glass and associated industries and with more than twenty one years experience, of which seven years have been within the Middle East region, I am able to offer a wealth of knowledge and experience on all aspects of glass processing, quality management, control and assessment, product specification in accordance with Architect, Consultant, Client and Government Legislation.

Industry Experience.

Consultant and Owner

RNG Consultancy, Dubai, United Arab Emirates
Technical consultant to the flat glass and associated industries

June 2011 – Present.

Group Facilities and Technical Manager – Group Head Office

Thomas Bennett Gulf LLC, Dubai, United Arab Emirates.
Product specification, production, process and quality audit and assessment.

September 2010 – June 2011.

Operations Manager – Glass Processing Facility.

Thomas Bennett Gulf LLC, Dubai, United Arab Emirates.
Insulated glazing unit manufacture, flat glass tempering and processing.

May 2007 – September 2010.

Technical Support Manager – Machinery Manufacturer.

Unilam International Ltd, Leeds, United Kingdom.
Architectural flat glass tempering furnace setup, training, audit and diagnostics.

February 2004 – May 2007.

Production Manager – Glass Processing Facility.

Donwood Double Glazing Ltd, Gateshead, Tyne & Wear, United Kingdom.
Insulated glazing unit manufacture, flat glass tempering and processing.

April 2001 – February 2004.

Company Director – Glass Processing Facility.

Gulliver Safety Glass Ltd, Newcastle Upon Tyne, United Kingdom.
Specialist flat glass tempering.

July 1993 – April 2001.

Key Skills:

- ✚ New facility start up, including design, preparation and implementation.
- ✚ Existing facility re-design and expansion.
- ✚ Tempering and Heat Strengthening setup, audit, training and diagnostics.
- ✚ Implementation of ISO, CEN and ASTM quality systems and standards.
- ✚ Implementation of factory production controls in preparation of CE accreditation.
- ✚ Production auditing and "Lean" manufacturing methods.
- ✚ Quality control assessment, setup and training.
- ✚ Operational production software setup, implementation and training.
- ✚ 088000 Glazing Specification preparation.
- ✚ Architect, consultant, client, main contractor and facade manufacturer support.
- ✚ Independent quality, installation and failure assessment.
- ✚ Employee training and assessment.
- ✚ Factory Production Control Auditing for Construction Products Regulation – Glass and Glazing Federation.
- ✚ Heat Soak Oven Calibration to EN 14179-1: 2005 – Glass and Glazing Federation.
- ✚ Impact Test Rig Calibration to EN 12600: 2002 – Glass and Glazing Federation.
- ✚ Project Management.

8. Partners



Technical partnership including the design of glazing components and the quality aspects of flat glass and associated processes.



Technical Consultant for and on behalf of the Glass and Glazing Federation. Partners in the development and promotion of GGF.Quality CEN.







Provide technical support with respect to the quality aspects of flat glass and associated processes.



Development of a Saint Gobain Glass version of GGF.Quality CEN for use within their World Class Manufacturing Program.

9. Projects

ADNOC Corporate Headquarters	
Location:	Corniche, Abu Dhabi
Client:	Abu Dhabi National Oil Company
Management Team:	Hill International LLC
Main Contractor:	BESIX Group
Façade Consultant:	Meinhardt Façade Technology
Façade Manufacturer:	J&H Emirates L.L.C.
Façade Testing:	Al Futtaim Exova LLC
Glass Processor:	White Aluminium Enterprises LLC
Period:	Feb 2012 - Current
Provide technical support to J&H Emirates LLC with respect to	
<ul style="list-style-type: none">  Project specification;  glass processing;  product quality;  failure assessment; 	



Dubai Airport - Terminal 3, Green Retrofit

Location:	Dubai
Client:	Dubai Airports
Main Contractor:	Pentagon International
Period:	Sept 2013 - Current

Provide project management to Pentagon International for the application of INFRAMAX53 Heat Shielding IR Film to the existing insulated glazing units installed in the main departure area.



ADNOC Corporate HQ, Underground Car Park

Location:	Corniche, Abu Dhabi
Client:	Abu Dhabi National Oil Company
Management Team:	Hill International LLC
Main Contractor:	Arabtec
Façade Consultant:	Al Futtaim Exova LLC
Façade Manufacturer:	White Aluminium Enterprises LLC
Façade Testing:	Thomas Bell-Wright LLC
Glass Processor:	White Aluminium Enterprises LLC
Period:	Aug 2013 - Current

Provide technical support to White Aluminium Enterprises LLC Fabrication with respect to

- ✚ Project specification;
- ✚ glass processing;
- ✚ product quality;
- ✚ failure assessment;



Human Impact Test Rig Calibration

Client:	White Aluminium Glass Processing
Location:	Abu Dhabi, UAE
Date:	January 2014

Calibrated the human impact performance test rig in accordance with the requirements of EN 12600: 2002. Ensuring the correct forces are achieved at the referenced drop heights. Carried out as a representative of the Glass & Glazing Federation.



Factory Production Control Audit - CE Mark

Client:	White Aluminium Glass Processing
Location:	Abu Dhabi, UAE
Date:	Sept 2013 to Current

Assessed the in house factory production control procedures to ensure conformity to the European Construction Products Directive as part of the overall requirements to achieve CE accreditation. Carried out as a representative of the Glass & Glazing Federation.



Heat Soak Oven Calibration	
Client:	White Aluminium Glass Processing
Location	Abu Dhabi, UAE
Date:	April 2013
<p>Calibrated the heat soak oven in accordance with the requirements of EN 14179-1:2005. Producing production parameters that ensure the glass is soaked at 290°C ± 10°C for a minimum of 2 hours. Carried out as a representative of the Glass & Glazing Federation.</p>	



Jersey Glass – New Factory	
Client:	Jersey Glass
Location	Doha, Qatar
Date:	Oct 2011 to April 2012
<p>Provided technical support for the development of a new glass factory including:</p> <ul style="list-style-type: none"> ✚ Quality Management System; ✚ Process Procedures and forms; ✚ Final design; ✚ Installation preparation; ✚ Software installation, training and integration; ✚ Water treatment; 	



10. European Quality Standards

Standard	Title
BS 952-1: 1995	Glass for Glazing; Part 1, Classification.
BS 6180: 2011	Barriers in and about buildings; Code of practice
BS 6262-1: 2005	Glazing for buildings; Part 1: General methodology for the selection of glazing.
BS 6262-2: 2005	Glazing for buildings; Part 2: Code of practice for energy, light and sound.
BS 6262-3: 2005	Glazing for buildings; Part 3: Code of practice for fire, security and wind loading.
BS 6262-4: 2005	Glazing for buildings; Part 4: Code of practice for safety related to human impact.
BS 6262-6: 2005	Glazing for buildings; Part 6: Code of practice for special applications.
BS 6262-7: 2005	Glazing for buildings; Part 7: Code of practice for the provision of information.
EN 410: 2011	Glass in building; Determination of luminous and solar characteristics of glazing.
EN 572-1: 2012	Glass in building - Basic soda lime silicate glass products; Part 1: Definitions and general physical and mechanical properties.
EN 572-2: 2012	Glass in building - Basic soda lime silicate glass products; Part 2: Float glass.
EN 572-3: 2012	Glass in building - Basic soda lime silicate glass products; Part 3: Polished wired glass.
EN 572-5: 2012	Glass in building - Basic soda lime silicate glass products; Part 5: Patterned glass.
EN 572-8: 2012	Glass in building - Basic soda lime silicate glass products; Part 8: Supplied and final cut sizes.
EN 673: 2011	Glass in building - Determination of thermal transmittance (U value); Calculation method.
EN 1063: 2000	Glass in building - Security glazing; Testing and classification of resistance against bullet attack.
EN 1096-1: 2012	Glass in buildings – coated glass; Part 1, definitions and classification.
EN 1096-2: 2012	Glass in buildings – coated glass; Part 2: Requirements and test methods for class A, B and S coatings
EN 1096-3: 2012	Glass in buildings – coated glass; Part 3: Requirements and test methods for class C and D coatings.
EN 1096-4: 2012	Glass in buildings – coated glass; Part 4: Evaluation of conformity/Product standard.
EN 1096-5: 2012	Glass in buildings – coated glass; Part 5: Test method and classification for the self-cleaning performances of coated glass surfaces.

Standard	Title
EN 1279-1: 2004	Glass in building. Insulating glass units: Part 1: Generalities, dimensional tolerances and rules for the system description.
EN 1279-2: 2002	Glass in building. Insulating glass units: Part 2: Long term test method and requirements for moisture penetration.
EN 1279-3: 2002	Glass in building. Insulating glass units: Part 3: Long term test method and requirements for gas leakage rate and for gas concentration tolerances.
EN 1279-4: 2002	Glass in building. Insulating glass units: Part 4: Methods of test for the physical attributes of edge seals.
EN 1279-5: 2005	Glass in building. Insulating glass units: Part 5: Evaluation of conformity.
EN 1279-6: 2002	Glass in building. Insulating glass units: Part 6: Factory production control and periodic tests.
EN 1288-3: 2000	Glass in building - Determination of the bending strength of glass; Part 3: Test with specimen supported at two points (four point bending).
EN 1748-1-2: 2004	Glass in building - Special basic products; Part 1-2: Borosilicate glasses - Evaluation of conformity/Product standard.
EN 1748-2-2: 2004	Glass in building - Special basic products; Part 2-2: Glass ceramics - Evaluation of conformity/Product standard.
EN 1863-1: 2000	Glass in building - Heat strengthened soda lime silicate glass; Part 1: Definition and description
EN 1863-2: 2004	Glass in building - Heat strengthened soda lime silicate glass; Part 2: Evaluation of conformity/Product standard.
EN 12150-1: 2012	Glass in building - Thermally toughened soda lime silicate safety glass; Part 1: Definition and description
EN 12150-2: 2004	Glass in building - Thermally toughened soda lime silicate safety glass; Part 2: Evaluation of conformity/Product standard.
EN 12600: 2002	Glass in building - Pendulum test; Impact test method and classification for flat glass.
EN 12758: 2011	Glass in building - Glazing and airborne sound insulation; Product descriptions and determination of properties.
EN 13363-1:2002	Solar protection devices combined with glazing Calculation of solar and light transmittance; Part 1: Simplified method.
EN 13541-1:2000	Glass in building - Security glazing: Testing and classification of resistance against explosion pressure.
EN 14179-1: 2005	Glass in building - Heat soaked thermally toughened soda lime silicate safety glass - Part 1: Definition and description
EN 14179-2: 2005	Glass in building - Heat soaked thermally toughened soda lime silicate safety glass - Part 2: Evaluation of conformity/Product standard.
EN 14449: 2004	Glass in building - Laminated glass and laminated safety glass; Evaluation of conformity/Product standard.

Standard	Title
EN ISO 12543-1: 2011	Glass in building - Laminated glass and laminated safety glass: Part 1: Definitions and description of component parts.
EN ISO 12543-2: 2011	Glass in building - Laminated glass and laminated safety glass: Part 2: Laminated safety glass.
EN ISO 12543-3: 2011	Glass in building - Laminated glass and laminated safety glass: Part 3: Laminated glass.
EN ISO 12543-4: 2011	Glass in building - Laminated glass and laminated safety glass: Part 4: Test methods for durability.
EN ISO 12543-5: 2011	Glass in building - Laminated glass and laminated safety glass: Part 5: Dimensions and edge finishing.
EN ISO 12543-6: 2011	Glass in building - Laminated glass and laminated safety glass: Part 6: Appearance.

11. American Quality Standards

Standard	Title
ANZI Z97-1: 2009	For safety glazing materials used in buildings; safety performance specifications and methods of test.
ASTM C1036: 2011 ^{e1}	Standard Specification for Flat Glass
ASTM C1048: 2012 ^{e1}	Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
ASTM C1072: 2009 ^{e1}	Standard Specification for Laminated Architectural Flat Glass.
ASTM C1249: 2006a	Standard Guide for Secondary Seal for Sealed Insulating Glass Units for Structural Sealant Glazing Applications.
ASTM C1265: 2011	Standard Test Method for Determining the Tensile Properties of an Insulating Glass Edge Seal for Structural Glazing Applications.
ASTM C1294: 2007	Standard Test Method for Compatibility of Insulating Glass Edge Sealants with Liquid - Applied Glazing Materials.
ASTM C1349: 2010	Standard Specification for Architectural Flat Glass Clad Polycarbonate.
ASTM C1369: 2007	Standard Specification for Secondary Edge Sealants for Structurally Glazed Insulating Glass Units.
ASTM C1464: 2006	Standard Specification for Bent Glass.
ASTM C1651: 2011	Standard Test Method for Measurement of Roll Wave Optical Distortion in Heat-Treated Flat Glass.
ASTM C1652/C1652M:2006	Standard Test Method for Measuring Optical Distortion in Flat Glass Products Using Digital Photography of Grids.
ASTM E576: 2008	Standard Test Method for Frost/Dew Point of Sealed Insulating Glass Units in the Vertical Position.

Standard	Title
ASTM E1300: 2012a ¹	Standard Practice for Determining Load Resistance of Glass in Buildings.
ASTM E2188: 2010	Standard Test Method for Insulating Glass Unit Performance.
ASTM E2189: 2010 ¹	Standard Test Method for Testing Resistance to Fogging in Insulating Glass Units.
ASTM E2190: 2010	Standard Specification for Insulating Glass Unit Performance and Evaluation.
ASTM E2269: 2005	Standard Test Method for Determining Argon Concentration in Sealed Insulating Glass Units using Gas Chromatography.
ASTM E2353: 2006	Standard Test Methods for Performance of Glass in Permanent Glass Railing Systems, Guards, and Balustrades.
ASTM E2358: 2010	Standard Specification for the Performance of Glass in Permanent Glass Railing Systems, Guards, and Balustrades.
ASTM E2431: 2012	Standard Practice for Determining the Resistance of Single Glazed Annealed Architectural Flat Glass to Thermal Loadings.
ASTM E2469: 2012	Standard Test Method for Determining Argon Concentration in Sealed Insulating Glass Units Using Spark Emission Spectroscopy.
ASTM F1642: 2012	Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings.
ASTM F2248: 2012	Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass.
UL 752: 2005	Bullet Resisting Equipment.



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12. GGF Membership Certificate.



13. Reference – J&H Emirates LLC



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Ref: JHO/IW/120917
Date: September 17, 2012

To whom it may concern:

Subject: RNG Glass Consultancy Services

Dear Sir,

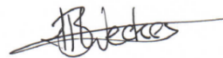
Please be advised that we have contracted the services of RNG Glass Consultancy Services, namely Richard Gulliver, for the following items:

- > Identification and interpretation of conflicting issues pertaining to the contract specification
- > To mediate with the client and main contractor to produce an agreeable glass viewing criteria and comprehensive cross reference of acceptable standards in line with the client requirements
- > To attend specific investigation services at our designated glass producers facility to review all operations pertaining to the varying glass types being produced, and to provide a fully detailed report of areas for improvement. Then to follow up the defined list of actions with the glass producer to ensure the highest standards are maintained.
- > To attend site to establish the glass viewing procedure being actioned by the client and main contractor and provide appropriate direction to the designated quality inspectors to ensure a full and clear understanding of implementation of works in accordance with the Inspection test Procedure.

Accordingly, it is without hesitation that I write this reference to acknowledge the works of Richard as listed above, which have proven to be of the highest standard and a great asset to ourselves, the main contractor and client alike.

I trust that the above meets with your understanding however should you have any queries then please do not hesitate to contact the writer.

Yours faithfully
J & H Emirates LLC



Ian Weekes
Project Director

Enc.: -
CC: -