InfraBuild

Building futures through sustainable steel

VIRIBAR® 750

A lighter, stronger and more sustainable reinforcing bar.

Viribar®750 Column Fitments

AUSTRALIAN MADE

www.infrabuild.com

Contents

For more information visit **www.viribar.com.au**

VIRIBAR®750 COLUMN FITMENTS V2.1/2021

VIRIBAR® 750

Developed by InfraBuild, Viribar®750 is a new range of high-strength reinforcing steels with normal ductility for column fitments. Key benefits include:

- Improved sustainability credentials
- Lower transport, handling and fixing costs
- Reduced safety risk

With 33 % less mass than 500N Standard fitments, it is more sustainable, delivers savings in fixing costs and reduces transport and cranage costs. The reduced mass of Viribar®750 also results in lighter manual handling with fewer back injuries and other on-site risks.

Produced in Equivalent Force Capacity diameters to make the direct substitution of Viribar®750 fitments for 500N fitments easy with no redesign requirements, it conforms to Australian Standards and is compliant to the National Construction Code (NCC) because it conforms to the Building Code of Australia (BCA).

Using less raw material and energy in production, Viribar®750 is more sustainable than standard 500 MPa fitments and is recognised by Australia's peak sustainability bodies for construction: the Green Building Council of Australia (GBCA) and the Infrastructure Sustainability Council of Australia (ISCA). The use of Viribar®750 has the potential to significantly improve the sustainability credentials of construction projects.

Note:
At time of publication (September 2021) Viribar®750 is only available in Sydney. Please contact your local branch for the latest availability information.

Green Building Council Australia
Member 2020–2021

ISCA Infrastructure Sustainability Council of Australia

What is Viribar®750?

Viribar®750 is InfraBuild's new grade of high-strength reinforcing steel with normal ductility, weldable and developed for column fitments.

Key features

- Viribar®750 comes in equivalent force capacity diameters that allow it to be directly substitutable for standard 500N fitments
- It conforms to:
  – AS/NZS 4671: 2019
  – AS 3600: 2018
  – the Building Code of Australia and hence the National Construction Code
- It is readily identifiable by a rolled-in mark showing the bar to be 750N material.

Grade and ductility

Figure 1 (below), from a typical length of Viribar®750, demonstrates the exceptional stress/strain properties of Viribar®750 compared with conventional 500 MPa reinforcing steels. The graph shows that Viribar®750 comfortably meets the requirements of the Australian Standard AS/NZS 4671 750 MPa, Ductility Class N reinforcing bar.

In the sample tested, the yield strength of around 800 MPa is above the required minimum 750 MPa point and with the strain in this sample around the 9–10% mark, it confirms that Viribar®750 comfortably exceeds the 4% mark requirement of the Australian Standard.

The Viribar®750 range

Viribar®750 is available in diameters that have the Equivalent Force Capacity to standard 500 MPa bars, making the designer's job easy. For example:

- The standard N10 500 MPa (10 mm diameter) bar has a force capacity of 39.3 kN. The equivalent Viribar®750 is 8.2mm diameter, giving it exactly the same force capacity of 39.3 kN
- For a column fitment, an N10 can be directly substituted with an 8.2mm Viribar®750, designated V8.2

Similarly, there are Equivalent Force Capacity diameter Viribar®750s for N12 and N16 500 MPa steels, specifically a V9.8 and V13.

The Substitution Table (Table 1, opposite) can be used by designers to specify the Viribar®750 product to replace the standard 500 MPa fitment.

Note: At time of publication (September 2021) Viribar®750 is only available in Sydney. Please contact your local branch for the latest availability information.

Figure 1. Stress/strain properties of Viribar®750 compared with conventional 500 MPa reinforcing steels

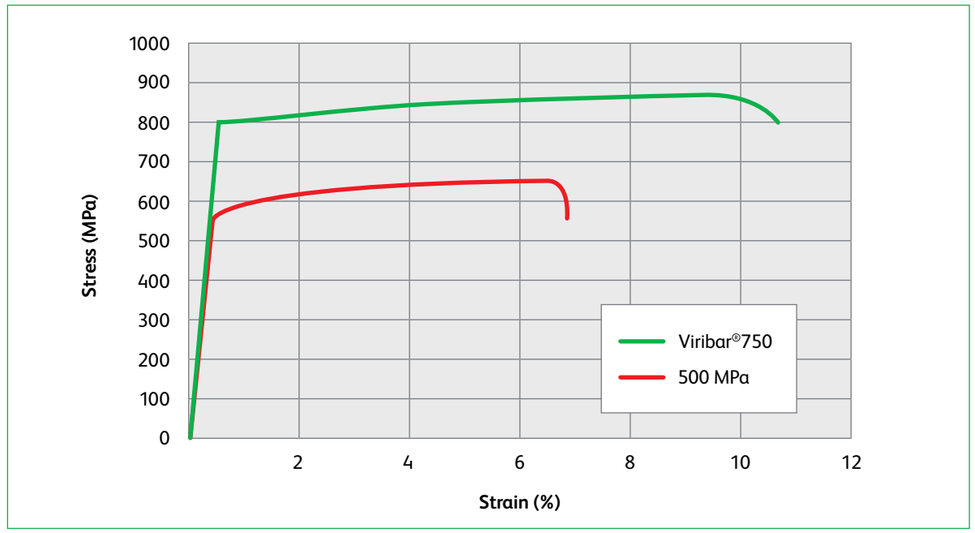


Table 1. Substitution Table

Equivalent Diameters (mm)			Minimum Capacity (kN) $A_{b.fit}$ x $f_{sy.f}$
Standard $f_{sy.f}$ = 500 MPa	Viribar®750 $f_{sy.f}$ = 750 MPa	Viribar®750 Designation	
10	8.2	V8.2	39.3
12	9.8	V9.8	56.5
16	13.1	V13	100.5

Identifying Viribar®750

Viribar®750 products are readily identified by the rolled-in mark indicating the bar is 750N material.

The bar markings, shown in Figure 2, are designated in the following format – Grade (MPa) / Ductility Class (N) / Diameter (mm). The letters 'LSA' (Liberty Steel Australia) are the mill mark.

Figure 2. Typical rolled-in bar markings

Test Certificates

The Viribar®750 fitments meet all the requirements of AS/NZS 4671: 2019 *Steel for the reinforcement of concrete*. Samples of the product have been independently tested by the University of New South Wales and MTS to confirm the conformance of Viribar®750 material to AS/NZS 4671: 2019.

Designs that conform to AS 3600: 2018 are deemed-to-satisfy the requirements of the Building Code of Australia, which is part of the National Construction Code.

Viribar®750 meets all the requirements of:

- AS/NZS 4671: 2019 *Steel for the reinforcement of concrete*, including:
  – Strength
  – Ductility
  – Chemical composition (weldability)
  – A Certificate of Conformity
- AS 3600: 2018 Clause 10.7.3.3, which allows fitments to be up to 800 MPa in strength provided they meet the requirements of AS/NZS 4671
- National Construction Code and Building Code of Australia deemed-to-satisfy
  – Designs that conform to AS 3600: 2018 are deemed-to-satisfy the requirements of the Building Code of Australia, which is part of the National Construction Code.

Figure 3. Conformance Certificate

InfraBuild Construction Solutions
CONFORMANCE CERTIFICATE : 750N - 9.8 - 0621

DATE :	1/06/2021

CUSTOMER

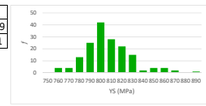
SUPPLIER
IBCS
33 SHADDOCK AVENUE
VILLAWOOD NSW 2163

GRADE :	750N
DIAMETER (mm) :	9.8
MILL MARKS :	750N 9.8 LSA
FORM :	DECOILED
CEV (%):	<0.49*

* - Maximum

MECHANICAL PROPERTIES			LTQ			
YIELD STRESS (MPa)			RATIO		A_{gt} (%)	
MEAN	$R_{eh.L}$	$R_{eh.U}$	MEAN	$(R_m/R_e)_{k.L}$	MEAN	$A_{gt.k}$
802	762	842	1.07	1.05	7.0	5.9
SPECIFICATION**	≥750	≤900		≥1.04		≥4

TEST DATE	No. TESTS :	166
	START :	22/03/2019
	FINISH :	1/06/2021



** - To AS/NZS 4671 : 2019

I certify the conformance of the material to AS/NZS 4671 : 2019 and that the information on this Certificate is in accordance with the records of InfraBuild Construction Solutions.

Graeme McGregor
Chief Engineer

Why use Viribar®750?

Directly substitutable

As Viribar®750 is directly substitutable for 500N Standard Fitments, a standard 500N fitment can be substituted with the equivalent Viribar®750 fitment without re-engineering, incurring no redesign costs.

More sustainable

Viribar®750 has 33% less mass than its equivalent 500 MPa fitment, so specifying Viribar®750 means specifying a more sustainable option.

Less raw material and energy to produce

Because Viribar®750 uses less raw material and energy to produce, it is more sustainable than the alternative 500N Standard Fitments. This reduction in raw material and energy use in production leads to a potential embodied energy and greenhouse warming saving of approximately 33%.

Table 2 (below) shows that the stronger Viribar®750 fitments are 33% lighter than equivalent 500 MPa standard fitments.

Table 2. Mass savings using Viribar®750 vs equivalent 500 MPa fitments

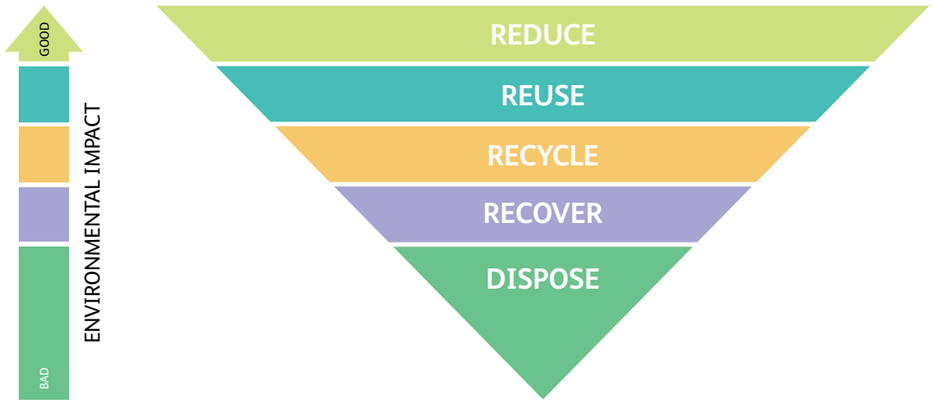
Viribar®750		500 MPa		Mass Saving (kg/m)	Saving (%)
Designation	Mass (kg/m)	Designation	Mass (kg/m)		
V8.2	0.43	N10	0.64	0.21	33
V9.8	0.62	N12	0.93	0.31	33
V13	1.10	N16	1.65	0.55	33

Reduce, Reuse, Recycle

Specifying Viribar®750 fitments delivers even greater sustainability outcomes than simply specifying steel. It is widely recognised that specifying a steel product improves sustainability in construction as it is considered the most recycled building material in the world.

The Waste Hierarchy (Figure 4), a fundamental guide to managing our diminishing resources, demonstrates the 33% reduction in mass provided by specifying Viribar®750 fitments is even more valuable for sustainability than is recyclability.

Figure 4. The Waste Hierarchy



The Benefits of Being 33% Lighter:

Recognised by the GBCA and ISCA

Australia's peak sustainability bodies for construction – the Green Building Council of Australia (GBCA) and the Infrastructure Sustainability Council of Australia (ISCA) – both recognise the role played by 'Reduce' as the highest tier of the Waste Hierarchy. The GBCA's Green Star rating tool and ISCA's Infrastructure Sustainability (IS) tool both reward a reduction in material consumption[1].

The GBCA also offers an automatic additional point under its Innovation Credit 30A for using only Viribar®750 fitments on a reinforced concrete project, subject to meeting eligibility criteria.

Innovation points may also be available for the IS tool as a result of the innovative method by which the Viribar®750 is produced. InfraBuild has successfully lodged patents for Viribar®750 production in 12 counties and regions around the world, four of which have already been granted in Australia, New Zealand, Singapore and China, confirming Viribar®750 is a world-first, a key criterion in the IS tool's Innovation Credit.

For more information visit www.gbca.org.au/faqs.asp?action=details&faqId=112 or www.isca.org.au/is_ratings or email: sustainability@infrabuild.com

Green Building Council Australia
Member 2020–2021

ISCA Infrastructure Sustainability Council of Australia

Lower transport, handling and fixing costs

The weight savings shown in Table 2 deliver potential savings for activities that are costed based on weight.

- Lower transport and handling costs: up to 50% more fitments that can be transported and craned onto a site in each load, leading to significant savings in transport and handling costs
- Reduced site storage requirements: the physical on-site storage space taken up by Viribar®750 fitments is significantly smaller than 500N Standard Fitments
- Lower fixing costs: where steel fixing is charged by the tonne, the 33% weight saving over 500N standard fitments results in considerable savings in fixing costs.

Transport and cranage energy savings

The lighter product offers opportunities for more energy savings from transport and cranage. Fifty per cent more fitments can be transported and craned onto a site in each load.

Reduced safety risk

The reduced mass of Viribar®750 results in lighter manual handling with fewer back injuries and other on-site risks.

[1] *Reduction in material use reduces the environmental impacts in Green Star Credit 19A and in the IS tool's Material Calculator.*

How to specify Viribar®750

Specifying Viribar®750 requires two simple steps:

1. Add the following note to the General Notes Drawing:

Reinforcement:
Material is indicated by the following symbols:
N Deformed Bar Grade 500 MPa (Normal Ductility)
R Plain Round Bar 250 MPa
V Viribar®750 Plain Round Bar Grade 750 MPa Normal Ductility
W Plain Wire Grade 450 MPa
SL Square Fabric Grade 500 MPa
RL Rectangular Fabric Grade 500 MPa

2. Add the following table below the Column Schedule on the column drawing:

Diameter of 500 MPa Fitment	Alternative Viribar®750 MPa Fitment
N10	V8.2
N12	V9.8
N16	V13
Viribar®750 plain round fitments may be used as an alternative to 500 MPa fitments in accordance with the table above.	

Endorsement

The technical aspects of this publication have been reviewed by Professor Stephen Foster of UNSW Sydney. Professor Foster confirms the Viribar®750 range fitments meet the requirements of Clauses 10.7.2 to 10.7.4 and Clause 15.5.4 of AS3600–2018 for substitution for 500N fitments in high-strength concrete columns as per the details of this publication.

VIRIBAR®750 COLUMN FITMENTS V2.1/2021

For more information – www.viribar.com.au

InfraBuild has published a Viribar®750 Technical Note, which can be downloaded from the InfraBuild website:

https://www.infrabuild.com/en-au/products-services/landing-pages/viribar750-high-strength-steel-fitments/


InfraBuild
Reinforcing
Technical Note
Viribar®750 Column Fitments
VIRIBAR 750
Viribar®750, a stronger steel and therefore lighter for the same design capacity compared with 500 MPa fitments, provides a more sustainable option, lower handling costs, and a safer product.
Endorsement
The technical aspects of this publication have been reviewed by Professor Stephen Foster of UNSW Sydney. Professor Foster confirms the Viribar®750 range fitments meet the requirements of Clauses 10.7.2 to 10.7.4 and Clause 15.5.4 of AS3600–2018 for substitution for 500N fitments in high-strength concrete columns as per the details of this publication.
Substitution for 500 MPa column fitments
Table 1: Substitution Table
Equivalent Diameters (mm)
Standard f_{sy} = 500 MPa
Viribar®750 f_{sy} = 750 MPa
Viribar®750 Designation
Minimum Capacity (kN) $A_{sv} \times f_{sy}$
10
8.2
V8.2
39.3
12
9.8
V9.8
56.5
16
13.1
V13
100.5
1 | Technical Note – Viribar®750 Column Fitments – v1.1 09/21
InfraBuild Reinforcing

To lodge an enquiry, visit the Viribar®750 enquiries page.

Note: At time of publication (September 2021) Viribar®750 is only available in Sydney. Please contact your local branch for the latest availability information.

InfraBuild

Building futures through sustainable steel

InfraBuild Reinforcing

For further information contact:

Customer Service

W: www.infrabuild.com/en-au/resource-centre/forms/viribar-enquiries/

E: reinforcing@infrabuild.com

www.infrabuild.com