Wood Protection

BS 5534 Compliant Roofing Battens

Treatment with VACSOL and TANALITH Preservatives: Best Practice Recommendations

What Makes a Quality BS5534 Compliant Timber Roofing Batten

Not all timber battens are suitable for roofing: There are many manufacturers of timber battens of which the finished quality will vary considerably.

Only battens manufactured, pre-graded and carry the BS 5534 mark can be used to achieve a quality roofing structure.

Quality is backed by UKAS accredited third party quality assurance and process controls to ensure both procedures and the product is compliant.

Treatment quality is backed by Lonza Wood Protection TREAT-RIGHT Quality Scheme.

Other battens may only be used in non-roofing applications e.g. garden trellis.

BS 5534 Roofing battens and counter battens should be graded and marked prior to delivery to the treatment company and the end user in order to comply with NHBC warranties and the Competent Roofer Scheme.

Compliance cannot be achieved at the point of installation.
Whilst timber grading and marking will have been completed prior to delivery of untreated timber to the treatment yard, the following BS 5534 quality assurance controls can be checked:

1. Timber Species

Roofing battens should be of the following species, with species identified with a four letter code as defined (BS EN 13556):

British Grown (UK and Republic of Ireland):

British Pine (Pinus sylvestris)	WPNN
British Spruce (Picea sitchensis)	WPCS
Larch (Larix decidua)	WLAD

Imported Timbers:

Redwood (Pinus sylvestris)	PNSY
Whitewood (Picea abies; Abies alba)	WPCA
Spruce Pine Fir (USA, Canada)	WPCE
Southern Pine (USA)	WPNE

NOTE: Combined or mixed species is referenced by the code: WPPA

2. Roofing Batten Sizes

Roofing Battens should not be less than the minimum sizes as follows:

- 25 x 38 mm
- 25 x 50 mm

NOTE: A 'face' is defined as that part of a batten parallel to the tile and the 'width' is the dimension of the face. A 'side' is defined as that part at 90 degrees to the tile and the 'thickness' is the dimension of the side.

Sizes are measured at 20% moisture content and can be adjusted to 20% moisture content by a 1% change in cross sectional dimension for every 4% change in moisture content.

3. Timber Marking

Individual roofing battens should be graded according to specific criteria and marked with indelible ink as follows:

- Name of Supplier
- Origin (Imported or British Grown and/or Species Code)
- Graded BS 5534 as a manufacturers declaration of conformity

June 2020

4. Roofing Batten Timber Grading Criteria: Characteristics and Defects

- **Knots:** There should be no distinction between knot holes, dead or live knots
  - Knots or knot holes < 5mm can be ignored
  - Where a knot appears on both faces, the sum of exposure should not exceed the width of the batten
  - A knot appearing on both sides of a batten and the face is not allowed
  - A knot appearing on both sides of a batten but not on the face is not allowed if the knot on each side is > one fifth of the thickness.
- **Wane:** This is permitted on one arris but should not exceed one third of the dimension of the faces on which it occurs
- **Fissures and Splits:**
  - A Split is defined as 'through the piece'
    - End splits that occur before fixing should be trimmed off
    - End split or split that occurs at intermediate support that occur due to nailing should be <150mm long
  - A Fissure is defined as 'not through the piece'
    - Fissures should not be > half the batten thickness and not exceed 300mm in length
- **Slope of Grain:** Deviation of the slope of the grain from the longitudinal axis should not exceed 1 in 6 on either axis according to BS4978
- **Rate of Growth:** An average of not less than 4 annual rings per 25mm measured at each end
- **Distortion:** Bow, spring or twist should each not be > 5mm measured over a length of 1.2m at reference 20%mc
- **Decay and Insect Attack:** Battens should be free from rot and live insect attack
- **Sapstain:** Bluestain is not deemed a structural defect and is therefore permitted
- **Resin pockets:** Permitted on either face so long as:
  - **Length < 70 mm**
  - **Width < 6 mm**
  - **< one third batten thickness**
- **Resin Pockets:** Permitted on sides so long as:
  - **Length < 70 mm**
  - **Width < 6 mm**
  - **< 12 mm depth**
- **Moisture Content:** %mc at the time of fixing must not be >22%

5. Preservative Treatment for BS 5534 Roofing Battens

Roofing battens are defined as Use Class 2 (EN335) for wood in service.

Use Class 2 is defined as wood undercover and not exposed to weather (rain or driving rain) but where occasional but not persistent wetting can occur. In this Use Class, condensation of water on the surface of the wood can occur.

BS 5534 states that for roofing timbers treated to Use Class 2, preservative treatments should be in accordance with the 60-year service life recommendations given in BS 8417, the latest version of which is 2011+A1:2014 Preservation of Wood – Code of Practice.

Preservative is applied using either vacuum, low pressure or double vacuum processes. Alternatively, preservative is applied using vacuum, high pressure processes.

NOTE: Dipping processes to treat roofing battens will not achieve the required preservative penetration and retention requirements to achieve long term protection against decay and insects for a service life of 60 years.

NOTE: Consideration should also be made to the Building Regulations (England & Wales), Building Regulations (Northern Ireland) and Building Standards (Scotland) and any local byelaws with regard to preservative treatment in areas subject to attack by the House Longhorn Beetle (Hylotrupes bajalus). BS8417 gives guidance as to the correct preservative treatments for wood used in roofs in these areas.

NOTE: Preservatives used should comply with the requirements of the Biocidal Products Regulations

6. Preservative Types

BS 5534 compliant roofing battens can be treated with either VACSOL Aqua or TANALITH.

Both preservatives are approved for use under the Biocidal Products Regulations.

VACSOL Aqua Treatment is colourless but coloured markers may be used to identify specific treated brands.

TANALITH treatment imparts a green colouration to battens which slowly weathers over time to a warm honey brown and eventually a natural grey.

7. Documentation

Each delivery of treated roofing battens should be accompanied by documentation stating the following as a minimum:

- Name of Supplier
- Origin (Imported or British Grown and/or Species Code)
- Graded BS 5534 as a manufacturers declaration of conformity
- Basic size or sizes
- Type of preservative and method of treatment if applicable

Timber Preparation

Treatment packs ideally should be prepared from a single species although mixed species are allowed.

Typically roofing battens are produced in bundles of ten cut from larger dimension timber.

Timbers should be dried to a moisture content of 20% and suitable for both machining (planing and regularisation) and treatment.

Roofing battens should be cut from fresh timber not exposed to the effects of ultra violet radiation (sunlight) which is usually observed as a yellowing of the timber surface.

Whilst blue stain is allowed, this should be avoided as it is an indication that timber may still be wet and potentially pre disposes timber to surface mould.

Timber wane should be limited according to the grading specification.

Packing

Battens are typically packed in bundles of ten with a pack formed by combining a multitude of these bundles.

Plastic straps should be used at all times, not metal. Excessive pack strapping should be avoided and if possible limited to 3 across the length of a pack. The same straps should secure packs to suitable bearers positioned underneath.

Until such a time packs are required for treatment, they should be completely wrapped in plastic or at least undercover avoiding exposure to the elements (rain and snow) and also the ultra violet effect of sunlight.

Genuine BS 5534 roofing battens are not those presented for treatment with excessive moisture or in an unseasoned (sappy) condition as this does not comply with the requirements of the specification.

Temperature and Treatment During the Winter

Modern preservatives such as VACSOL and TANALITH are water based and therefore may freeze on contact with a cold timber surface.

It is acceptable to maintain preservatives at 20° C achieved through heating pipes circulated within the storage tank.

However, it is important that the surface temperature of the timber is maintained above 10° C at all times. This is achieved by storage in a heated building or for a short time in a kiln drying facility.

All plastic wrap should be removed from timbers prior to treatment.

Ideally all timbers should be sloped on the bogie to allow free drainage of excess solution during final vacuum since this ensures a dry (drip free) product retrieved from the treatment vessel. It also improves the accuracy of charge uptake measurement.

Whilst packs should be securely attached to bogies, this strapping should not be over tight.

Preservative Mixing

Target strength is dependent on the preservative type used.

Additional colour may be used with VACSOL preservative, typically in the form of an orange dye or blue pigment. Other colours may be developed from time to time.

Water should be of sufficient good quality and should be softened if found to be over hard in terms of calcium. For further advice contact the local Lonza Wood Protection representative.

Preservative concentrate and any associated additive should be dosed automatically and directly into either a mixing or storage tank.

After dosing, the contents of a tank should be recirculated or a charge completed to ensure complete mixing.

For accuracy of measurement, preservative concentrate and any associated colour should be dosed using a suitable pump or flow meter system. For advice contact local Lonza Wood Protection representatives.

Where pigment colours are used in VACSOL, solutions contained within a mixing or storage tank should be recirculated at all times to maintain pigment in suspension. This helps maintain consistency of colour on surface of timber.

Whilst TANALITH strengths can be measured on site using a hydrometer, this system cannot be used to confirm strengths of VACSOL on site.

If corrective action is required, this should be completed with immediate effect. Advice can be given by the local Lonza Wood Protection representative at all times.

NOTE: Where two preservatives are used on the same Autoclave (e.g. TANALITH and VACSOL), steps should be taken to avoid cross contamination at all times to avoid compatibility and colour issues. Lonza Wood Protection cannot take responsibility for any cross contamination.

NOTE: Mixing tank and storage tanks should occasionally be cleaned out with any sludge that may have accumulated over time removed from tanks. Sludge should be disposed of following local authority and environmental regulations.

Treatment cycle

Treatment cycles will be set up on an individual basis depending on the preservative used. Treatment cycles are set up to comply with the preservative retention and penetration requirements of Use Class 2 for a service life of 60 years. Typically these are envelope treatments.

Treatment cycles are generally specific to an individual treatment plant and depend largely on plant design, age and performance.

Ideally double vacuum process plants should be square but it is also acceptable to use cylindrical plants. On occasion cylindrical tanks with baffles installed to square off tanks are used and this is perfectly acceptable.

On occasion it may be necessary to slow down fill and empty times through engineering modification.

Treatment cycles are dependent on preservative used and set up is completed to achieve correct preservative uptake. However, this has to be balanced with avoidance of inconsistent or patchy treatment. This also relates to how timber is packed, moisture content and temperature

NOTE: Overall preservative uptakes in Pine are dependent on the ratio of heartwood to sapwood present. Typically, uptakes in Pine are more difficult to control compared to those in Spruce and will be higher. Given the variability in treatment, overall uptakes cannot easily be controlled by cycle manipulation and will have to be accepted as a natural feature of the timber being treated.

Overall Preservative Uptakes

(Accuracy of Measurement)

Given low overall uptake requirements per charge, the accuracy of measurement is difficult to achieve particularly on a charge by charge basis. It can however be improved by the use of a lower volume measure or injection tank. Further accuracy can be achieved by following all the guidelines indicated in this document.

It may be necessary to confirm overall preservative uptakes as an average of multiple (at least ten) charges.

Overall uptakes confirmed by weight are accurate as long as the timbers are weighed drip free after treatment.

It is acceptable to treat mixed species packs but uptakes will be higher in Pine packs.

Preservative Retention and Treatment Specification Compliance

Quality control of BS 5534 roofing battens should be confirmed through a combination of indirect and direct testing, typically twice yearly.

Solution strength test and sample return should be completed on a regular basis. Overall preservative uptakes should be recorded at all times.

Successful auditing and BS 5534 compliance is confirmed through Lonza Wood Protection TREAT-RIGHT certification on a six monthly basis.

Timber Storage After Treatment

Packs should be allowed to dry completely (drip free and surface dry for at least 48 hours before leaving the treatment plant.

NOTE: In the winter time, any excess preservative within the packs will potentially freeze. On thawing, this could result in non-containment of preservative away from the treatment plant area in direct contravention of local and IED regulations.

Treated packs should be protected from the elements, in particular sunlight which can cause fade of colour of VACSOL treated packs.

A plastic wrap is acceptable.

Exposure to sunlight will result in a discrepancy in colour between exposed and covered timber which is not ideal.

Wrapping packs will also protect them against exposure from rain and snow. Treated battens should be dispatched to the customer as soon as possible, dated with the appropriate and correct labelling applied at all times (e.g. specification stamp and BPR label).

Any quality treatment mark including TREAT-RIGHT certification should also be supplied with compliant BS 5534 roofing battens.

Metal Fastenings

TANALITH: Roofing battens treated with copper based preservatives such as TANALITH, should be re dried to 20%mc for at least 7 days before potential contact with metal fittings, fasteners or flashings.

Where occasional dampness is expected, steel fittings or fasteners should be galvanized.

Where timbers are likely to become wet, austenitic stainless steel should be used.

VACSOL: No adverse effects on metal fittings, fasteners or flashings is expected so long as timber is re dried before use.

Further information can be obtained from Lonza Wood Protection.

VACSOL treated BS 5534: Consistency of colour (Special Considerations)

Using Spruce timbers is preferred since heartwood and sapwood bands cannot be distinguished (they are all the same white colour) unlike bands heartwood and sapwood observed in Pine.

NOTE: Compliance with BS 5534 is more easily achieved using Spruce.

- The colour does not cover heartwood bands in the same manner as sapwood bands in Pine simply because the heartwood in Pine is more resistant to treatment and therefore it is more likely to result in a darker colour compared to lighter coloured sapwood.
- Colour pigment will not cover weathered, blue stained, resinous timber and therefore the use of such timber should be avoided / rejected at all times.
- Correct mixing to achieve the minimum target strength requirements (concentrate preservative and pigment) should be achieved at all times.
- Recirculation of the solution in mixing / injection or storage tanks should be maintained at all times.
- Treatment solution temperature should be maintained at around 20°C at all times, particularly in the winter.
- Timber surface temperature should be maintained above 10°C particularly in the winter.
- Timber should not be treated with excessive surface moisture, snow, ice present.
- Timber should not be treated wrapped in plastic.
- Excessive strapping and over tightening of timber packs should be avoided.
- Excessive agitation or shear of solution should be avoided during mechanical operations.
- The minimum retention requirements of preservative should be achieved in order to comply with the treatment specification.
- Timbers should be suitably stored post treatment in order to avoid exposure to excessive sunlight in particular and the elements in general. This is usually achieved by suitable plastic wrapping.

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