

TTT Products Limited Poles

The innovative and versatile use of New Zealand Radiata Pine Poles

Introduction

TTT Products Limited (TTT) is a family owned and operated business, with more than 150 years of combined experience in the fields of civil and structural engineering, design, construction, and manufacturing.

TTT are leading manufacturers of New Zealand Radiata Pine timber poles for construction, retaining, and foundations. TTT produce a comprehensive range of poles – TTT SED, TTT Uglies, TTT UniLogs, TTT Tested, and our award winning hollow-core TTT MultiPoles.





TTT Products Limited production site, Tuakau, New Zealand

Tuakau is located about halfway between Auckland and Hamilton in the North Island of New Zealand. Our nearest ports are Auckland and Tauranga.

Sourcing and Selecting New Zealand Radiata Pine Logs for TTT Poles

- Common names: Radiata Pine and Monterey Pine. Botanical name: Pinus Radiata.
- First introduced into New Zealand in the late 1850's, but it was not until the 1920's and 1930's that the first forestry planting boom really took off.
- Renewable resource.
- Radiata Pine is an exotic species and makes up 90% of New Zealand's commercial plantation forest.
- More than 1.5 million hectares planted which makes up one third of the world's total Radiata Pine stocks.
- Sustainable yield – 34 million tonnes of logs harvested annually.
- TTT supply timber poles manufactured from logs sourced from sustainably managed forests using responsible logging contractors.





Why use TTT Poles?

- TTT are leading manufacturers of a comprehensive range of consistent, high quality timber poles.
- TTT Poles are incredibly versatile and have a myriad of applications either on their own, or as a building component, and can be installed in a wide variety of ground conditions.
- Timber poles have a high strength-to-weight ratio, are flexible, lightweight, easy to handle, and are an earthquake resistant construction material.
- New Zealand Radiata Pine is a renewable resource that is readily available. It is very durable and is likely to be the worlds' most treatable wood species due to superior timber preservative penetration and uptake.
- Preservative treated timber poles can offer a limited lifetime warranty (H1 to H5) of 50 years (refer to Koppers Treated Wood Product Warranty).
- TTT can process up to 6,000m³ of treated poles per month.
- Engineers can perform quality assurance checks on timber poles before, during, and after installation to ensure adequate 'sets' are achieved.



TTT SED Poles ready for delivery on a TTT truck

TTT operate 8-wheeler tip trucks. Deliveries are made either to depots or sites, with either truck only or truck and trailer combinations.

TTT Pole Manufacturing Process

- Machine-peeling targets the outer bark and cambium (inner bark) layers. The strong sapwood layer is minimally affected thereby ensuring the pole retains the bulk of its strength.
- The raw log is either machine-peeled to produce TTT SED Poles that follow the natural taper (6mm per metre) of the log or rounded to produce TTT UniLog Poles with a uniform diameter.
- TTT Uglies are debarked – not machine-peeled.

Peel

Grade

- The peeled, rounded or debarked poles are visually graded for sweep, crooks, knot size, taper, and ovality in accordance with NZS3605:2001.
- Each pole is measured to determine diameter and length.

Steam

- Steaming is a drying process that prepares the poles for timber treatment. Low-pressure saturated steaming has been proven to be the most efficient and effective drying process when it comes to poles.

Treat

- TTT is a registered treatment plant No. 444.
- In order for Radiata Pine to be protected against fungal and insect attack each pole needs to be impregnated with timber preservative.
- TTT treat poles with Chromated Copper Arsenate (CCA) which is a waterborne preservative with proven durability in the harshest conditions.
- [The Hazard Class](#) system denotes the level of timber preservative treatment required for the job in mind.

Fixate

- The poles are treated with heat in our fixation chamber for a specified period of time. This results in the reliable 'fixing' of the timber preservative to the wood cells within a very short period of time.

Sample

- Sampling a number of wood borings is required for quality control. TTT has a sampling regime that exceeds the industry standard.

TTT Poles and the Environment

TTT take seriously our duty of care to manufacture poles in an environmentally responsible manner:

- Logs are sourced from sustainably managed forests.
- Our manufacturing facility is operated within the strict terms of our resource consent and TTT Site Management & Monitoring Plan.
- The timber preservative we use is CCA (Chromated Copper Arsenic) and we follow the Best Practice Guideline for the Safe Use of Timber Preservatives & Anti-sapstain Chemicals.
- TTT operates an effective fixation system (not many, if any, treatment plants do this successfully). This is an extra manufacturing process which essentially ‘fixes’ the timber preservative to the wood cells and means our poles don’t drip timber preservative chemicals after processing has been completed.

Compliance

We comply with a multitude of Standards, Codes of Practice, and Best Practice Guidelines, including but not limited to:

- NZS3640:2003 Chemical Preservation of Round and Sawn Timber (one of the Company Directors is currently involved in reviewing this NZ Standard).
- NZS3605:2001 Timber Piles and Poles for Use in Building.
- AS/NZS1605:2006 Methods for sampling and analysing timber preservatives and preservative-treated timber.
- AS/NZS2843:2006 Timber preservation plants.
- Best Practice Guideline for the Safe Use of Timber Preservatives & Anti-sapstain Chemicals.
- Hazardous Substances & New Organisms Act 1996 (HSNO).
- NZ Timber Preservation Council (NZTPC) Woodmark accredited licensee #444.
- NZ Timber Preservation Council (NZTPC) Timber Quality Scheme for Timber Treatment.
- Health & Safety at Work Act 2015 (HSWA).

Typical TTT Pole Uses

- Construction poles.
- Foundation piles.
- Retaining wall poles.
- Ground improvement piles.
- Bridge piles.
- House piles.
- Building components, frames and structures.



Types of Poles

TTT manufactures and stocks a comprehensive range of poles for use in many different situations:

SED Poles

Are naturally tapered (approx. 6mm per metre), machine-peeled poles, typically used in construction, retaining walls, and piling. SED refers to Small End Diameter and this is how all poles are measured and graded.

Uglies

Are debarked rather than peeled so look 'ugly' as a result. Generally they are used in foundations or out of sight situations like ground improvement as they offer greater skin friction when used as piles.

UniLog Poles

Are machined, uniform diameter poles many of which are exclusively produced by TTT. They are mainly used as structural building components such as frames, columns, diaphragm floor panels, and retaining walls.

MultiPole

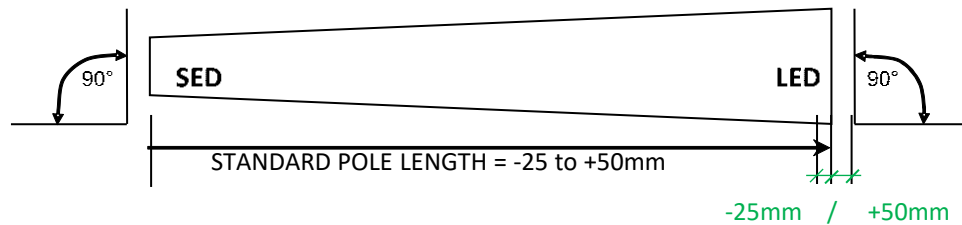
Are incredibly versatile poles with a unique hollow core. They are useful in many situations including foundations, retaining walls, and ground improvement. Available as TTT SED, TTT Uglies, or TTT UniLogs.

TTT Pole Sizing – Standard Pole Length

Poles are supplied in lengths, measured in metres, as follows:

1.8 2.4 2.7 3.0 3.6 4.2 4.8 5.4 6.0 7.0
8.0 9.0 10.0 11.0 12.0 and longer, in metre increments

The pole length must be no shorter than 25mm or 50mm longer than a standard pole length.



TTT Pole Sizing – Small End Diameter (SED)

Poles are manufactured from logs that are tapered, so are sized based on the diameter of the smallest end – hence the Small End Diameter (SED). This has become the industry standard for sizing poles. Each size has a range of 25mm:

- 150 SED Will have an SED range of 150mm to 174mm
- 175 SED Will have an SED range of 175mm to 199mm
- 200 SED Will have an SED range of 200mm to 224mm, and so on through the size range

In the case of UniLog Poles, we still refer to them using SED as the size even though they are machined, constant diameter poles with no taper. UniLog Poles are manufactured in the following diameters:

- 160mm, 185mm, 210mm, 230mm, 255mm, 275mm, 300mm

TTTested Proof-Tested Poles

TTTested Poles are High Strength Poles. We call them High Strength because their strength has been verified on our purpose-built Certified Pole Testing rig. TTT Poles such as SED, Uglies, or MultiPoles can be proof-tested.

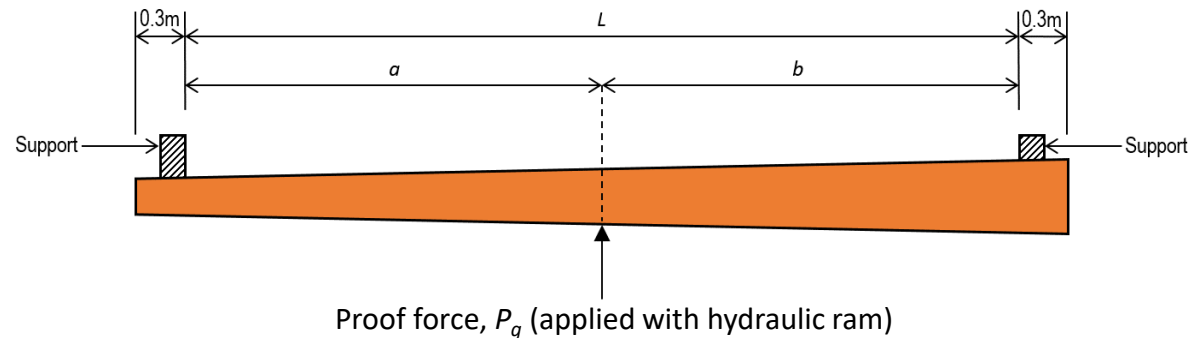
Proof-testing is carried out at the very beginning of the manufacturing process, with no damage to the pole, and immediate results available.

Proof-testing involves loading a pole into the pole testing rig, applying a proof force by way of an hydraulic ram to achieve the required force in 3-30 seconds, and maintaining the proof force for at least 15 seconds with the pole showing no signs of distress. Modification factors to account for characteristic stresses are applied in accordance with NZS3603:1993 Timber Structures Standard.

TT Tested Pole Proof-Testing Process

Poles are proof-tested using a three-point bending test method with the force being applied at the assumed groundline point (unless advised, we assume this groundline location to be approximately halfway down the length of the pole). Poles are tested in the raw, unprocessed condition.

Specialised software applies the relevant modification factors and automatically calculates the modified characteristic bending stress required in strict accordance with NZS 3605:2001. Each pole is tested to the required proof loading.



Pole testing arrangement based on NZS 3605:2001, Appendix C, Section C1 (b)

Use TTT Poles for Retaining Walls:

Cantilevered Timber Pole Retaining Wall

- Is a structure built to hold back a bank of earth where there is a change of grade.
- Are designed to support (retain) the lateral load or pressure of the earth or fill behind it and prevent water build up behind or below the wall.
- Takes into account applied loads such as vehicles, structures, and ground slope.
- Piles can be driven or concrete embedded.

In-Ground Retaining Wall

- Is a structure designed to resist lateral ground movement.
- The piles resist the loads as soon as they are installed.
- Pile numbers can easily be increased to account for design variations.
- Temporary or permanent structures.
- Piles are usually driven.















Use TTT Poles for Foundations:

Deep Pile Foundation

- Is where poles are installed, usually to great depth.
- The design objective is to drive the piles into a bearing layer at least 3m thick or to rely on skin friction.
- TTT Poles can be supplied in long lengths, or if using TTT MultiPoles they can be joined during installation.
- Piles are usually driven or vibrated.

Ground Improvement

- Is where poles are installed into the ground at very close spacings.
- The design objective is to install the piles to reinforce the ground against lateral movement and the seismic induced strains that trigger liquefaction.
- There is no requirement for piles to reach a bearing layer.
- Piles are usually driven or vibrated.





TTT Poles used in a Deep Pile Foundation – Commercial Site, Avon River, Christchurch New Zealand
H6 TTT MultiPole Uglies 4.8m long x 250mm diameter were used for a punt stop and river wall.







TTT Export

Export scope

TTT Products Ltd is approved by the NZ Government Ministry of Primary Industries (MPI) to process Radiata Pine poles and sawn timber for export.

- **Our scope covers:**

Heat treatment (saturated steam), CCA timber preservative treatment, and Phytosanitary inspection.

- **TTT provides:**

Export Heat Treatment Certificates, Export CCA Timber Preservative Certificates, and Export Phytosanitary Inspection Certificates (Export Inspection Record).

- **Poles and sawn timber are shipped to export markets:**

Containerised or as break bulk.



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