

Practice Note – What is a prescriptive standard?

Purpose

This Practice Note is provided for the purposes of section 3(2) of the *Professional Engineers Registration Act 2019* (the Act). It sets out the requirements for determining whether a document is a prescriptive standard.

It covers the:

- meaning of a prescriptive standard under the Act
- prescriptive standard exemption
- criteria for determining a prescriptive standard
- different types of prescriptive standards, and
- performance of work under a prescriptive standard.

It also includes checklists for determining when a document is a prescriptive standard, and when the prescriptive standard exemption applies.

What the Act requires

Under the Act an engineering service is not a professional engineering service if it is “provided only in accordance with a prescriptive standard”.¹ This means that a person providing a professional engineering service only in accordance with a prescriptive standard does not need to be registered with the Business Licensing Authority to provide that engineering service.

A prescriptive standard is defined in section 3(1) of the Act as “a document that states procedures or criteria –

- (a) for carrying out a design, or a construction or production activity, relating to engineering; and
- (b) the application of which, to the carrying out of the design, or the construction or production, activity, does not require advanced scientifically based calculations;”.

The prescriptive standard exemption is one of two exemptions from the requirement to be registered that is provided under the Act. The second exemption allows an unregistered person to carry out professional engineering services provided they do so under the direct supervision of a registered practising professional engineer.²

For guidance on the meaning of professional engineering services and direct supervision see the “Guidelines on providing professional engineering services” and the “Guidelines on direct supervision” at consumer.vic.gov.au/engineers.

The prescriptive standard exemption

For an engineering service to qualify for the prescriptive standard exemption it must be provided:

- in accordance with, and
- only in accordance with

a ‘prescriptive standard’.

¹ Definition of professional engineering service in section 3(1) of the *Professional Engineers Registration Act 2019*.

² A professional engineer who is registered with the Business Licensing Authority as a ‘non-practising’ professional engineer cannot provide professional engineering services.



Criteria for determining a prescriptive standard

For a standard to be a prescriptive standard it must meet four criteria. It must:

- (i) be a document
- (ii) state procedures or criteria for carrying out the design, or the construction or production activity to which it relates
- (iii) require little or no engineering judgement to apply the stated procedures or criteria, and
- (iv) not require advanced scientifically based calculations to apply the stated procedures or criteria.

These criteria are described in detail below.

(i) The standard is in the form of a document

A prescriptive standard must be a document as it must physically record in some way the procedures or criteria for the activities it covers. Verbal instructions and procedures or criteria carried out from memory, without being documented in any way, cannot be a prescriptive standard.

A document is something on which things are written, printed or inscribed and which gives information. A document may be a physical or electronic written record but can also include:

- “any book, map, plan, graph or drawing
- any photograph
- any label, marking or other writing which identifies or describes anything of which it forms part, or to which it is attached by any means whatsoever
- any disc, tape, soundtrack or other device in which sounds or other data (not being visual images) are embodied so as to be capable (with or without the aid of some other equipment) of being reproduced therefrom
- any film (including microfilm), negative, tape or other device in which one or more visual images are embodied so as to be capable (with or without the aid of some other equipment) of being reproduced therefrom, and
- anything whatsoever on which is marked any words, figures, letters or symbols which are capable of carrying a definite meaning to persons conversant with them”.³

(ii) The document states procedures or criteria


The prescriptive standard must state procedures or criteria for carrying out the activity to which it relates. Procedures are the way the activity is to be done. Criteria are the principles and standards the activity must comply with and will be assessed against. If a document does not state one or more ways of performing or conducting the activity it covers, or one or more principles or standards by which the activity will be assessed, it is not a prescriptive standard.

(iii) Little or no choice or judgement is required

An element of a prescriptive standard is that it requires little or no choice or judgement to apply the procedures or criteria it sets out. This is because, by definition, any ‘prescriptive’ standard or approach sets specific actions, measurements or other qualifiable means as the sole means of complying with it. For example, a standard design template developed by a registered professional engineer requires no judgement if prescriptively followed.

If the procedures or criteria require more than little or no choice or judgement to apply engineering principles and/or interpret engineering calculations or data, to the activity being undertaken, the document is not a prescriptive standard.

³ Section 38 *Interpretation of Legislation Act 1984*.



Therefore, a prescriptive standard provides a well-described and comprehensive approach that is easy to understand and follow. For example, pressure vessel fabrication drawings, which include materials, dimensions and parameters that can be simply followed to undertake work in particular circumstances.

A prescriptive standard usually applies to a repetitive engineering activity that is routine, involves manageable risk and has minimal scope for misinterpretation, or to an activity normally carried out by an engineering technologists or technician⁴ e.g. an electrician.

(iv) No advanced scientifically based calculations are required

A prescriptive standard must not require advanced scientifically based calculations to carry out the activity it covers.

Advanced scientifically based calculations include the science, physics and mathematics calculations that are required to model real world engineering applications and that combine mathematical theory and practical engineering. Calculations that use software modelling or computational simulations are not necessarily advanced scientifically based calculations.

Advanced scientifically based calculations are distinguished from other engineering calculations by the level of engineering and mathematical knowledge required to calculate and interpret the output.

An example of a calculation that WOULD BE classified as 'advanced scientifically based'

Analysing power flows in a system using the Newton-Raphson method of solving nonlinear equations.

Power flow studies require a highly developed understanding of various branches of mathematics, including linear algebra and multivariable calculus. In practice, such calculations may be carried out by computational software. However, the level of electrical engineering knowledge required to accurately interpret the output and provide sound engineering advice exceeds that of the routine case.

An example of a calculation that WOULD NOT BE classified as 'advanced scientifically based'

The method for determining voltage drop specified in AS/NZS 3008.1.1:2017 Electrical installations.

Low-voltage installation voltage drop determined by the method in AS/NZS 3008 would not be categorised as advanced scientifically based because it only requires substitution of known or specified values into a defined formula and a general understanding of mathematical principles.

Further, the output of the calculation is evaluated with respect to thresholds set in AS/NZS 3000:2018 (Wiring Rules), thus constraining the level of engineering knowledge required to interpret the results.


Advanced scientifically based calculations, which usually require the application of sometimes complex engineering principles and data, can only be made by a person with the level of knowledge and experience required of a registered practising professional engineer. Calculations required by a prescriptive standard must be able to be performed by a non-professional engineer who may have been trained in the use of such calculations.

If calculations in a standard can only be made by a person with the level of knowledge and experience of a registered practising professional engineer, the standard is not a prescriptive standard.

Services are provided only in accordance with a prescriptive standard

To qualify for the prescriptive standard exemption, an engineering service being carried out under a prescriptive standard must be provided 'only' in accordance with that standard. That is, the whole of the professional engineering service/s must be provided under the prescriptive standard and the prescriptive standard must be prescriptively followed.

⁴ Engineering technologists and technicians adopt and apply technologies or develop related technologies to create, operate, maintain and improve the systems, applications and equipment devised by professional engineers.



If the professional engineering service/s deviates even slightly from the process detailed in the prescriptive standard being used or includes engineering services being done outside that standard, the prescriptive standard exemption will not apply.

Published and internal prescriptive standards

A prescriptive standard may be a document that is:

- published by a body such as Standards Australia (published document), or
- endorsed by a registered professional engineer (internal document).

Published document

While Standards Australia and similar bodies may publish standards, many Australian Standards and other published standards may not meet the definition of a prescriptive standard as they require more than little or no judgement and/or advanced scientifically based calculations to follow the stated procedures or criteria.

However, in other situations such formal standards will be prescriptive standards. For example, AS/NZS 3000:2018 Electrical Installations (the Wiring Rules), would be considered a prescriptive standard for the design and construction of a typical domestic electrical installation.

Internal document

For an internal document to be a prescriptive standard it must be endorsed by a registered professional engineer for application in particular circumstances.

As with a published document, an internal document must meet the requirements for a prescriptive standard set in the Act – state procedures and criteria and not require scientifically based calculations – and not require the person using the document to make a judgement about whether it applies in a particular situation or how to follow the procedures or criteria.

A decision to use a prescriptive standard

A decision to use a prescriptive standard is likely to be a professional engineering service because it requires professional judgement about which prescriptive standard to apply in a particular situation.

Where such a decision:


- is a professional engineering service, the decision to use a prescriptive standard must be made by a registered professional engineer, or
- is not a professional engineering service, the decision to use a prescriptive standard does not need to be made by a registered professional engineer.

Checklist for determining whether a document is a prescriptive standard

It is important that registered practising professional engineers understand what is and is not a prescriptive standard so that they can leave activities undertaken only in accordance with prescriptive standards to unregistered engineers or technicians. In turn, registered practising professional engineers can concentrate on carrying out or providing direct supervision for professional engineering services that are not provided only in accordance with a prescriptive standard.

A document is a prescriptive standard if it:

- provides a physical or electronic record of the procedures and criteria for the activity it covers, and

- 
- details and explains exactly how the procedures or criteria will apply to the activity it covers, and
 - requires little or no choice or engineering judgement to apply the procedures or criteria it sets out, and
 - provides a simple, well-described and comprehensive approach that clearly explains how to carry out the activity so that the knowledge and experience of a registered practising professional engineer is not needed.

The prescriptive standard exemption from registration applies if an engineering service is provided:

- in accordance with a prescriptive standard, and
- only in accordance with that standard.