



PermaPine

ROUNDWOOD SPECIALISTS

Company Profile and Roundwood Product Guide



Contents

About PermaPine.	pg2
Our Vision and Core Values.	pg3
Four Good Reasons to Specify PermaPine.	pg4
Our Team	pg5
New Zealand Pine a Renewable Resource.	pg6
Our Products	pg7
Our Services.	pg7
Roundwood	pg8
Poles	pg8
Tapered poles.	pg8
Debarked “Ugly Poles”	pg9
Uni Poles	pg9
Utility (Power) Poles	pg1
Marine Poles.	pg10
High Density Poles	pg10
Timber	pg11
Rough San Timber.	pg11
Half Round Uni Rails	pg11
Square House Piles	pg12
Bollards	pg12
SelfLok Pole Fencing	pg12
The Production Process	pg13
Green Production.	pg13
Wood Drying.	pg13
Wood Preservation	pg13
Wood Fixation	pg13

Timber Manufacturing Process.	pg 15&16
Quality Control	pg17
Wood manufacturing.	pg17
Wood Drying.	pg17
Wood Preservation	pg18
Timber & Roundwood Performance	pg19
Checking in Posts & Poles.	pg19
Twisting in Timber Products.	pg20
Resin on Surface Timber.	pg20
Photo of PermaPine Site	pg19 & 20
Post and Pole Strength	pg21
Safety of Wood Preservation	pg22
Treatment Warranty	pg25
Roundwood Product Guide	pg26





About PermaPine

PermaPine is a 100% New Zealand owned company operating a modern large Roundwood manufacturing operation near Taupo. Our processing operation is located near New Zealand's most significant pine forests in the Central North Island. The logs and timber we process are largely sourced from these plantations, which are managed sustainably to ensure continuous future log supply.

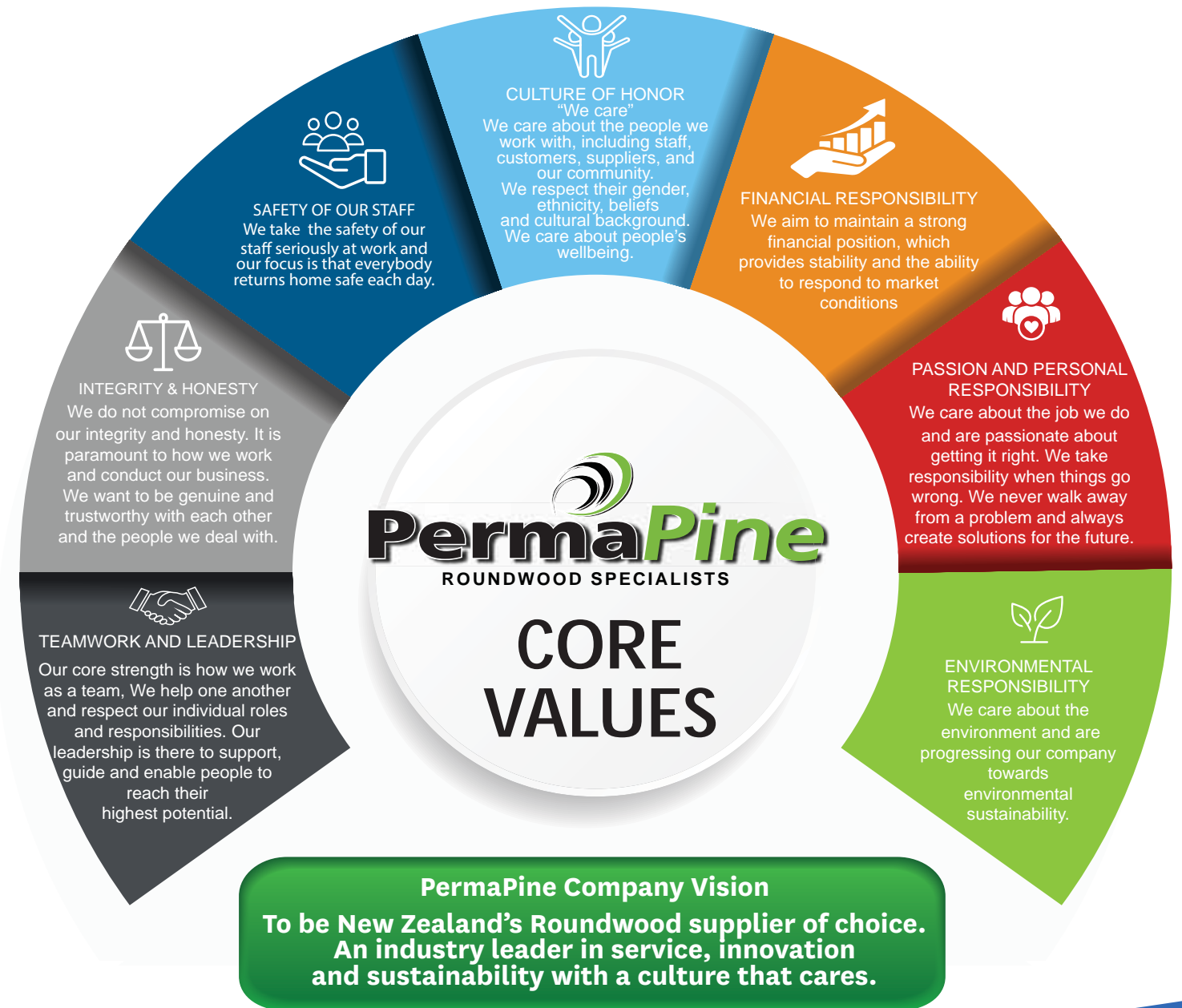
Our specialisation is in the production and distribution of Roundwood and outdoor products for a range of applications.

Our target markets are:

- Rural
- Residential and commercial construction
- Utility and infrastructure
- Marine timbers and poles
- Lifestyle and outdoor applications

PermaPine has a long term focus, striving to build strong lasting relationships with both our customers and our suppliers. This long term focus is consistent with the long life customers can expect from our product.

By placing a focus on producing consistent quality products using modern systems and technologies, and understanding our customers businesses we are able to add value for our customers, contractors and end users.



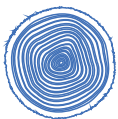
“PermaPine is a **100%**
New Zealand
owned company”



4

Good reasons to specify PermaPine

STRENGTH



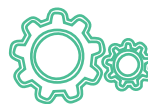
The logs we process are strong. Our products are consistently sized and often larger than our competitors. This is due to how we measure our product not by average, but by actual size. We stand by our product, which is supported by a 50-year treatment warranty.

SERVICE



Our team has over 100 years combined experience in the roundwood industry. We stand by our customers and products. Our relationships with our customers and suppliers are our greatest strength. Our integrity is paramount. We care about doing our job right and if things go wrong, we go the extra mile to put it right.

CAPACITY



PermaPine is the largest roundwood manufacturer in New Zealand, with over 20 hectares of stock ready to meet the demand of our customers.

AFFORDABILITY



The old adage “The cheapest always cost you more in the long run” rings true for roundwood. Our product strength, 50-year treatment warranty and exceptional service makes PermaPine a wise choice for our customers giving them long term affordability. We will never compromise product quality over price.



Our Team.

PermaPine have an experienced team with a strong focus on meeting customer needs. The sales team work closely with the team in production to ensure they have a high degree of product knowledge and can represent our product accurately with our customers.

The team has a “Can Do” attitude which is important in getting product to customers on time.

Where we may not have expertise within PermaPine we rely on industry experts and our suppliers to assist. PermaPine recognize we add value for our customers if we can provide accurate technical information on product performance.



New Zealand Pine. . . a renewable resource

Our wood supply is plantation grown radiata pine. The most significant resource of radiata pine is in the Central North Island surrounding the PermaPine manufacturing plant.

These forests are managed sustainably to ensure continuous future log supply. Our log supplier's forest management practices have been certified by international agencies and environmental groups as being environmentally sound and sustainable.

Plantation grown radiata pine is preferred by PermaPine as it is of a consistent quality.



A Sound Environmental choice

Trees and the wood they grow absorbs carbon dioxide during their growth. Timber products are a natural and sustainable product and trees are beneficial for our environment, our health, and our landscapes.

The New Zealand government has passed legislation committing NZ to be net zero in climate change emissions by 2050. A cornerstone policy to achieve this goal is NZ's Billion Tree Policy. This is due to trees absorbing an estimated 1.7 tonnes of CO₂ per tonne of tree (wood) growth compared to steel production which emits 1.24 tonnes of CO₂ per tonne of steel production (other estimates put this emission at 2-2.5 Tonnes CO₂ produced per tonne of steel)

Concrete and Steel account for 10-13% of global climate change emissions during manufacturing of this product.

A significant portion of PermaPines energy requirements are met by burning our waste wood residues to produce energy.

- PermaPine are committed to sustainable environmental management and minimising our environmental impact.
- Surplus wood waste is used for standoff pads for wintering livestock and home heating.
- The majority of our staff are transported to and from work in 5 vans, eliminating many vehicle movements .
- We have commenced electrifying our company vehicles.
- All surplus plastic, steel and wood residues are recycled or re-used.
- Logs are sourced from sustainably managed forests which are internationally certified by the Forest Stewardship Council (FSC).
- We have installed chemical fixation. This is a process that occurs after wood preservation and fixes or bakes the preservative into the timber. This significantly reduces the potential for timber to drip preservatives after treatment.
- All operations comply with strict conditions of our Resource consent and Council District plan.

Our Products

PermaPine specialises in the production of roundwood products.
Note: *More information on our products is in the following pages*
These products include:

Roundwood

- Post and Strainers
- Battens and Stakes
- Pony Jump Rails
- Landscape Uni Rounds



Poles

- Naturally tapered poles
- Uni (machined) Poles up to 200mm
- Debarked (ugly not peeled)



Timber

- Rough Sawn timber rails
- Half round machined rails
- Larger cross sections of outdoor timbers
- H6 Timber
- Speciality products such as sheep grating
- Kiwifruit Stringer Poles 50x50mm in Douglas Fir and Radiata



Square House Piles & Anchor Piles



SelfLok Pole fencing

Bollards

Please Note we also have available . . .

- Pointed roundwood and pointed small diameter poles up to 5.4m
- Larger diameter Uni poles on request
- Through our transport partners we also have peel and sawdust available for animal bedding



Our Services

- We offer Custom Steaming and Treating
- We are an MPI approved organisation for phytosanitary inspection
- We are an MPI approved “Transitional Facility” allowing PermaPine to import sawn timber, roundwood and Poles
- Our Timber Remanufacturing plant offers custom cutting to length (CTL) capability for timber products.

Roundwood

Refer to the, **PermaPine Roundwood Product Guide** at the back of this document for a description of PermaPines range of roundwood products.

PermaPine produces a comprehensive range of roundwood products, with both a Flat & Pointed end.

Should you have specific requirements such as:

- Rounded quarter round posts.
- Oversize “Super” half rounds.
- Special treatment, H5, or an alternative preservative.

Please contact one of our sales team on **0800 PermaPine (0800 737 627)** to discuss further.



Poles

Tapered Poles

PermaPine poles are peeled and have natural taper, such that the small end diameter (SED) is smaller than the large end.

Pole taper varies, but is typically 6-8mm of taper per metre of pole length.

As pole length increases the maximum SED of pole available will reduce due to being limited by maximum available tree size.

Pole Length (m)	SED Range (mm)
<8m	125 - 550mm
8-10m	150 - 500mm
11-14m	175 - 450mm

“PermaPine specialises in the production of roundwood and Treated Timber products”



Debarked “Ugly” Poles

PermaPine debarked poles have been debarked but not peeled. These poles have more taper than peeled poles and natural swelling around knots. As a consequence of this, these poles are stronger and have more frictioned resistance during piling.

Debarked poles may be an option for piling applications where the pole will not be visible.

Debarked “Ugly” poles are made to order not sold from stock.

Note: Debarked “Ugly Poles” are available in H5 or H6. Minimum order quantities are required.



Uni Poles

PermaPine Uni Poles have no taper and every pole is uniform sized.

These poles are used in applications where a consistent appearance is required.

Note: A Uni Pole of the same SED as a tapered pole will have less strength than tapered poles.

Size Options	
Diameters	75mm – 200mm
Lengths	1.8m – 8m

Note: Smaller diameters are not available at longer lengths. Diameters larger than 200mm are available on request.



Utility (Power) Poles

PermaPine produce a range of power poles for the domestic and international markets. Poles can be shaped, disced, and capped with aluminium caps to meet specific requests.

Marine Poles

Where poles or treated timber are used in a marine or estuary application they must be H6 treated. H6 poles are made to order and require lead time to manufacture.

Each treatment batch of H6 poles will have core samples taken and analysed in an independent laboratory. Once lab results have confirmed the H6 product meets the appropriate treatment standard NZS3640, the product can be despatched from site.

The PermaPine warranty provided by our chemical supplier, Lonza covers H3, H4, and H5 treated product. Due to the environment H6 products are installed in, this product is not covered by our treatment warranty. Every H6 treatment charge is sampled and analysed in an external laboratory for compliance to NZS3640. A copy of the lab results showing compliance to NZS3640 for the H6 product is available on request. If these lab results are required these should be requested within 2 weeks of product delivery.

High Density Poles

High density peeled and natural “ugly” poles are available on request





Rough Sawn Timber

Outdoor timber is available in commonly used rural sizes.

Size	Grade	Length	Treatment
100 x 25	Merch	4.8m, 5.4m, 6.0m	H3.H\$
150 x 25	Merch	4.8m, 5.4m, 6.0m	H3
125 x 32	Merch	3.0m, 3.6m, 4.0m	H3
150 x 32	Merch	4.8m, 6.0m	H3
150 x 40	Merch	4.8m, 6.0m	H3
100 x 50	Frame 2	4.8m, 6.0m	H3
150 x 50	Frame 2	4.8m, 6.0m	H3, H4
200 x 50	Frame 2	4.8m, 6.0m	H4

Larger sizes up to 300 x 300mm are available and produced to order.

- Boutique products such as sheep grating are available on request
- Douglas fir and Radiata Pine 50 x 50mm timber for kiwifruit stringer poles are available on request
- The above timber sizes are available in H4,H5,H6 on request

Half Round Uni Rails

This is a premium rail which is heavy and strong and used in applications where a special and permanent appearance is desired. Uses are rail fencing and retaining applications.

Face Size (mm)	Length	Treatment
125	3.6 - 6m	H4
150	3.6 - 6m	H4

Half Round Uni Rails with a 180mm face size are available on request

Square House Piles

PermaPine square house piles are used in sub floor or decking construction, fencing and lighter retaining applications.

Length	Treatment	Description
450mm, 600mm, 750mm, 900mm	H5	Standard piles
1.2m - 3.6m	H5	Anchor piles

Square house piles are produced to comply to NZS3605:2001.

Piles longer than 3.6m can be manufactured to order. These piles will not comply with NZS3605:2001 since this standard covers piles up to 3.6m in length. Where twisting of piles will create design or compliance issues, for example in multi level dwellings, PermaPine recommend Uni Poles or laminated square posts as an alternative.

An information video on our square house piles can be found on our website. www.permapine.co.nz

Bollards

A range of Bollards are available.

Length:	900mm, 1.2m, 1.5m
Diameters:	140mm, 155mm, 180mm, 200mm
Finish on top of bollard	<ul style="list-style-type: none"> • Bull Nose • Full Rounded top for 140mm or 180mm

Note:

- Collars can be added. (as shown in photo)
- Chain or rope hole can be added 25-38mm diameter

SelfLok Pole Fencing

PermaPine Selflok Pole Fencing is a premium product and provides a unique look that will set your property off. SelfLok is commonly installed along high profile driveways, entrances and roadways. The product comes as a kitset no nails or fixings are required and the product can be installed yourself.

	Post Diameter	Rail Diameter	Rail Length
Homestead Range	180mm	113mm	2.4m
Signature Range	200mm	123mm	2.4m

Most commonly a 1.8m post length is preferred with a 3 rail fence

Selflok Pole fencing is made to order. Manufacturing will not begin until SelfLok order form is completed. The SelfLok order form is available from PermaPine.



The Production Process

Green Production

Logs are delivered to PermaPine in long lengths. Logs are cut to length and peeled through one of our seven peelers before being graded, stacked and if required bundled. As product is produced and graded, tags are generated with a product description. Touch screen technology allows real time visibility of our inventory, this is critical in planning production and committing accurate delivery dates to our customers.



Wood Drying

When logs and wood products are freshly cut the cells hold water, resin is also present in the wood. During the steam drying process wood and the water and resin within the wood is heated to over 100 degrees at pressure. Moisture loss occurs during the steaming process and at the conclusion of steaming when pressure is released quickly allowing vapourised water to escape from the timber. This rapid pressure release also creates pathways for preservative entry into the timber.



Wood Preservation

Radiata pine is not naturally durable without wood preservative. The most effective preservative for roundwood and timber products in outdoor applications is CCA. CCA is made up of Copper, Chromium, and Arsenic, with each of the 3 elements having an important role to play in ensuring durability of the timber product after treatment.

- Copper is a fungicide
- Arsenic is an insecticide, with some additional fungicidal properties
- Chromium is the fixing agent, fixing the other chemicals into the wood (the glue)

CCA is impregnated into the timber through pressure treatment.



Wood Fixation

Preservative will fix into treated product naturally with time and temperature. This process can be accelerated and controlled within a cyclinder through adding steam. This results in treated product which is drier and easier to handle and install immediately after treatment. PermaPine have fixation and will add additional fixation capacity in 2021.





"We have **real time** inventory information which allows us to commit accurate delivery dates to our customers"



Whole tree stems
transported to
processing plant



Timber products
graded to NZ standard
Measured & stacked



Timber products
dried by steaming

Peel and wood
residue used as Boiler
fuel to steam dry product.



Timber products
treated with
preservative



Timber products
fixated



Treated timber
products sampled for
compliance NZ standards



 **Perrin**
ROUNDWOOD

Timber Manufacture

Paper

Plywood

Timber

MDF

Tree scanned & cut into logs
for many different Markets

PermaPine take smaller
logs for Roundwood
larger straight logs
for poles

Delivery to PermaPine

Logs cut up
and peeled

Products
delivered
to market

maPine

WOOD SPECIALISTS

Manufacturing Process

Timber Product delivered
to market



Quality Control

Wood manufacturing

Most Roundwood products are essentially the same shape and form as the log they are manufactured from. Logs have natural variations in form and quality. Timber Piles and Poles are graded according to the New Zealand Pile & Pole standards NZ53605:2001 for use in building.

This standard provides specifications for:

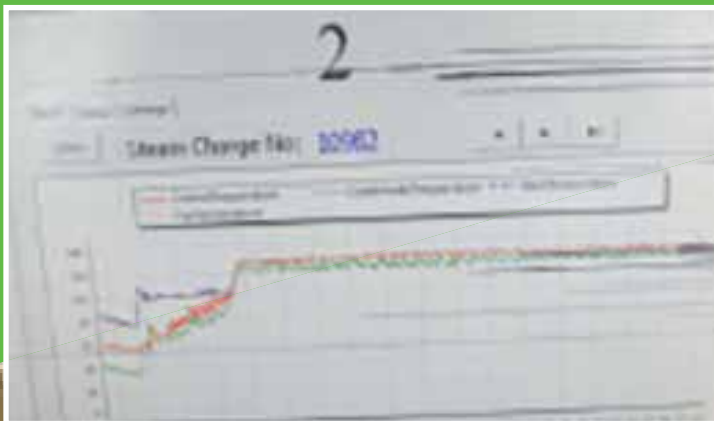
- Maximum sweep over the length of pile or pole.
- Pole grading.
- Knot size.

Should you want additional information on the New Zealand Standard please feel free to contact PermaPine. Note the standard must be purchased from Standards NZ, it cannot be reproduced.

A handheld computer, called a HITMAN is used to assist with pole grading for density and stiffness. This tool records the velocity of a sound wave as it travels along the log and is used as a predictor of pole stiffness and density

Wood drying

The method of Steam drying used at PermaPine allows for effective drying right through the cross section of the timber products which is critical in ensuring timber can be effectively treated with preservative. Drying operations are closely monitored and computer controlled to ensure target temperature and time are achieved. The duration of the steam drying charge cycles is dependent on the diameter or size of the timber products being steamed with larger timber cross sections requiring more drying time.





Wood preservation

Timber treatment operations are precisely controlled to ensure wood products are well treated. Treatment operations comply with the following standards:

- New Zealand Standard: NZS3640.
- New Zealand Timber Preservation Quality manual.
- Our external auditors timber treatment programme.
- Waikato Regional Council resource consent conditions.



PermaPine have a comprehensive internal and external Quality Control process to ensure wood products are treated in accordance with the regulations and standards above.

The uptake of wood preservative is measured for every treatment charge against the target uptake.

At prescribed charge intervals core samples are taken to measure penetration of preservative through the cross section of the timber.

At prescribed charge intervals core samples are analysed at an independent laboratory for chemical loadings (retention) and penetration of chemical.

Through the year an independent audit party, Bureau Veritas, audit our treatment operations on site to ensure compliance with the above standards and regulations.



Timber & Roundwood Performance

Unique Performance Characteristics of Roundwood & Timber Products

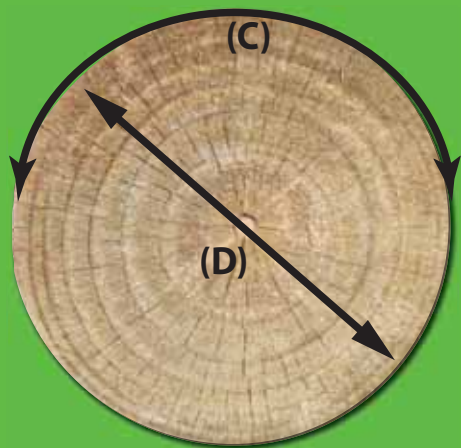
Timber is a natural product, this is a part of its appeal. As a consequence of being natural it exhibits some unique characteristics when compared to manufactured alternatives such as steel and concrete. Customers should be aware of these and plan for them.

Checking in Posts & Poles

Post or Pole checking refers to vertical cracks which open up lengthways in dry product.

Why does wood, in particular round posts & poles check?

As wood dries it shrinks, the rate of shrinkage is different in each direction, see figure below.



Rates of wood shrinkage during drying

- D: is Pole diameter (radial shrinkage)
- C: is Pole Circumference (Tangential shrinkage)

Shrinkage

(from wet to 12% Moisture)

Shrinkage	% Range
Tangential	3.5 – 4.5
Radial	1.5 – 2.5
Longitudinal shrinkage along length	0 – 0.5

Scion (Forest Research) verify that checking in posts, strainers and poles has practically no effect on strength since checks follow the grain along the wood fibres and this has no effect on bending or compression strength of posts or poles.

Checking has practically no effect on product durability since checking is into sapwood which is required to be fully treated with preservative.

Checking will increase as product dries out, as atmospheric moisture changes checks will expand and contract. Quarter Round and Half Round posts and rails check only a little as timber shrinkage during drying is concentrated on the cut face.

Twisting in timber products.

Twisting in sawn timber and round post/pole products is a consequence of the grain in trees not always being straight up and down the tree, it's a genetic trait and is more prevalent in the early years of tree growth. This is referred to as Spiral grain. As timber dries it has a tendency to twist, some pieces more than others. Twist will always be in a clockwise direction. Sawn timber products produced from the centre of logs, referred to as "core wood", twist significantly more than sapwood. Poles will also twist as they dry following treatment. We recommend seasoning poles (through air drying) prior to installation and using heavy fixings/fasteners, which will help restrain timber products as they dry.

Timber rails are especially susceptible to twisting. To reduce the incidence of twisting there are a number of things that can be done:

- Air season sawn timber by filleting it, ensure it is strapped or weighted during drying. Dry in a location with good air flow. Cover timber to reduce exposure to direct sunlight while drying.
- When a packet is opened and partially used, restrap or weight remaining timber.
- Try and keep packets of timber out of the sun especially when the packet is open.
- For roundwood and pole products we recommend air seasoning the product prior to installation, this will minimise the potential for product twisting after installation.

• Resin on surface of timber

Resin is removed from timber during the steam drying process. Resin on the surface of timber product is an indication the product has been well steamed, the presence of this resin is unique to steaming, it is not present with the 2 other methods of drying wood; air drying and kiln drying.

For timber products containing corewood where it is necessary to achieve higher chemical retentions such as H4, H5 and H6 PermaPine choose to steam wood rather than air dry or kiln dry. This ensures effective treatment.



"Timber is a natural product, this is part of it's appeal"

Post and Pole Strength

Post strength is important for fencers and pole contractors installing product, as good strength means minimal breakage, and a good long life for the product once it is installed. Breakages cost time and money.

Post & Pole strength are a function of a number of factors. These can be categorised in 3 groups:

1. **Product size**
2. **Post and Pole grading**
3. **Wood quality**

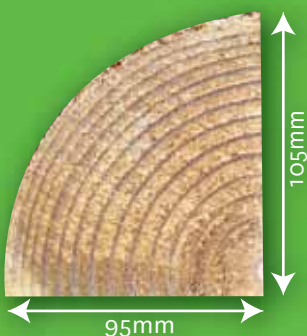
Product size

Product size and consistency of size is very important in ensuring the product is set firmly in the ground, and breakages are minimised. A bigger post or pole will always be able to be set more firmly in the ground than a smaller post or pole.

Product size is also very important in minimising breakage, a small post or pole will always break more easily than a larger post or pole.

Post and Pole grading

Consistency of sizing is the most important factor with product grading. Each post or pole is graded by measuring the length of the smallest face, for example on a Quarter Round, the smallest of the 2 faces. If comparing product from various merchants it pays to check on sizing before making your purchase decisions as some manufacturers grade using an average face size rather than a minimum face size. Roundwood graded using the average face size will be smaller.



Product Grading

The smallest face is 95mm therefore the PermaPine product is graded as a No2 quarter round(75-100mm) not as a 100mm quarter round.

Wood Quality

Wood quality is the least well understood factor in determining wood strength. The wood quality factor which is generally most important for posts & poles is wood stiffness. Wood stiffness is difficult to measure in standing trees in the forest, so most foresters use wood density as a predictor of stiffness, as wood density can be measured by taking core samples from standing trees.

What factors influence density or stiffness?

- Wood stiffness or density is determined by the thickness of the cell walls in the tree.
- Wood near the outside of the tree has thicker cell walls so it is more dense and stronger than wood near the centre.
- The higher the mean annual temperature of the site the tree grew on the greater the average density.
- Genetics affects density.
- Average density increases with age.

Note: Studies by the Forest Research Institute have found that growth rate (or distance between each growth ring) and wood density are not strongly related.



Safety of Wood Preservatives

Health and Safety

PermaPine Tanalised® roundwood is safe to use and handle. This has been assessed and confirmed by the Environmental Risk Management Authority of New Zealand.

- PermaPine recommend washing of hands before eating or smoking after handling treated wood product.
- PermaPine recommend use of dust masks when cutting or machining treated timber products.
- Do not burn offcuts and left over pieces in confined spaces or in home heating, or for cooking food.
- Treated offcuts can generally be disposed of in landfills. If unsure check with your local landfill prior to disposal.
- Treated sawdust or peel or shavings should not be used as garden mulch or animal litter or bedding

Hazzard Guide

H3.2	Moderate decay hazard exposed to the weather but not in contact with the ground	Uses: battens, fence rails, decking
H4	Product in contact with the ground, or in prolonged moist conditions above ground	Uses: fence posts, strainers, timber in ground contact, pointed battens, selflok, half round rails
H5	Severe decay hazard or critical load bearing applications	Uses: house piles, poles, uni poles
H6	Marine hazard, prolonged exposure to sea water H6 produced to order, not generally stocked	Uses: marine piles/poles, marine timber





Treatment Warranty

When timber is pressure treated with TANALISED C preservatives in accordance with relative New Zealand specifications and used as prescribed therein, it can be expected to have a long and trouble-free life.

ARCH WOOD PROTECTION (NZ) LTD therefore offers the purchaser of timber, posts or poles treated with TANALISED C and carrying the approved brand or label, the following warranty:

ARCH WOOD PROTECTION (NZ) LTD will supply new TANALISED C treated timber at any time within 50 years of purchase, to replace any timber which complied with the above requirements for treatment, branding and end use, and which becomes unfit for further use due to fungal or insect attack.

This warranty does not cover consequential effects, and does not apply to timber used in marine applications or where subject to continuous water immersion. Statutory rights assured by law are not affected by this guarantee.

It is the responsibility of the purchaser to ensure that the hazard of the proposed application is correctly evaluated and that timber with correct preservative retention level is used.

Use of treated wood for cattle yards and other intensive use animal management enclosures

CCA treated wood is a useful material for posts and rails for construction of typical rural infrastructure such as cattle/sheep/goat yards and other animal management structures. However premature failure of treated wood posts at the ground contact sections in these installations has been noted in a number of cases particularly with intensive and frequent animal contact.

The likely reason for premature failure is aggressive decay organisms in highly nutrient enriched ground media due to animal faeces and urine. It is well documented that increased levels of organic nutrients such as nitrogen (ammonia and urea) and phosphorous (such as phosphates) can lead to increased rate of premature decay of treated wood. In addition, high levels of these nutrients may also have a direct effect on depletion of the preservatives from wood by ion exchange or possibly chemical chelation mechanisms.

In normal soil conditions with low to moderate levels of biological activity and nutrient loads, CCA treated wood is very reliable and is expected to last for decades. In the cases where treated wood posts are used around intensive and frequent animal containment areas the following steps are recommended to reduce likelihood of premature decay.

- Use H5 level treated posts where these conditions are expected. H5 treatment level has approximately 50% higher concentration of preservative compared to H4 and is recommended for more severe conditions, or where very long service life is expected such as foundation piles.
- Dip posts in or paint posts with a heavy bitumen or water proofing coating (such as Bitpost from Biosymph) in the whole ground contact surface and up to at least 30 cm above ground level. This will reduce the penetration of water and the nutrients into the posts which is what causes the premature decay.
- Alternatively, wrap the same lower ground contact area of posts with a robust DPC (damp proof course) such as a butyl rubber or fibre reinforced bituminous wrap (such as Ardex WPM 117). Ensure that the wrap extends at least 30 cm above the ground level.
- Ensure that animal enclosure areas are free draining and that animal wastes do not collect and reside in the enclosures.

With these simple measures, posts used in these situations are expected to provide long and trouble free service.



Roundwood Product Guide





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