

Australian Standard™

**Coated steel wire fencing products for
terrestrial, aquatic and general use**



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Australian Standard™

Coated steel wire fencing products for terrestrial, aquatic and general use

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee MT-001, Iron and Steel, to supersede AS 2423 — 1991, *Galvanized wire fencing products*. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian rather than an Australian/New Zealand Standard.

The objective of this Standard is to ensure that the requirements and options for zinc/aluminium-alloy coated steel wire products are met for a broad range of applications including marine and general uses for fencing applications.

This revision now includes requirements for zinc/aluminium-alloy coatings and organic coatings together with comprehensive information on product durability. The range of fencing materials has been extended to cover welded mesh fabrics and specialized products for aquatic enclosures.

In preparing this Standard cognizance was taken of ISO 7900:1988, *Zinc-coated steel wire for fencing*. This International Standard was not adopted because its scope is limited to zinc-coated single-strand wires. It does not cover any fabricated fencing products, nor zinc/aluminium-alloy coatings or supplementary organic coatings.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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STANDARDS AUSTRALIA

Australian Standard

Coated steel wire fencing products for terrestrial, aquatic and general use

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements, and sets out options, for zinc or zinc/aluminium-alloy coated steel wire and wire products for a broad range of fences, trellises, enclosures and the like. Terrestrial, aquatic (notably marine) and general uses are covered.

In addition, the Standard provides for the optional application of organic coatings, such as paints and plastics, on the metallic coated wire and wire products.

The following types of fencing product are included in the Standard:

- (a) Wires (single strand) for direct use and for conversion into fabricated products.
- (b) Barbed wire.
- (c) Wire netting.
- (d) Chain-link fencing fabric.
- (e) Prefabricated field fencing fabric.
- (f) Lightweight and mediumweight welded mesh fabric.
- (g) Heavyweight welded mesh fabric (panels).
- (h) Specialized products for aquatic enclosures.

Only specialized, continuous or in-line processes, both hot-dip and electrolytic, are specified for application of the zinc or zinc/aluminium-alloy coating to single-strand wires and most of the fabricated products. The main exception is for heavyweight welded mesh fabric where the batch hot-dip process is commonly used to apply the metallic coating.

This Standard does not apply to some products that are employed for specialized uses, even though the same, or very similar, requirements and specifications may be applicable. One such product, welded wire fabric for life safety applications, is covered by AS/NZS 4389.

NOTES:

- 1 Advice and recommendations on information to be supplied by the purchaser at the time of enquiry and order are contained in the purchasing guidelines set out in Appendix A.
- 2 Means for determining compliance with this Standard are given in Appendix B.
- 3 Where the term 'fence' or 'fencing' is used in a non-specific context in this Standard, it implies any of the products and applications covered by this Standard.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS	
1199	Sampling procedures and tables for inspection by attributes
1391	Methods for tensile testing of metals

AS

- 1399 Guide to AS 1199—Sampling procedures and tables for inspection by attributes
- 1442 Carbon steels and carbon-manganese steels—Hot-rolled bars and semifinished products
- 2331 Methods of test for metallic and related coatings
- 2331.3.1 Method 3.1: Corrosion and related property tests—Neutral salt spray (NSS) test
- 2505 Metallic materials
- 2505.5 Part 5: Wire—Simple torsion test
- 2700 Colour Standards for general purposes
- 2706 Numerical values—Rounding and interpretation of limiting values
- 3894 Site testing of protective coatings
- 3894.3 Method 3: Determination of dry film thickness
- 3942 Quality control—Variables charts—Guide

AS/NZS

- 1580 Paints and related materials—Methods of test
- 1580.601.3 Method 601.3: Colour—Methods of colour measurement
- 1580.601.4 Method 601.4: Colour—Calculation of colour differences
- 2312 Guide to the protection of iron and steel against exterior atmospheric corrosion
- 2633 Guide to the specification of colours
- 4389 Safety mesh
- 4506 Metal finishing—Thermoset powder coatings
- 4534 Zinc and zinc/aluminium-alloy coatings on steel wire
- 4680 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles

AS/NZS ISO

- 9001 Quality management systems—Requirements
- 9004 Quality management systems—Guidelines for performance improvements
- HB 18 Guidelines for third-party certification and accreditation
- HB 18.28 Guide 28—General rules for a model third-party certification system for products

ISO

- 9223 Corrosion of metals and alloys—Corrosivity of atmospheres—Classification

BS

- 2782 Methods of testing plastics
- 2782-1 Part 1: Thermal properties
- Method 151A—Determination of cold bend temperature of flexible polyvinyl chloride extrusion compound

ASTM

- D 412 Test methods for vulcanized rubber and thermoplastic rubbers and thermoplastic elastomers—Tension
- D 792 Test methods for density and specific gravity (relative density) of plastics by displacement
- D 1203 Test methods for volatile loss from plastics using activated carbon methods

ASTM

- D 1238 Test method for melt flow rates of thermoplastics by extrusion plastometer
- D 1242 Test methods for resistance of plastic materials to abrasion
- D 2240 Test method for rubber property —Durometer hardness
- D 2287 Specification for nonrigid vinyl chloride polymer and copolymer moulding and extrusion compounds
- G 154 Practice for operating fluorescent light apparatus for UV exposure of nonmetallic materials

1.3 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.3.1 Batch

A quantity of some commodity produced under conditions which are considered uniform.

NOTE: Each batch is assumed, as far as practicable, to consist of materials or items of a single type, grade, class, size, and composition, and to have been manufactured under essentially the same conditions at essentially the same time.

1.3.2 Breaking load

A wire industry term for the maximum force attained in tensile testing wire, this being before fracturing actually occurs; the breaking load converts to tensile strength, or UTS, when divided by the original cross-sectional area of the test piece.

1.3.3 Camber

A term describing the deviation from overall linearity (that is, general sideways curvature), relative to a prescribed straight line, of a specified length of broad, fabricated fencing product, such as netting, after it has been unwound from a roll and allowed to lie naturally (flat and unrestrained) on a horizontal surface.

1.3.4 Coil

A continuous length of single-strand wire, neatly and compactly wound in the form of a torus (quoit shape) and containing no mechanical joints (such as knots), but may contain electric resistance butt-welds, provided they are made before metallic coating.

1.3.5 End user

The person(s) or organization that actually uses, or is responsible for, the fencing wire or fabricated fencing product in fence erection or in the ultimate fencing or enclosure construction (see Clause 1.3.19).

1.3.6 Fabric

A general term for a long, broad (wide) fencing product, supplied in the form of rolls, sheets or panels, and that is manufactured by forming, weaving or welding a number of individual wires of the same or similar diameter and properties into a continuous open pattern, thus forming a mesh.

1.3.7 Galvanized

Describes a protective coating obtained by dipping (immersing) prepared steel wire and wire products in a bath of molten zinc of purity not less than 98%.

NOTE: By definition, the terms 'galvanized' and by extension, 'galvanizing' relate strictly to the hot-dip application of zinc. However, zinc coatings applied by alternative processes may also be referred to as 'galvanized', provided they are distinguished at all times by a distinctive, process-specific qualifier or prefix, such as 'electrolytic' or 'electro' (but not by cryptic abbreviations, such as 'e-' or 'el').

1.3.8 Height

Equivalent to width; the term relates to the height of a fabricated fencing product as if it has already been erected in a fence.

1.3.9 Length

In relation to a fencing wire or fabricated fencing product, the overall greatest dimension (usually quoted in metres), as measured during manufacture.

1.3.10 Manufacturer

Person(s) or organization that produces single-strand fencing wires or converts fencing wires into fabricated fencing products (e.g. barbed wire and netting).

1.3.11 Mesh

The network of individual apertures, or openings, that have been progressively built up (by weaving, for example) to form a fabric.

NOTE: Mesh apertures, each enclosed by wires in the fabric, form the pattern of regular geometric shapes characterizing the fabric.

1.3.12 Metallic coating

A protective coating applied by a specialized, continuous or in-line process or by a batch process, and consisting of zinc or zinc/aluminium alloy as defined in Clauses 1.3.7, 1.3.27 and 1.3.28.

1.3.13 Organic coating

A coating of paint or plastic, based on one or more organic resins or polymers in the form of liquid, granules or powder, applied by a variety of processes over the metallic coated substrate, to provide corrosion protection, for product differentiation or for aesthetics.

NOTE: Where the final organic coating is nominally less than 0.080 mm (80 µm) in thickness (e.g. paint), it is referred to in this Standard as a thin organic coating. Where it is nominally more than 0.080 mm thick (e.g. extruded PVC), it is described as a thick organic coating or, more usually, a plastic coating.

1.3.14 Ovality

The difference between the maximum and minimum diameters of a wire, measured at the same cross-section; also known as out-of-roundness.

1.3.15 Panel

Substantially rigid sheet of welded mesh fabric, usually having sturdy longitudinal edges of wire, or subsequently added bar or tubing, each designed to provide strength, safety and a decorative finish; a panel is essentially in its final form for direct insertion into a fence, or into fencing modules, without the need for trimming, shaping or other adjustment.

1.3.16 PE (polyethylene or polythene) coating

An organic coating having a polymer base composed of at least 85% ethylene (also known as ethene), which constitutes essentially the only monomer.

1.3.17 Plastic coated/coating

Synonymous with 'thick organic coated/coating' as defined in Clause 1.3.13.

1.3.18 Powder coating

An organic coating, consisting of pigments and reinforcing fillers combined with resins such as epoxy and polyester, that has been deposited over the metallic coating by electrostatic spraying or from a fluidized bed, followed by a sintering process.

1.3.19 Purchaser

Optional definitions are as follows —

- (a) person(s) or organization supplied with single-strand wire for resale or for conversion to a fabricated fencing product, the purchaser thereby becoming the manufacturer of the latter;
- (b) person(s) or organization supplied with any fabricated fencing product for resale; or
- (c) the purchaser may also be the end user (see Clause 1.3.5).

1.3.20 PVC (polyvinyl chloride) coating

A non-rigid (soft) organic coating having a homopolymer or copolymer base obtained by various polymerization processes, where the resin portion of the composition contains at least 99.9% vinyl chloride.

1.3.21 Roll

In relation to fabricated fencing products, one continuous length of product that has been neatly wound into the form of a compact cylinder. Depending on the type of product, component wires of a roll may contain electric resistance butt-welded joints, made only before metallic coating, and mechanical joints, such as knots.

NOTE: In common parlance, a roll may be referred to as a coil, e.g. a coil of netting.

1.3.22 Selvedge

Longitudinal edge wire(s) of fabricated fencing product, such as netting and prefabricated field fencing fabric, so woven, attached, or shaped to prevent unravelling or fraying of the product at its edges.

NOTE: The term is also applied to a separate single-strand fence wire placed and secured at the top and bottom of fabricated fencing products to support them in the finished fence.

1.3.23 Sheet

A flexible or semi-rigid, substantially flat, rectangle of fabricated fencing product, such as welded mesh fabric, supplied in a pre-determined length.

1.3.24 Single strand

Describes a single wire intended either for direct use in fence, trellis or enclosure construction, or for manufacture into fabricated products for fences and trellises and the like (e.g. barbed wire).

1.3.25 Sintering

Process involving agglomeration of organic particles on wire, by heating below their melting temperature, to produce a consolidated coating; the process is also known as fusion.

1.3.26 Width

Refers to the transverse dimension, as opposed to length, of a fabricated fencing product manufactured in coils, rolls, sheets or panels; also referred to as height.

1.3.27 Zinc coating

A coating applied to prepared steel wire and wire products by a suitable method, such as by (hot-dip) galvanizing (see Clause 1.3.7) or by electrodeposition of essentially pure zinc.

1.3.28 Zinc/aluminium-alloy coating

A coating obtained by dipping (immersing) prepared steel wire and wire products in molten zinc/aluminium alloy containing between 4.5% and 50% aluminium, the predominant coating designation suffix being Z5A, i.e. zinc/5% aluminium.

1.4 WIRE AND WIRE PRODUCTS MANUFACTURE

Fencing wires shall be manufactured from hot-rolled carbon steel rods of chemical compositions complying with AS 1442. The steel grades chosen shall be appropriate to achieve the mechanical properties and formability requirements specified or implied in the relevant Sections of this Standard.

NOTE: Rods of steel grades differing from those listed in AS 1442 may be used, provided their chemical compositions and other characteristics are in harmony with the requirements of AS 1442 as well as with this Standard.

All products for fencing, whether supplied as single strand for direct use or in a fabricated form, shall be protected against corrosion by application of a metallic coating during manufacture, optionally overlaid with an organic coating (see Clause 1.3.13).

Any organic (i.e. thin organic or plastic) coating material, its composition and technique of application shall be in accordance with the coating process appropriate to the wire item in question and with the specified, agreed or implied properties of the organic coating on the final product.

The fencing product, whether a single strand or a fabricated article, shall be suitably finished for its intended purpose and shall possess all of the properties and attributes required to ensure adequacy of performance, both during fence construction and in service, under the normal or traditional conditions of use for which it was designed.

Where fabricated fencing products are manufactured from plastic coated wires, the plastic coating shall, after conversion into these products, be free of tears or cuts that reveal the metallic substrate, cut wire ends excepted. Other superficial damage, such as indentations and abrasions, shall not exceed that achievable with modern industrial technology.

NOTE: With thin organic coatings, such as paint, it is normally not possible to avoid slight damage, such as tool marks, during conversion.

1.5 REQUIREMENTS AND TESTS FOR WIRE AND WIRE PRODUCTS

1.5.1 Diameter and tensile strength

1.5.1.1 General

Following removal of any organic coating by a mechanical or chemical means that does not materially affect the metallic substrate, the diameter and tensile strength of fencing wires or the component wires of a fabricated fencing product shall comply with the requirements specified in Section 2, Section 4 or Section 7, as applicable.

NOTES:

- 1 Thin organic coatings of thickness nominally less than 0.020 mm (20 µm) do not require removal for the above purposes, unless specifically requested by the purchaser or end user.
- 2 Testing requirements for dimensional characteristics of organic coatings on wires are specified in Clause 1.5.4.4.

Testing of the metallic coated wires shall be in accordance with Clauses 1.5.1.2 and 1.5.1.3.

1.5.1.2 Diameter testing

The diameter of the metallic coated wire shall be measured on a straight, or suitably straightened, length using an instrument accurate to at least 0.005 mm, and with due regard to Clause 1.5.4.5.

The diameter value for comparison with the specified nominal value and its tolerance shall be the average of two readings taken at right angles to each other and at the same cross-section of the wire.

Lengths sampled from fabricated wire products shall be free of any distortion or deformation, such as forming marks from manufacturing operations, that could lead to erroneous results.

NOTE: It is recognized that the surface of metallic coatings on wire, particularly those produced by hot dipping, are not perfectly smooth or free of irregularities. If the diameter tolerances specified in this Standard are rigidly applied to such irregularities that are inherent in the product, unjustified rejection may occur of coated wire that is actually satisfactory. Therefore, it is intended that these tolerances be used in measuring the uniform areas of the metallic coated wire.

1.5.1.3 Tensile strength testing

The tensile strength (or breaking load) of the metallic coated wire, where specified in the relevant Sections of this Standard, shall be determined in accordance with AS 1391.

The tensile strength shall be calculated using the actual (original), as opposed to nominal, diameter of the metallic coated wire.

NOTE: Steel wire metallic coated by hot dipping may, in time, exhibit slight changes in mechanical properties after manufacture, particularly tensile strength and ductility. These changes result from a phenomenon known as strain ageing or strain age hardening, and lead to an increase in tensile strength and a decrease in ductility, compared to the wire immediately after hot-dip coating. At ordinary temperatures, the ageing processes progress relatively slowly over a period of weeks. The tensile strengths specified in the relevant Sections of this Standard generally apply to tests conducted immediately after wire manufacture. Therefore, results of tests performed by the purchaser may be at variance with those reported by the supplier.

1.5.2 Ductility (steel)

1.5.2.1 General

The wire shall not exhibit any degree of brittleness likely to cause fracturing during normal fencing operations or in the manufacture of fabricated fencing products.

Testing shall be in accordance with Clause 1.5.2.2.

1.5.2.2 Ductility testing

Where specified in the relevant Sections of this Standard, the metallic coated wire, devoid of any plastic coating, shall be closely wrapped around a mandrel of the same diameter as the wire for a minimum of six turns, to assess steel quality. The test shall otherwise be in accordance with AS 2505.5.

The wire shall show no signs of fracture of the basis steel.

1.5.3 Metallic coating

1.5.3.1 General

When applied by a specialized continuous process, the metallic coating shall meet the requirements of AS/NZS 4534. The coating class shall be selected by the manufacturer, or by agreement between interested parties, from Classes W02 to W25, unless specified otherwise in this Standard, the intention being to provide adequate corrosion protection for the projected end use.

Fabricated fencing products may be manufactured from metallic coated wires or they may be metallic coated after manufacture, depending on the nature of the product and market requirements.

When a zinc coating is to be applied to a fabricated fencing product by means of the hot-dip batch process, it shall comply in all respects with the requirements specified in AS/NZS 4680.

Specific requirements for the various fencing products are given in the relevant Sections of this Standard.

NOTES:

- 1 A passivation coating may be applied to the metallic coating.
- 2 Guidance on metallic coating selection to suit environmental exposure conditions is given in Appendix C.
- 3 Appendix D gives advice on the transport and storage of metallic coated wire.

1.5.3.2 Metallic coating—Testing

Single-strand fencing wires shall be tested for coating mass and coating adherence in accordance with the requirements specified in AS/NZS 4534.

Specimens taken from fabricated fencing products, as required in the relevant Sections of this Standard, shall be tested for coating mass or thickness in accordance with AS/NZS 4534 or AS/NZS 4680, as appropriate.

Testing of fabricated fencing products for metallic coating adherence is not required. However, testing may be considered in the event of a dispute; in such cases, for products coated in accordance with AS/NZS 4534, it is acceptable to demonstrate satisfactory adherence, or otherwise, either by performing the test specified in AS/NZS 4534 or, where this is impracticable by virtue of the nature of the fabricated article, by bending a length of the suspect wire approximately 180° around a mandrel of the relevant diameter specified in AS/NZS 4534.

NOTE: No adherence test is specified in AS/NZS 4680.

1.5.4 Organic coating**1.5.4.1 General**

The organic coating may be thin, such as a paint ('colour') film, or it may be relatively thick, as is usual with plastic coatings such as extruded PVC. Thin organic coatings are usually applied to allow product differentiation or for visual enhancement. By contrast, the main purpose of thick organic (i.e. plastic) coatings is to provide either an important barrier against corrosion or a long-term decorative finish, or both.

Details of the organic coating, such as colour, compound, method of application if relevant, and any properties not specified in this Standard, are at the (wire) manufacturer's discretion, unless agreed otherwise between purchaser and manufacturer at the time of enquiry and order.

NOTES:

- 1 Terms relating to organic coatings are defined in Clauses 1.3.13, 1.3.16, 1.3.17, 1.3.18, 1.3.20, and 1.3.25.
- 2 Plastic compounds, other than PVC and PE, for coating wire are permitted provided their performance in service is of the same calibre as either PVC or PE and, importantly, this can be substantiated by the (wire) manufacturer. Alternatively, their use may be agreed between (wire) manufacturer and end user.
- 3 Longevity of plastic coatings in sunlight is paramount, especially under Australia's harsh exposure conditions; however, while most commonly available colours in PVC perform satisfactorily, special colours or effects (e.g. fluorescence) may not allow the requirements for long-term stability to be met, since the pigments and dyes may not provide sufficient resistance to degradation of the plastic coating by ultraviolet light. In such cases all parties should agree on acceptable performance criteria.
- 4 Colorimetric data for standard colours are given in AS 2700, while AS/NZS 2633 sets out factors which should be taken into account in specifying colours.

1.5.4.2 Organic coating—Raw materials

The requirements for the raw materials for organic coating wire are as follows:

- (a) *Requirements and application* Raw materials for organic coatings shall be thoroughly compounded so that there is uniform dispersion of components. Such components include primary plasticizers, light and heat stabilizers, lubricants, dyes and pigments.

In the case of PVC, no extender or filler, other than stabilizers or pigments, shall be used, and, for extrusion, no copolymers shall be used.

PE coatings shall contain anti-oxidants at a concentration of at least 500×10^{-6} (500 ppm). PE coatings are classified into three types (I, II and III) according to whether the polyethylene is of low, medium or high density.

Plastic coatings may be applied by extrusion or by sintering (fusion). Unless nominated otherwise in relevant Sections of this Standard, plastic coatings applied by extrusion shall be prefixed by the letter 'e' in manufacturers' promotional material and in product labelling, while those applied by sintering (fusion) shall be prefixed by an 's'.

NOTE: Examples are ePVC, sPVC, ePE and sPE.

Thin organic coatings, for example paints, may be applied by an appropriate method such as dipping or spraying. Where specified in relevant Sections of this Standard, thin organic coatings shall be identified in promotional material and labelling by the upper case letter 'O'.

NOTE: In other Sections the use of an 'O', to denote a thin organic coating, is at the manufacturer's option.

Plastic coatings may be bonded to the wire, by means of an adhesive primer, or may be unbonded. PVC coatings applied by extrusion may or may not be bonded, but, when the fluidized-bed process (sintering) is used, bonding is usual. By contrast, PE coatings applied by either process do not require bonding.

The plastic coating, whether extruded or fused, shall be as smooth and as uniformly distributed on the wire as industrial technology allows.

It is usual to completely cover the fencing product with the organic coating, except perhaps for cut ends. With fabricated fencing products, the organic coating may be applied either to the single-strand wire feedstock during manufacture, or to the fabricated product itself, depending on the nature of the fencing product, its eventual purpose or specific application.

The hue of a particular colour of a plastic coating shall not vary significantly within a batch of wire or wire product, nor from batch to batch, at the time that the batch or batches are delivered.

NOTES:

- 1 To avoid disputes, purchasers are strongly advised to provide wire manufacturers and, in turn, organics manufacturers, with samples (or other suitable means) that visually define limits of colour variation that can be tolerated. These referee samples should be carefully protected against conditions that may cause deterioration; for greater colour stability, they should be stored in an airtight container in a freezer (see AS 2700 for storage recommendations).
- 2 By their nature, thin organic coatings may lack opacity, leading to changes in hue depending on the lustre or greyness of the metallic substrate. Hence, a specification on variations in the hue of thin organic coatings is not appropriate.

- (b) *Testing* The requirements for plastics raw materials are specified in Paragraph E2.2 of Appendix E.

The raw materials for thin organic coatings, such as paint, are not required to be tested, unless otherwise indicated in relevant Sections of this Standard or agreed by interested parties.

1.5.4.3 Organic coating—Performance criteria

The performance criteria for organic coated wire are as follows:

- (a) *Plastic coating* Plastic coated wires shall meet the appropriate requirements of Clause 1.5.4.4(a), as well as the relevant Clauses in other Sections of this Standard.

The plastic coating shall exhibit sufficient hardness and resilience to withstand damage, such as the level of abrasion, crushing or shear that may be encountered during normal product fabrication or traditional fencing applications.

Plastic coated wires shall be capable of being fabricated into fencing products, or being conventionally tied off or otherwise deformed, during normal fencing applications, without any cracking or peeling of the plastic coating. However, the manufacturer shall not be held responsible for any such failing of the plastic coating if the wire has been stored under adverse conditions, such as exposure to elevated temperatures, harmful chemical vapours, or direct sunlight for an abnormal period.

NOTE: Acceptable exposure conditions will vary with the nature of the plastic material and its colour, i.e. with the dyes or pigments used.

- (b) *Thin organic coating* With the exception of powder coatings, no specific requirements are stipulated for thin organic coatings; however, they should remain intact during handling and transportation, and should be capable of withstanding conversion and normal fencing operations with minimal cracking or flaking. Powder coatings shall comply with AS/NZS 4506.

1.5.4.4 Organic coating—Properties and testing

The properties and testing requirements for organic coatings are as follows:

- (a) *Plastic coating* Plastic coated wires, when tested in accordance with Paragraph E2.1 of Appendix E, shall comply with the specified values of radial thickness and concentricity detailed in Section 2, 4 or 7, as appropriate.

Values for relevant properties of plastic coatings and test methods for their determination or verification shall be as specified in Paragraph E2.2 of Appendix E.

NOTE: Since many characteristics and properties of plastic coating materials prove difficult to measure (or cannot be measured reliably) on specimens of wire, the test methods in Paragraph E2.2 of Appendix E relate to the raw organic materials in specially prepared forms. These tests are normally carried out by the plastics manufacturer.

The plastic coating on each manufactured wire unit, such as a coil, shall be continuous and free from discolouration, variations in colour, and pinholes. No blisters, craters, marks or scores shall be detectable when subjected to normal or corrected visual inspection. Small dents, resulting from contact with adjacent wires, shall not be considered to be a cause for rejection, unless they can be shown to adversely affect the use or performance of the wire or wire product.

NOTE: Where the presence of dents is considered to be deleterious, purchasers are advised to submit illustrative type samples to the manufacturer at the time of inquiry or order.

Irrespective of whether the plastic coating has been applied by a bonding process (that is, by using an adhesive) or by non-bonding, it is important that it does not separate easily from the metallic core.

The colour stability of plastics for plastic coated wire shall comply with the specification given in Paragraph E2.2 of Appendix E.

- (b) *Thin organic coating* Powder coatings shall comply with AS/NZS 4506.

Other thin organic coatings on each batch of wire or wire product supplied shall be uniformly applied, firmly adherent and of uniform colour; such coatings shall be continuous, except that, on fabricated fencing products, any minor disturbance or disruption, discernible only upon inspection at a distance closer than 1.5 m, shall be acceptable (also see Clause 1.5.4.3(b)).

Except for powder coatings, thin organic coatings are not required to be tested, unless otherwise specified in relevant Sections of this Standard or agreed by interested parties.

1.5.4.5 Organic coating—Effect on wire dimensions

Unless otherwise agreed between manufacturer and purchaser, wire diameters and dimensions of fabricated products, as specified in the relevant Sections of this Standard, shall relate to the metallic coated wire (the ‘core’) and/or to the fabricated product, before any organic coating has been applied or from which the organic coating has been carefully removed, as appropriate.

NOTE: However, see Note 1 to Clause 1.5.1.1 for diameter testing of wires with thin organic coatings.

1.5.5 Camber

1.5.5.1 General

Fabricated fencing products in rolls, either woven or welded mesh, shall be manufactured to comply with the permissible degree of camber specified in the relevant Sections of this Standard.

The test method shall be in accordance with Clause 1.5.5.2.

1.5.5.2 Camber testing

When a 25 m or 50 m length, as appropriate, of the woven- or welded-mesh fabricated fencing product is unwound from a roll along a horizontal surface and allowed to lie naturally flat, the maximum camber displayed by the product shall be measured from a straight line joining opposite ends of the specimen length, the ends of this straight line and the deviation of the unwound product being referenced to the same selvage wire, or edge.

1.6 ROUNDING OF TEST RESULT VALUES

Wire diameters, measured in millimetres, shall be rounded to two decimal places.

The determined value of tensile strength shall be rounded to the nearest 10 MPa.

Rounding of metallic coating mass test results (or thickness results, if relevant) shall comply with the requirements specified in AS/NZS 4534 or AS/NZS 4680, as appropriate.

Plastic coating thicknesses, measured in millimetres, shall be rounded to two decimal places. Powder coating thicknesses, measured in micrometres, shall be rounded to the nearest 5 µm.

The camber of fabricated wire products shall be rounded to the nearest 10 mm.

NOTE: For advice on the method of rounding, see AS 2706.

1.7 MARKING

Each separate unit of fencing product (e.g. coil, roll and pack of sheets) shall carry a securely-affixed, weather-resistant label or tag with legible and durable marking, incorporating the following details, together with product-specific information as prescribed in the relevant Section:

- (a) The manufacturer's name and address or approved brand, plus the registered trade name or trademark, if available.
- (b) Reference to this Standard (i.e. AS 2423).

NOTES:

- 1 Where a consignment of coils or rolls is to be supplied by the manufacturer direct to the end user, it is permissible, with the end user's consent, to affix a single label or tag to individual grouped-units of identical product. For example, one label to a pallet of rolls of welded mesh fabric of the same designation.
- 2 Manufacturers making a statement of compliance with this Australian Standard on a product, or on packaging or promotional material related to that product, are advised to ensure that such compliance is capable of being verified.

SECTION 2 SINGLE STRAND WIRES

2.1 SCOPE AND GENERAL

This Section specifies requirements for steel wire intended to be used directly as single strands in fencing or for conversion into fabricated fencing products (see Clause 1.1, Note 3) for both terrestrial and non-critical aquatic use, except for wire netting and light/mediumweight welded mesh fabric. (Because of the complex specifications for netting and light/mediumweight welded mesh fabric, wires for these products have been covered separately, in Sections 4 and 7 respectively.)

NOTE: Enhanced requirements for products for specialized, or demanding, aquatic purposes are given in Section 9.

Fencing wires covered in this Section include the following types:

- (a) *For direct use for general purposes* The following applications are included:
 - (i) Low tensile (soft) fencing.
 - (ii) Medium tensile fencing.
 - (iii) High tensile fencing
- (b) *For direct use for specific purposes* The following applications are included:
 - (i) Electric fencing.
 - (ii) Trellising.
 - (iii) Horse protector.
- (c) *For conversion into the following:*
 - (i) Soft barbing.
 - (ii) High tensile barbing.
 - (iii) Chain-link fencing fabric.
 - (iv) Prefabricated field fencing fabric.
 - (v) Heavyweight welded mesh fabric panels (wire nominal diameters 4.00 mm and greater).
- (d) *For miscellaneous uses*, such as fence tie wire.

Single-strand plain-carbon wires for direct use in fencing are always supplied with a metallic coating for corrosion protection. Additionally, certain products may be organic coated over the metallic coating.

Wires intended for conversion into fabricated products are usually supplied by their manufacturer in the metallic coated condition. However, where the fabricated product is to be metallic coated after conversion, notably heavyweight panels (see Section 8), the wire feedstock is commonly supplied uncoated (bare).

2.2 REQUIREMENTS

2.2.1 Diameter and diameter-related requirements

The average diameter of the metallic coated wire, as determined in accordance with Clause 1.5.1.2, shall not differ from the relevant nominal diameter by more than the appropriate tolerance given in Table 2.1.

The maximum permissible ovality of metallic coated wire shall be equal to half the relevant diameter tolerance range. For example, if the diameter tolerance is ± 0.10 mm, the tolerance range is 0.20 mm and the maximum ovality permitted is 0.10 mm.

Where the wire is plastic coated, the overall diameter of the wire and the diameter-related requirements of the plastic coating shall comply with the limits given in Table 2.2.

NOTE: Dimensional requirements, other than those for the metallic coated core itself, are not specified for wires that are thin-organic coated (see Clause 1.3.13, Note).

TABLE 2.1
DIAMETER TOLERANCES FOR METALLIC COATED WIRE
FOR FENCING APPLICATIONS (see Note 1)

millimetres				
Nominal diameter (see Note 2)		Diameter tolerance (see Note 3)		
Over	Up to and including	Coating class W02	Coating classes W05 and W10	Coating classes W15 to W25
1.40	1.60	± 0.05	± 0.06	± 0.08
1.60	2.50	± 0.07	± 0.08	± 0.10
2.50	4.00	± 0.09	± 0.10	± 0.12
4.00	5.00	± 0.10	± 0.11	± 0.13
5.00	6.00	± 0.13	± 0.14	± 0.16
6.00	8.00	± 0.15	± 0.16	± 0.18

NOTES:

- 1 Except for wire netting and lightweight and mediumweight welded fabric (see Sections 4 and 7).
- 2 Wire diameters listed are those after metallic coating, and the diameter includes the total metallic coating thickness.
- 3 These tolerances relate to metallic coatings applied in accordance with AS/NZS 4534.
- 4 See Clause 1.5.4.5.

2.2.2 Tensile strength

The tensile strength of the metallic coated wire, as determined in accordance with Clause 1.5.1.3, shall be within one of the discrete ranges specified in Table 2.3.

It shall be permissible for manufacturers to apply more restrictive (or narrower) ranges than those listed in Table 2.3 to single-strand products. However, such restricted ranges shall then be clearly identified by the manufacturer to the purchaser, or end user, by printing the relevant details on the product tag or label or by means of promotional material that is readily available to the public.

NOTE: Such promotional material may be available on an Internet web site.

TABLE 2.2
RELATIONSHIP OF METALLIC COATED CORE DIAMETER
AND PLASTIC COATED WIRE DIAMETER

Nominal diameter of metallic coated wire (core) mm	Minimum plastic coating radial thickness mm		Tolerance on overall diameter of plastic coated wire mm	Maximum permissible variation in thickness of plastic coating (see Note 1)	
	Extruded (e)	Sintered (fused) (s)		Extruded (e)	Sintered (fused) (s)
1.50 ≤2.00	0.25	0.12	±0.10	1.3 : 1	1.5 : 1
2.01 ≤3.00	0.35	0.15	±0.15	1.3 : 1	1.5 : 1
3.01 ≤6.00	0.40	0.20	±0.20	1.3 : 1	1.5 : 1
6.01 & over	0.50	—	±0.25	1.3 : 1	1.5 : 1

NOTES:

- 1 The permissible variation in thickness, or concentricity, of the plastic coating is the ratio of its measured maximum thickness to its measured minimum thickness.
- 2 Sintered plastic coatings may not be commercially available for all products.

TABLE 2.3
TENSILE STRENGTH RANGES FOR FENCING WIRES

Quality	Tensile strength, MPa	
	Min.	Max.
Low tensile	350	700
Medium tensile	600	1 150
High tensile	1 000	1 600

Where the wire is supplied for direct use (that is, for fence construction), the tensile strength variation within a batch shall not exceed 250 MPa, within the appropriate range specified in Table 2.3 and also within any restricted tensile strength range that may have been applied to a particular product.

With the exception of chain-link fencing fabric, the tensile strength variation within a batch of wire for conversion to a fabricated product shall not exceed 150 MPa, within the appropriate range specified in Table 2.3, and also within any restricted tensile strength range that has been applied to a particular product. For chain-link fencing fabric the variation shall not exceed 75 MPa.

NOTE: More restrictive variations in tensile strength within a batch of wire may be agreed between manufacturer and purchaser. With wire for chain-link fencing fabric, manufacturers should aim for a variation of no more than 50 MPa.

2.2.3 Metallic coating

The zinc or zinc/aluminium-alloy coating shall be applied by a specialized continuous process. Determination of coating mass and testing for coating adherence shall be in accordance with Clause 1.5.3.2.

NOTES:

- 1 Commonly available coating designations for fencing wires are given in Table C5 of Appendix C.
- 2 See Clauses 1.3.7, 1.3.27 and 1.3.28 for metallic coating definitions.
- 3 Where wire is supplied in the uncoated (bare) condition for subsequent conversion to fabricated products that are then metallic coated, the coating requirements are specified in the relevant Sections of this Standard.

2.2.4 Organic coating

Organic coatings shall comply with the appropriate requirements of Clauses 1.5.4.1 to 1.5.4.5 and 2.2.1.

2.2.5 Ductility (steel)

The metallic coated wire, tested in accordance with Clause 1.5.2.2, shall show no signs of fracture of the basis steel.

Any cracking or flaking of the metallic coating occurring during this test shall not be taken to signify brittleness of the steel substrate.

2.2.6 Joints

Coils supplied for direct use for fence construction shall contain no welds or other joints made subsequent to metallic coating.

The requirements for wire feedstock for conversion to fabricated fencing products are given in the relevant Sections of this Standard.

2.3 PREFERRED PRODUCTS, DIAMETERS AND TENSILE STRENGTHS

The preferred requirements for the various types of single-strand fencing wires, either for direct use or for conversion to fabricated products, are given in Table 2.4.

NOTES:

- 1 The tensile strength ranges in Table 2.4 are narrower than those in Table 2.3 and are therefore required to be identified by the manufacturer in accordance with Clause 2.2.2.
- 2 The list in Table 2.4 is not exclusive.

2.4 PACKAGING

2.4.1 Wire for direct use

Unless agreed otherwise, wire shall be supplied in coils that are safely, securely and neatly tied, with the 'start' end of the coil clearly indicated.

Unless otherwise agreed, the mass or length of wire in each coil shall be at the discretion of the manufacturer.

2.4.2 Wire for conversion to fabricated product

Single-strand wires destined for the manufacture of fencing products (such as barbed wire) shall be supplied in coils. Their method of presentation may be agreed between purchaser and manufacturer.

NOTE: For example, several individual coils of wire may be aggregated, or stacked, on transportable tubular frames, the aggregated mass usually being one tonne or more.

Unless otherwise agreed, the mass or length of wire in each coil and the total mass or length of wire supplied in aggregated form shall be at the discretion of the manufacturer.

Depending on the agreed presentation, coils may be supplied untied.

Irrespective of mode of presentation, the 'start' end of tied or untied coils shall be clearly identified by the manufacturer.

NOTE: Inadequate identification of 'start' ends of untied coils supplied in aggregated form can present a safety hazard in subsequent manufacturing operations.

2.5 MARKING

In addition to the information required by Clause 1.7, each coil of product shall be labelled or tagged to show at least the following details:

- (a) The nominal diameter of the wire, in millimetres.
- (b) For wire for direct use (i.e. not for conversion), the length of wire in the coil in metres, or mass of individual coils in kilograms.
- (c) The type of wire (e.g. low tensile (soft) fencing and soft barbing) (see Clauses 2.1 and 2.3).
- (d) The metallic coating designation (e.g. W10Z).
- (e) The tensile strength range where this is not otherwise formally notified (see Clauses 2.2.2 and 2.3 for requirements and Table 2.4 for preferred ranges).
- (f) The 'start' end of coils.
- (g) If the wire is plastic coated, identification of the basis polymer, together with a prefixed letter 'e' for extruded or 's' for sintered (e.g. ePVC, sPVC).

TABLE 2.4
PREFERRED DIAMETERS AND TENSILE STRENGTH REQUIREMENTS FOR
VARIOUS TYPES OF METALLIC COATED FENCING WIRES (see Note 1)

Wire type	Preferred nominal diameter mm	Preferred tensile strength, MPa (see Note 2)		Nominal breaking load, kN (see Note 3)	
		Min.	Max.	Min.	Max.
Low tensile (soft) fencing, including horse protector (see Note 4)	2.00	350	700	1.1	2.2
	2.50	350	700	1.7	3.4
	3.15	350	700	2.7	5.5
	3.55	350	700	3.5	6.9
	4.00	350	700	4.4	8.8
Medium tensile fencing	2.50	750	1 050	3.7	5.2
High tensile fencing	1.57	1 000	1 400	1.9	2.7
	1.60	1 000	1 400	2.0	2.8
	1.80	1 000	1 400	2.5	3.6
	2.00	1 000	1 400	3.1	4.4
	2.50	1 100	1 400	5.4	6.9
	2.80	1 200	1 600	7.4	9.9
Electric fencing	1.60	380	650	0.8	1.3
	2.50	750	1 050	3.7	5.2
Low tensile (soft) barbing (for barbs and lines)	1.47	380	650	0.65	1.1
	1.57	380	650	0.74	1.3
	1.60	380	650	0.76	1.3
	1.80	380	650	0.97	1.7
	2.00	380	650	1.2	2.0
	2.50	380	650	1.9	3.2
High tensile barbing (for lines)	1.57	1 000	1 400	1.9	2.7
	1.60	1 000	1 400	2.0	2.8
	1.80	1 000	1 400	2.5	3.6

(continued)

TABLE 2.4 (continued)

Wire type	Preferred nominal diameter mm	Preferred tensile strength, MPa (see Note 2)		Nominal breaking load, kN (see Note 3)	
		Min.	Max.	Min.	Max.
Chain-link fencing fabric (see Note 5)	2.00	380	500	1.2	1.6
	2.50	380	500	1.9	2.5
	3.15	380	500	3.0	3.9
	4.00	380	500	4.8	6.3
Field fencing fabric —lines	2.24	750	1 050	3.0	4.1
	2.30	750	1 050	3.1	4.4
	2.44	750	1 000	3.5	4.7
	2.50	750	1 000	3.7	4.9
	2.80	920	1 150	5.7	7.1
—pickets	2.00	850	1 100	2.7	3.5
	2.44	750	1 000	3.5	4.7
	2.50	620	850	3.0	4.2
	2.64	380	650	2.1	3.6
—joints (separate wire)	2.24	380	650	1.5	2.6
	2.62	625	900	3.4	4.9
Trellising	2.00	850	1 100	2.7	3.5
	2.65	1 100	1 400	6.1	7.7
	2.85	1 200	1 600	7.7	10.2
	3.15	1 200	1 500	9.4	11.7
Heavyweight welded mesh fabric (panels)	4.00	450	700	5.7	8.8
	5.00	450	700	8.8	13.7
	5.60	450	700	11.1	17.2
	8.00	450	700	22.6	35.2
Fence tie	1.57	350	550	0.7	1.1
	2.00	350	500	1.1	1.6
	2.50	350	500	1.7	2.5
	3.15	350	500	2.7	3.9
	4.00	350	500	4.4	6.3

NOTES:

- 1 Not applicable to wires for netting and lightweight and mediumweight fabric (see Sections 4 and 7).
- 2 For maximum permissible tensile strength variations within a batch, see Clause 2.2.2.
- 3 The nominal breaking load values are based on nominal diameter. (These values are supplied for information only, except for testing barbed wire (see Table 3.1).)
- 4 Horse protector wire is supplied white plastic coated.
- 5 Wire for chain-link fencing fabric is optionally supplied plastic coated.

SECTION 3 BARBED WIRE

3.1 SCOPE

Very many different forms of barbed wire exist world-wide. This Standard specifies the requirements only for the conventional twist and reverse twist types, these being the two most commonly available in Australia.

3.2 MANUFACTURE

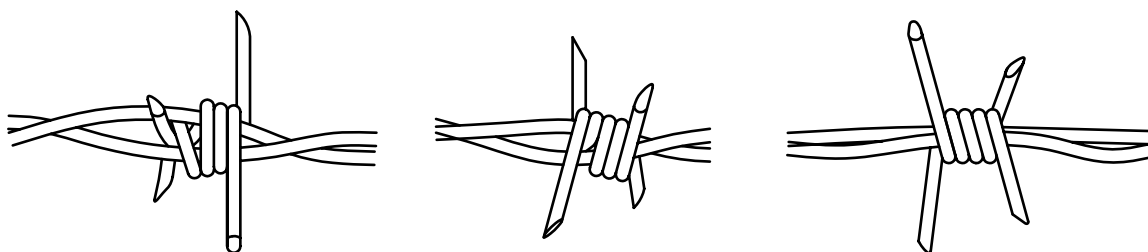
Both the conventional twist and the reverse (alternating) twist types of barbed wire are formed from two line wires, tightly and uniformly twisted (or stranded) together. In the case of the conventional type, the twisting is continuous in one direction, either clockwise or anticlockwise, whereas twisting for the reverse twist variety alternately reverses direction between successive barbs.

With both types, the barbs, each composed of two short lengths of wire, are twisted tightly around the two stranded line wires at approximately equal intervals, by a method that prevents slippage of the barbs along the line wires. Securing the barbs on the conventional twist type is normally achieved by partially interlacing the barb and line wires.

Three typical barb formations are shown in Figure 3.1.

The reverse twist style of barbed wire is so designed to ensure that unwinding of the alternately twisted line wires does not occur below a specified minimum force during tensioning in fence erection.

Barbed wire may be supplied with an overlaid organic coating.



(a) Two styles of barb on conventional twist barbed wire

(b) Barb on reverse twist barbed wire

FIGURE 3.1 TYPICAL BARB CONFIGURATIONS

3.3 REQUIREMENTS

3.3.1 Wire diameter and tensile strength

Metallic coated wire feedstock for the manufacture of barbed wire shall comply with the requirements of Section 2, and shall be of diameter(s) and tensile strength(s) appropriate to the product. For preferred wires, see Clause 2.3 and Table 2.4.

NOTE: Because of the mechanics of manufacture when forming barbs, a certain amount of deformation of the cross-section of the wires in the barbs can be expected. The consequent condition of the wires, coupled with the size of the barbs, preclude their being subjected to accurate diameter checks.

3.3.2 Barbs

The barbs shall be manufactured to incorporate four sharp points, each at $90 \pm 30^\circ$ to the adjacent point, and shall be affixed by being tightly wrapped around the two stranded line wires, such that slippage is minimal (see Figures 3.1 and 3.2(a)).

NOTE: Barbs are subject to deformation during both coiling and handling of the barbed wire. This may result in distortion of the angles of some points.

For conventional-twist barbed wire, the extreme ends of the barb points shall project a distance of 11 ± 4 mm from the centre-line of the relevant line wire, as shown in Figure 3.2(c). For the reverse-twist product, the extreme ends of the barb points shall project a distance of 10 ± 3 mm from the centre-line of the respective line wires from which they emerge.

The ends of barb points shall be cut at an angle of not more than 35° to the axis of the barb point.

3.3.3 Spacing (pitch) of barbs

The nominal barb spacing, or pitch, as shown in Figure 3.2(a), shall not be less than 75 mm nor more than 110 mm. The average spacing shall not vary by more than 10% from the nominated value specified by the manufacturer.

NOTE: The average spacing, for comparison with the manufacturer's nominated value, should be determined over a large number of spacings; a specimen length of at least 7.5 m is recommended. Barbs are subject to a certain amount of relocation during fabrication and handling; therefore, some individual spacings may vary appreciably from the manufacturer's nominated value.

3.3.4 Stranding of line wires

3.3.4.1 Requirement

The average number of twists in the line wires per barb spacing, determined as described in Clause 3.3.4.2, shall not be less than 5 for the reverse-twist and 2.8 for the conventional-twist product. The line wires shall be stranded such that the barbed wire is capable of complying with Clauses 3.3.3 and 3.3.7.

The two line wires shall be continuous throughout each coil of barbed wire (also see Clause 3.3.5).

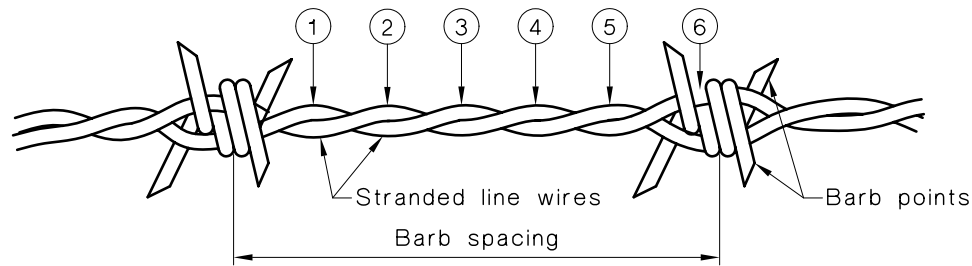
3.3.4.2 Determination of number of twists

The procedure for determining the average number of twists formed per barb spacing shall be as follows:

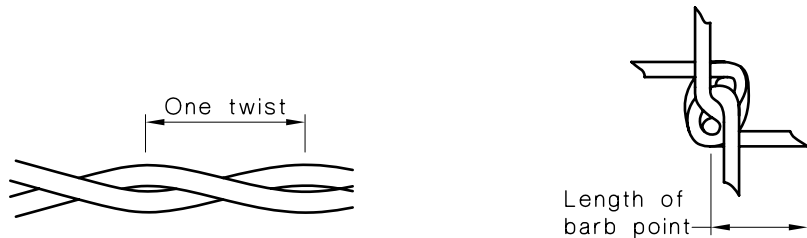
- (a) Take a representative length of barbed wire containing at least 20 barb spacings.
- (b) Count the number of twists in each of the 20 or more consecutive barb spacings in the representative length, in the manner indicated by the numbered sequence shown in Figure 3.2(a); for conventional-twist barbed wire, the twist within each barb itself (where the number of barbs equals the number of spacings) is counted, whereas, for the reverse-twist product, only complete full twists and complete half-twists between barbs are counted.

NOTE: One twist rotation is where elemental lengths of the two wires are twisted a half rotation (180°) about their common axis (see Figure 3.2(b)).

- (c) Total the number of twists and divide by the number of barb spacings covered by the count.



(a) Features of barbed wire (conventional twist illustrated)



(b) Example of one twist rotation

(c) Details of a barb

FIGURE 3.2 FEATURES OF BARBED WIRE

3.3.5 Joints

High tensile barbed wire shall contain no welded joints made subsequent to metallic coating.

Low tensile (soft) barbed wire should contain, typically, no more than three welded joints made after metallic coating in any single line wire, for every tonne of finished product.

Each coil of barbed wire, high or low tensile, shall consist of a single continuous (one-piece) length of product.

Coils of barbed wire may contain patent mechanical wire-joining devices, provided that —

- (a) such devices do not protrude beyond the extent of the barbs once the fence is erected;
- (b) the strength of the length of barbed wire containing the device is not less than the minimum breaking load of the product concerned (see Clause 3.3.8); and
- (c) the device does not reduce the service life of the barbed wire in which it is installed.

Other types of joints, such as knots, shall not be permitted.

3.3.6 Metallic coating

The coating shall comply with the requirements specified in Clause 2.2.3, and shall be of the same designation for both barbs and line wires comprising each coil of barbed wire within a batch.

3.3.7 Organic coating

Barbed wire may be supplied with a plastic coating or a thin organic coating. Each may be applied either to the feedstock wires before manufacture or to the fabricated product itself.

Each type of organic coating shall meet the requirements of Clauses 1.5.4.2 to 1.5.4.4. Plastic coatings shall also comply with Clause 2.2.1.

NOTE: Where the barbed wire is plastic coated after fabrication, it may not be possible to determine coating dimensions with accuracy.

3.3.8 Tensile properties

The properties of the barbed wire, determined by tensile testing a representative specimen comprising a free length between tester grips of an even number of complete barb spacings, shall be in accordance with the requirements given in Table 3.1.

NOTE: The minimum length of test piece consists of two barb spacings and three barbs, clear of the tester grips.

TABLE 3.1
TENSILE PROPERTIES OF BARBED WIRE

Construction of barbed wire	Breaking load as % of total min. specified B/L	Unravelling force as % of specified min. B/L of barbed wire
Conventional twist	90% min.	N/A
Reverse twist	90% min.	75% min

NOTES:

- 1 The total minimum specified breaking load is the combined values of minimum nominal breaking load of the two line wires (see Clause 2.3, for breaking loads of preferred products, or as otherwise identified by the line wire manufacturer).
- 2 The unravelling force is defined as the point at which unstranding of the line wires is perceived to commence. It coincides with the first major fall in applied force during the tensile test.
- 3 B/L = breaking load; N/A = not applicable.

3.4 TEST SPECIMEN FOR DETERMINATION OF COATING MASS

The test specimen for metallic coating mass determination shall consist of at least four complete barb spacings of barbed wire. Testing, in accordance with Clause 2.2.3, shall be carried out separately on each of the line wires, but on the mass of barbs as a whole.

3.5 PACKAGING

The barbed wire shall be supplied on suitable reels or frames that permit the wire to be paid out with minimum difficulty during fence installation.

The nominal set length of barbed wire coils within each batch supplied shall be at the manufacturer's option, unless agreed otherwise between manufacturer and purchaser.

NOTE: Preferred coil lengths are 400 m and 500 m.

Each coil shall be securely and neatly tied, with its 'start' end obvious to the end user.

3.6 MARKING

In addition to the information required by Clause 1.7, each coil of barbed wire shall be labelled or tagged to include at least the following details:

- (a) The nominal diameter of (a single) line wire, in millimetres.
- (b) The length of barbed wire in the coil, in metres.
- (c) Type of barbed wire (e.g. high tensile).
- (d) The metallic coating designation (e.g. W02Z).
- (e) If the wire is plastic coated, identification of the basis polymer, together with a prefixed letter 'e' for extruded or 's' for sintered (e.g. ePVC, sPVC).