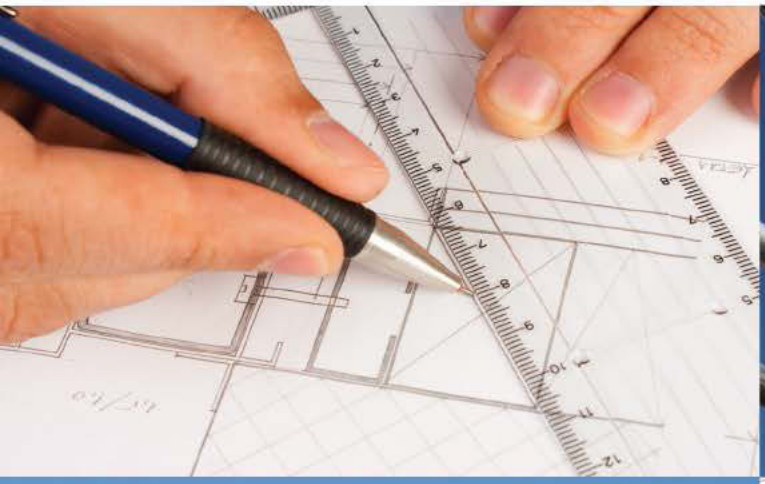
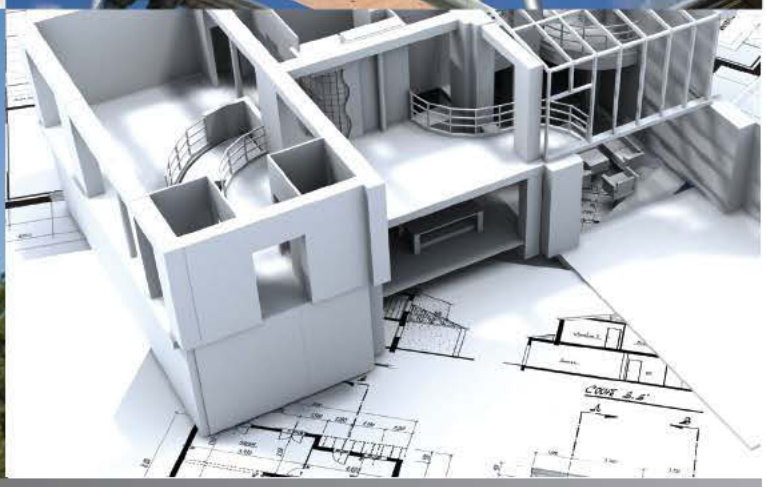
SmartPlank Design Guide





WOOD NATURALLY BETTER

Edition 2 2012

SmartPlank®

SmartPlank is a lightweight yet robust structural Laminated Veneer Lumber (LVL) manufactured to AS/NZS 4357, sized and engineered to meet or exceed the performance requirements for scaffold planks as defined in AS 1577 Scaffold Planks.

The use of LVL scaffold planks have become well established within the construction industry, due to their superior performance and robustness compared to conventional timber.

Quality

Compliance with process based quality control requirements is third party audited by SAI-Global, and the audits, together with end product testing is used as the basis for Product Certification by SAI-Global as a JAS-ANZ accredited Product Certification body.

Certified Product™ Australian Standard
AS 4357 Lic SMKB25260
SAI Global

JAS-ANZ stands for the government established "Joint Accreditation System of Australia and New Zealand" which exists as the peak organisation for accreditation of Product Certification bodies.

SmartPlank scaffold planks are individually proof tested at the time of manufacture to confirm that each plank complies with the requirements of AS 1577. They are carefully packed, strapped and covered in weather proof wrap and stored in a dry environment, prior to be being dispatched to any site.

SmartPlank scaffold plank is only intended for use as a Scaffold plank - i.e. for support of persons equipment and materials on scaffold constructed and loaded as per relevant Australian/New Zealand Standards.

Use for any other purpose voids continued use as a scaffold plank - SmartPlank used for any other purpose (or subject to trauma) should:

1. Have edge labelling on both sides planed off
2. Be indelibly and permanently marked by painting or stencilling as no longer suitable as a scaffold plank

PRODUCT SPECIFICATION:

Veneer:

Thickness (normal):	2.5 - 3.2 mm
Species:	Douglas Fir
Grade:	CD (Metriguard graded)

Joints:

Face:	Scarf and overlap
Internal:	Scarf and overlap

Moisture content:	8 - 15 %

Dimensional tolerances:

Length:	± 10 mm
Depth:	± 2 mm
Thickness:	- 0, + 4 mm

Density:

Approximately 600 kg/m^3

Adhesive:

Phenol Formaldehyde
(Type "A", AS 2754.1)

Product Marking

Each SmartPlank is permanently marked along its edge with the following information as per AS 1577:

- ✔ SmartPlank logo and LVL grade (13.2 GPa)
- ✔ AS 1577 reference
- ✔ SAI Global logo and license number
- ✔ JAS-ANZ logo
- ✔ OHSA (United States *Occupational Safety and Health Administration*)
- ✔ Working Load Limit (WLL)
- ✔ Proof tested
- ✔ Allowable span in metres

Proof Loading

ALL SmartPlanks undergo extensive proof testing within the factory prior to shipment. All SmartPlanks in service should undergo regular proof testing to ensure their structural integrity.

Subsequent proof test load should be twice the Work Load Limit (WLL) and the plank should be tested with critical defects as near as possible to the load point but on the opposite face. For planks longer than their maximum span and where there is no clearly defined suspect weak point , testing of planks in a number of positions and orientation is suggested.

Appendix B of AS 1577 sets out a method for determining the strengths of scaffold planks in bending. Users may develop their own test methods provided that this proof test method meets the requirements of the test as described in the above standard.

SmartPlank Spans and Working Load Limit (WLL)

SmartPlank size width x thickness (mm)	Approximate mass (kg/m)	Maximum span (lineal metres)	Working load limit WLL (kg)
230 x 38	5.3	1.8	210

Available in lengths of 3.6 to 6.0 metres (check available lengths from you local stockist before ordering)

USING SmartPlank IN THE WORK-PLACE

To ensure that each SmartPlank can safely perform to the requirements of AS 1577 during its entire service life, it is important that the SmartPlank is stored, used and maintained according to the following recommendations.

Storage

Never allow SmartPlank to be stored where it can come into direct contact with water or damp surfaces.

(a) Wet SmartPlanks

Locate stack in a dry, well ventilated area. Stack on bearers or similar supports, 3 per plank, well above the ground to let the air circulate (minimum recommended distance of 300 mm). Separate each layer with stickers (spacer), approximately aligned with bearers below.

(b) Dry SmartPlanks

Keep dry !

- If under cover, use good timber stacking practice
- If outside, use a weatherproof cover to keep dry and stack as per wet planks.

ENVIRONMENTAL FACTORS AFFECTING THE PERFORMANCE OF SmartPlank

1. Industrial Chemicals

Once cured, the adhesive within SmartPlank becomes inert, thus the adhesive process cannot be reversed. The adhesive is therefore not affected by chemicals usually found in any conventional construction site.

Moderate strength acids or alkalis within the pH range of 2 -10 will have little impact on SmartPlank. Substances with pH outside the above range will cause a breakdown in natural components of the wood, thus causing a reduction in strength of the SmartPlank.

SmartPlank used in environments which experience exposure to strong acid or alkalis, should be regularly proof tested to check their continued compliance to AS 1577.

2. Decay

Fungal decay occurs when the wood has moisture content in excess of 20% for an extended period. The normal cyclic wetting and drying environment experienced by scaffold planks in service caused by weather is not likely to cause fungal attack provided that:

1. Wet planks are stored as per recommendations above. Never store SmartPlank touching each other or other surface which prevents airflow around each plank.

2. SmartPlank is never left in service where the moisture content of the timber is likely to remain at or above 20%, e.g. in a constantly humid wet environment. (The moisture content can be checked with a moisture meter)

3. SmartPlank showing ANY evidence of fungal decay such as mould on any surface should be removed from service, dried to moisture contents less than 15% and then proof tested to ensure no reduction in strength has occurred.

MISUSE LEADS TO DAMAGE

The service life of a SmartPlank® will be dramatically reduced if it is damaged through misuse:

DO NOT EXCEED MAXIMUM SAFE PLANK LOAD

DO NOT DROP YOUR PLANKS

DO NOT EXCEED MAXIMUM SAFE PLANK SPAN

MISUSE LEADS TO DAMAGE (Cont'd)

DO NOT DROP HEAVY MATERIALS ON YOUR PLANK

DO NOT SPILL STRONG OR CORROSIVE CHEMICALS ON YOUR PLANK

DO NOT JUMP ON YOUR PLANK

DO NOT ALLOW OXYACETALYNE CUTTING OR WELDING TO CAUSE BURNS TO YOUR PLANK

DO NOT ALLOW VEHICLES OR PLANT ON YOUR PLANKS

DO NOT USE YOUR PLANKS FOR ANY PURPOSE OTHER THAN AS SCAFFOLD PLANKS

If a SmartPlank does suffer any form of misuse (including misuse not specified above), it should be checked immediately, taking into account that fractures and other internal damage may not be visible. If in doubt, please proof test the plank.

TYPICAL DEGRADATION EFFECTS AND GUIDELINES FOR CONTINUED USE

CONDITION	APPEARANCE	POSSIBLE CAUSE/EFFECT	NECESSARY ACTION
Mould	On surface	Indicates onset of fungal attack which may have become sufficiently established to result in loss of strength	Do not use planks. Await validation for continued use. Wash mould off and then allow to dry, examine for soft patches or other evidence of decay. If there is no decay, proof test and return validated planks for service
Burns	In aggregate, more than 75 mm across the width of the plank and less than 1 mm maximum depth	Welding slag or torch burns causing loss of section and loss of strength	Proof test plank to validate for continued use
	In aggregate, more than 75 mm across the width of the plank and more than one veneer thickness or (3 mm) maximum depth	As above	Either remove defect by cutting off affected portion or discard plank
Saw cuts	In aggregate, more than 75 mm across width of the plank and more than 1 mm deep. Edge cuts more than 10 mm deep	Notches, such as saw cuts, can result in a disproportionate loss of strength	Discard plank or cut off affected area
Notches or holes	Any notches or holes other than nail holes	Holes or notches made in planks to permit penetrations, bolting etc. may result in excessive loss of strength	Discard plank or cut off affected area
Discoloured patches	Not identified as due to paint/stain, cement, oil or other common substances with moderate pH	Fungal decay or chemical degradation leading to softening of wood and loss of strength	Discard plank or cut off affected area. Otherwise, proof test to validate continued use
	Oil, grease, paint or other substance on surface with potential to increase slipperiness	Slip hazard	Withdraw planks from service. Gently scrape material and/or wash from surface with detergent. Clean planks may be returned to service
General discolouration	Plank surface grey in colour, possibly accompanied by fine checks (splits) in surface veneers. No evidence of defibration or softening of the surface	Normal bleaching by the sun. Surface checking is also normal and not critical early effect of weathering	No action required
	Dark grey or bleached, accompanied by softening of the wood surface and defibration - ridges of harder wood, parallel to the grain may be left and soft wood readily removed if scratched or rubbed	Chemical degradation or advanced weathering leading to loss of strength	Discard planks exhibiting defibration or softening of the wood fibre on the surface. For planks subjected to strong acids and alkalis, proof testing at intervals related to time, usage cycles and exposure is recommended

TYPICAL DEGRADATION EFFECTS AND GUIDELINES FOR CONTINUED USE (Cont'd)

CONDITION	APPEARANCE	POSSIBLE CAUSE/EFFECT	NECESSARY ACTION
Splits	Discontinuous surface splits, usually not extending deeper than the 3rd layer of veneer	The result of weathering effects of constant wetting and drying. called 'checks'	No action required. Checking of this type is normal and has little effect on structural capacity
	End splits, extending through the full thickness, but not more than 300 mm in length	Result from moisture differentials near the end of planks and the moisture-induced shrink and swell characteristics	No action required. Where splits exceed 300 mm, cut off and paint seal end of plank to limit the ingress of moisture
Splits in edges	Splits in edges between plies. Individually more than 150 mm long and allowing insertion of a knife blade to a depth of more than 10 mm	Possibly a manufacturing defect. Bond. defects are usually apparent after first exposure to moisture. (Not to be confused with numerous small checks associated with weathering) - unlikely to be critical unless extensive	Remove plank from service and seek advice from manufacturer
Lifting veneer	Veneer lifting from surface, bubbles etc. or veneer separation at face scarf joint	Defective manufacture, usually evident very early in the life of the plank. Poorly made scarf joints may be critical	Remove plank from service and seek advice from manufacturer
Any observation suggesting planks have been used as 'duck boards', sole plates, formwork, or for any other purpose other than as scaffold planks		Damaged plank - damage may not be immediately obvious but plank may break suddenly under normal load in future	Discard plank. Tag, paint or otherwise clearly and permanently distinguish as not suitable for scaffolding purposes
Any plank seen to be subjected to unusually severe loading - impact loading from falling objects excessively loaded (more than 210 kg) with stacked materials, subjected to vehicular traffic etc		Weakened plank - weakening may not be immediately obvious but plank may break under normal load in future	Remove immediately. Discard and tag, paint or otherwise clearly and permanently distinguish as not suitable for scaffolding purposes
Corner damage at ends	Part of the width of the plank near the end or ends (more than 15% of the width) has been broken away reducing the width of bearing at the end support	Usually the result of dropping. The loss of the width may result in the plank rolling at the affected support	Cut off affected end and paint seal to reduce moisture ingress
Loss of section	Corner or other part of cross-section area exceeding 400 mm^2 broken away	The result of damage. Will reduce strength depending upon the loss of cross-section	Cut off affected portion or reject for continued use as a scaffold plank

Applicable Design Standards

The design of scaffold components must comply with:

- AS/NZS 4576:1995 Guidelines for scaffolding
- Relevant Local or National OH&S regulations (Where applicable)
-

In-service strength testing

Appendix L of AS/NZS 4576 describes a convenient non destructive field test for assessing the suitability or otherwise of individual planks suspected to have been damaged or showing signs of excessive wear. This test is not a substitute for regular proof testing of all scaffold planks as part of an ongoing quality assurance program.

Disclaimer:

I. The information contained within this SmartPlank® Design Guide is current as at September 2012 and is offered as a guide only . Users must satisfy themselves that the SmartPlank as described in this Design Guide meets any design requirements of Australian Acts, Regulations or Codes of Practice.

II. Tilling Timber Pty Ltd Pty Ltd reserves the right to change the information contained in this document without prior notice.

III. Users should satisfy themselves that this Design Guide for SmartPlank is most up to date information available by referring to www.tilling.com.au to check for updated product information.

IV. Tilling Timber Pty Ltd has used all care to ensure the accuracy and reliability of the information contained in this document and, to the extent permitted by law, will not be liable for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

SMARTFRAME DESIGN COMPENDIUM

Design Compendium Contents	Interactive	Printable	PC
Specification Software	✓	✓	✓
- Technical Support	✓		✓
Design Guides (pdf)	✓	✓	✓
Technical Illustrations (dxf/dwg for CAD)		✓	✓
Fixing Details - fixing details/hangers (jpg)			✓
Video Clips - installation/company (mpg)			✓
Software Tutorial	✓		✓

Never before has so much user friendly computer power been unleashed into the hands of building industry professionals to allow the design and detailing of engineered timber products. This software, in conjunction with the SmartFrame Design Centre and SmartFrame engineered timber products themselves, combines to form the most sophisticated structural timber option ever available to the Australian market. The SmartFrame Engineered Timber Solution represents an entirely new and revolutionary concept in the delivery of 21st century technology and service to the building industry.

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