Joint Accreditation System of Australia and New Zealand

Australian Technical Infrastructure Committee

ATIC Suite of Schemes

ATIC Scheme 21 -
Mechanical Fasteners - Conformity Assessment

20 February 2019

(Note: Scheme ownership changed on 1 July 2020)

Authority to Issue

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Chief Executive
with Authority of the Governing Board

Contents

(i) Foreword

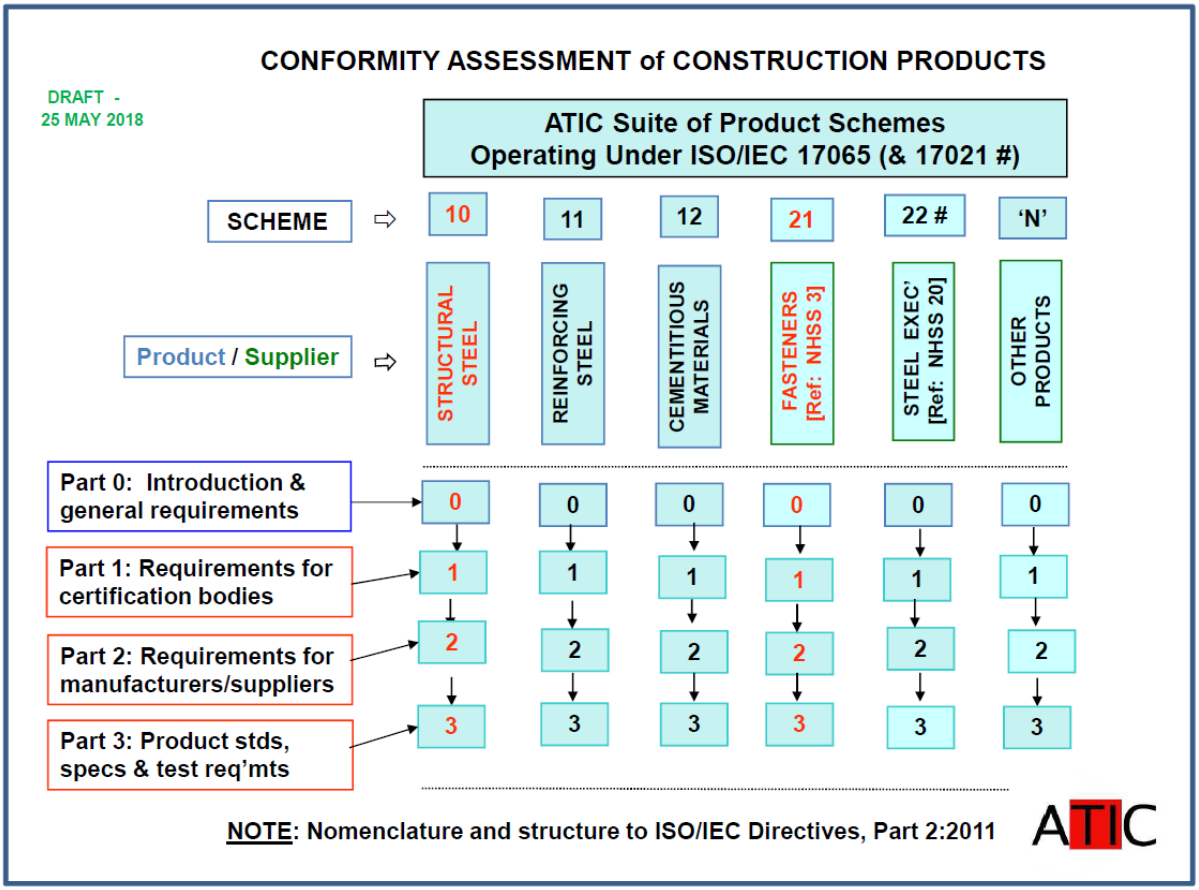
Australian Technical Infrastructure Committee (ATIC) is a national technical group of government agency representatives, which is progressively producing the 'ATIC Suite of Schemes' for conformity assessment of strategic products used in public infrastructure, as shown in Diagram 1. These will complement the standard technical specification included in ATIC-SPEC and also those in the Water Services Specification (WS-SPEC).

JAS-ANZ was established by an agreement between the Australian and New Zealand Governments to provide accreditation services to certification and inspection bodies.

NATSPEC is a national not-for-profit organisation, owned by Government and industry, whose objective is to improve the construction quality and productivity of the built environment through leadership of information. It is impartial and is not involved in advocacy or policy development.

Governance is achieved through the ATIC Terms of Reference and is administered by Construction Information Systems Limited (NATSPEC).

Diagram 1 – The Proposed ATIC Suite of Schemes



(ii) Transition Policy

Not yet applicable, hence no requirement

Part 0 Introduction and general requirements

1 Scope

1.1 Introduction

'ATIC Scheme 21' (this Scheme) is for the supply of mechanical fasteners for use in buildings, civil works, rail and other similar infrastructure projects. It covers stocking and distribution by Australian Distributors (Organizations) for manufacture, or for obtaining mechanical fasteners from a manufacturer or supplier, and who may transport them, store them, or split them into smaller quantities, before supplying them to a customer.

This Scheme also sets out minimum inspection and testing criteria for the product. While in the past an Organization could simply buy and sell without conducting any quality inspections, they are now required to conduct some inspection and testing. Users then purchase the product from an Organization which has conducted this testing and has an auditable paperwork trail, but the benefits are only realised if the users (eg: structural steel erectors) purchase their product from certified Organizations. The Organization, the last point of sale, must be certified to this Scheme.

The requirements of this Scheme are intended to be applicable to all Organizations regardless of type, size and product provided, and include product related as well as quality management system (QMS) criteria. QMS requirements are included to provide confidence in the ability of the Organization to consistently supply product that meets the requirements of this Scheme.

1.2 Background

This Scheme requires product to comply with minimum requirements, with the objective of producing compliant certified product. Hence in consultation with stakeholders, as the basis for the 'Conformity Assessment' scheme, ISO/IEC 17065:2012, the International Standard that sets down the requirements for bodies certifying products, processes and services, was adopted. This Scheme supplements but does not diminish the requirements of ISO/IEC 17065, and the major headings in Part 1, excluding the Annex headings, have been reproduced from it.

The basis for Part 2 of this Scheme, the National Highway Sector Scheme 3 (NHSS 3), is acknowledged with kind permission from Highways England. NHSS 3 is one of a series of bespoke management schemes within a quality management system framework, developed to interpret ISO 9001 in the context of a particular activity / industry within the UK. Part 2 has reproduced major headings from ISO 9001:2015.

Following Brexit, the British Standards Institution (BSI) has indicated that for the foreseeable future it expects no change to BSI's status and obligations as a full member of CEN. BSI believes that the CEN single Standard model, with identical adoption of European Standards across 33 countries and the withdrawal of conflicting national standards, facilitates market access and simplifies the market structure across Europe and as such the intention of the UK Government will be to adopt European Standards. Hence it is assumed there is no change to the use of the Eurocodes and related Standards in the UK for the foreseeable future. Hence compliance with the Construction Products Regulations 2011 (CPR), will continue and is accepted. As part of this, the system of attestation of conformity of the components of bolt / nut / washer assemblies, and the conditions for CE marking, will continue post Brexit.

It is noted that the NHSS 3 version, based on ISO 9001: 2008, will remain current until it is withdrawn in 2018. During the transition, both versions of NHSS 3 (i.e. that which is based on ISO 9001:2008 and that which is based on ISO 9001:2015) will be accepted.

Within the above constraints, the intention is, as far as possible, for this Scheme to harmonise with both versions of NHSS 3. However given that this Scheme is structured around ISO/IEC 17065, certification bodies accredited to NHSS 3 will need a scope extension for accreditation to 'ATIC Scheme 21'.

It is not the intention of this Scheme to imply attestation to ISO 9001. An existing scheme developed and administered by the International Accreditation Forum (IAF) provides such a pathway and therefore whilst ISO 9001 criteria are relied upon the certification document concerns only the attestation of compliance with this Scheme.

1.3 Technical Aspects

The EN 14399 suite of Standards contains all the dimensions and requirements within its 10 Parts. Also in brief, EN 14399-3, 7 and 9 replaced the British / French Standards (bolts, countersunk bolt and direct tension indicators), EN 14399-4 and 8 replaced the German Standards (bolts and fit bolts), and EN 14399-10 was developed later for Tension Control Bolts.

Other than the CE marking element in Part 1 and the suitability test in Part 2, EN 15048 does not have any dimensions or requirements. The concept is that the bolts and nuts can each be manufactured to any current combination of ISO, or EN, or other standards, then undergo the extra testing required in EN 15048-2. Also the factory is required to undergo factory production control (FPC) assessment, and if successful, affixing of the CE marking follows, both in accordance with EN 15048-1.

For example, EN 15048 assemblies could include bolts manufactured to either ISO 4014 or ISO 4017 and the nuts manufactured to ISO 4032 or ISO 4033. If the assembly then passes the EN 15048-2 suitability test, and the assembler meets the FPC requirements, CE marking can be affixed (Table A.4 has examples of other Category 1 products). But ISO 10642 countersunk socket bolts cannot be certified to EN 15048 as the capacity of the bolt head would not be able to sustain the loads required of the suitability test.

1.4 Testing

To ensure a high probability of compliance with this Scheme, verification of purchased product is specified in Part 1, Clause 7.4.3 and Part 2, Clause 8.6. Part 2, Clause 8.6, for the inspection and sample testing element, adopts ISO 3269 for acceptance inspection of fasteners and the sampling inspection is applied to each individual lot. ISO 3269 specifies acceptance inspection criteria for mass produced fasteners, accepting that it is not practical to test all fasteners for compliance, nor is it possible to ensure that all fasteners are compliant.

The committee responsible for producing NHSS 3, included structural fasteners experts from manufacturers, distributors and users. The considered view was that the sample size adopted for verification of dimensional and mechanical properties in accordance with ISO 3269 and Part 3 of this Scheme, in support of the other verification activities that are required under Clause 7.4.1 (b) and (c), is sufficient to validate the certificates / test reports supplied by the fastener manufacturer, plus providing sufficient assurance of fastener quality for most structural applications. Also the tests described in Part 3 of this Scheme, are adequate to validate the quality of fasteners, and are relevant being referenced from EN 15048 for non-preload, EN 14399 for preload, and ISO 3269 for other products. In adopting this Scheme, it does not preclude a purchaser specifying additional verification requirements.

1.5 AS/NZS 1252.1

As AS/NZS 1252.1 is not used in the EU, CE marking cannot be specified, however there are equivalent products. “EN 14399-3 Hexagon bolt and nut assemblies, System HR”, apart from the M20 size and larger scope are close. For non-preloaded applications, any combination of ISO or EN Standards can be used which may also offer other options, but it is essential that the assemblies meet the suitability test requirements of EN 15048-2.

2 Normative references

The following normative references relate to all parts of this document, and other specific technical references are listed in Part 3, Clause 2. Also for clarity in the text, the prefixes ‘AS/NZS’, ‘AS’ and issue dates are omitted. Where the issue date is omitted, the latest version of these Standards shall be adopted, except that, for the first three years after the date of issue, the previous version may also be adopted.

AS/NZS ISO 9001:2016	Quality management systems – Requirements
AS ISO 17000	Conformity assessment – vocabulary and general principles
AS/NZS ISO/IEC 17021-1:2015	Conformity assessment – Requirements for bodies providing audit and certification of management systems – Part 1 Requirements

17021-3:2017	Part 3: Competence requirements for auditing and certification of quality management systems
AS ISO/IEC 17025:2018	General requirements for the competence of testing and calibration laboratories
AS/NZS ISO/IEC 17065:2013	Conformity assessment – Requirements for bodies certifying products, processes, and services
AS/NZS ISO/IEC 17067:2015	Conformity assessment – Fundamentals of product certification and guidelines for product certification schemes
ISO 3269:2001	Fasteners – Acceptance Inspection
ISO 19011:2011	Guidelines for quality and/or environmental management system auditing
AS/NZS 1252.1:2016	High-strength steel fastener assemblies for structural engineering – Bolts, nuts and washers - Technical requirements
ATIC-SPEC	Section SP39 – Fasteners for Structural Purposes

3 Terms and definitions

general

For the purposes of this Scheme, the terms and definitions given in ISO/IEC 17000, ISO/IEC 17065 and ISO/IEC 17067 apply.

The term **'should'** is used in this Scheme to indicate recognised means of meeting the requirements. Such requirements can meet these in an equivalent way, provided this can be demonstrated to the certification body (CB) and / or the accreditation body.

The term **'shall'** is used in this Scheme to indicate those provisions which are mandatory.

infrastructure assets

Includes but is not limited to highway and rail bridges, gantries, masts, columns, signal posts, electrification masts, station structures and buildings.

Australian distributor ('the Organization')

An entity (corporation or otherwise) based in Australia, including but not limited to an Australian manufacturer, overseas manufacturer's local representative, wholesaler, importer, primary distributor (stockist) or contractor, which has the responsibility for verifying that the properties comply with this Scheme.

CE marked product

A mechanical fastener for which a declaration of performance is required to be drawn up by the manufacturer in accordance with the Construction Products Regulations [Regulation (EU) No 305/2011 of the European Parliament and of the Council]. (See also definition for Manufacturer's Certificate).

quality management system (QMS)

The Organization's structure, responsibilities, procedures, processes and resources for implementing quality management.

certificate of conformity

Attestation of conformity with this Scheme, including the relevant provisions, issued by a certification body (CB) accredited by JAS-ANZ or by an accreditation body that is a member of the International Accreditation Forum (IAF) and a signatory to the IAF MLA Level 3 with a main scope including ISO/IEC 17065. (See Part 1, Appendix 'A').

renewal

The reissuing of certification after expiry on the basis of a formalised review of compliance with current requirements

major nonconformity

A deficiency where the product does not conform to the product Standard, or a situation that raises significant doubt about the ability of the client's management system to consistently produce conforming product.

A major nonconformity may lead to suspension or withdrawal of certification. The CB shall require an agreed corrective action plan that may include a range of responses depending on the nature of the deficiency and the distribution of the nonconforming product.

minor nonconformity

A deficiency in the application of the management system as prescribed by this Scheme. Any deficiency that is not adequately addressed may lead to a major nonconformity. The CB shall require an agreed corrective action plan and timetable for resolution.

site

Location (physical or virtual) where an Organization performs work or provides a service on a continuing basis.

accredited laboratory

A test laboratory that is accredited by NATA or by an accreditation body that is a signatory to the ILAC or APLAC Mutual Recognition Arrangement (MRA) within a technical field that includes the test methods specified within this Scheme.

JAS-ANZ

The Joint Accreditation System of Australia and New Zealand

NATA

The National Association of Testing Authorities, Australia

Part 1 Requirements for certification bodies (CBs)

1 Scope

CBs shall comply with the accreditation criteria for a product certification body including ISO/IEC 17065 and this Scheme. This Scheme supplements, but does not diminish the requirements of ISO/IEC 17065. Also the requirements of ISO/IEC 17065 *are not duplicated in this or any other part of the document and shall be referred to separately.*

2 Normative references

See Part 0, Clause 2.

3 Terms and definitions

See Part 0, Clause 3.

4 General requirements

4.1 Legal and contractual matters

No additional requirements

4.2 Management of impartiality

No additional requirements

4.3 Liability and financing

No additional requirements

4.4 Liability and financing

No additional requirements

4.5 Confidentiality

No additional requirements

4.6 Publicly available information

No additional requirements

5 Structural requirements

5.1 Organizational structure and top management

No additional requirements

5.2 Mechanism for safeguarding impartiality

No additional requirements

6 Resource requirements

6.1 CB personnel

6.1.2 Management of competence for personnel involved in the certification process

6.1.2.1.1 All auditors and audit team leaders shall have:

a) tertiary qualifications in a relevant technical field and at least five years of relevant technical experience in mechanical fastener practices, or

b) at least ten years of relevant technical experience in steel fabrication and erection; and

c) the QMS knowledge and skills detailed in ISO/IEC 17021-3; and

d) the personal attributes detailed in ISO 19011.

6.1.2.1.2 At least one person on the audit team shall also be a technical expert having the demonstrated ability to interpret test results directly relevant to the scope of the audit.

6.1.2.1.3 The person or persons conducting the independent review [see Clause 7.5] shall have the knowledge and experience indicated by Appendix B, which is based on ISO/IEC 17021-1, and specifies the knowledge and skills that a CB shall define for specific certification functions.

6.2 Resources for evaluation

No additional requirements

7 Process requirements

7.1 General

7.1.1 In summary the CB shall:

- Review evidence that the manufacturer's production control system complies with the applicable requirements specified by the product Standards nominated in Part 3 of this Scheme or elsewhere (eg: FPC certificate from a notified body).
- Conduct a review of evidence used to demonstrate product compliance with this Scheme. (eg: EC certificate and declaration of conformity).
- Commission independent testing to the extent required by this Scheme.
- Evaluate test results.
- Conduct an initial, and annual on-site audit, of the Organization in accordance with this Scheme.

7.2 Application

7.2.1 The CB shall require the Organisation to:

a) supply the CB with a copy of the documented policies and procedures relating to its QMS

b) state which Standard(s) the product is to be certified to (Refer to Part 3)

c) state whether the product has been tested against the relevant Standard and if so, supply copies of test reports

7.3 Application review

No additional requirements

7.4 Evaluation

7.4.1 The evaluation plan shall include the:

(a) Review of test reports provided by the Organization;

(b) Identification of the products to be selected for verification testing and associated sampling and scopes of testing in accordance with Part 2, Clause 8.6;

(c) Scope of verification testing to be applied to the samples;

(d) Requirements for on-site witnessing of acceptance sampling and testing;

(e) Development of an on-site audit plan of the relevant items listed in Table 1.1 and of Part 2.

7.4.2 *No additional requirements*

7.4.3 For each product submitted for certification, the CB shall ensure that the relevant test reports, as required by Clause 7.1.1, are issued by an approved laboratory and bear the endorsement of the accrediting body.

7.4.5 The CB's evaluation reports shall include conformity requirements and findings citing evidence of conformity.

7.4.6 A separate audit report shall be provided for each site.

Table 1.1: Scope of the audit plan

Items	**Initial Audit** (Clause 7.4)	**Surveillance Audit** (Clause 7.9)
(a) Critical QA elements [non-conformance, non-conforming product, corrective action & design control (change control)]	●	●
(b) Assess management review outcomes	●	●
(c) Input/source material management	●	●
(d) Change to input/source material	--	●
(e) Product realisation process	●	●
(f) Change to product realisation process	--	●
(g) Equipment management	●	●
(h) Changes to equipment	--	●
(i) Traceability	●	●
(j) Product testing and review of test data	●	●
(k) Inspection	●	●
(l) Sampling for CB verification testing	●	**--**

Notes: ● Applicability of each product.

7.5 Review

No additional requirements

7.6 Certification decision

7.6.1 The CB's procedures shall ensure that any major nonconformity is closed before certification. The certification decision may be made by the reviewer providing the reviewer also satisfies the competencies of the decision maker as per Clause 6.1.2.1.3 and Table B.1. (Refer Clause 7.5)

7.7 Certification documentation

7.7.1 A valid Certificate of Conformity shall contain the following and all other information as shown in Appendix A:

(a) The identification of all permanent locations where this Scheme's activities are carried out.

(b) Logos for the CB and ATIC, and the JAS-ANZ symbol (or equivalent).

(c) A unique reference number / code.

7.7.2 The validity of the certificate shall be 3 years, commencing from the date of certification decision.

7.8 Directory of certified products

No additional requirements

7.9 Surveillance

7.9.1 The CB shall implement the surveillance program of Table 1.1 within twelve months of the certificate being issued and thereafter at annual intervals.

7.9.2 Where a major nonconformity is identified, the CB shall require the Organization to provide within 7 days, an agreed corrective action plan and timetable for implementation. Where product nonconformance is indicated, this plan shall ensure the Organization takes all necessary steps to prevent the supply of nonconforming product and, to the extent practicable and commensurate with the risks, immediately notify all other significantly affected parties. Major nonconformities shall require follow-up audit(s) within 3 months to verify implementation of corrective action.

Where a nonconformity is identified, the CB shall require the client to provide within 30 days, an agreed corrective action plan and timetable for implementation, and shall be followed up and closed by the next surveillance audit.

7.9.3 Reports of surveillance audits shall include any useful comparison with the results of previous audits.

7.10 Changes affecting certification

No additional requirements

7.11 Termination, reduction, suspension or withdrawal of certification

7.11.3 The CB shall immediately advise ATIC of suspension or withdrawal of certification.

7.12 Records

No additional requirements

7.13 Complaints and appeals

7.13.1 If a written detailed complaint about a certified product is received from a customer, ATIC, or the accreditation body, or where an additional activity is deemed necessary by the CB, the CB shall promptly take appropriate action, which may include an extraordinary audit.

8 Management system requirements

8.1 Options

No additional requirements

8.2 General management system documentation (Option A)

No additional requirements

8.3 Control of documents (Option A)

No additional requirements

8.4 Control of records (Option A)

No additional requirements

8.5 Management review (Option A)

No additional requirements

8.5.1 General

No additional requirements

8.5.2 Review inputs

No additional requirements

8.5.3 Review outputs

No additional requirements

8.6 Internal audits (Option A)

No additional requirements

8.7 Corrective actions (Option A)

No additional requirements

8.8 Preventive actions (Option A)

No additional requirements

Appendix A
Interpretation of Certificates Issued by CBs

A.1 Model Certificate

Figure 1 is a model for the certification showing an example of a specific 'ATIC Scheme 21' certificate including all location information.

Note: This model Certificate of Conformity is for information only and show the minimum information required to be included on any such certificates. It does not imply any specific layout or format, and is not intended to inhibit the house style of the CB.

Figure 1: Model 'Certificate of Conformity'

[CB's Name / Logo]

CERTIFICATE OF CONFORMITY

[Organization's Name & Address]

'ATIC Scheme 21' -
Mechanical Fasteners - Conformity Assessment

[CB's Name] issues this certificate to the above named company at the locations listed below, after finding it in compliance with 'ATIC Scheme 21' in respect of the Standard(s) and products described below.

Locations covered by this certificate

[Depot 1- Address]		
[Depot 2- Address]		
Certificate Number:	*[Certificate Number]*	
Issue Date	*[Date]*	
Renewal (expiry) Date	*[Date]*	
	[Name & Title of Authorised CB Signatory]	
Signature		

[CB's standard footer: Name / Logo / JAS-ANZ Symbol / ATIC Logo etc.]

Schedule of mechanical fasteners

Full product description covered by the certificate(s), for example:

[Common name & applications
Standards
Components, main manufacturing Standards & marking
Heads & thread
Size & dimensional characteristics
Property class & mechanical characteristics
Chemical composition
Finish & coating
Product markings for traceability]

Note: To authenticate certificates refer to: JAS-ANZ Register & *[CB's website]*.

Appendix B
Required Knowledge and Skills

B.1 General

Table B.1 specifies the knowledge and skills that a CB shall define for specific certification functions. "X" indicates that the CB shall define the criteria and depth of knowledge and skills. The knowledge and skill requirements specified in Table B1 (in brackets), are explained in more detail in ISO/IEC 17021-1, Annex A.

Table B.1: Table of Knowledge and Skills

Knowledge and skills	Sales enquiries and fee proposals	Conducting the application review #	Preparation of evaluation plans	Auditing and leading the audit team	Evaluation of test results	Independent technical review	Making certification decisions
Knowledge of business management practices	--	--	--	X (see A.2.1)	--	--	X (see A.2.1)
Knowledge of audit principles, practices and techniques	--	--	--	X (see A.2.2)	--	X (see A.3.1)	X (see A.3.1)
Knowledge of specific management system Standards/normative documents	--	X (see A.4.1)	--	X (see A.2.3)	--	X (see A.3.2)	X (see A.3.2)
Knowledge of CB's processes	X (see A.3.3)	X (see A.4.2)	X (see A.4.2)	X (see A.2.4)	X (see A.3.3)	X (see A.3.3)	X (see A.3.3)
Knowledge of client's business sector	X(see A.3.4)	X (see A.4.3)	X (see A.4.3)	X (see A.2.5)	--	X(see A.3.4)	X(see A.3.4)
Knowledge of client products, processes and organization	--	X (see A.4.4)	X (see A.4.4)	X (see A.2.6)	X (see A.3.4)	X (see A.2.6)	X (see A.2.6)
Language skills appropriate to all levels within the client organization	--	--	--	X (see A.2.7)	--	--	
Note-taking and report-writing skills	--	--	--	X (see A.2.8)	X (see A.2.8)	--	
Presentation skills	--	--	--	X (see A.2.9)	--	--	
Interviewing skills	--	--	--	X (see A.2.10)	--	--	
Audit-management skills	--	--	--	X (see A.2.11)	--	--	
Knowledge of product Standards	--	--	--	X	X	X	X
Knowledge of testing methodologies	--	--	--	X	X	X	--
Knowledge of mechanical fastener production practices	--	--		X		X	

To determine audit team competence required, to select the audit team members, and to determine the audit time.

Part 2 Requirements for Australian distributors

1 Scope

1.1 General and particular requirements of ISO 9001

This Scheme supplements, but does not diminish, the requirements of ISO 9001:2015. Also the requirements of ISO 9001 *are not duplicated in this or any other part of the document and shall be referred to separately.*

Clauses 4 to 10 should be read in conjunction with the requirements of ISO 9001.

Clause / paragraph numbers in this part reference appropriate paragraphs of ISO 9001. The requirements of ISO 9001 are deemed to apply unless specific additions are required. Where 'no specific particular requirement' is recorded under an ISO 9001 clause heading this means that it is not considered necessary to provide a particular requirement for that clause.

The particular requirements given below are to assist in the clarification of the ISO 9001 text for the relevant activity, no inference should be made that ISO 9001 requirements are diluted or deleted because of this particular requirement.

1.2 Application

See Part 0, Clause 1.2.

2 Normative references

See Part 0, Clause 2.

3 Terms, definitions and abbreviations

client

The owner or manager of the infrastructure asset.

contract specification

The specification for the mechanical fastener included in the contract.

customer

The body purchasing the mechanical fasteners from the Organization, for use in infrastructure assets.

manufacturing lot

As defined in the standard appropriate for the mechanical fastener under consideration.

supply lot

A quantity of fasteners of the same designation from the same fastener manufacturer delivered at the same time.

manufacturer

Any natural or legal person who manufactures or modifies a mechanical fastener or who has a mechanical fastener designed or manufactured, and markets the mechanical fastener under their name or trademark. A manufacturer may be registered to this Scheme for stocking and distribution activities.

manufacturer's certificate

The declaration of conformity in the English language, issued by the manufacturer of the mechanical fasteners, addressing the product related requirements of this Scheme.

mechanical fastener: product

The component and or assembly used to mechanically connect two or more elements as defined in the appropriate Standard, specified in Part 3 of this Scheme.

Organization

See Part 0, Clause 3 and Table 2.1.

quality manual

The document that specifies the QMS and the documentation to be used.

quality policy

The overall quality intentions and direction of an Organization as regards quality as formally expressed by Top Management.

splitting

The separation of mechanical fasteners belonging to the same lot into smaller quantities.

stockist distributor

An importer or distributor of mechanical fasteners. A stockist distributor may be an Organization or supplier within the supply chain of mechanical fasteners. (See Table 2.1 for application of definitions)

supplier

A stockist distributor, who may be registered to this Scheme, who supplies mechanical fasteners to the Organization. (See Table 2.1 for application of definitions)

Table 2.1: Application of Definitions to the Supply Chain

'ATIC Scheme 21' Definitions		
Manufacturer: (Product must meet the requirement for CE marking, as applicable)	**Australian Distributor: (ie: the Organization)** (The last point of sale must be certified to 'ATIC Scheme 21')	**Customer:** (Requires compliance to ATIC-SPEC Section SP39
Manufacturer (both stockist & non-stockist) ⇨	Australian Manufacturer ⇨ Local Representative for Overseas Manufacturer and/or Stockist ⇨ Wholesaler ⇨ Importer ⇨ Primary Distributor (Stockist) ⇨ Contractor ⇨	Client (direct purchase) OR Contractor

4 Context of the Organization

4.1 Understanding the Organization and its context

No additional requirements.

4.2 Understanding the needs and expectations of interested parties

Interested parties shall include the customer and client.

4.3 Determining the scope of the QMS

The scope of the QMS shall cover the stocking and distribution of mechanical fastener services that the Organization is competent to supply and for which they are seeking registration.

4.4 QMS and its processes

4.4.1 The Organization shall operate a QMS to ISO 9001:2015 and this Scheme.

4.4.2 Valid certifications are published on the JAS-ANZ website: www.jas-anz.org/register

5 Leadership

5.1 Leadership and commitment

5.1.1 General

The Organization's policy document shall include Top Management support for this Scheme.

5.1.2 Customer focus

No additional requirements.

5.2 Policy

5.2.1 Establishing the quality policy

The Organization's quality policy statement shall include a statement of commitment to this Scheme.

5.2.2 Communicating the quality policy

No additional requirements.

5.3 Organizational roles, responsibilities and authorities

No additional requirements.

6 Planning

6.1 Actions to address risks and opportunities

6.1.1 The Organization's policy document shall include Top Management support for this Scheme.

6.1.2 *No additional requirements.*

6.2 Quality objectives and planning to achieve them

6.2.1 (i) The quality objectives shall include a commitment to meet customer and client requirements with respect to the stocking and distribution of mechanical fasteners.

(ii) The quality objectives shall include maximising opportunities for the re-use and recovery of wastes.

6.2.2 *No additional requirements.*

6.3 Planning of changes

No additional requirements.

7 Support

7.1 Resources

7.1.1 General

The Organization shall be able to demonstrate that it is able to meet its customer order commitments.

7.1.2 People

No additional requirements.

7.1.3 Infrastructure

The Organization shall determine, provide and maintain the infrastructure to confirm and maintain conformity of mechanical fasteners.

7.1.4 Environment for the operation of processes

The Organization shall consider all factors that may affect maintaining mechanical fastener conformity including but not limited to temperature, humidity, lighting and cleanliness.

7.1.5 Monitoring and measuring resources

7.1.5.1 General

The Organization shall establish and maintain a record of the monitoring and measuring devices used in the verification, preservation and supply of mechanical fasteners. (See Appendix 'A' for guidance.)

7.1.5.2 Measurement traceability

The Organization shall implement and maintain processes for the calibration of monitoring and measuring devices. Where no standard exists, monitoring and measuring devices shall be calibrated in accordance with the manufacturer's instructions or the Organization's own procedures.

7.1.6 Organizational knowledge

No additional requirements.

7.2 Competence

No additional requirements.

7.3 Awareness

No additional requirements.

7.4 Communication

The Organization shall ensure that personnel have access to QMS documentation, and that the standard operating processes appropriate to their responsibilities are communicated to all relevant employees.

7.5 Documented information

7.5.1 General

The Organization shall have in place auditable processes to identify publication of relevant new Standards and documents, and implementation requirements.

7.5.2 Creating and updating

No additional requirements.

7.5.3 Control of documented *Information*

7.5.3.1 *No additional requirements.*

7.5.3.2 (i) The Organization shall have processes in place to ensure that the latest versions of relevant Standards and documents are always available.

(ii) The Organization shall typically keep the following records:

a) Customer orders including product requirements with any variations, and product delivery records.
b) Manufacturer's certificates and inspection documents.
c) Manufacturer's technical documentation, product information, instructions and safety information.
d) Verification records including records of inspection and testing of mechanical fasteners carried out by the Organization (See Clause 8.4.2).
e) Calibration and test records of any test equipment used.
f) Storage control and stock rotation records for time dependent product.

g) Records to enable mechanical fastener traceability (lot traceability) including following splitting.
h) Product recalls.
i) Non-conformance, corrective action and preventive action records.
j) Complaints and feedback.
k) Manufacturers performance reviews (See Clause 8.4.1)

(ii) Product related documented information shall be retained for a minimum of ten years after the product has been withdrawn from the market.

(iii) Customer specific documented information shall be retained for a minimum of ten years unless otherwise required to be retained for a longer period in the customer order. Documented information shall be made available to the customer and / or client as requested in accordance with contract requirements.

(iv) Where documented information is stored in an electronic form the integrity of the system and the back-up procedures shall be appropriately validated. Such information shall be traceable to the original documentation.

8 Operation

8.1 Operational planning and control

No additional requirements.

8.2 Requirements for products and services

8.2.1 Customer communication

The Organization shall ensure that documents required by the customer order / specification to accompany the mechanical fastener are provided when requested by the means specified by the customer, and are protected against loss and deterioration. The documents to accompany the mechanical fastener shall include any manufacturer product instructions and safety information in a language that can be easily understood by users.

8.2.2 Determining the requirements for products and services

No additional requirements.

8.2.3 Review of the requirements for products and services

8.2.3.1 (i) The Organization shall review in a timely manner the customer order to verify that product requirements are defined and that they are able to meet those product requirements.

(ii) From the outset and during the progress of fulfilling the customer order the Organization shall review:

a) The risks associated with meeting the customer order including delivery timescales; and
b) Opportunities for control of risks and performance improvement relating to the customer order.

(iii) Where omissions, irregularities or inconsistencies with the customer order or other customer related issues are encountered these shall be brought to the attention of the customer for resolution.

8.2.3.2 *No additional requirements.*

8.2.4 Changes to requirements for products and services

No additional requirements.

8.3 Design and development of products and services

Not applicable to this Scheme.

8.4 Control of externally provided processes, products and services

8.4.1 General

(i) Organizations shall:

a) Maintain a register of approved manufacturers and suppliers of mechanical fasteners that includes the scope of approval. The scope of approval shall include maintaining the manufacturer's identification and lot traceability
b) Periodically review manufacturers' and suppliers' performance in meeting specified purchase requirements; records of these reviews shall be used as a basis for establishing the frequency of review and level of controls to be implemented.
c) Define the necessary actions to take when dealing with manufacturers and suppliers that do not meet specified purchase requirements.
d) Prevent the purchase of counterfeit / nonconforming mechanical fasteners.

(ii) The Organization shall be responsible for the quality of all products purchased from manufacturers and suppliers, including customer-designated sources.

8.4.2 Type and extent of control

Organizations shall implement and maintain processes that are suitable for ensuring that purchased mechanical fasteners meet specified purchase requirements. Such verification processes shall include but are not necessarily limited to:

a) Obtaining objective evidence of the authenticity and quality of the mechanical fasteners such as manufacturer's certificates and/or test reports from manufacturers and / or suppliers.
b) Review of the mechanical fastener documentation to confirm authenticity, relevance, accuracy and completeness.
c) Inspection and sample testing of the mechanical fasteners upon receipt or evidence of inspection and sample testing of the mechanical fasteners undertaken by an independent testing laboratory accredited in accordance with ISO/IEC 17025 (see note below), or by an Organization certified to this Scheme. The inspection and sample testing shall include verification of dimensional characteristics and testing of the mechanical characteristics of the mechanical fasteners. (See Clause 8.6)

Note: The testing laboratory shall be a legal entity that fulfils the requirements of ISO/IEC 17025, and is accredited by a signatory of the ILAC or APLAC Mutual Recognition Arrangement (MRA) for Testing Laboratories with an accreditation scope that covers one or more of the testing methods included in this Scheme.
[ILAC & APLAC = International & Asia Pacific Laboratory Accreditation Cooperation.]

8.4.3 Information for external providers

Purchasing information for mechanical fasteners shall include:

a) The mechanical fastener description or other positive identification.
b) The relevant standards, specifications and inspection document for the mechanical fasteners.
c) For CE marked product, requirements for notification of the manufacturer's and where applicable the importer's name, registered trade name or registered trade mark, and address, which shall be a single point of contact in the case of the manufacturer.
d) Requirements for manufacturer and supplier notification to the Organization of any non-conforming product which shall include notification of any non-conforming product that could present a risk (e.g. affects reliability or safety).
e) Requirements for a manufacturer's certificate (including appropriate marking where relevant) and / or test reports, together with any related manufacturer technical documentation (see note below), product information, instructions and safety information in a language that can be easily understood by users.
f) Requirements for notification of any specific manufacturer's requirements for preservation of mechanical fasteners in the condition as supplied by the manufacturer.

Note: For CE marked product, this shall describe all the relevant elements related to the required system of assessment and verification of the certificate of conformity.

8.5 Production and service provision

8.5.1 Control of production and service provision

The Organization shall ensure that environmental conditions are suitable for the calibrations, inspections, measurements and tests being carried out.

8.5.2 Identification and traceability

(i) The Organization shall implement and maintain documented processes to ensure that retained documents and records can be clearly identified and traced.

(ii) The Organization shall implement and maintain documented processes to ensure the identification and traceability of mechanical fasteners by suitable means from receipt, during transportation, splitting, storage, packaging, and until delivery.

(iii) The Organizations processes shall include:

a) Maintaining the manufacturer's identification and lot traceability.
b) The ability to identify and trace mechanical fasteners from the same lot.
c) For CE marked product, the ability to identify the manufacturer's and where applicable the Importer's name, registered trade name or registered trade mark, and address.

8.5.3 Property belonging to customers or external providers

No additional requirements.

8.5.4 Preservation

The Organization shall implement and maintain documented processes for the appropriate transportation, handling, storage, splitting and packaging to ensure the preservation of mechanical fasteners in their condition as supplied by the manufacturer. The processes shall make provisions for:

a) Any manufacturer's recommendations / requirements.
b) Storage control and stock rotation.

8.5.5 Post-delivery activities

No additional requirements.

8.5.6 Control of changes

No additional requirements.

8.6 Release of products and services

(i) Inspection and sample testing shall be in accordance with ISO 3269 for dimensional characteristics, and ISO 3269 and Part 3, Clause 3, for mechanical characteristics.

(ii) Mechanical property requirements for mechanical fastener acceptance shall be documented and include::

a) Criteria for acceptance and/or rejection
b) A record of the measurement results, and
c) Type of measurement instruments required and any specific instructions associated with their use.

(iii) Test records shall show actual test results data.

(iv) When required by the customer, a market surveillance authority or competent national authority, the Organization shall provide evidence of the product's conformity to its technical specifications. This may include conformance documents, such as the original manufacturer's certificate and/or the evidence obtained under Clause 8.4.2 in verifying mechanical fasteners.

(v) When splitting product, records shall be kept recording amount delivered, purchase order number and customer's name.

(vi) When agreed with the customer, the Organization may provide a manufacturer's certificate created by the Organization that references the original manufacturer's certificate that are retained and traceable by the Organization.

8.7 Control of nonconforming outputs

8.7.1 (i) Non-conforming product includes any nonconforming product returned from a customer.

(ii) The Organization shall implement and maintain documented processes to ensure that mechanical fasteners that they consider or have reason to believe are non-conforming product are not placed or made available on the market and that where the product presents a risk (e.g. affects reliability or safety), the manufacturer or the importer and market surveillance authorities are informed.

(iii) The Organization shall implement and maintain documented processes to deal with mechanical fasteners that they have placed or made available on the market and that they subsequently consider or have reason to believe are non-conforming product. The processes shall include as appropriate investigating the non-conformance and taking the necessary action to bring the mechanical fasteners into conformity, withdrawal, recall and disposal of non-conforming product.

(iv) The Organization shall ensure, with the manufacturer or the importer, that similar mechanical fasteners are not similarly affected and shall where necessary inform the customer and other customers of any non-conformities affecting mechanical fasteners already delivered.

(v) In addition to any contract reporting requirements, the Organization's processes shall provide for timely reporting of delivered non-conforming product that may present a risk (e.g. affects reliability or safety). Notification shall include a clear description of the non-conformity, which includes as necessary parts affected, customer and / or Organization part numbers, quantity, date(s) delivered, and details of any corrective measures taken.

Note: Parties requiring notification of non-conforming product may include: manufacturers, importers, market surveillance authorities, relevant competent national authorities, suppliers, internal organizations, customers and stockist distributors.

(vi) Disposal of non-conforming product shall be limited to:

- scrap;
- rejection for return to the supplier;
- rejection for revalidation by the manufacturer;
- submittal to customer for "Use As Is" disposal.
- rework/repair and revalidation by the Organization

Product disposed of as scrap shall be conspicuously and permanently marked, or positively controlled, until physically rendered unusable.

8.7.2 *No additional requirements.*

9 Performance evaluation

9.1 Monitoring, measurement, analysis and evaluation

9.1.1 General

No additional requirements.

9.1.2 Customer satisfaction

No additional requirements.

9.1.3 Analysis and evaluation

(i) Statistical techniques using AQLs from ISO 3269 may be applied in inspecting and testing mechanical fasteners so long as they are statistically valid and appropriate for use.

(ii) In the event of process nonconformity, the Organization shall:

a) Take appropriate action to correct the nonconforming process,
b) Evaluate whether the process nonconformity has resulted in mechanical fastener nonconformity,
c) Identify and control any nonconforming mechanical fasteners in accordance with Clause 8.7.

9.2 Internal audit

9.2.1 *No additional requirements.*

9.2.2 (i) Internal audits shall be carried out at and by a suitable technically competent person/s to ensure a robust assessment of the compliance of the product.

(ii) Internal audits of the QMS against this Scheme shall include office-based audits of the processes associated with stocking and distribution, at no more than twelve monthly intervals.

9.3 Management review

9.3.1 General

The Organization shall review the QMS at least once every twelve months to ensure its continuing suitability and effectiveness to conform to this Scheme.

9.3.2 Management review inputs

No additional requirements.

9.3.3 Management review outputs

The output and actions from the management review shall be considered by Top Management at regular intervals throughout the year.

10 Improvement

10.1 General

No additional requirements.

10.2 Nonconformity and corrective action

No additional requirements.

10.3 Continual improvement

No additional requirements.

Appendix A
Guidance for the Control of Monitoring and Measuring Devices

A.1 General

Table A.1.1 is provided as an example to assist Organizations establish and maintain a register for monitoring and measuring devices.

A.2 Calibration

Calibrations to comply with the following:

a) 'In house' calibrations (of equipment measuring criteria that do not directly determine compliance with the product Standard) shall be in accordance with procedure(s) described in the equipment's operating manual or the Organization's own procedures and shall be against equipment that has been externally calibrated in accordance with (b).
b) External calibrations (of equipment measuring criteria that directly determine compliance with the product Standard) shall be certified by accredited laboratories providing traceability to national measurement Standards.
c) Records of all equipment in use, their calibration status and calibration or verification checks undertaken shall be implemented and maintained

Table A.1.1: Example Record of Monitoring and Measuring Devices

Equipment & Unique Reference Number	Equipment Test Specification	Calibration Control	Calibration Frequency	Date of Calibration	Date Next Calibration Due	Calibration Certificate Reference

Part 3 Requirements for mechanical fasteners

1 Introduction

1.1 Inspection and testing requirements for mechanical characteristics falls into 3 categories:

- Category 1: Products that fall within EN 15048 (non-preloaded) (see Table A.1)
- Category 2: Products that fall within EN 14399 (preloaded) (see Table A.2)
- Category 3: Products not included in EN 14399 and EN 15048 (see Table A.3).

2 References

Where the issue date is omitted, the latest version of these Standards shall be adopted except that, for the first three years after the date of issue, the previous version may also be adopted.

The normative references for this Part 3 are:

AS 1110:2015	ISO metric hexagon bolts and screws - Product grades A and B - Part 1: Bolts. - Part 2: Screws.
AS 1111:2015	ISO metric hexagon bolts and screws - Product grades C - Part 1: Bolts. - Part 2: Screws.
AS 1112:2015	ISO metric hexagon nuts - Part 1: Style 1 - Product grades A and B - Part 2: Style 2 - Product grades A and B - Part 3. Product grade C - Part 4: Chamfered thin nuts - Product grades A and B.
AS 1237	Plain washers for metric bolts, screws and nuts for general purposes - Part 1:R2015 General plan. - Part 2:2016 Tolerances.
ISO 898	Mechanical properties of fasteners - Part 1:2013 Bolts, screws and studs with specified property classes - Coarse thread and fine pitch thread - Part 2:2012 Nuts with specified proof load values - Coarse thread fasteners.
ISO 3506:2009	Mechanical properties of corrosion-resistant stainless steel fasteners - Part 1: Bolts, screws and studs. - Part 2: Nuts.
ISO 3269:2001	Fasteners – Acceptance Inspection
EN 14399	High-strength structural bolting assemblies for preloading - Part 1:2015 General requirements. - Part 2:2015 Suitability test for preloading. - Part 3:2015 System HR - Hexagon bolt and nut assemblies. - Part 4:2015 System HV- Hexagon bolt and nut assemblies. - Part 5:2015 Plain washers. - Part 6:2015 Plain chamfered washers - Part 7:2007 System HR- Countersunk head bolt & nut assemblies. - Part 8:2007 System HV- Hexagon fit bolt and nut assemblies - Part 9:2009: System HR or HV- Direct tension indicators for bolt and nut assemblies. - Part 10: Bolt and nut assemblies with calibrated preload.
EN 15048	Non-preloaded Structural Bolting Assemblies - Part 1:2016 General requirements. - Part 2:2016 Fitness for purpose.

Table A.1, Category 1: Mechanical Fastener Test Requirements

PRODUCTS WHICH FALL WITHIN EN 15048 (NON-PRELOAD)		
Component	**Test & Specification**	**Comment**
External Threaded Items	Wedge Tensile ISO 898-1	If the test result is above the minimum for the relevant property class and below the minimum of the next higher property class the result is satisfactory. If the result is above the minimum of the next higher property class, hardness testing shall be carried out and the result shall not exceed the maximum hardness for the relevant property class.
Internal Threaded Items	Proof Load & Hardness ISO 898-2	If the internal threaded item is supplied together with an external threaded item as an assembly and the assembly satisfies the EN 15048-2 Suitability Test then proof load testing of the internal threaded item is not required.
If an assembly is to be supplied, then the following test shall be conducted in addition to the individual component tests shown above.		
External and Internal Threaded Items - to be supplied together	Suitability Test EN 15048-2	

Table A.2, Category 2: Mechanical Fastener Test Requirements

PRODUCTS WHICH FALL WITHIN EN 14399 (PRELOAD)		
Component	**Test & Specification**	**Comment**
External Threaded Items	Wedge Tensile ISO 898-1	If the test result is above the minimum for the relevant property class and below the minimum of the next higher property class the result is satisfactory. If the result is above the minimum of the next higher property class, hardness testing shall be carried out and the result shall not exceed the maximum hardness for the relevant property class.
Internal Threaded Items	Proof Load & Hardness EN 14399 relevant part	If the internal threaded item is supplied together with an external threaded item as an assembly and the assembly satisfies the EN 14399-2 Suitability Test then proof load testing of the internal threaded item is not required.
Washers	Hardness Test EN 14399-5, -6, -9	
Direct Tension Indicators	Performance Test EN 14399-9	
Tension Controlled Bolts (TCB) / System HRC	See Comment	TCB / System HRC assembly components shall be tested individually as External Threaded items, Internal Threaded items and Washers, as above.
If an assembly is to be supplied, then the following test shall be conducted in addition to the individual component tests shown above.		
External and Internal Threaded Items - to be supplied together	Suitability Test EN 14399-2	
TCB / System HRC	Suitability Test EN 14399-10	

3 Category 3 products not included in EN 14399 and EN 15048

3.1 Products which do not fall within the scope of EN 15048 or EN14399, shall be tested in accordance with ISO 3269 and Table A.3:

Table A.3
Values to be used with ISO 3269:2001

AQL to be used for non-destructive tests	0.65
AQL to be used for destructive tests	1.5
Ac Level	0

4 Non-preload Assembly Test Standards

4.1 The Australian Standards listed in Table A.4, are identical with and have been reproduced from the ISO Standards shown in brackets, and are examples of Category 1 products which fall within the scope of EN 15048 (Non-preload).

Table A.4
AS (& ISO Equivalents) for use with EN 15048 (Non-preload)

Standard	Title (and Abstract)
AS 1110.1 *(ISO 4014:2011)*	ISO metric hexagon bolts and screws - Product grades A and B – Bolts
	Specifies the dimensions, tolerances and material requirements for hexagon head bolts, ISO product grades A and B and ISO metric coarse threads and diameters from 1.6 mm to 64 mm inclusive.
AS 1110.2 *(ISO 4017:2014)*	ISO metric hexagon bolts and screws - Product grades A and B – Screws
	Specifies the dimensions, tolerances and material requirements for hexagon head screws, ISO product grades A and B with ISO metric coarse threads and diameters from 1.6 mm to 64 mm inclusive.
AS 1111.1 *(ISO 4016:2011)*	ISO metric hexagon bolts and screws - Product grade C – Bolts
	Specifies the dimensions, tolerances and material requirements for hexagon head bolts, ISO product grade C with ISO metric coarse threads and diameters from 5 mm to 64 mm inclusive.
AS 1111.2 *(ISO 4018:2011)*	ISO metric hexagon bolts and screws - Product grade C – Screws
	Specifies the dimensions, tolerances and material requirements for hexagon head screws, ISO product grade C with ISO metric coarse threads and diameters from 5 mm to 64 mm inclusive.
AS 1112.1 *(ISO 4032:2012)*	ISO metric hexagon nuts - Style 1 - Product grades A and B
	Specifies dimensions, tolerances and material requirements for style 1 hexagon nuts, ISO product grades A and B with ISO metric coarse threads and diameter from 5 mm to 64 mm inclusive.
AS 1112.2 *(ISO 4033:2012)*	ISO metric hexagon nuts - Style 2 - Product grades A and B
	Specifies dimensions, tolerances and material requirements for hexagon nuts, ISO product grades A and B with ISO metric coarse threads and diameter from 5 mm to 64 mm inclusive.
AS 1112.3 *(ISO 4034:2012)*	ISO metric hexagon nuts - Product grade C
	Specifies dimensions, tolerances and material requirements for hexagon nuts, ISO product grade C with ISO metric coarse threads and diameters from 5 mm to 64 mm inclusive.
AS 1112.4 *(ISO 4035:2012)*	ISO metric hexagon nuts - Chamfered thin nuts - Product grades A and B
	Specifies dimensions, tolerances and material requirements for hexagon chamfered thin nuts, ISO product grades A and B with ISO metric coarse threads and diameter from 1.6 mm to 64 mm inclusive.
AS 1237.1 *(ISO 887:2000 Cor.1.2006)*	Plain washers for metric bolts, screws and nuts for general purposes - General plan
	Specifies the nominal dimensions for plain washers product grades A and C for use with metric general-purpose bolts, screws and nuts with nominal thread diameter from 1 mm to 150 mm inclusive.
AS 1237.2 *(ISO 4759-3:2016)*	Plain washers for metric bolts, screws and nuts for general purposes – Tolerances
	Specifies the tolerances for the principle fasteners of plain washers of product grades A and C for use with metric bolts, screws, studs and nuts with nominal thread diameters from 1 mm to 150 mm inclusive.
(ISO 3506-1)	Mechanical properties of corrosion-resistant stainless steel fasteners - Part 1: Bolts, screws and studs
	Specifies the mechanical properties of bolts, screws and studs made of austenitic, martensitic and ferritic steel grades of corrosion-resistant stainless steels, when tested over an ambient temperature range of 10 °C to 35 °C. Properties vary at higher or lower temperatures.
(ISO 3506-2)	Mechanical properties of corrosion-resistant stainless steel fasteners - Part 2: Nuts
	Specifies the mechanical properties of nuts made of austenitic, martensitic and ferritic steel grades of corrosion-resistant stainless steels, when tested over an ambient temperature range of 10 °C to 35 °C. Properties vary at higher or lower temperatures.

5 HS Structural Bolting Assemblies Standards

5.1 Table A.5 outlines the scopes of AS/NZS and EN Standards for High-strength Structural Bolting Assemblies.

Table A.5
HS Structural Bolting Assemblies: Scopes

Standard, Title (and abstract)
EN 15048-1 Non-preloaded structural bolting assemblies - Part 1: General requirements. *Specifies the general requirements for the components of bolt/nut/washer assemblies for non-preloaded structural bolting and for the assemblies themselves. It applies to bolts (including screws, studs and stud bolts) and nuts made of carbon steel, alloy steel and stainless steel with the following property classes:* *- bolts made of carbon steel and alloy steel: 4.6, 4.8, 5.6, 5.8, 6.8, 8.8, 10.9;* *- nuts made of carbon steel and alloy steel: 4, 5, 6, 8, 10, 12;* *- bolts and nuts made of austenitic stainless steel: 50, 70, 80;* *- if appropriate, washers according to hardness class HV 100 or HV 200.* *Notes: (i) The property classes 4.8, 5.8 and 6.8 may be subjected to limitations of use (refer to EN 1090-2). (ii) It applies to thread sizes from M12 to M36 and to the associated washers but does not preclude the use of other sizes. (iii) Bolted connections with components to this Standard are able to be shear and/or tensile loaded. (iv) Bolts, nuts and washers to this Standard are not normally intended for welding.* **EN 15048-2** Non-preloaded structural bolting assemblies - Part 2: Fitness for purpose. *Specifies a tensile test for bolt/nut assemblies to guarantee their suitability for non-preloaded bolted connections in civil engineering structures. It applies to assemblies of bolts, nuts (and washers if required) with dimensional and mechanical characteristics as specified in EN 15048-1.*
EN 14399-1 High-strength structural bolting assemblies for preloading - Part 1: General requirements. *Specifies the general requirements for the components of bolt/nut/washer(s) assemblies for high strength structural bolting, which are suitable for preloading, and for the assemblies themselves.* *Examples for components which fulfil the requirements of this document are specified in EN 14399-3, EN 14399-4, EN 14399-5 and EN 14399-6.* **EN 14399-2** High-strength structural bolting assemblies for preloading - Part 2: Suitability test for preloading. *Specifies a tightening test to verify the suitability of high strength bolt/nut/washer assemblies for preloaded bolted connection in metallic structures. The purpose of this test is to check the behaviour of the fastener assembly so as to ensure that the required preload can be reliably obtained by the tightening methods specified in EN 1090-1 with sufficient margins against over tightening and against failure.* **EN 14399-3** High-strength structural bolting assemblies for preloading - Part 3: System HR - Hexagon bolt and nut assemblies. *Specifies, together with EN 14399-l, the requirements for assemblies of high-strength structural bolts and nuts of system HR suitable for preloaded joints with large widths across flats, thread sizes Ml2 to M36 and property classes 8.8/8 and 10.9/10.* **EN 14399-4** High-strength structural bolting assemblies for preloading - Part 4: System HV- Hexagon bolt and nut assemblies. *Specifies, together with EN 14399-1 the requirements for assemblies of high-strength structural bolts and nuts of system HV suitable for preloaded joints with large widths across flats, thread sizes M12 to M36 and property classes 10.9/10.* **EN 14399-5** High-strength structural bolting assemblies for preloading - Part 5: Plain washers. *Specifies, together with EN 14399-1, hardened and tempered plain washers intended for assembly with large series hexagon high-strength structural bolts and nuts with threads from M12 to M36 inclusive. Washers according to this standard can be applied under the nut only.* **EN 14399-6** High-strength structural bolting assemblies for preloading - Part 6: Plain chamfered washers. *Specifies, together with EN14399-1, hardened and tempered plain washers with chamfer intended for assembly with large series hexagon high-strength structural bolts and nuts with thread sizes from Ml2 to M36 inclusive.* **EN 14399-7** High-strength structural bolting assemblies for preloading - Part 7: System HR - Countersunk head bolt and nut assemblies. *Specifies general requirements; testing for conformity evaluation; evaluation of conformity; regulatory marking; for assemblies of high-strength structural countersunk bolts and nuts of system HR suitable for preloaded joints with thread sizes M12 to M36 and bolt property classes 8.8 and 10.9 and EN 14399-2 for suitability testing.* **EN 14399-8** High-strength structural bolting assemblies for preloading - Part 8: System HV- Hexagon fit bolt and nut assemblies. *Specifies general requirements; testing for conformity evaluation; evaluation of conformity; regulatory marking; for assemblies of high-strength structural fit bolts and nuts of system HV suitable for preloaded joints with, thread sizes M12 to M36 and bolt property class 10.9.* **EN 14399-9** High-strength structural bolting assemblies for preloading - Part 9: System HR or HV- Direct tension indicators for bolt and nut assemblies. *Specifies the requirements for assemblies of high-strength structural bolts and nuts, with large width across flats, of system HR or HV, including the requirements for the general dimensions, tolerances, materials and performance for two grades, H8 and HI0, of compressible washer-type direct tension indicators, nut face washers and bolt face washers suitable for preloaded joints.* **EN 14399-10** High-strength structural bolting assemblies for preloading - Part 10: Bolt and nut assemblies with calibrated preload. *Specifies, together with EN 14399-1, the requirements for assemblies of high-strength structural bolts and nuts of system HRC suitable for preloaded joints, with hexagon head (large widths across flats) or cup head, thread sizes M12 to M30 and property class 10.9/10.*