Frequently Asked Questions

Q. What is the difference between Class L and Class N reinforcing steels?

A. Under the Steel Reinforcing Materials Standard, AS4671, there are two ductility classes for reinforcing steel in Australia. These are Class L (for low ductility) and Class N (for normal or high ductility). Class L steel is typically produced from a cold rolling or cold drawing process and the resulting wire is used in mesh (Class L) manufacture. Class N steels are typically produced from a hot rolling process and these products include OneSteel TEMPCORE and micro-alloyed reinforcing bars.

For more information see Australian Standard, AS4671- 2001.

Q. Can Class L reinforcing mesh still be used in suspended slab applications?

A. Yes! Under the Concrete Structures Code, AS3600-2001, there are some limitations on its design in suspended slabs. For instance, moment redistribution should not be incorporated in design if Class L mesh is used (see clauses 7.6.8.1 and 7.6.8.3) and Class L should not be used in conjunction with plastic design (see clause 7.9.1). Also, it should not be used where the reinforcing steel is expected to undergo large deformations under strength limit state conditions (see clause 1.1.2). There is also a cautionary note under clause 5.9 in regard to moment redistribution that occurs in fire situations where Class L steel is used in critical regions. The latest Amendment 2 (Oct 2004) to AS 3600 provided some additional changes to design rules to cater for Class L steel.

Wire that is used in mesh has been manufactured by either the drawing or rolling processes for more than fifty years and mesh has been used throughout that time in structures. Prior to the publishing of the new Steel Reinforcing Materials Standard, AS4671, there was no control over the ductility of the wire. Under this latest Standard, wire that is used in mesh will have to achieve minimum characteristic values of uniform elongation and ultimate to yield ratio that are considered suitable for use in structural applications. Thus, the new Class L mesh has higher ductility and quality requirements than all previous mesh types made under the old superseded Standards.

For more information see **ONEMESH500 Mesh Solutions brochure.**

Q. Are there any differences between 400Y bars and 500N grade bars?

A. Besides strength, there are only marginal differences between the two grades of rebar. The steel chemistry for OneSteel TEMPCORE bars and for 500N grade micro-alloyed bars has been increased slightly to provide the increased strength. The ductility of the grade 500N steel is also similar to the 400Y grade. The uniform elongation of Class N grade bars always exceeds the Class N minimum value of 5% and mean values exceed 10%.

For more information see **500PLUS Rebar Product Guide.**

Q. Are there any limitations on bending and rebending 500PLUS rebar?

A. Bending and rebending should be carried out in accordance with Section 19.2.3 of the Concrete Structures code, AS3600-2001. Further information and directions are contained in our web document, **500PLUS Rebar Application guide.**

Q. Can 500PLUS reinforcing bars be welded?

A. Reinforcing bars can be welded. The procedures for welding are set out in Australian Standard AS 1554 part 3. Information is also available in **500PLUS Rebar Application Guide.**

Q. How can 500PLUS rebars be joined?

A. Bars can be joined by either welding or by the use of mechanical splices.
For more information on welding refer to **500PLUS Rebar Application Guide**
See also **Accessories.**

Q. What is the smallest bend radius that we can bend a bar?

A. Australian Standard, AS 3600, Concrete Structures, sets out the minimum bending pin diameters for the various types of reinforcement. The details are shown in section 19.2.3. Smaller bend radii are possible if they are approved by the Design Engineer but you should consult a OneSteel Reinforcing technical representative on the type of steel to be used.
For more details, see our **500PLUS Rebar Application Guide.**

Q. Can reinforcing bars be bent on site using a heating process?

A. Yes. Heating the bars up to a maximum of 450 °C is recommended to retain the steel strength but heating up to a maximum temperature of 600 °C is permitted. Temperature crayons or an optical pyrometer should be used to control and monitor steel temperature. However, if the bar temperature exceeds 450 °C, then the design strength of the steel has to be reduced to 250 MPa in accordance with AS3600.
For more information, see our **500PLUS Rebar Application Guide.**

Q. Does galvanizing effect the properties of reinforcing bars?

A. Galvanising does not generally have any significant effect on the steel properties. Galvanising temperatures are normally in the order of 450 °C and this temperature has little influence on the steel. However, at this temperature some strain ageing will occur in any cold worked section of the bar and this may have some effect on local properties depending on the time period at the elevated temperature.

Q. Does galvanizing have any detrimental effects on bent bars?

A. Bent rebars that are subsequently galvanized can be affected in a number of ways. Heating of the steel to 450 °C will induce some degree of strain ageing into the cold worked section of the steel. Immersion in a pickle bath to clean the steel may induce some hydrogen embrittlement in the steel. Immersion of steel in a molten metal zinc bath can cause liquid metal embrittlement due to absorption of zinc into the steel grain boundaries.

For these reasons bars should not be bent around pins of less than 5 db for bars up to 16 mm and 8 db for bars greater than 16 mm. It is preferable to bend bars after galvanizing in order to overcome any potential for small surface folds, that may be formed in the bar surface during bending around small pins, to become a surface cracking problem in bent and galvanized rebars. We do not recommend that pre-bent and galvanized bars be rebent on site.

Q. Does rusting affect the performance of reinforcement?

A. Surface rusting of reinforcing bars or mesh does not affect the performance of the steel. In fact, surface rusting can increase the bond of the steel to the concrete. However, prolonged surface rusting can eventually lead to pitting of the steel and this may lead to a weakening of the steel section. Suspect steel can be checked by weighing a cleaned sample of wire or bar to ensure that the section is not below the lower tolerance limit of mass per unit length and tensile testing undertaken to ensure that the physical properties are still above the minimum requirements of AS4671.

Q. What mesh is typically used in a driveway or garage floor?

A. For lightly trafficked ground slabs, you should refer to Australian Standard AS3727, "Guide to residential pavements". This standard recommends mesh sizes ranging from SL52 to SL82 depending on the service requirements. Typically SL62 or SL72 would be used. For more information on mesh see **ONEMESH500 Mesh Solutions brochure.**

Q. Can you produce mesh sheets different from the standard sheet size (6m x 2.4m)?

A. Standard sheets can be cut into smaller sizes. Larger sheets and special sheet sizes can be tailored as Special Run and Engineered mesh for large projects. UTEMESH500 is also available. For more information see our **ONEMESH500 Mesh Solutions brochure.**

Q. How do you calculate the number of mesh sheets required for a slab area?

A. Divide the concrete area by 12.5 and round up to a whole number.

Q. How many bar chairs are required to support a sheet of mesh (6m x 2.4m)?

A. Typically 20 chairs would be required. A rule of thumb formula is concrete/mesh area x 1.5.

Q. Does all reinforcing mesh have to contain ribbed wire?

A. In 1995 the mesh producers in Australia changed from plain wire to ribbed wire in concrete reinforcing mesh. However, under the current Australian Standards, AS4671, Steel Reinforcing Materials and AS3600, Concrete Structures, plain, indented or ribbed wire is acceptable to be used in reinforcing mesh for use in concrete structures. There may be occasions when producers use plain wire in mesh manufacture without compromising the quality or performance of the mesh.

Q. What is TRUSSDEK and how is it different from other steel decking?

A. TRUSSDEK is an advanced form of decking that provides far greater spanning capacity than the currently available common decks. This hybrid deck consists of a number of cold formed elements which provide optimum shapes, steel thickness, steel grade and coatings. The truss panels can be cambered longitudinally to offset the wet concrete deflection.
For more information see **Construction Solutions – TRUSSDEK.**

Q. What is the BAMTEC system?

A. 500PLUS® BAMTEC® is a patented, steel reinforcing system, which is as easy to place as a roll of carpet. Developed in Germany, BAMTEC is a revolutionary approach to placing steel reinforcing in a wide variety of slabs and decks, greatly improving speed, quality and safety of construction.
BAMTEC involves prefabricating reinforcing steel "carpets" to virtually any shape or size. Individual 500PLUS Rebar steel reinforcing bars are welded to flexible steel straps, which can connect up to hundreds of bars together. When a carpet has been completed, it is rolled up for handling and transport. When needed on site, the carpet is simply lifted into place and unrolled - generally onto continuous bar chairs.
For more information see **BAMTEC Slab Solution.**

Q. What is ACRS and what is its role?

A. ACRS stands for the Australian Certification Authority for Reinforcing Steels.
It is an independent voluntary product certification scheme set up to provide an audit of the manufacturing processes for reinforcing steels as supplied to the Australian market to ensure their compliance with Australian Standard, AS 4671. It is supported by third party testing of finished products. The ACRS Council has been established under the Chairmanship of Professor Graham Hutchison of the University of Melbourne and Deputy Chairmanship of Dr John Fenwick of Main Roads Department, Queensland. OneSteel Reinforcing was one of the first rebar and mesh processors in Australia to receive Quality Compliance Certification from ACRS. For more information, contact **www.acrs.net.au.**

Q. Are OneSteel Reinforcing Products QA certified?

A. Yes - a copy of our certification is available on request.
Copies of ACRS Certification can also be provided.

Q. What Standards apply to Reinforcing Steel and Reinforced Concrete?

A. The following Standards apply -

AS 4671 – Steel Reinforcement Materials

AS 3727 – Guide to residential pavements

AS 3600 – Concrete Structures

AS 2870 – Residential Slabs and Footings

AS 2327 – Composite Structures

AS 2873 – Concrete Swimming Pools

AS 1170 – Structural Design Actions (Loading Code)

AS 1100 – Technical Drawing

AS 1554 – Welding of Reinforcement

AS 5100 – Bridge design - Concrete

Q. What additional tests are required under the Standard, AS4671?

A. The Reinforcing Steel Materials Standard, AS 4671- 2001 replaced AS 1302, 1303 and 1304. Under the new Standard, the physical testing of all reinforcing products is more comprehensive particularly in regard to steel ductility. There are now two ductility classes of steel, namely Class N for normal or high ductility and Class L for low ductility. All steels are generally 500 grade. Characteristic minimum values for strength are now required rather than outright minimum values and this requires the accumulation of long-term data and assessment for compliance. Characteristic minimum values are also required for uniform elongation and the ratio of ultimate to yield strength. Testing of de-coiled and straightened rebar is now required.

Q. When will I get my reinforcing steel delivered?

A. Processed bar (i.e. cut and bent rebar) generally requires seven working days to allow for scheduling, processing and delivery to site. Mesh, ex-stock bar and accessories can usually be delivered the next day if orders are placed before 1 pm.

Q. What is rolling margin and why is it applied?

A. Steel rolling mills cannot roll rebar feed material to the exact nominal dimensions due to the variations in the rolling process. Reinforcing steel suppliers therefore add a margin of 2.5% onto the calculated mass to cover rolling variations and other associated costs.

Q. Do OneSteel make reinforcing steel products from scrap steel?

A. Reinforcing bars and rod feed for mesh are hot rolled from billets that are produced from steel made predominately from scrap. A statement on recycled steel content in our steel reinforcing products is available on application.

Q. What traceability do you offer on reinforcement?

A. The steel heat numbers are maintained on rebar up until the steel bundle or coil is processed. With Reomesh, the traceability is maintained on packs of mesh sheets via the pack tag.