

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, power transmission, telecommunication, and marine use. TTT produce a comprehensive range of poles – TTT SED, TTT Uglies, TTT UniLogs, TTTested, and our award winning hollow-core TTT MultiPoles.





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.
- The majority of New Zealand forests have Forest Stewardship Council® (FSC®) Certification. FSC® is dedicated to the promotion of responsible forest management worldwide.
- TTT are certified to supply FSC® Product Classifications: Poles and piles; Impregnated roundwood; and Treated dimensional lumber, timber or plywood. FSC® License Code: FSC-C115855.



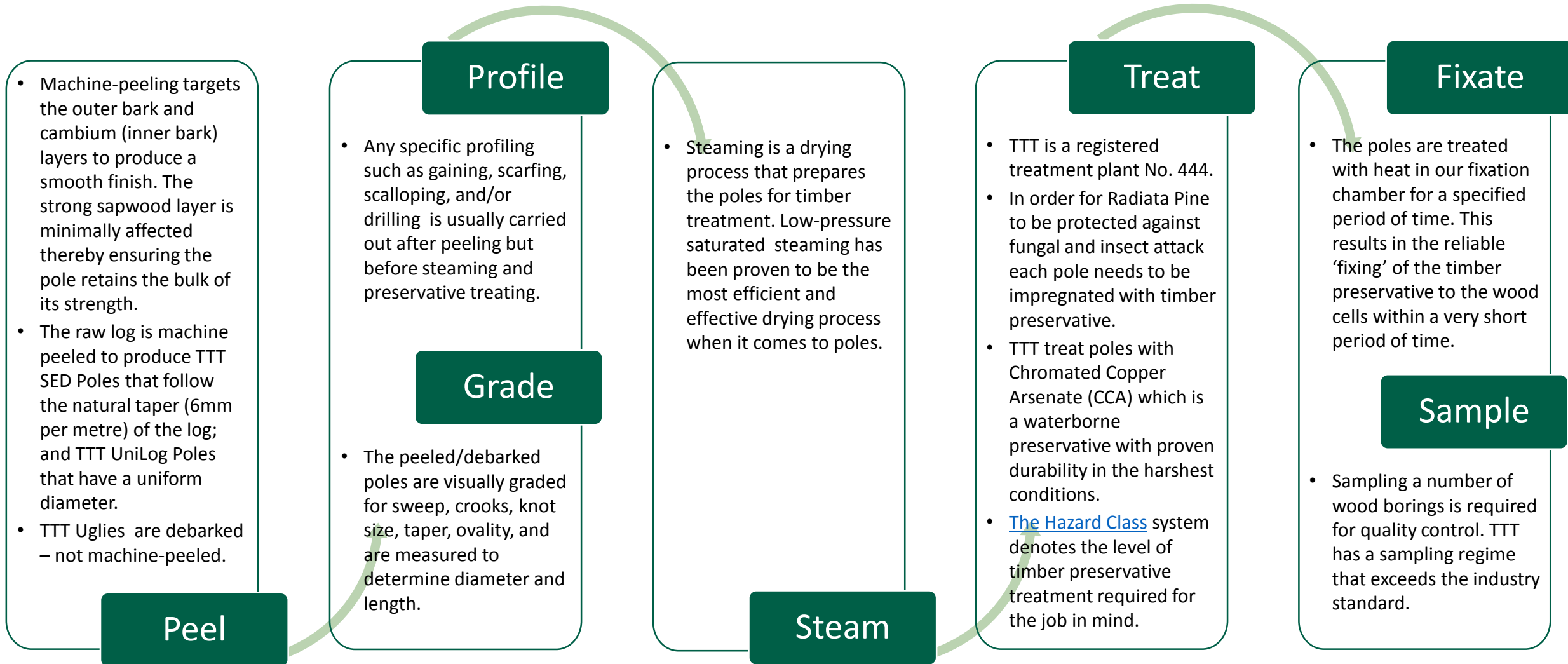


Why use TTT Poles?

- 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 easily perform quality assurance checks on timber piles before and after installation.



TTT Pole Manufacturing Process



TTT Poles and the Environment

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

- Logs are sourced from FSC® certified 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

- Power transmission poles.
- Telecommunication poles.
- Foundation piles.
- Retaining wall poles.
- Jetty/Marina/Wharf piles.
- 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:



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



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.



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.



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 Uglier, or TTT UniLogs.



Are treated with a higher level of preservative (H6) typically to be used in marine for jetties, marinas, and wharf piles. Available as TTT SED, TTT Uglier or TTT UniLogs.



Are poles that have been drilled, gained, tagged, and/or proof-tested to meet the requirements of a power transmission or telecommunication pole. They are usually TTT SED Poles.



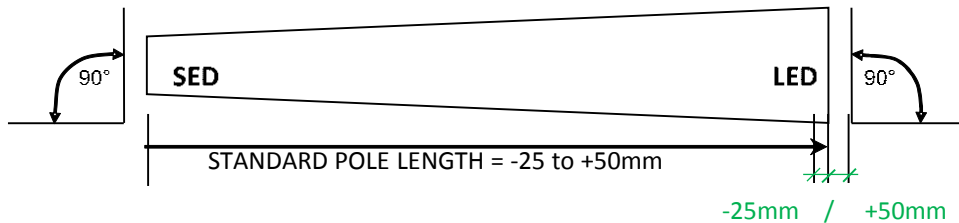
Are poles that have had a PE100 (polyethylene) sleeve pressed onto the pole. TTT Protect Sleeved Poles are great for use in extreme situations such as marine environments.

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
- 225 SED Will have an SED range of 225mm to 249mm
- 250 SED Will have an SED range of 250mm to 274mm
- And so on...

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.

TTTested Proof-Tested Poles

The strength and quality of Radiata Pine varies around New Zealand. Structural engineers want to be able to confidently specify products they know will perform. TTTested Proof-Tested poles provide structural engineers with certified test results that prove the products will do the job they are specified for.

- **The Four-Point Proof Test Method:**

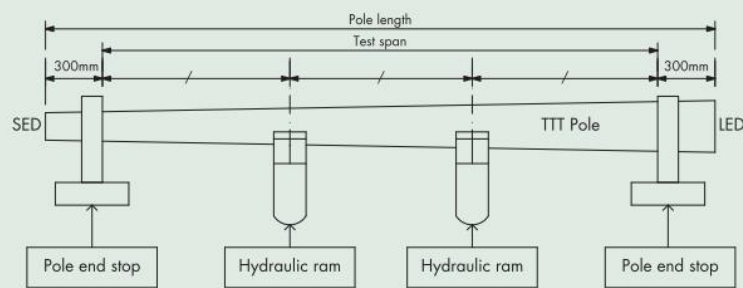
To prove timber poles meet ISO 15206:2010 for classification as a high or normal density pole.

- **The Three-Point Proof Test Method:**

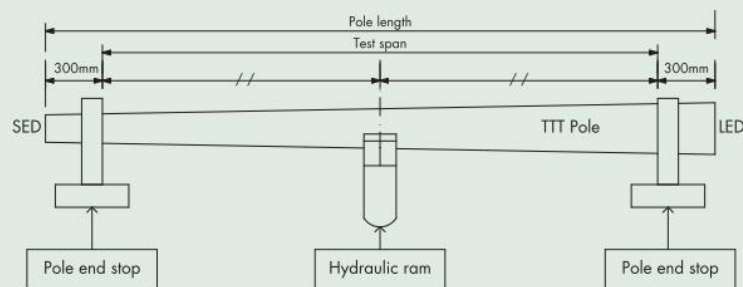
To prove timber poles meet NZS 3605:2001 and/or ISO 15206:2010 for classification as high or normal density.

- **The Three-Point Ground Line Proof Test Method:**

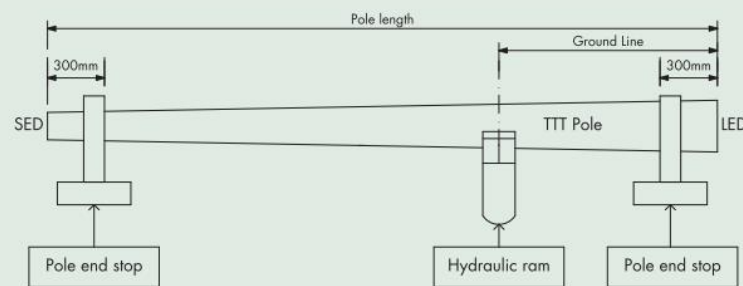
To apply a proof load at the Ground Line to test the pole to high or normal density specification and also calculate the Ultimate Top Load (e.g TTT Utility Poles) according to NZS 3605:2001. The customer supplies the Ground Line (m) as measured from the large end of the pole or the Ultimate Top Load (kN) that needs to be achieved.



Illustrated Four-Point Proof Test Method



Illustrated Three-Point Proof Test Method



Illustrated Three-Point Ground Line Proof Test Method



TTTested – TTT SED Utility Pole being tested on the TTT Pole Tester
Illustration of Three-Point and Four-Point Proof Test Methods.

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.
- TTT Poles can be supplied in long lengths, or if using the TTT MultiPole 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 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.



Contact

TTT Products Limited
Web: www.unilog.co.nz
Ph: +64 9 2368880
PO Box 99
Tuakau
New Zealand

Territory Manager – Sales
Angela Bishop
angela@unilog.co.nz
Ph: 0274 584 852

Sales – Waikato/BOP
Chris Winter
Chris.winter@unilog.co.nz
Ph: 021 0860 0312

Director – Sales
James Sayers
james@unilog.co.nz
Ph: 021 715 235



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