UIAA 123

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Rock-Anchors

Climbing and Mountaineering Equipment

International Climbing and Mountaineering Federation
UNION INTERNATIONALE DES ASSOCIATIONS D'ALPINISME

UIAA Safety Standard – 123 – Version 5.0

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Foreword

UIAA standards are the only 'globally recognized' standards for mountaineering equipment. In order to prevent multiplicity, the UIAA collaborates with its partner in standardization, CEN, and bases UIAA 123 on the European Standard EN 959:2018.

The EN standards are derived from the original UIAA standards, the first of their kind. The UIAA publishes user-friendly pictorials for each standard. UIAA 123 imposes requirements in addition to those of EN 959:2018.

The UIAA Standards are reviewed at intervals to see whether they meet the latest technical requirements and revised if necessary.

The UIAA invites manufacturers of mountaineering and climbing equipment worldwide to become members of the UIAA Safety Commission as Safety Label Holders. Members can participate in discussions on standard requirements, test methods, and revisions thereof (see the "Regulations for existing and potential Safety Label Holders").

A complete list of UIAA standards for mountaineering and climbing equipment can be found on the UIAA website www.theuiaa.org/safety-standards/.

NOTE – Owing to copyright restrictions, this UIAA Standard does not reproduce the full requirements of the referenced standards. To ensure full compliance, users must obtain official copies of these documents. They are available for purchase from the CEN, ASTM, and ISO websites.

REVISION DISCLAIMER – The previous version of this standard incorporated updates based on the latest knowledge regarding general ambient corrosion, with particular emphasis on Atmospherically Induced Stress Corrosion Cracking (AISCC), refer to Annex A. However, certain environmental conditions, such as high sulfate concentrations, may necessitate additional specific testing procedures. Significant guidance was also provided regarding installation procedures, refer to Annex B. The most notable updates introduced in this version (V5.0) include new requirements for welding qualification and enhanced material traceability, further mitigating risks associated with both general corrosion and AISCC.

This standard has been created and updated based on scientific research coordinated and funded by UIAA, as a service to all mountaineers.

Copyright and Version Management

The versioning is V*x.y*, where:

- *x* Major revision of the document. Each change in requirement implies a main evolution.
- *y* Minor revision of the document. Editorial or non-technical updates.

For example, **V5.0** denotes the fifth major revision of the document.

Note that test reports comprising only the main issue, e.g., V5, are also accepted (instead of, e.g., V5.2) since the requirements are identical.

Normative References

The following documents are referenced in such a way that their content, in whole or in part, constitutes requirements of this standard. For dated references, only the edition cited applies. For undated references, the latest edition (including any amendments) applies.

EN 959:2018, *Mountaineering equipment — Rock anchors — Safety requirements and test methods*

EN 10204:2004, *Metallic products — Types of inspection documents*

ISO 10474:2013, *Steel and steel products — Inspection documents*

ISO 3834-2:2021, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements*

ISO 4628-3:2024, *Paints and varnishes — Evaluation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting*

ASTM B117-19, *Standard Practice for Operating Salt Spray (Fog) Apparatus*

ASTM G36-24, *Standard Practice for Evaluating Stress-Corrosion-Cracking Resistance of Metals and Alloys in a Boiling Magnesium Chloride Solution*

Acronyms

The following acronyms are used in this document. Full forms are provided for reference.

AISCC: Ambient Induced Stress Corrosion Cracking
ASTM: American Society for Testing and Materials
CEN: European Committee for Standardization
EN: European Standard
GC: General Corrosion
IAF: International Accreditation Forum
ISO: International Organization for Standardization
LC: Low Corrosion
MTR: Material Test Report
MSST: Modified Salt Spray Test
NSST: Neutral Salt Spray Test
QMS: Quality Management System
SDoC: Supplier's declaration of conformity
SCC: Stress Corrosion Cracking
TCE: Torque-Controlled Expansion
UIAA: International Climbing and Mountaineering Federation

1 General Remarks on the UIAA Trademark and UIAA Label

1.1 The UIAA Trademark (see Clause 8) is copyright protected internationally. The UIAA Safety Label is only granted to items of mountaineering and climbing equipment upon approval of the prospective label holder's application by the UIAA.

1.2 The procedure to be followed by a manufacturer, when applying for a UIAA Safety Label, is laid down in the "Regulations for existing and potential Safety Label Holders" available at the UIAA website.

2 Scope

This UIAA Standard specifies the requirements and test methods applicable to rock-anchor products from a manufacturer seeking to obtain the UIAA Safety Label. It establishes additional safety criteria beyond those defined in EN 959:2018, specifically corrosion-resistance testing for claimed classes, welding qualification, and material traceability. Furthermore, it defines the conditions under which a rock-anchor manufacturer may display the UIAA Safety Label on certified products, referencing the "General Regulations for the UIAA Safety Label Certification" for details concerning application and approval processes.

To obtain the UIAA Safety Label, the manufacturer shall demonstrate compliance with all applicable technical, testing, and marking requirements. These include, but are not limited to:

- strength testing
- corrosion testing
- welding qualifications
- material traceability

Compliance with these requirements ensures that rock-anchors granted the UIAA Safety Label meet defined criteria for performance and reliability, providing end-users and regulatory bodies with verifiable evidence of product quality.

The UIAA Safety Label is granted on the basis of test reports from UIAA-accredited laboratories and Supplier's Declarations of Conformity for quality-management, welding, and traceability systems. UIAA shall verify the submitted documentation but shall not audit the manufacturer's internal processes. This clear separation of responsibilities aligns with internationally recognized product-conformity practices.

3 Terms and Definitions

For the purposes of this document, the terms and definitions given in EN 959:2018 apply, with contextual adaptations where necessary, while maintaining alignment with the original intent of the standard. Additional terms and definitions specific to this document are listed below.

3.1
Rock-anchor
Anchoring device intended for repeated use after installation, that is inserted into a drilled hole in the rock and held in place by gluing, or expansion forces, or positive locking, and with an attachment point.

3.2
Glued-in rock-anchor
Rock-anchor held in place by a chemical bonding agent.

3.3
Expansion rock-anchor
Rock-anchor held in place by friction forces.

3.4
Eye
Attachment point for a connector.

3.5
Hanger
Attachment point for a connector capable of being separated from the body of a rock-anchor.

3.6
Manufacturers
Entities that design, produce, or market rock-anchor products, bearing full responsibility for their compliance with this standard and any applicable regulatory requirements.

3.7
Sub-suppliers
Entities that provide materials, components, or services to the rock-anchor manufacturer. These may include suppliers of raw materials, hardware, or other parts incorporated into the final rock-anchor product.

3.8
Supplier's declaration of conformity (SDoC)
First-party *declaration of conformity* (ISO/IEC 17000:2020, 7.5) in which the supplier attests that specified requirements relating to the object of conformity assessment have been fulfilled.[1]

4 Requirements

This clause specifies the technical and quality requirements that manufacturers seeking the UIAA Safety Label shall fulfill.

4.1 Manufacturers applying for the UIAA Safety Label shall have a valid certificate in accordance with ISO 9001:2015, the international standard for quality management systems.

4.2 The UIAA Safety Label is granted only for rock-anchors which meet all the requirements of EN 959:2018, with the following exception:

4.2.1 No EN number is required.

4.2.2 No printed leaflet if all information is provided in accordance with Clause 7.

4.3 The following additional safety requirements shall be met for the grant of the UIAA Safety Label:

4.3.1 Design Requirements

This sub-clause specifies the design requirements for rock anchors, including the bonding strength of the embedded part of glued-in anchors, axial load-bearing capacity, and torque capacity. The corresponding requirements are detailed in the following lettered items.

(a) Embedded part of glued-in anchors: The embedded part of any rock-anchor held in place by a chemical bonding agent (glued-in) shall have deformations or roughness, intended to prevent extraction and/or rotation.

(b) Axial load-bearing capacity: When tested in accordance with 5.2, all types of rock-anchors shall withstand an axial load of at least 20 kN without breaking.

(c) Torque capacity: When tested in accordance with 5.3, all types of rock-anchors held in place by a chemical bonding agent (glued-in) shall withstand a torque of 150 kN (+5 / 0) for a duration of 60 s (+5 / 0) without rotating in the hole.

4.3.2 Corrosion Resistance

This sub-clause specifies corrosion-resistance requirements for rock-anchors, including test methods and marking obligations. The manufacturer shall nominate a single corrosion class, in accordance with Table 1, for type-testing. The corresponding requirements are detailed in the following lettered items.

(a) Testing: The entire rock-anchor, including all constituent parts (e.g., nut, washer, bolt, rings), shall be tested according to Table 2, based on the corrosion class nominated for type-testing. Prior to testing, each component shall be marked using the final intended method (e.g., laser engraving or stamping) to ensure that the specimen is representative of the finished product in terms of surface characteristics and residual

[1] In the context of this document, the object is a complete rock-anchor.

stresses. This marking method shall not be modified thereafter.

(b) The “UIAA” letters and the corrosion class as per Table 1 shall be marked on each anchor in a visible area after installation: e.g., “UIAA SCC”.

4.3.3 Welding Requirements

In the fabrication of rock-anchors, the manufacturer shall ensure that all welding—whether structural (e.g., rings, eye) or non-structural (e.g., tack welding)—complies with ISO 3834-2:2011. For informative details, refer to Annex C.

4.3.4 Material Traceability Requirement

In the fabrication of rock-anchors, the manufacturer shall only acquire and use materials (e.g., bars, plates) or components (e.g., hardware) that are accompanied by test reports complying with ISO 10474:2013 or EN 10204:2004 at least Type 2.2. For informative details, refer to Annex D.

4.4 Painting of rock-anchors or any of their safety-relevant components is prohibited for any purpose, including corrosion protection or identification.

Table 1: Rock-anchors Class and Environment Characteristics

Class	Signification	Characteristics of Environment	Important Considerations
SCC	SCC and General Corrosion Resistance	SCC in evidence, for example (but not only): high chloride concentration, temperature above 30°C, humidity between 20% to 70%, sea salt and/or other chloride salts, and/or acidic environment.	Although SCC is commonly associated with seaside cliffs, it can also occur inland and in other locations, e.g., indoor swimming pools. See Annex A for more information about contributing factors to SCC.
GC	General Corrosion Resistance	No SCC in evidence and none suspected. Some corrosion agents.	-
LC	Low Corrosion Resistance	No SCC in evidence and none suspected.	Class SCC rock-anchors may be required even in indoor gyms or sheltered locations if corrosive agents like chlorides are present, such as near swimming pools, industrial areas, or the sea.

5 Test Methods

This clause specifies the test methods for determining conformity with the requirements of this document.

5.1 Visual Inspection

Check by visual examination that the requirements according to 4.3.1(a) and 4.3.2(b) are met.

5.2 Axial Load Requirements

Carry out an axial load test on a rock-anchor of any type in accordance with the test methods in the relevant parts of EN 959:2018 and with the requirements of 4.3.1(b).

5.3 Torque Requirement

Carry out a torque test on glued-in rock-anchor by applying a torque to the eye of the rock-anchor, in accordance with 4.3.1(c).

5.4 Requirement for Corrosion Class

Depending on the corrosion class that is claimed, the entire anchors shall be tested according to Table 2. For the LC and GC class, the rock-anchor shall be tested according to 5.9. For the SCC class, the rock-anchor shall be tested according to 5.10.

Table 2: Rock-anchors Required Corrosion Tests

Class	SCC Resistance	General Corrosion Resistance	Required General Corrosion Test (refer to 5.9)	Required SCC Test (refer to 5.10)
SCC	High to immune	High	4-week modified ASTM B117-19 (MSST[2])	1-week ASTM G36-24[3]
GC	Unspecified	High	4-week modified ASTM B117-19 (MSST[2])	None
LC	Unspecified	Medium	4-week ASTM B117-19 (NSST[1])	None

[1] Neutral Salt Spray Test (NSST), conducted in accordance with ASTM B117-19.
[2] Modified Salt Spray Test (MSST), conducted in accordance with ASTM B117-19, except for the test solution, which uses 5% calcium chloride ($CaCl_2$) instead of sodium chloride.
[3] SCC test conducted in accordance with ASTM G36-24, with anchors installed in a manner simulating service conditions, including installation-induced stress.

5.5 Number of Samples

Five rock-anchor shall be tested for each corrosion class claimed, in accordance with Table 2.

5.6 Requirement for Coated Rock-anchors

All coated metallic components of the rock-anchor shall be scribed with a 0,5 mm scribing tool through the coating to expose the underlying metal before testing.

5.7 Pre-testing Inspection

The rock-anchor shall be inspected for the presence of cracks (resulting from the manufacturing process) under 50× magnification before testing.

5.8 Degreasing

The rock-anchor shall be degreased in acetone prior to undergoing corrosion testing.

5.9 Neutral Salt Spray Test (NSST) and Modified Salt Spray Test (MSST)

The following items outline the requirements for NSST and MSST of rock-anchors.

(a) Exposure Test: The assembled rock-anchor shall be individually labeled, photographed, and exposed in a salt spray chamber according to the test specified in Table 2 for the LC or GC corrosion class being claimed. No engraving for testing identification is allowed.

(b) Notice for MSST: The salt solution shall be prepared by dissolving (5 ± 1) parts by mass of calcium chloride in 95 parts by mass of water. The pH of the salt solution shall not be modified.

(c) Post-Exposure: The exposed rock-anchor shall be gently washed in clean running water at the end of the test to remove salt deposits from their surface, and then immediately dried.

(d) Pass Criteria: The exposed rock-anchor shall be photographed and inspected, and the degree of rusting evaluated following the EN ISO 4628-3 standard. To pass the test, all anchor parts of at least four of five tested replicates shall be classified Ri 2 or better (less than 1 % surface coverage with red rust). No coating delamination from scribes shall be tolerated.

5.10 Stress Corrosion Cracking (SCC) Testing

The following items outline the requirements for SCC testing of rock-anchors.

(a) Exposure Test: The assembled rock-anchor shall be individually labeled, photographed, and exposed in a salt spray chamber according to the test specified in Table 2 for the SCC corrosion class being claimed. No engraving for testing identification is allowed.

(b) Installation for Exposure: Rock-anchors installed using methods that induce service stress (e.g., TCE or positive locking rock-anchors) shall be installed in a manner that simulates service conditions (e.g., in a granite block), using the specified torque in accordance with the manufacturer's instructions. After a 24-hour relaxation period, the rock-anchors shall be re-torqued and exposed. Rock-anchors that do not induce

installation stress (e.g., glued-in anchors) shall be exposed freely. General installation recommendations are provided in Annex B.

(c) Salt Spray Chamber Material: Any apparatus made of glass, titanium or other resistant material with provisions for a thermometer and water-cooled condenser can be used, provided that it has been designed to contain the stressed specimen while maintaining a constant temperature and concentration of the magnesium chloride solution by minimizing or preventing losses of condensate and water vapor during prolonged periods of test.

(d) Post-Exposure: The exposed rock-anchor shall be gently washed in clean running water at the end of the test to remove salt deposits from their surface, and then immediately dried.

(e) Pass Criteria: The exposed rock-anchor shall be photographed and inspected for cracks under 50× magnification. To pass the test, all parts of the five tested replicates shall be free of any cracking. No general corrosion is acceptable. In case of uncertainty, more inspection is requested, either non-destructive or destructive, e.g., pull test.

6 Demonstrating that the Requirements are Met

This clause specifies the means for demonstrating conformity with the requirements of this document.

6.1 Conformity Assessment

Conformity with this standard shall be demonstrated by both of the following:

(a) Testing: Mechanical and corrosion testing in accordance with Clause 5, carried out by a UIAA-accredited laboratory (see 6.2);

(b) Supplier's Declaration of Conformity (SDoC): Signed declarations, with supporting certificates where applicable, demonstrating compliance with the management-system requirements (see 6.3).

For a summary of verification methods and responsibilities, see Table 3.

Table 3: Summary of Compliance Verification Methods

Requirement	Verification Method[1]	Issued by	Reviewed / Accepted by	Clause Ref.
EN 959 Compliance	Test report per UIAA requirements[2]	UIAA-accredited laboratory	UIAA review[3]	6.2.1
Design Compliance	Test report per UIAA requirements[2]	UIAA-accredited laboratory	UIAA review[3]	6.2.2
Corrosion Compliance	Test report per UIAA requirements[2]	UIAA-accredited laboratory	UIAA review[3]	6.2.3
Management-System Requirements				
Quality management (ISO 9001)	SDoC + ISO 9001 certificate[4]	Manufacturer; IAF-accredited certifier	IAF-accredited body[4]; accepted by UIAA	6.3.1
Welding quality (ISO 3834-2)	SDoC + ISO 3834-2 certificate[5]	Manufacturer; IAF-accredited certifier	IAF-accredited body[5]; accepted by UIAA	6.3.2
Material traceability system (ISO 10474 or EN 10204)	SDoC + optional MTR (Type 2.2)[6]	Manufacturer	Manufacturer declaration; reviewed by UIAA	6.3.3

[1] Summary of required documentation and responsible parties for verification.
[2] Test reports shall be issued by a UIAA-accredited laboratory and demonstrate compliance with Clause 5.
[3] UIAA performs a desk review; third-party revalidation is not required.
[4] SDoC = Supplier's Declaration of Conformity. The accompanying certificate shall be issued by an IAF-accredited body. UIAA verifies scope and validity but does not perform audits.
[5] Same as [4], but applied to welding quality per ISO 3834-2.
[6] A sample MTR (Type 2.2) may be submitted; third-party certification is not required.

The following subclauses specify the conditions and documentation required for each verification method listed

in Table 3.

6.2 Testing

All tests required by this standard shall be carried out by a UIAA-accredited laboratory in accordance with the procedures set out in Clause 5 and the related subclauses.

6.2.1 EN 959 Compliance

Compliance with 4.2 shall be evidenced by a test report issued by a UIAA-accredited laboratory.

6.2.2 Design Compliance

Compliance with the design requirements in 4.3.1 shall be evidenced by a test report issued by a UIAA-accredited laboratory.

6.2.3 Corrosion Compliance

Compliance with the corrosion-resistance requirements in 4.3.2 shall be evidenced by a test report issued by a UIAA-accredited laboratory.

6.3 Manufacturer Declarations

The manufacturer shall submit a Supplier's Declaration of Conformity (SDoC) for each management-system requirement defined in this standard, as specified in the subclauses below.

6.3.1 Quality Management System

The manufacturer shall provide an SDoC attesting that an ISO 9001-compliant quality-management system is implemented and audited (see 4.1). The SDoC shall be accompanied by a valid ISO 9001 certificate issued by an IAF-accredited certification body. UIAA shall verify the certificate's scope and validity; it shall not conduct QMS audits.

6.3.2 Welding Quality Management

The manufacturer shall provide an SDoC attesting that a welding-quality-management system compliant with ISO 3834-2 is implemented and audited (see 4.3.3). The SDoC shall be accompanied by a valid ISO 3834-2 certificate issued by an IAF-accredited certification or inspection body. UIAA shall verify the certificate's scope and validity; it shall not conduct welding audits.

6.3.3 Material Traceability System

The manufacturer shall provide an SDoC attesting that a documented material-traceability system is implemented within the ISO 9001 QMS (see 4.3.4). The system shall link each rock-anchor component to a representative Material Test Report (Type 2.2) in accordance with ISO 10474 or EN 10204. A sample MTR may be submitted as supporting evidence; third-party certification is not required.

NOTE UIAA-accredited laboratories are responsible solely for executing the mechanical and corrosion tests specified in Clause 5. They do not assess quality-management, welding-quality or traceability systems. All SDoCs and supporting documents demonstrating system compliance shall be submitted directly by the manufacturer to UIAA and retained for review and audit purposes.

7 Information to be Supplied

The "information to be supplied" shall be given in standard English and, if required, in the official language(s) of the country in which the product is made available on the market. As an alternative to a printed form, the information may be provided via an electronic or other data storage format link (e.g., a QR code) allowing the downloading of the information. The information link shall be preceded or surmounted by an icon showing an open booklet; the information link and icon may be directly printed on the product in a clearly visible and accessible place.

8 Attachment of the UIAA Safety Label

8.1 Safety Label Marking

For any model of mountaineering equipment, which has been granted the UIAA Safety Label, the UIAA Trademark (see Figure 1) or the four letters ”UIAA” shall be marked clearly and indelibly on each item sold in accordance with the branding guidelines specified in the “Regulations for existing and potential Safety Label Holders”.

Figure 1: UIAA Trademark or the four letters “UIAA” word mark.

8.2 Corrosion Class Marking

The corrosion class obtained, as defined in Table 1, shall be marked in accordance with 4.3.2, Item (a) and (b).

8.3 Other

In addition, the UIAA Trademark or the four letters ”UIAA” may be included in the instructions for use and/or on a swing ticket as well as in catalogs and other publications of the manufacturer. In the last case, the illustration and/or the text shall clearly apply only to the equipment which has been granted the UIAA Safety Label.

Informative Bibliography

The following references were consulted in the development of this standard:

- LIEBERZEIT, J.; PROŠEK, T.; JARVIS, A.; KIENER, L. Atmospheric Stress Corrosion Cracking of Stainless Steel Rock Climbing Anchors. Part 1. *Corrosion*, v. 75, n. 10, 2019, p. 1255–1271.
- PROŠEK, T.; LIEBERZEIT, J.; JARVIS, A.; KIENER, L. Atmospheric Stress Corrosion Cracking of Stainless Steel Rock Climbing Anchors. Part 2: Laboratory Experiments. *Corrosion*, v. 75, n. 11, 2019, p. 1371–1382.

Annex A (informative) — Notice regarding stress-corrosion-cracking (SCC) risk assessment

The information in Table 4 is based on the latest knowledge from the UIAA Safety Commission, obtained through detailed analysis of anchor failures, in-situ observations, and laboratory testing. This table outlines the key factors influencing Stress Corrosion Cracking (SCC) in rock-anchors, emphasizing the most critical elements and providing additional remarks for each factor.

Table 4: Factors contributing to stress corrosion cracking (SCC) in rock-anchors

Factors	Most Critical One	Remarks
Environmental Characteristics		
Concentration of chloride	Magnesium chloride, calcium chloride, sea salt.	Chloride deposits containing salts with high solubility can be formed.
Temperature	Not any cut-off or safe level, but above 30 °C is worse.	SCC could start at 20 °C; a higher temperature increases the cracking speed; the temperature of a rock-anchor in the sun can be significantly higher than the ambient air temperature.
Humidity	Low relative humidity, between 20% and 70%.	Relative humidity close to the deliquescence point[1] of the chloride solution poses a significant danger to SCC. Localized relative humidity of the anchor can be significantly different from ambient relative humidity, e.g., when exposed to the sun.
Location — coastal / wind from the sea	Next to the sea, up to typically 30 km from the coast.	There is no clear limit; winds from the sea with significant salt concentration can travel very far inland.
Washed by rain or not	Not washed by rain.	The absence of washing allows the chloride to concentrate locally on anchors.
Rock type	Unspecified, all rock types could be affected.	Some rock types can make conditions worse than others, depending on specific circumstances.
Anchor Characteristics		
Stresses	High tensile stress.	– From manufacturing, e.g., due to rolling, bending, cutting, drilling, or welding. – From normal installation, e.g., due to tension pre-load on TCE. – From deformation, e.g., due to over-torquing on TCE, excessive hammering during installation, snow load etc. – From use, e.g., due to multiple hard falls.

[1] The deliquescence point is the relative humidity at which a substance begins to absorb moisture from the air and dissolve into a solution.

Annex B (informative) — Recommendation on Installation

The following recommendations support the correct installation and maintenance of rock-anchors, with the goal of achieving service lifetimes of 50 years or more.

They do not replace the manufacturer's instructions for use, which shall always be followed, but provide field-oriented guidance to improve installation quality, consistency, and durability.

Proper installation minimizes corrosion (e.g., surface contamination), mechanical failure (e.g., insufficient torque or poor adhesive bonding), and long-term degradation (e.g., loss of preload or anchor rotation). The procedures below apply to both torque-controlled expansion (TCE) and glued-in anchors and include advice on material compatibility, hole preparation, and torque control.

Following these practices is critical to preserving anchor integrity under varied environmental and mechanical conditions.

- **General instructions:** The manufacturer's instructions for use shall be followed. These instructions specify hole dimensions, torque values, curing times, and any product-specific precautions.
- **TCE anchors:** The anchor shall be inserted into a drilled hole matching the specified diameter and depth, after the hole has been cleaned by brush and blow, normally three times. The anchor shall be lightly hammered until the hanger contacts the rock. The nut shall then be tightened to the prescribed torque using a calibrated wrench. This expansion shall create radial pressure, clamp the hanger, and induce pre-load in the anchor body to reduce displacement and fatigue. The nut shall be re-tightened once after a 24-hour relaxation period to restore the prescribed torque, and up to two additional times if specified by the manufacturer, ensuring the hanger sits flush with no visible gap.
- **Glued-in anchors:** The hole shall be drilled and cleaned thoroughly. The approved bonding material shall be injected, and the anchor shall be inserted to the required embedment depth with slight rotation to ensure full wetting. As no radial expansion occurs, the bond quality alone shall transfer load. Only bonding materials approved by the anchor manufacturer shall be used. The embedment depth shall be selected according to the rock type, and countersinking part of the eye shall be considered where feasible to improve rotational stability. The anchor shall not be loaded before the full curing time specified in the bonding material data sheet has elapsed.
- **Preventing surface damage:** The anchor or hanger shall not be struck with metallic tools that may scratch or contaminate the surface. If impact is unavoidable, tools made of the same alloy or equipped with a soft-face adapter shall be used to minimize the risk of corrosion-initiating defects.
- **Material compatibility:** Since UIAA 123 Version 4, certification shall apply to the complete anchor system, including hanger, bolt, nut, washer, and any rings. Components from different manufacturers or corrosion classes shall not be mixed. Dissimilar stainless grades (e.g., AISI 304 with AISI 316) shall not be combined, as galvanic coupling accelerates corrosion and compromises long-term safety.

Annex C (informative) — Welds in Rock-anchors

This annex outlines the rationale for the welding requirements in 6.3.2. ISO 3834-2:2021 defines the most stringent quality controls for fusion welding of metallic materials, making it the preferred standard for rock-anchor components.

Well-executed welds allow complex designs—such as integral rings—with consistent metallurgical properties. In contrast, deficient welding can create stress concentrations, undesirable microstructure, and variable quality that increase corrosion risk and compromise structural integrity.

Manufacturers should implement the controls described in ISO 3834-2: qualified welding procedures (WPS), certified welders, documented production records, inspection protocols, and post-weld heat treatment where required. Records of these activities support traceability and process consistency.

Anchors bearing the UIAA Safety Label give users confidence that welding controls—and, by extension, the broader safety requirements of this document—have been properly applied, thereby reducing long-term risk in climbing systems.

Annex D (informative) — Material Certification and Traceability

This annex explains why material certification and traceability are essential to support 6.3.3. Corrosion-class testing verifies that a rock-anchor can resist its intended environmental category, but ensuring long-term performance requires matching tested materials in the field.

To prevent alloy substitution, each anchor supplied should exactly match the chemical composition of the type-examined specimen; manufacturers should therefore obtain and retain a Material Test Report (MTR) for every component.

For UIAA Safety Label certification, the manufacturer should submit a Supplier's Declaration of Conformity accompanied by a Type 2.2 Material Test Report (MTR) in accordance with ISO 10474 or EN 10204 — a document in which the manufacturer declares that the supplied components comply with the order requirements and provides test results based on non-specific inspection. A representative MTR may be submitted to UIAA for record-keeping; end-user distribution is optional.

Manufacturers may optionally submit a Type 3.1 inspection certificate — a document in which they declare that the supplied components comply with order requirements and provide test results based on specific inspections. Such certificates are accepted for enhanced traceability but are not mandatory, balancing assurance with practical cost and availability considerations.

Revision History

V5 — July 2025

This version introduces major updates grouped into technical, structural, and editorial improvements.

New Technical Requirements

1. Added ISO 9001 certification requirement (4.1, 6.3.1).
2. Introduced ISO 3834-2 welding quality requirements (4.3.3, 6.3.2).
3. Defined material traceability per ISO 10474/EN 10204 (4.3.4, 6.3.3).
4. Updated marking requirements (4.3.2(a)).
5. Prohibited painting of safety-relevant components (4.4).
6. Added Table 3 summarizing compliance verification methods and responsibilities.

Clause Reorganization and Structural Improvements

1. Added a dedicated “Introduction” section to clarify purpose.
2. Moved and updated the Acronyms section to appear before the main body.
3. Added a new “Terms and Definitions” (Clause 3) aligning with EN 959:2018 and UIAA terminology.
4. Consolidated Clauses 3.2.1 to 3.2.3 into 4.3.1 as lettered items.
5. Consolidated Clauses 3.2.4 and 3.2.5 into 4.3.2 with new format and marking rules.
6. Split and renumbered former Clause 5.2 into 6.2.2 and 6.2.3.
7. Reworded former Sub-clause 4.6 as a general note about referenced standards.
8. Refactored all test protocols into structured lists for NSST/MSST and SCC testing (5.9, 5.10).
9. Clarified terminology: replaced ”Assembled anchor” with ”rock-anchor” throughout.

Editorial and Formatting Improvements

1. Redesigned the cover page layout.
2. Added a Table of Contents and improved hyperlink navigation throughout.
3. Standardized terminology (e.g., ”UIAA Safety Label”, rock-anchor) and harmonized clause language.
4. Clarified and simplified descriptions in 5.2, 5.3, 5.5, 5.6, and 5.8.
5. Updated Annex B to include best practices for rock-anchor installation.
6. Added Annex C and Annex D for informative guidance on welding documentation and traceability implementation.

V4 — December 2020

Update to include corrosion classes and associated tests, including Annex 1 and 2.

V3 — June 2017

5.1 The information to be supplied: (in accordance with EN 959:2018) shall be given in English, or at least in the language of the country in which the product is sold.

Has been updated with: The ”information to be supplied” shall be given in standard English and, if required, in the official language(s) of the country in which the product is made available on the market. As an alternative to a printed form, the information may be provided via an electronic or other data storage format link (e.g. a QR code) allowing the downloading of the information. The information link shall be preceded or surmounted by an icon showing an open booklet; the information link and icon may be directly printed on the product in a clearly visible and accessible place. Unanimously approved Safecom Worden June 2017.

V2 — March 2013

Corrections in points 2 and 3. Regarding Material requirements, under review due to corrosion in tropical areas.