



CSi Technical Guidance

Planning, Conducting and Witnessing Security Glazing Testing to EN 356

A Practical Guide for Manufacturers and Laboratories

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This publication is provided as technical guidance only. It does not replace EN 356, applicable Standards, legislation, accreditation requirements, certification scheme rules or professional engineering advice. Users remain responsible for ensuring compliance with all applicable regulatory, accreditation and certification requirements.

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Revision History

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I1	R0	30 July 2026	Initial draft prepared for internal review.	CSi Board of Directors

Distribution and Use

This guidance may be issued to CSi personnel, prospective clients, certified clients, manufacturers, laboratories and other interested parties. It may be used to support product-development planning, test-facility preparation, client education and the preparation of evidence for product certification. It must not be represented as a substitute for the controlled text of EN 356 or as approval of a specific glazing construction.

Publication Notice

Scope of this Publication

This publication provides practical guidance for manufacturers, testing laboratories, certification bodies, regulators and other interested parties undertaking testing and conformity assessment of products.

It has been developed from Certification Solutions International's experience in accredited product certification, factory inspections, witness testing and conformity assessment.

This publication explains recognised industry practice but does not replace applicable legislation, Standards, accreditation requirements or certification scheme rules.

Intended Audience

This publication has been prepared for:

- Manufacturers
- Glass processors
- Product certification clients
- Testing laboratories
- Regulatory authorities
- Engineers
- Building surveyors
- Technical managers
- Factory quality personnel
- Importers and distributors

Relationship to Product Certification

Successful testing does not, by itself, constitute product certification.

Product certification requires the evaluation of manufacturing controls, quality management, traceability, surveillance, product testing and ongoing conformity assessment in accordance with the applicable certification scheme and ISO/IEC 17065.

Testing forms only one component of the certification process.

Relationship to Building Regulations

Compliance with EN 356 alone does not necessarily demonstrate compliance with the National Construction Code (Australia), the New Zealand Building Code or other applicable statutory requirements.

Product suitability should always be assessed against the applicable Building Code, referenced Standards and project-specific design requirements.

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Abbreviations

Abbreviation	Meaning
CSI	Certification Solutions International Pty Ltd
NATA	National Association of Testing Authorities
ISO	International Organization for Standardization
IEC	International Electrotechnical Commission
AS	Australian Standard
NZS	New Zealand Standard
AS/NZS	Joint Australian/New Zealand Standard
QC	Quality Control
QA	Quality Assurance
PPE	Personal Protective Equipment

Foreword

Certification Solutions International Pty Ltd has developed this Technical Guidance publication to assist manufacturers, testing laboratories and certification clients in understanding the practical implementation of;

- EN 356:1999 Glass in building — Security glazing — Testing and classification of resistance against manual attack.

Although EN 356 specifies the technical requirements for the testing and classification of security glazing resistant to manual attack, it does not explain how manufacturers should develop suitable glazing constructions, establish compliant test facilities, prepare representative specimens, document testing or integrate test evidence into an accredited product certification programme.

This publication has been prepared from practical experience gained during factory inspections, witness testing, product certification and conformity assessment activities undertaken throughout Australia, New Zealand and international manufacturing facilities.

The objective of this publication is to improve the quality, repeatability and consistency of **security glazing testing** while reducing invalid testing, product failures and certification delays.

It is intended to assist manufacturers in developing robust testing systems capable of consistently demonstrating product conformity while supporting accredited third-party product certification.

Throughout this publication, recommendations identified as **CSI Recommendations** represent recognised industry best practice developed through Certification Solutions International's experience in product certification, factory inspections and witness testing. Although these recommendations may exceed the minimum requirements of EN 356, their implementation is encouraged to improve product conformity, test repeatability and certification outcomes.

The guidance provided throughout this publication represents recognised industry practice developed by Certification Solutions International and should be read together with the current edition of EN 356 and all applicable regulatory and certification requirements.

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1. Executive Summary

EN 356 establishes a recognised European classification system for security glazing based upon its resistance to manual attack. The Standard classifies glazing into eight performance categories ranging from P1A to P8B using two distinct test methods.

Successful demonstration of compliance requires considerably more than performing a laboratory test. Manufacturers should ensure that glazing constructions are technically suitable, representative specimens are produced under controlled manufacturing conditions, test equipment complies with the Standard, testing is correctly documented and the resulting evidence is suitable for the intended conformity assessment activity.

This Technical Guidance has been developed from Certification Solutions International's practical experience in security glazing product certification, witness testing and manufacturing assessments. It explains recognised industry practice for planning, conducting and witnessing EN 356 testing, while highlighting common causes of invalid testing and certification delays.

The guidance is intended to assist manufacturers, laboratories and certification bodies in producing technically reliable test evidence capable of supporting accredited product certification and ongoing product conformity.

2. Purpose and Scope

This publication provides practical guidance for organisations involved in the planning, preparation, conduct, witnessing and interpretation of security glazing testing in accordance with EN 356.

It is intended to assist manufacturers, testing laboratories, certification bodies and regulators by explaining recognised industry practice for:

- understanding the EN 356 classification system;
- selecting suitable glazing constructions for evaluation;
- preparing representative production specimens;
- establishing compliant test facilities;
- conducting and witnessing security glazing tests;
- documenting test results and certification evidence;
- avoiding common causes of invalid testing; and
- integrating test evidence into accredited product certification.

Although this publication discusses the complete EN 356 classification system, particular emphasis is given to the planning and execution of P5A testing because this classification is one of the most commonly requested by manufacturers seeking third-party product certification.

This publication complements EN 356 and should be read together with the current authorised edition of the Standard. Where any conflict exists between this publication and EN 356, the requirements of the current authorised edition of EN 356 take precedence.

3. Key Terms

Term	Meaning
Category of resistance	The classification assigned to the demonstrated capability of a security glazing product to resist specified actions of force in accordance with EN 356.
Hard-body impactor	The polished steel sphere specified by EN 356 for P1A to P5A testing.
Penetration	For the hard body drop test, complete passage of the impactor through the test specimen within five seconds of impact.

Security glazing composition	The complete tested glazing construction, including glass type, glass ply thickness, interlayer product, interlayer thickness, coatings, plastics layers and relevant manufacturing details.
Test piece	A prepared glazing specimen of the dimensions specified by EN 356 submitted for testing.
Type testing	Testing undertaken on representative specimens to establish the performance of a defined security glazing composition.
Witnessed testing	Testing conducted by the manufacturer or another organisation using equipment that satisfies the requirements of EN 356, under observation and documented control arrangements accepted by CSI. Witnessed testing may be conducted at a manufacturer's premises where suitable equipment, competent personnel and appropriate controls are available.
Accredited testing	Testing performed within the recognised scope of an accredited testing laboratory in accordance with its accreditation. Witnessing by CSI does not, by itself, confer accredited laboratory status or replace applicable accreditation requirements.

4. Understanding EN 356

4.1 Applications of Security Glazing

This section would explain where EN 356 products are typically used, such as banks, embassies, government buildings, correctional facilities, jewellery stores, data centres, schools and high-security commercial buildings. It gives the reader context before introducing the classification system and would strengthen the document in the same way CTG_003 introduces the regulatory framework before the technical content.

EN 356 applies to security glazing intended to delay access to protected spaces by resisting actions of force for a limited period. The standard provides comparative resistance classifications. It does not assign each category to a particular building type, threat or regulatory application. Selection of a suitable classification remains an application-specific decision.

The standard evaluates the glazing product as tested. The installed system must also include a frame, supports, beads, fixings and surrounding construction capable of providing resistance appropriate to the intended security level. A high-performing pane installed in a weak frame does not produce a secure glazing system.

Holes, cut-outs, notches, edge damage, unsupported edges, incompatible sealants and changes to the tested construction can materially reduce performance. Certification or a test result must not be extended to untested changes without technical evaluation.

5. Classification System

Class	Test method	Principal requirement
P1A	Steel-sphere drop	Three impacts forming a triangle from 1,500 mm.
P2A	Steel-sphere drop	Three impacts forming a triangle from 3,000 mm.
P3A	Steel-sphere drop	Three impacts forming a triangle from 6,000 mm.
P4A	Steel-sphere drop	Three impacts forming a triangle from 9,000 mm.
P5A	Steel-sphere drop	Nine impacts: three repeated impacts at each of three triangular positions from 9,000 mm.
P6B	Hammer and axe	30 to 50 total strikes to create the specified opening.
P7B	Hammer and axe	51 to 70 total strikes to create the specified opening.
P8B	Hammer and axe	More than 70 total strikes to create the specified opening.

P5A is the highest hard-body category. It should not be described as equivalent to P6B, P7B or P8B because the B categories use a different attack method and assess different performance characteristics.

6. Product Design Considerations

6.1 Complete glazing composition

Performance depends on the complete construction, not simply the nominal overall thickness. The following must be defined before testing:

- number and thickness of glass plies;
- glass type and heat treatment;
- interlayer manufacturer, product designation, thickness and number of layers;
- coatings, tints, printed areas or plastics layers;
- lamination process, de-airing method and autoclave cycle;
- edge finish and specimen orientation;
- production tolerances and batch traceability.

6.2 Glass plies

Increasing glass thickness may increase resistance to initial fracture, but it does not by itself guarantee repeated-impact resistance. Annealed, heat-strengthened and thermally toughened glass fracture differently. The selected glass type must be compatible with the intended security function, residual behaviour, installation and any separate safety-glazing requirements.

6.3 Interlayer

After the glass fractures, the interlayer becomes the primary barrier preventing the impactor from passing through. Interlayer thickness, formulation, adhesion, tear resistance, elongation, temperature sensitivity and compatibility with the glass are therefore central to P5A performance.

The manufacturer should consult the interlayer supplier during product development and obtain written recommendations for glazing constructions intended to achieve the required EN 356 classification. Published supplier guidance should be used as a development aid only and does not replace formal testing of the exact glazing composition.

6.4 Lamination quality

Poor de-airing, contamination, moisture, under-processing, over-processing, edge defects, bubbles, local adhesion loss or delamination may significantly affect performance. Test specimens must be representative of routine production and must not be specially manufactured under controls that cannot be maintained in normal production.

7. Assessment of Glazing Constructions for EN 356

7.1 Selection of Suitable Glazing Constructions

Selection of a glazing construction for EN 356 should be based on the required classification rather than the overall laminate thickness. Security glazing performance depends on the complete glazing composition, including the number and thickness of the glass plies, the interlayer product, interlayer thickness, adhesion characteristics and the quality of the lamination process.

As the required EN 356 classification increases, greater emphasis is generally placed on the performance of the interlayer following fracture of the glass plies. Increasing glass thickness alone does not necessarily improve resistance to repeated manual attack. For higher classifications, manufacturers should select glazing constructions recommended by the interlayer supplier and supported by previous test evidence wherever available.

Only testing of the exact glazing composition can establish compliance with EN 356.

7.2 Technical assessment

Conventional laminated safety glass incorporating a single 0.38 mm PVB interlayer is generally intended to provide safety glazing performance rather than resistance to repeated manual attack. Such constructions should be regarded as having a high risk of failure when assessed against EN 356 P5A.

Overall thickness is not a reliable indicator of security classification. A laminate with thinner glass and a substantially thicker security interlayer may provide greater resistance to repeated manual attack.

7.3 Development approach

Before formal testing, the manufacturer should:

1. confirm the exact proposed build-up;
2. obtain written advice from the interlayer supplier identifying suitable P5A development constructions;
3. conduct preliminary internal impact trials where practicable;
4. select at least one conservative construction for formal testing;
5. ensure production controls can reproduce the tested construction;
6. accept that only formal testing of the exact composition can establish the classification.

Representative development approaches	Guidance
Conventional laminated safety glass	Generally unsuitable for higher EN 356 classifications without additional security interlayer performance.
Multi-layer security PVB laminate	Commonly used for higher EN 356 classifications where supported by supplier recommendations and formal testing.
Structural ionoplast laminate	May provide enhanced post-fracture resistance depending on the complete glazing composition.
Alternative engineered construction	Evaluate in consultation with the interlayer supplier and verify by formal EN 356 testing.

8. Test Specimens

8.1 Number and dimensions

The sample for type testing consists of three test pieces for each category requested. At least one additional spare specimen should be provided to cover damage or an invalid test. CSi recommends four specimens as a minimum and five where the product is still in development.

Each specimen must be $1,100 \pm 5$ mm long $\times$ 900 ± 5 mm wide. Edges must be free from visible chips, cracks and flaws. The surface intended to be impacted must be clearly identified.

8.2 Conditioning

Specimens must be stored vertically and self-supporting at the test temperature for at least 12 hours immediately before testing. The test temperature is 23 ± 2 °C. The conditioning location and test location must be controlled and recorded.

8.3 Identification and traceability

Each specimen must carry a unique identifier linked to the production batch and manufacturing record. The record should include measured overall thickness, glass ply details, interlayer details, production date, lamination cycle, operator and orientation.

8.4 Representative production

Specimens used for certification evidence must be representative of the product intended for ongoing manufacture. Any special processing, hand selection, unusual curing, additional cleaning or other non-routine control must be declared and evaluated.

9. P1A-P5A Hard-Body Drop-Test Equipment

9.1 Steel impact sphere

The impactor must be a polished steel sphere with a diameter of 100 ± 0.2 mm, a mass of 4.11 ± 0.06 kg and a hardness of 60 HRC to 65 HRC. Diameter, mass and hardness must be supported by traceable verification records. The sphere must be inspected for damage before testing.

9.2 Drop and release system

For P5A, the release system must permit a drop height of $9,000 \pm 50$ mm, measured from the bottom of the sphere to the specimen surface. The release must not impart rotation, horizontal momentum or other energy. The sphere must fall vertically under gravity alone.

9.3 Specimen support apparatus

The horizontal support apparatus must be rigidly connected to a solid base, support the specimen on all four edges and prevent contact with anything other than the clamping frame during the test. The nominal supported opening is approximately $1,040 \pm 2$ mm $\times$ 840 ± 2 mm. The receiving box below the specimen must contain fragments and the sphere without causing hazardous rebound or damage to the impactor.

9.4 Edge clamping

All four edges must be clamped with an edge cover of 30 ± 5 mm. Contact surfaces must be covered with rubber strips 30 mm wide and 4 mm thick, with a hardness of 40 IRHD to 60 IRHD. The specimen edges must be clamped uniformly at 140 ± 20 kN/m².

If higher pressure is required to prevent slippage, it must be recorded. Pressure should not exceed 200 kN/m². The method used to establish and verify clamping pressure must be documented and calibrated or validated.

9.5 Receiving box and venting

The receiving box must prevent dangerous rebound and must not cushion impact through trapped air. Vent holes or an equivalent arrangement must allow air to escape freely. An energy absorber must be positioned to protect the sphere after penetration.

9.6 Measurement and recording equipment

Equipment	Minimum purpose
Calibrated height-measurement system	Verification of the $9,000 \pm 50$ mm drop height.
Calibrated thermometer or data logger	Verification of 23 ± 2 °C conditioning and test temperature.
Calibrated mass and dimensional equipment	Verification of sphere and specimen characteristics.
Clamping-pressure verification system	Demonstration of uniform pressure within the specified range.
Impact-position template or dimensional layout	Accurate marking of the equilateral triangle and repeated impact points.

Video recording	Evidence of release, impact sequence, five-second penetration assessment and specimen behaviour.
Timing method	Confirmation of whether complete penetration occurs within five seconds.
Photographic equipment	Before, during and after-test condition records.

10. P5A Test Procedure

10.1 Pre-test verification

7. confirm the standard, classification and approved test plan;
8. verify specimen identity, dimensions, construction and conditioning;
9. verify test temperature;
10. inspect the sphere, release system, frame, rubber strips and receiving box;
11. confirm current calibration or verification records;
12. mark the clamp boundary and impact pattern;
13. confirm the exclusion zone and remote operating controls.

10.2 Impact pattern

The three impact positions form an equilateral triangle centered on the geometric centre of the specimen, with a side length of 130 ± 20 mm. One side of the triangle is parallel to the short side of the specimen. The point opposite that side is struck first.

10.3 Number and sequence of impacts

For P5A, the three-point sequence is repeated three times, producing nine impacts per specimen: three impacts at each of the three marked positions. Loose fragments are removed after each impact without disturbing the specimen or changing its support conditions.

10.4 Evaluation

After every impact, determine whether the sphere has completely passed through the specimen within five seconds. Complete passage within five seconds constitutes penetration. All three specimens must prevent penetration to achieve P5A.

10.5 Slippage and invalid testing

The specimen must be marked relative to the clamping frame. If any edge moves more than 5 mm, the test is invalid and must be repeated using a new specimen. Increased clamping pressure used to prevent movement must be recorded in the report.

11. Client-Site Test Facility Requirements

A client-site test can only proceed after CSI has reviewed the proposed facility and determined that the required test controls can be achieved. Approval of a site for one test does not create general laboratory approval or accreditation.

11.1 Facility information required in advance

- dimensioned drawings and photographs of the drop tower and test frame;
- structural details and method of anchoring;
- clear internal height and safe lifting access;
- sphere specifications and verification records;
- release mechanism description;
- clamping method and pressure calculations or validation;

- rubber specifications and hardness evidence;
- receiving-box, venting and energy-absorption details;
- temperature-control arrangements;
- calibration register;
- risk assessment, safe work method and emergency arrangements;
- proposed personnel and responsibilities.

11.2 Commissioning trial

Before formal testing, CSI should require a commissioning trial or dry run to demonstrate clean release, vertical alignment, reliable impact positioning, safe sphere recovery, effective containment, stable clamping, temperature control and complete video coverage.

11.3 Limitations

Where the client owns or controls the equipment, potential conflicts of interest and control risks must be addressed. CSI must retain authority over the approved method, observations, records, acceptance of results and any decision to stop or invalidate the test.

12. CSI Witnessing and Control of Testing

The purpose of CSI witnessing is to establish confidence that the agreed test method was followed and that the evidence is suitable for the intended certification activity. The following controls should be applied:

14. approve the test plan before attendance;
15. verify competence and assigned responsibilities;
16. identify and inspect all specimens;
17. review calibration and equipment-verification records;
18. observe specimen installation, clamping and impact marking;
19. witness each release and each post-impact evaluation;
20. record all deviations, interruptions and invalid conditions;
21. retain contemporaneous notes, photographs and video;
22. ensure results are not altered, selected or combined inappropriately;
23. prepare or approve the final witness record.

CSI personnel must not direct unsafe work or operate unfamiliar site equipment unless authorised, trained and covered by the site safety arrangements.

13. Test Records and Reporting

The final report or witness record should include, as applicable:

- name and address of the test organisation and test location;
- unique test and report number;
- date and time of testing;
- reference to EN 356 and the category requested;
- name of the submitting organisation;
- product trade name and complete glazing composition;
- specimen identifiers, dimensions and measured thickness;
- conditioning duration and temperature;
- sphere diameter, mass, hardness and equipment identifiers;
- drop height and measurement method;
- frame, rubber and clamping-pressure details;
- impact sequence and result after each impact;

- penetration and five-second assessment;
- slippage observations;
- photographs and video references;
- deviations, invalid tests, replacement specimens and retesting;
- classification obtained, or a clear statement that classification was not obtained.

The report must distinguish between a formal classification result, a development trial, a witnessed test and an accredited laboratory report. These terms must not be used interchangeably.

14. Common Causes of Invalid Tests and Product Failure

Issue	Likely consequence	Preventive control
Inadequate interlayer thickness or unsuitable interlayer	Tearing or complete penetration after glass fracture.	Use supplier-supported development construction and preliminary trials.
Poor lamination or local adhesion loss	Premature delamination and reduced residual resistance.	Control cleaning, de-airing, moisture and autoclave cycle.
Specimen edge damage	Early cracking or unrepresentative failure.	Inspect and reject damaged specimens before conditioning.
Incorrect drop height	Invalid energy level and unreliable classification.	Use traceable height measurement and verify before testing.
Sphere outside specification	Invalid impact energy or contact characteristics.	Verify mass, diameter, hardness and surface condition.
Frame movement or flexibility	Energy absorption by apparatus and invalid results.	Rigid anchoring and commissioning trial.
Uneven or unverified clamping	Slippage, local stress concentration or invalid testing.	Validate pressure distribution and mark the specimen/frame interface.
Incorrect impact geometry	Invalid P5A sequence.	Use a dimensioned template and independent verification.
Temperature outside 23 ± 2 °C	Changed interlayer behaviour and invalid conditions.	Condition and test in a monitored environment.
Incomplete records	Result unsuitable for certification.	Use controlled test sheets, photographs and video.

15. Health and Safety

A 4.11 kg sphere dropped from 9 m carries approximately 363 joules of potential energy before impact. The test also creates sharp glass fragments, suspended-load hazards, possible rebound and heavy manual-handling risks. A documented site-specific risk assessment is mandatory.

- fully barricaded exclusion zone;
- remote lifting and release wherever practicable;
- secondary retention while personnel are setting up;
- no person beneath or adjacent to a suspended sphere;
- fragment-resistant screens and contained receiving box;
- safe glass handling and removal procedures;
- suction lifters and suitable lifting equipment;
- cut-resistant gloves, face protection, safety footwear and protective clothing;
- emergency stop and communication arrangements;
- inspection of the tower, frame and anchors before use.

Compliance with EN 356 does not replace local workplace health and safety legislation, engineering certification of the structure or the equipment owner's duties.

16. Use of Results for Product Certification

The test result is one part of product certification evidence. CSI may also require product specifications, manufacturing controls, quality-plan requirements, factory assessment, batch traceability, control of changes, surveillance and ongoing verification.

Certification must be limited to the composition evaluated. At a minimum, the certification scope should control:

- glass type and nominal ply thickness;
- interlayer manufacturer, product designation and nominal thickness;
- number and arrangement of plies;
- coatings, tints, plastics and special layers;
- maximum or tested product dimensions where relevant;
- manufacturing site and lamination process;
- permitted tolerances and controlled substitutions.

Changes to glass type, interlayer product, interlayer thickness, layer sequence, production location or lamination process must be reviewed before the certified product is represented as unchanged.

17. Frequently Asked Questions

Can EN 356 P5A testing be performed at the manufacturer's factory?

Yes, provided the site and apparatus satisfy the test requirements and CSI accepts the control arrangements. The result must be accurately described as accredited, witnessed or development testing according to the actual status.

Can laminated safety glass achieve EN 356 P5A?

There is no minimum overall laminate thickness specified by EN 356. Performance depends on the complete glazing composition, including the glass plies, interlayer product, interlayer thickness and lamination quality. Conventional laminated safety glass using a single 0.38 mm PVB interlayer generally presents a high risk of failure under P5A testing. Compliance can only be established by testing the exact glazing composition.

Are three specimens enough?

Three valid specimens are required for classification. At least one spare should be supplied, and CSI recommends five specimens during early product development.

Can a successful test cover other interlayers or glass types?

Not automatically. The security glazing composition is specific. Substitutions require technical evaluation and may require additional testing.

Does P5A prove the installed window or door is secure?

No. EN 356 classifies the glazing product. The frame, beads, fixings, seals and surrounding construction must also provide suitable resistance.

Does CSI witnessing make the result an accredited laboratory report?

No. Accredited status depends on the recognised scope and conditions of the laboratory or conformity assessment activity. The report must state its status accurately.

18. CSI Technical Recommendations

24. Do not select a P5A construction by total thickness alone.
25. Obtain written product-development guidance from the interlayer manufacturer.
26. Treat conventional laminated safety glass incorporating a single 0.38 mm PVB interlayer as a high-risk proposal for EN 356 P5A unless supported by previous test evidence.
27. Manufacture at least four, and preferably five, traceable specimens.
28. Complete a documented readiness review before CSI travels to the site.
29. Commission the apparatus before formal specimens are tested.
30. Record every impact with controlled test sheets, photographs and video.
31. Stop the test when an unsafe, uncontrolled or invalid condition occurs.
32. Limit certification and marketing claims to the exact tested and approved composition.

19. References

Reference	Relevance
EN 356, Glass in building - Security glazing - Testing and classification of resistance against manual attack	Primary test and classification standard.
ISO 48, Rubber, vulcanized or thermoplastic - Determination of hardness	Referenced for support-rubber hardness.
ISO 6508, Metallic materials - Rockwell hardness test	Referenced for impactor and tool hardness verification.
ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories	Relevant where accredited laboratory testing is required.
ISO/IEC 17065, Conformity assessment - Requirements for bodies certifying products, processes and services	Relevant to use of test evidence in product certification.
Kuraray – Trosifol® and SentryGlas® Security Glazing Technical Guide	Published guidance illustrating representative security glazing constructions and interlayer configurations for EN 356 product development.
Saint-Gobain Glass – STADIP PROTECT® Security Glazing Technical Literature	Published guidance describing laminated security glazing constructions and typical EN 356 performance classifications.
Applicable CSI certification scheme and quality-plan requirements	Relevant to manufacturing control, surveillance and scope of certification.

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Appendix A - Pre-Test Readiness Checklist

No.	Readiness question	Yes/No/N/A	Evidence or comments
1	Has the exact EN 356 classification requested been confirmed?		
2	Is the current authorised standard available to test personnel?		
3	Has CSi approved the test plan?		
4	Are at least three valid specimens plus a spare available?		
5	Are specimen dimensions and edge condition acceptable?		
6	Is the complete glazing composition documented?		
7	Has 12-hour conditioning at 23 ± 2 °C been completed?		
8	Are sphere mass, diameter and hardness records current?		
9	Has the $9,000 \pm 50$ mm P5A drop height been verified?		
10	Is the frame rigidly anchored?		
11	Are rubber-strip dimensions and hardness verified?		
12	Can uniform clamping pressure be demonstrated?		
13	Is the receiving box vented and safely contained?		
14	Has a commissioning trial been completed?		
15	Are risk assessment and emergency arrangements approved?		
16	Are video and photographic systems operational?		
17	Are controlled test sheets ready?		
18	Are responsibilities and authority to stop the test clear?		

Appendix B - Equipment Verification Checklist

Equipment	ID	Required characteristic	Verification record	Accepted
Steel sphere		100 ± 0.2 mm; 4.11 ± 0.06 kg; 60-65 HRC		
Drop-height system		$9,000 \pm 50$ mm for P5A		
Release mechanism		No added momentum or rotation		
Support frame		Rigid; correct opening and edge support		
Rubber strips		30 mm $\times$ 4 mm; 40-60 IRHD		
Clamping system		140 ± 20 kN/m ² uniform pressure		
Temperature instrument		Suitable for verification of 23 ± 2 °C		
Timing system		Five-second penetration assessment		
Video system		Release, impact and post-impact coverage		
Receiving box		Containment, venting and energy absorption		



Appendix C - Witness Test Record

Client: _____ Site: _____

Product: _____ Test date: _____

Requested classification: _____ Standard edition: _____

Specimen	Impact point	Drop no.	Penetration within 5 s?	Edge movement	Observations
1	A	1			
1	B	2			
1	C	3			
1	A	4			
1	B	5			
1	C	6			
1	A	7			
1	B	8			
1	C	9			
2	A	1			
2	B	2			
2	C	3			
2	A	4			
2	B	5			
2	C	6			
2	A	7			
2	B	8			
2	C	9			
3	A	1			
3	B	2			
3	C	3			
3	A	4			
3	B	5			
3	C	6			
3	A	7			
3	B	8			
3	C	9			

Witness _____

conclusion: _____

Deviations _____

or

invalid _____

conditions: _____

CSi witness name/signature: _____

Date: _____

Appendix D - Manufacturer Product Information Form

Information required	Manufacturer response
Product trade name	
Manufacturer and manufacturing site	
Glass ply sequence and nominal thickness	
Glass type and heat treatment	
Interlayer manufacturer	
Interlayer product designation	
Interlayer nominal thickness and number of layers	
Coatings, tints, printing or plastics layers	
Lamination/de-airing method	
Autoclave temperature, pressure and duration	
Nominal and measured overall thickness	
Proposed impact face	
Previous development or formal test evidence	
Intended market and application	

Appendix E - Specimen Manufacturing Record

Field	Specimen 1	Specimen 2	Specimen 3	Spare
Unique identifier				
Production date				
Glass batch				
Interlayer batch				
Measured length				
Measured width				
Measured overall thickness				
Edge inspection accepted				
Autoclave cycle record				
Conditioning start				
Conditioning completion				
Impact face marked				
Released by				