

EN1279: Some Background Information

A Brief History of EN 1279

In 1988 members of the Glass and Glazing Federation were appointed by BSI to represent the United Kingdom in the negotiations to develop a new European Standard for insulating glass units. This standard was to meet the requirements laid down in the legislation covering harmonisation of technical standards in the construction industry.

The initial meetings in 1989 began with each country submitting its own standard. It was obvious from the outset that BS 5713 would not be considered as onerous as the standards prevailing in other European countries. Rather than use one country's standard, it was decided to take the best of each and develop a truly European Standard. Submissions included the following:

- **BS 5713**
- **BSI A new approach (an improved version of BS 5713)**
- **Dutch Standard NEN 3567**
- **Italian Standard UNI 7171**
- **GEPVP proposed basic document**
- **UEATc Directive for Insulating Glass**
- **Spanish Standard UNE 43-752-85**
- **German Standard 1286 parts I and 2**
- **French CEBTP standard**
- **Description of the proposed Norwegian standard**

Also the committee considered relevant ISO standards.

The BSI new approach was the revision of BS 5713 that had been started, but under CEN rules could not be proceeded with. It was however useful to signal that the UK delegates were aware of the European Standards, and the new approach acknowledged this.

There were a number of issues that had to be resolved such as unit size, test temperatures, the necessity for cycling and heat soaking, and the requirements for UV testing. In addition it has to be remembered that only the UK delegates were in favour of retaining hot melt butyl sealants as part of the European system.

The necessity and reasoning for the type of test and its requirement is covered in the detailed description, but highlighting a few of the issues will serve to enable people to understand the time taken to reach the completion of the documents. The committee had a remit to ensure that no one country had to bear excessive costs, and no currently successful product could be eliminated. Developments after 1990 would have to catch up to be included, or the manufacturers would have to demonstrate how compliance could be achieved.

Firstly there were the regulations from CEN and the European Commission that had to be taken into account. These changed over the period of negotiations and are the reason why the standard is now in six parts. Also the Commission did not reach a decision on the level of attestation until March 2000, despite the fact that the decision was required in 1995.

Technically the most significant advance was the move to moisture penetration index from dew point tests. It had been shown that the dew point test was inefficient when trying to differentiate between good IGUs and those just achieving a pass. Secondly the new products based on using the desiccant dispersed within a polymer matrix made dew point testing obsolete, as the older standards had not envisaged this development. (These products are slow to give a final dew point, and retain a low dew point longer, making result translation difficult). Thus the Karl Fischer test was introduced. There was also the acknowledgement that different desiccant manufacturers presented their product data in different forms, making comparison difficult.

A second significant step was to drop asymmetric testing, as this rarely gave failures and did not replicate natural ageing of the IGU. An unpublished survey by BSI showed that less than 1% of the BS 5713 failures was due to the cycling procedure.

Many countries had examined ways of testing IGUs, with various degrees of success. In Norway a large (1 m x 0.5m) unit was tested for creep at 50degC to replicate creep problems that had been noted. In Germany the units were subjected to intense UV radiation, as there had been fogging failures using certain glass/sealant combinations. Sweden had experimented with impact testing to replicate the opening and closing of windows in the winter. Some countries had a 'test to failure' philosophy, which had given rise to the hot water/UV combination test. The UK's view was that the testing had to be meaningful.

Another part of the debate has been the role of independent test houses and assessors. These arguments have often been heated as the two opposing views were brought to a compromise middle ground. On the one hand was the Benelux view of quarterly audits and full third party intervention. On the other was the opposing view of self-certification with a legally enforceable standard. The UK view was to follow the BSI third party certification scheme, with testing by accredited laboratories made compulsory.

Finally, the committee decided to follow the car manufacturers' philosophy of making the product 'right first time', with well-controlled raw materials and processes. Thus the document has a clearly defined Part 6 (factory production control) and sealant testing (Part 4), with little in house testing. Part 4 would also make the comparison of sealants more transparent.

The whole standard had to be written in such a way that it could be translated into at least German and French without altering the meaning. It is this latter point that has caused some of the delays, as the technical detail was worked out as early as 1996.

EN 1279 The New IG Standard - What you must do

1. Prepare a system description
 - a. detail spacer sealant and desiccant
 - b. indicate seal depth level of fili, etc
 - c. indicate cutting tolerances
 - d. obtain data on standard characteristics of all products used
2. Have your units tested to part 2 by an independent accredited test house
 - a. units must be manufactured as per the system description
 - b. show certificates of conformity for all products used in the unit manufacture
3. If gas filling, submit units to part 3 at the independent accredited test house
4. Either carry out tests, or obtain data to show the sealant conforms to part 4
5. Comply with part 5
6. Have a factory production control scheme operational
 - a. based on part 6
 - b. kept up-to-date
 - c. available for inspection at all times
7. If you are ISO 9000 Quality Management Systems accredited, ensure your process manual is updated to take EN 1279 into account
8. Prepare a test regime for changing sealant, desiccant or spacer as specified

Technical Description of EN1279 Part 1

Part 1 : Generalities, dimensional tolerances and rules for the system description. Our first step must be to attempt to understand the title and the contents of this standard.

Although the document may change slightly between the "pr", (provisional stage) and the final document, these changes will be minor editoria) changes, rather than any significant change to the technical content of the standard.

When the document is finalised, and adopted as a European Standard it will become BS EN 1279, a British and European Standard. This may happen in 2003.

Copies will be available from British Standards, who hold the copyright for the standard. The 1279 number refers to a numerical reference for this standard, which relates to insulating glass units for building.

The provisional standard has been issued in six parts; details of each part follow.

Before proceeding with the explanation of this part of the standard, it is important for the reader to understand the meaning of the terms "Normative" and "Informative", as used in European Standards.

' Normative' means that there is a legal requirement to carry out the instruction, a "must do" situation. The word "shall" may also be used in this context.

' Informative' means for information only. However, it is advisable to conform to these requirements, as the whole standard represents a legal requirement.

Scope

Part 1 of this standard deals with a number of key issues for all professions dealing with insulating glass units in building.

For any sealed unit system of components and for any method of construction, the energy savings for a given unit configuration will be relatively consistent.

Similarly, the personal environmental factors, such as noise reduction and vision through the glass, will be maintained in the long-term, and will also remain consistent from product to product.

Safety may be assured, as mechanical resistance will remain consistent. The application of electrical current to the glass is limited to a safe level.

Other important requirements, including product marking, are detailed in this section.

The major application of insulating glass units referred to in this standard are those fixed in windows, doors, curtain walling, roofs and partitions where the unit edges are protected from direct ultraviolet radiation.

Sealed units with edge seals which are exposed to direct ultraviolet radiation, and units destined for artistic applications, are not covered by this standard. Additional standards apply to sealed units that have exposed edges.

This part includes the requirements for the materials, the rules for the description of the sealed unit construction, and the physical performance of the system, including optical and visual properties.

Dimensional tolerances and recommendations for glazing and installation are included in an informative annex.

Normative references

This European Standard incorporates a broad spectrum of requirements and provisions from other standards and publications. Details of the normative requirements from other standards and documents are shown elsewhere in this guide. The normative reference generally indicates a ' ' must do" legal requirement to carry out the specified element of the standard.

Definitions

Definitions are included for the various elements of the sealed unit components, construction, physical properties and quality control limits.

Insulating Glass Unit System

A variety of raw materials, products and construction methods may be used. It is permissible to substitute some materials. Possible substitutions are detailed in Annex C Table CI and C2, and in EN 1279-4.

The manufacturer shall describe his system for conformity control, for production control or quality assurance systems. Refer also to EN 1279-6.

The presentation of a detailed system description is discretionary.

Rules for system description, including action limits, are absolute limits.

Materials and methods of construction may be varied. A variety of glass panes may be used. Cavity filling may be air and/or gases. Cavity inserts shall be non-volatile - see fogging test in EN1279-6. A variety of shapes is possible. Curved insulating glass units are permissible, depending on bending radius

Requirements

Conformity with the definition of insulating glass units.

All the insulating glass units supplied shall conform to the system description, as tested and approved to the standard. In this way the performance and longevity of the products is assured. and the sealed units will be fit for the purpose intended.

However, it is permissible to have some substitution and changes, provided that these are carried out to the guidelines laid down in Annex C Table CI and C2, and as in Part 4 of the standard.

Non-European specification glass should demonstrate chemical and mechanical stability similar to EN 572 and EN 1748 - I and 2.

Table I - Seal performance, applicable to all units

All the insulating glass units shall conform to the essential requirements of resistance to moisture penetration and glass-to-sealant adhesion, when tested to the required conditions on prescribed equipment.

The requirements, test and equipment are detailed within this standard.

Table 2 - Seal performance, supplementary validation methods and requirements for gas filled and coated glass units

Additional tests are required for inert gas filled units and when coated glasses are used. Gas concentration and gas loss is measured.

In the case of coated glasses, sealant adhesion to the coatings and interlayers of the coatings is measured.

Performances to the characteristics

The required performance to Table 3 characteristics shall be determined by Annex B methods. The purchaser may also agree requirements with the supplier, which are additional to this standard. Other than fire resistance, edge design changes to table CI and C2 will not generally alter the glass sealed unit performance.

Any changes which may affect performance shall be checked. Annex A EN1279-6

Durability is ensured by compliance with this standard, and by installation to relevant European requirements or manufacturer' s specifications.