

TRC

TIMBER REPAIR & COSMETICS

Focus on damaged areas &
surface treatment

 **WINTERSTEIGER**
Thinking about tomorrow.

The pooled timber expertise of WINTERSTEIGER

WINTERSTEIGER
Thinking about tomorrow.

SERRA

HEMA
BANDSÄGETECHNIK
SCHNEIDSYSTEME

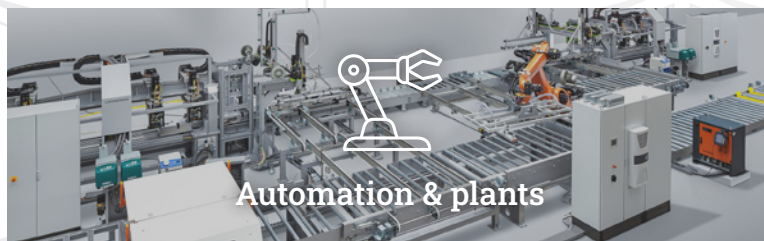
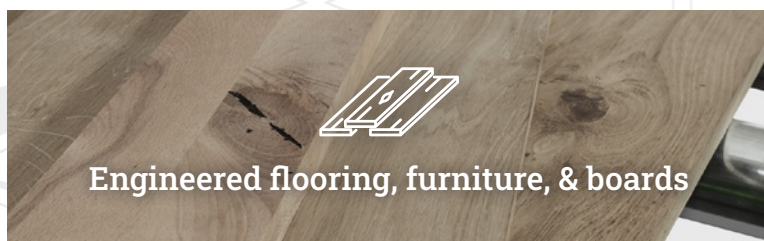
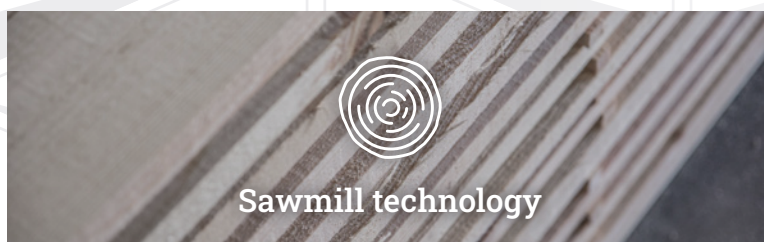
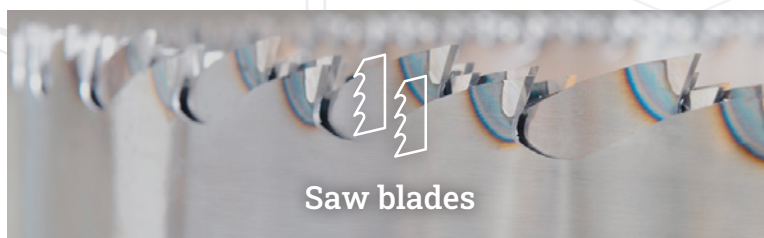
Division WOODTECH

The company started out in 1970 with the development of the thin-cutting frame saw and has since become the world market leader in precision thin-cutting of wood. We have gradually expanded our portfolio along the value chain of our customers.

Today we offer solutions spanning the entire timber industry – from the saw blade through fully automated woodworking machines to optimizing your production area with customer-specific automation solutions.

The World of WOODTECH combines 5 WINTERSTEIGER companies, each of which is a top player in its own right:

- **WINTERSTEIGER Sägen GmbH** in Arnstadt, Germany, one of the largest and most modern saw blade manufacturers in Europe
- **SERRA Maschinenbau GmbH** in Rimsting, Chiemsee, leading manufacturer of broadband sawmills in Germany
- **WINTERSTEIGER AG** in Ried, Austria, global market leader in thin-cutting saw machines for engineered flooring, furniture, multi-layer boards, and timber surface repair and cosmetics (TRC)
- **Heermann Maschinenbau GmbH** in Frickenhausen, Germany, an internationally active company which has specialized in band saw technology and customized cutting systems
- **VAP-WINTERSTEIGER GmbH** in Mettmach, Austria, the automation specialist in engineered flooring, furniture, and multi-layer boards, as well as industrial sawmill technology



TRC

Timber Repair & Cosmetics

The umbrella term TRC stands for „timber cosmetics“ with unprecedented quality and enormous production efficiency. Whether it's semi-automatic or fully automatic, WINTERSTEIGER is always able to offer the perfect solution when it comes to timber cosmetics or repairing defects.

Our subsidiary VAP-WINTERSTEIGER offers vast automation expertise. We develop customized systems to meet your requirements.

**Before
repair:**



**After
repair:**



Your benefits summed up:

- Save valuable personnel resources
- Crafting skills are no longer required
- Defects around the edges of the component can be repaired automatically
- Significantly fewer rejects thanks to perfect repair
- One pass is sufficient to repair even large defects
- Maximum flexibility thanks to enormous know-how
- Multi-color repairs on a single component is possible
- The material holds well due to a special injection process
- The filling material is harmless to both humans and the environment
- Years of experience working with wood surfaces

TRC

Technologies

Detect – Clean – Repair

The Timber Repair & Cosmetics range comprises systems for detecting, cleaning, and filling defects in the top layer of wood products. WINTERSTEIGER uses thermoplastic or organic filling material or real wood inserts.



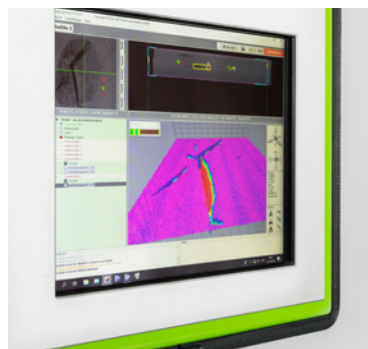
The TRC systems from WINTERSTEIGER cover the entire process chain – so you receive everything from a one stop supplier!

Detection with „Faulty Spot Eye“

The WINTERSTEIGER „Faulty Spot Eye“ defect scanner is a key component of every fully automatic TRC machine. It has been optimized for detecting defects on wood top layers.

Unlike other scanners on the market, „Faulty Spot Eye“ calculates the dimensions based on depth differences using laser triangulation, which in turn is based on algorithms and filters developed by WINTERSTEIGER. This valuable expertise makes the scanner unique since the evaluation is not based on database comparisons with samples. All defects are calculated for each board from scratch, with Faulty Spot Eye working quickly and precisely for the best results. It detects defects from a size of 0.5 mm (knothole diameter, crack width, etc.) and the scanner works at a speed of approximately 72 m/minute. Additionally, the scanner can be used for quality checks – with a final scan performed after the repair process.

Thanks to the unique WINTERSTEIGER software, the repair units move to the identified defects at high speed for maximum efficiency and get to work.



The Faulty Spot Eye (FSE) is adapted to suit any cleaning or repair technology for precise detection of all relevant defects every time.

Different scanner technologies and types are used depending on the application and system, from a color scanner to a 3D scanner. Both the upper surface and underside can be scanned simultaneously if required.

The defect scanner accurately identifies defects such as knotholes, cracks, face cracks, resin pockets, rot, and brownness, then delivers ultra-precise results which form the basis for the next process step and maximum quality results.

Cleaning with TRC Preclean

The TRC Preclean system enables automated pre-cleaning of wood surfaces. Before repairing defects, it used to be necessary to manually pre-clean – i.e., mill – raw boards.

The TRC Preclean removes bark inclusions and soft parts from knotholes automatically, while cracks or similar defects are cleaned. The defects scanned by the „Faulty Spot Eye“ are processed by the TRC Preclean to deliver a completely natural result.

Repairing defects in wood

The fully automated machines in the TRC product line scan the raw materials using a 3D camera. The software then calculates the exact position and size of the defects, which are repaired with maximum efficiency.



Your benefits summed up:

- Save valuable personnel resources
- Maximum flexibility thanks to enormous know-how
- Consistently high level of quality; crafting skills are no longer required
- The natural appearance of the defects is retained

Filling material

The right solution for every requirement

Repair using thermoplastic (TH)

The main advantage of thermoplastic fillers is that they are harder than alternative filling materials. Using these materials also means that further processing can be carried out on the timber product immediately. Imperfections are filled with a thermoplastic filling material via an injection unit and immediately cooled again to cure. Panels, boards, and similar can be stacked without sticking to each other or further processed immediately after the repair.



Your benefits summed up

- Minimal resources required thanks to precision injection
- A variety of colors to choose from
- Different filling material manufacturers
- Immediate downstream processing thanks to active cooling
- The material holds well due to a special injection process
- The filling material is harmless to both humans and the environment
- Repaired parts can be stacked immediately after filling

Repair with organic filling material (OR)

The mineral, water-based, single-component filling material was specially developed for the requirements of mechanical processing and is suited for all conventional further machine processes and surface coatings in parquet manufacture. The TRC Organic Filler is available in 8 standard colors and custom color adaptation is also possible.

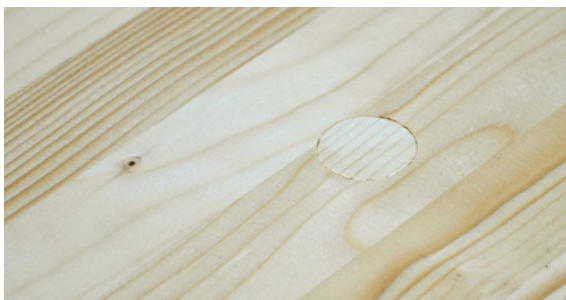
Your benefits summed up:

- Eco-friendly filling material to meet the growing demand for sustainable solutions
- Minimal resources required thanks to precision injection
- Minimal correction in downstream steps thanks to precise filling quantity
- Very clean application without smearing over a large area



Repair with patches from your own wood strips

With the TRC Woodpatch, the defects located by the „Faulty Spot Eye“ scanner are drilled out and repaired by applying patches. The patches or plugs are created from a wood strip on the machine itself and pressed in precisely in line with the direction of the wood fibers. Larger defects are repaired individually using several overlapping plugs.



Wood patch repair process

1. The defect is milled out, and at the same time, the plug is created from the patch strip.
2. The patch unit changes from the milling to the setting position.
3. The stamp presses plugs out of the patch strip and into the milled defect.
4. The gripper then moves the patch strip along and the next plug is created.

Your benefits summed up:

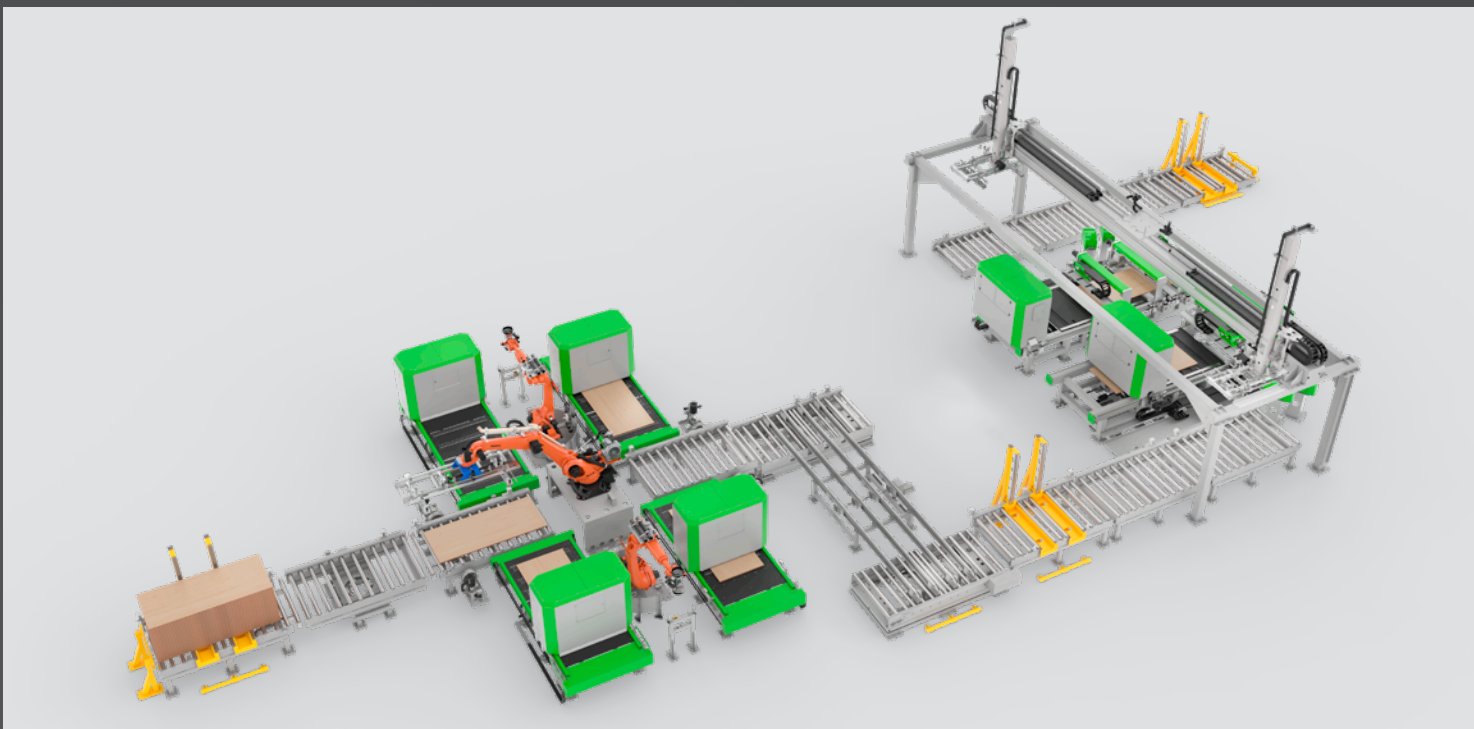
- Maximum efficiency – just one scanning process for double-sided evaluation of the board
- Practical and economical: patch creation integrated in the machine, patches do not need to be purchased separately
- Perfect results, as patching is automatically performed in the direction of the wood fibers
- Save valuable personnel resources
- Consistently high quality

TRC

Customer-specific complete systems

As well as the standard versions of the TRC systems, we also produce customized solutions. This includes customized automation settings and transportation systems as well as wood dimensions.

If customer-specific production systems are needed, then the automation expertise of VAP-WINTERSTEIGER is at hand – for integrating TRC systems into existing production systems and processes, for example.



TRC Preclean 4M and two TRC Panel 3TH with automation and interlinking

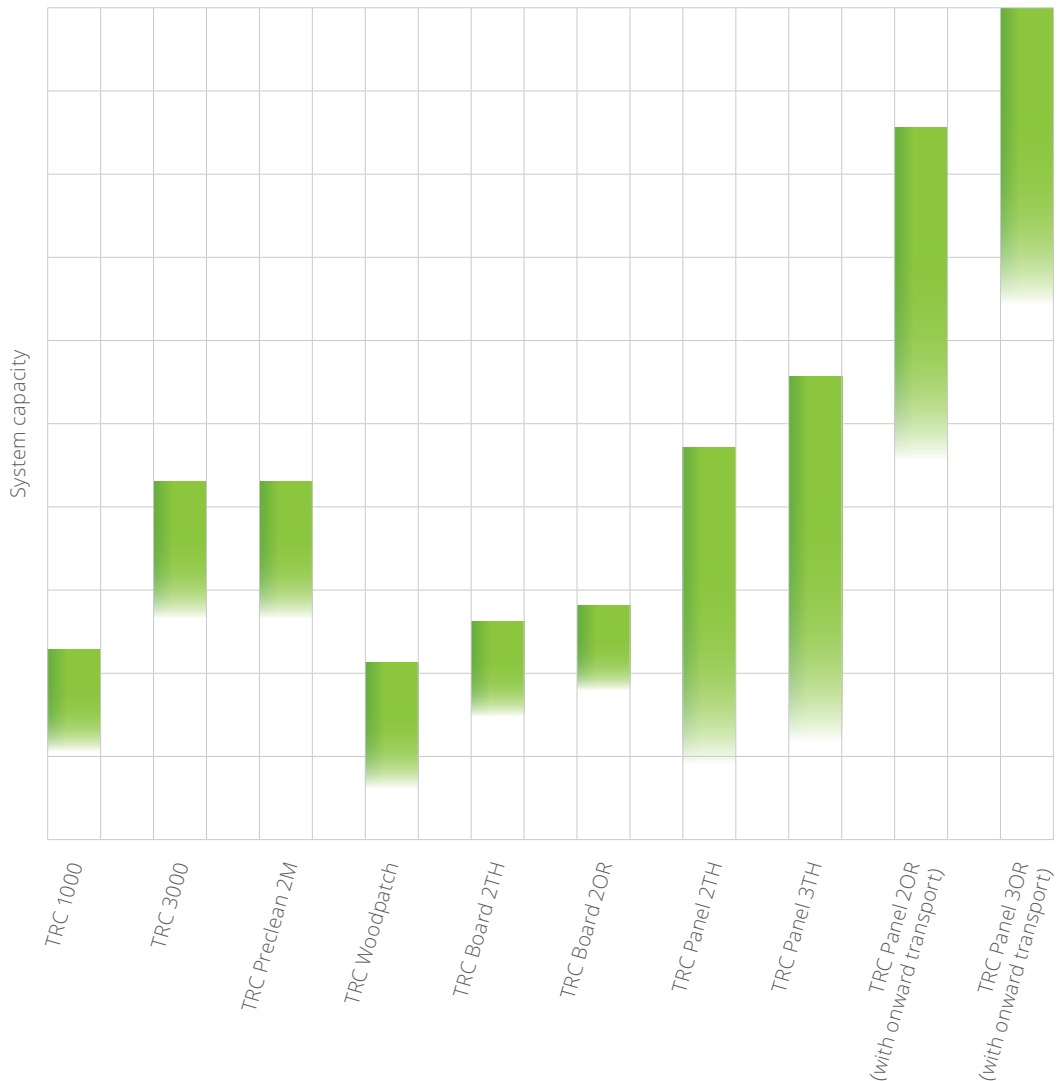
Product portfolio

Our customers' products are as individual as the systems used to produce them. Which is why WINTERSTEIGER offers the right solution for all products in all sectors:

- Engineered wood flooring
- Solid wood flooring
- Solid wood boards
- Multilayer boards
- Plywood
- Formwork panels
- Glulam panels
- Furniture panels
- Finished lumber
- Window scantlings
- etc.

Our TRC product portfolio provides the right solution for any requirement – from engineered flooring to formwork panels, small to industrial enterprises, manual feeding to full automation.

TRC systems in comparison:



TRC Preclean

Cleaning of panels, single and multiple boards

TRC Preclean enables the automated pre-cleaning of wood surfaces. Before repairing defects, the raw boards are pre-cleaned. This involves treating cracks or similar and removing bark inclusions or soft parts from knotholes.

Process-optimized alternate processing of 2 clamping tables allows secondary processes such as loading and unloading, scanning, and evaluation to be carried out while defects are being cleaned. The TRC Preclean can be upgraded with additional modules and can process layers with multiple boards and panels up to 2,500 x 1,300 mm.

The optional double spindle allows 2 different milling tools to be set up on the machining robot at the same time without a tool change.

Optionally, the TRC Preclean can also be used for repairing top layers as well as raw engineered flooring.



Preclean 2M with 2 machining tables and one machining robot



Double capacity – Preclean 4M with 4 machining tables and 2 machining robots

Application areas:

- Top layers
- Engineered wood flooring
- Solid wood flooring

Wood dimensions:

- Min. / max. length: 900 mm / 2500 mm
- Min. / max. width: 650 mm / 1300 mm
- Min. / max. thickness: 3 mm / 45 mm

TRC M-Easy

Repair of single boards

The TRC M-Easy is the entry-level model in the TRC product family. This product is designed for workshops and small enterprises. It produces perfect, semiautomatic repairs of defects in wood surfaces. This TRC variant is distinguished by the quality of the finishing work along with good output capacity and low investment costs.

Duplex version.

With the duplex version, one board can be repaired with 2 colors. The operator chooses between a lighter and darker color depending on the type of wood. The defect is defined manually by the operator. An integrated laser cross on the machine indicates the injection points to the operator.

Once the injection points have been defined, the operator presses the foot switch to begin the injection cycle. The operator decides which of the 2 colors is used. The machine has an integrated control system which calculates and applies the injection and cooling time automatically depending on how long the foot switch is actuated.



Application areas:

- Top layers
- Engineered wood flooring
- Solid wood flooring
- Solid wood boards
- Multilayer boards
- Plywood
- Furniture panels
- Finished lumber
- Window scantlings
- etc.

Wood dimensions:

- Min. / max. length: any / any
- Min. / max. width: any / 620 mm
- Min. / max. thickness: 3 mm / 40 mm

TRC 1000

Repair of single boards

The TRC 1000 is the ideal entry-level machine for the automated timber repair process. Thanks to several design variants, from simple feeding to a fully automated production cell, the TRC 1000 meets every need for medium capacity requirements and offers a very good price/performance ratio. The available work area provides maximum flexibility when it comes to workpiece dimensions.



Application areas:

- Engineered wood flooring
- Solid wood flooring
- Solid wood boards
- Multilayer boards
- Plywood
- Furniture panels
- Finished lumber
- Window scantlings
- etc.

Wood dimensions:

- Min. / max. length.: 500 mm / any
- Min. / max. width: 90 mm / 650 mm
- Min. / max. thickness: 3 mm / 20 mm



TRC 3000

Repair of single boards

The TRC 3000 is the most powerful model in the TRC family of products. This system is intended for the medium to high performance range for commercial and industrial enterprises. The modular design and various transport solutions enable customized degrees of automation in various different configurations.



Application areas:

- Top layers
- Engineered wood flooring
- Solid wood flooring

Wood dimensions:

- Min. / max. length: 800 mm / 2500 mm
- Min. / max. width: 100 mm / 270 mm
- Min. / max. thickness: 5 mm / 25 mm

The TRC 3000 is equipped with a side guide and face ruler, which can also be used to precisely measure and repair cracks on the face of the material.

In addition to this, all defects directly around the edges can also be filled.

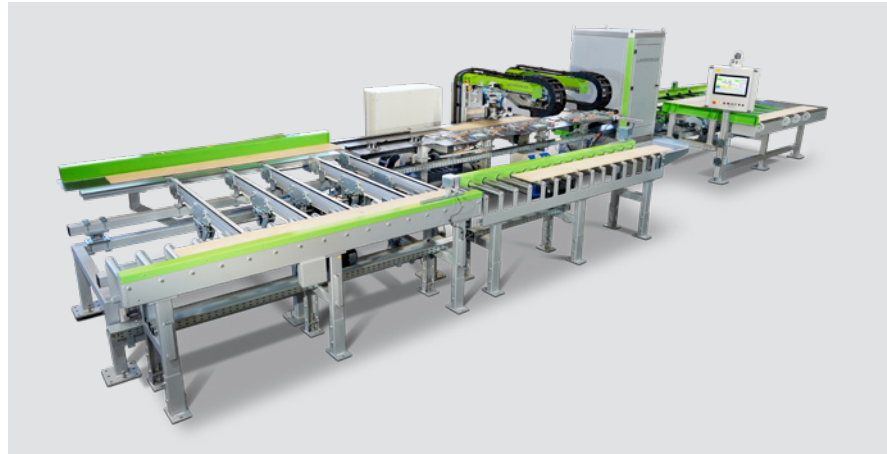


TRC Board

Repair of single boards

TRC Board is a modular platform for the fully automatic repair of individual boards.

This system is intended for medium output with high performance for commercial and industrial enterprises. It produces perfect repairs of damaged timber surfaces. Defects are repaired with thermoplastic or organic filling material using injection units. No filling material is wasted thanks to the precise calculation of the filling quantity and precision injection.



The TRC Board is also optionally equipped with a face ruler, which can also be used to measure and repair cracks on the face of the material.

In addition to this, all defects directly around the edges can also be filled.

Duplex version.

The system can be optionally equipped with 2 different filling materials at the same time. Each of the 2 repair units is equipped with an additional injection unit.

Cooled supporting table.

Thanks to the cooled, full-length supporting table with external cooling system, products with rough defects, such as knotholes through the entire lamella thickness as well as lamella/top layers, can be repaired with ease.

Handling system – manual feeding.

The feed is designed so that the boards can be placed close to one another. This also enables (automated) layer-by-layer placement of boards on the cross conveyor.

In order for us to supply you with the perfect system for your capacity, repair, material flow, and other requirements, we make use of a modular system with the following options and/or configurations:

Options:

Number of repair units	1 to 3 injection units
Filling material	<ul style="list-style-type: none"> • Thermoplastic (TH) • Organic (OR)
Options for TH version	<ul style="list-style-type: none"> • Side guide and face ruler • Duplex version • Cooled supporting table
Handling system	<ul style="list-style-type: none"> • Manual feeding • Manual removal <ul style="list-style-type: none"> • Cross conveyor • Return conveyor
Process flow	Control scan

Face ruler and side guide.

The face ruler and side guide are needed when the damage is on the edge of the boards. The following profile seals are available:

- Longitudinal profile seals (right and left)
- Front/end profile seals



Handling system – manual removal.

The TRC Board can be optionally equipped with a return conveyor system, which can be operated by just one person. The return conveyor system consists of a cross conveyor and a roller conveyor. The roller conveyor is connected to the cross conveyor and conveys the boards back so they can subsequently be stacked manually.

Control scan.

If required, a second scan unit can be integrated. It controls the quality of the boards following repair.

Random length.

The „Random Length“ function allows boards of different lengths to be processed directly one after another without the need for any adjustment. This function comes as standard with TRC Board.

Application areas:

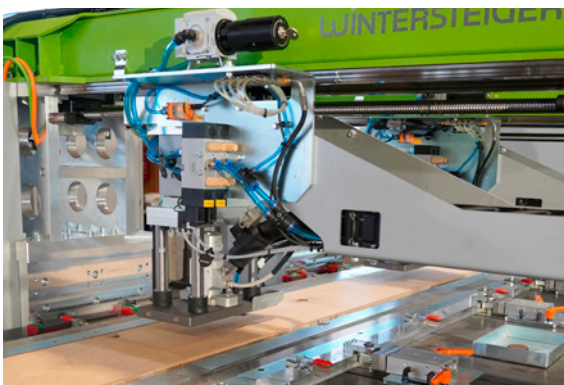
- Top layers
- Engineered wood flooring
- Solid wood flooring
- Finished lumber
- etc.

Wood dimensions:

- Min. / max. length: 500 mm / 3000 mm
- Min. / max. width: 100 mm / 350 mm
- Min. / max. thickness:
3 mm / 30 mm (TH version),
9 mm / 30 mm (OR version)

Reference systems

TRC Board 2TH



Filling material	Thermoplastic (TH) 2 injection units
Handling system	Manual feeding of the cross and return conveyor
Options	Side guide and face ruler Cooled supporting table
Process flow	No control scan
Application	Engineered wood flooring industry
Board size	W: 100 mm – 350 mm L: 920 mm – 2000 mm

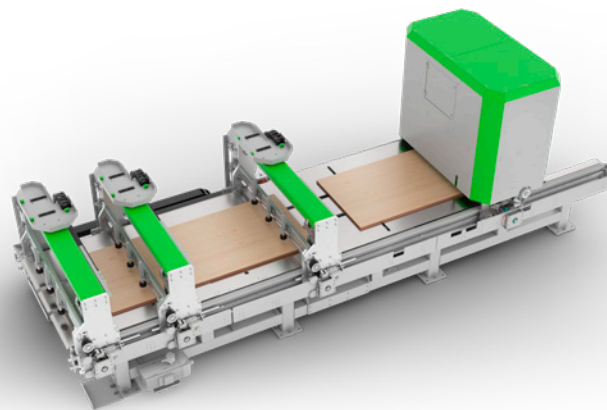
TRC Panel

Repair of panels, single and multiple boards

Repair with several injection units.

The repair process starts with the panel being scanned. The scanner scans the entire panel in one sweep. As soon as it is finished, it sends the data to the injection units and the defects are repaired in a high-precision process. Only the volume calculated by the scanner is filled into the crack or knothole; the surrounding grain of the wood is not processed.

The repairs can be made in various material colors. It is possible to carry out remote technical support of the TRC system via the internet.



TRC Panel is a modular platform for fully automatic repair of large panels.



Repairing slabs

Number of repair units.

The number of repair units significantly affects the system capacity and must be tailored to the rustic nature of the goods and the subsequent process steps.

Handling system.

The panel is taken from the stack, repaired, and restacked. Once a panel stack has been completely processed, the system stops, and the repaired stack can be replaced by a new stack.

Random length

The „Random Length“ function allows panels of different lengths to be processed directly one after another without the need for any adjustment.

In order for us to supply you with the perfect system for all your needs when it comes to capacity, repairs, material flow, and so on, we make use of a modular system with the following options and/or configurations:

Options:

Number of repair units	<ul style="list-style-type: none"> • 2 injection units • 3 injection units
Filling material	<ul style="list-style-type: none"> • Thermoplastic (TH) • Organic (OR)
Handling system	<ul style="list-style-type: none"> • Turning unit (for repair on both sides) • Onward transport
Process flow	<ul style="list-style-type: none"> • Onward transport <ul style="list-style-type: none"> • Scan and repair simultaneously • Scan and repair one after the other • Double loading • Random length • Control scan

Turning unit.

Once the front of the board is completed, the turning unit turns the board 180° and the back undergoes the same process.

Onward transport.

After the board has been scanned, it is transported onwards via a slider in the machining table so that the defects can be processed by the repair unit. This step significantly increases the system's capacity as one board is being repaired while the next is being scanned.

Double loading.

As well as machining individual panels and boards, two short boards with a length of around 900 mm to 1500 mm can be placed on the machining table, scanned, and processed in a single step. This increases capacity for short boards.

Control scan.

Once the boards have been repaired, the scan is repeated to check the result of the repair.



Repair of multiple boards

Application areas:

- Top layers
- Engineered wood flooring
- Multi-strip parquet flooring
- Solid wood flooring
- Multilayer boards
- etc.

Wood dimensions:

- Min. / max. length: 900 mm / 3500 mm (2 units)
900 mm / 2600 mm (3 units)
- Min. / max. width: 650 mm / 1300 mm
- Min. / max. thickness: 16 mm / 45 mm

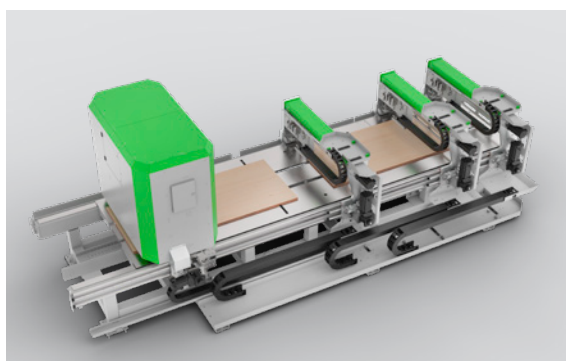
Reference systems

TRC Panel 2TH



Filling material	Thermoplastic (TH) 2 injection units
Handling system	Turning unit
Process flow	Scanning and touching up in sequence
Application	Solid wood panels
Panel size	W: 650 mm – 1300 mm L: 900 mm – 3000 mm

TRC Panel 3OR



Filling material	Organic (OR) 3 injection units
Handling system	Onward transport
Process flow	Scan and touch up at the same time
Application	Multiple boards
Panel size	W: 650 mm – 1250 mm L: 900 mm – 2020 mm

TRC Woodpatch

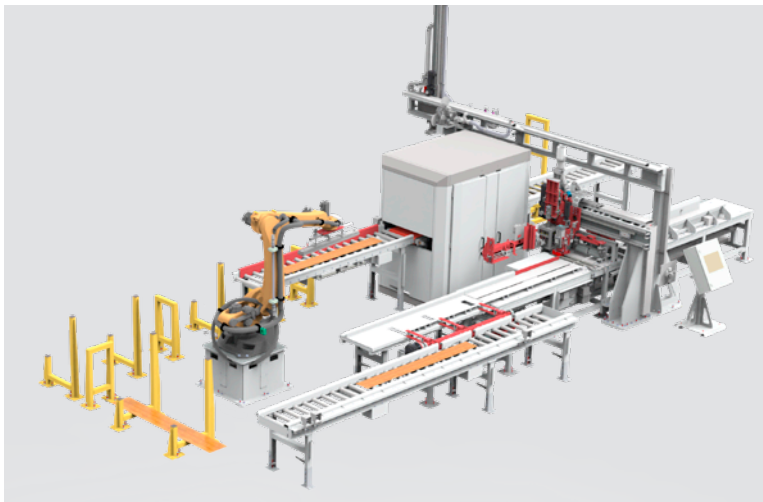
Repair of panels

The fully automated TRC Woodpatch timber repair system for multilayer boards (for example, formwork panels), glulam panels, solid wood boards, etc., scans the board on both sides with Faulty Spot Eye (FSE) and detects the defect. The defect is then milled out and repaired.

This technology enables various types of defects to be detected and analyzed and their positions to be determined. What is more, the Faulty Spot Eye (FSE) allows discoloration to be detected and taken into account when evaluating the different quality levels.

Straight after the repair of the first side of the board, it is possible to turn the board and repair the second side in another pass. The board can also be repaired on both sides in just one pass using two TRC Woodpatch systems connected in series.

Capacity: 520 boards per layer for a reference length of 2000 mm and approx. 10 patched areas per board



TRC Woodpatch with a machining and turning unit

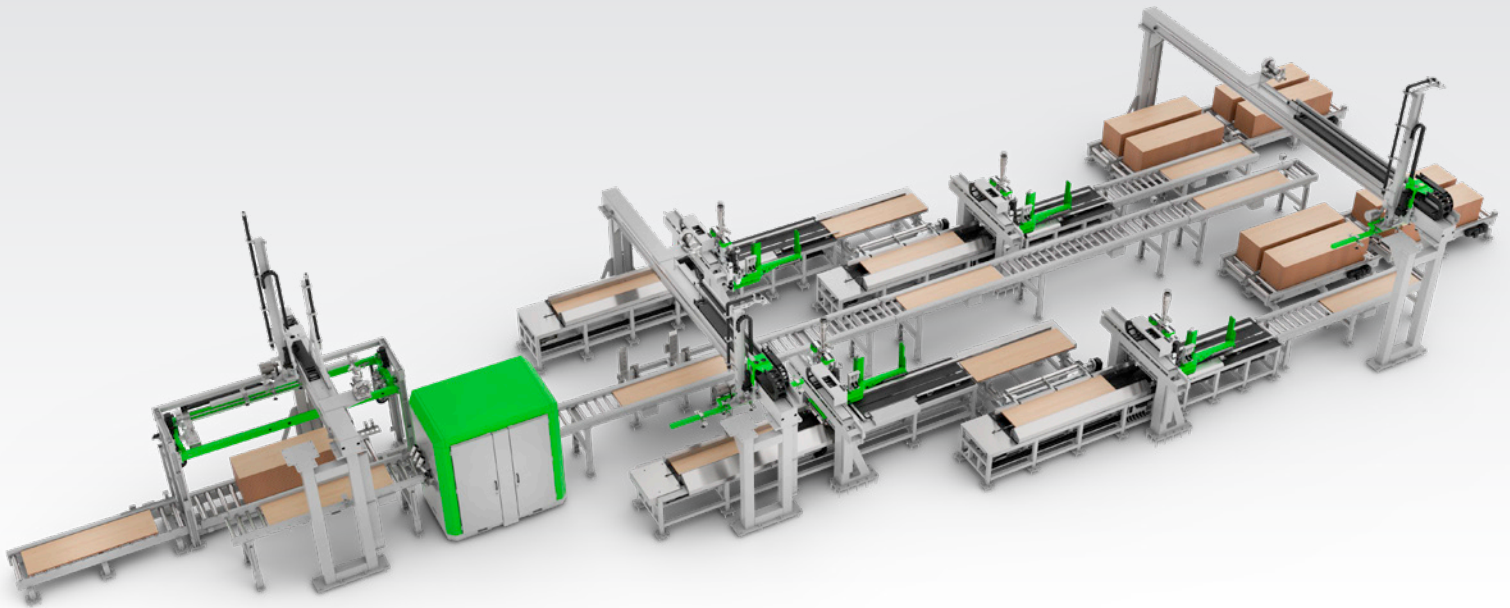


Application areas:

- Multilayer boards (for example, formwork panels)
- Glulam panels
- Solid wood boards
- etc.

Wood dimensions:

- Min. / max. length: 1500 mm / 3000 mm
- Min. / max. width: 500 mm / 510 mm
- Min. / max. thickness: 10 mm / 20 mm



After-sales service

When the delivery ends the support begins

The best time to evaluate the quality of an investment is several years after delivery. For this reason, WINTERSTEIGER has an after-sales service that is available to you all over the world.

Installation and training.

WINTERSTEIGER ensures both with its experts world-wide and of course on site.

Support.

We provide continuous support to quickly optimize the profitability of the machine for our customers.

Proactive maintenance.

Maintenance and preventive active replacement of pre-defined wear parts at firmly defined times (e.g. during company holidays) which also helps to keep maintenance and repair costs to a minimum.

Contracts for consumables and saw blades.

These agreements enable us to plan our annual requirements in advance and save costs which of course we pass on immediately to our customers.

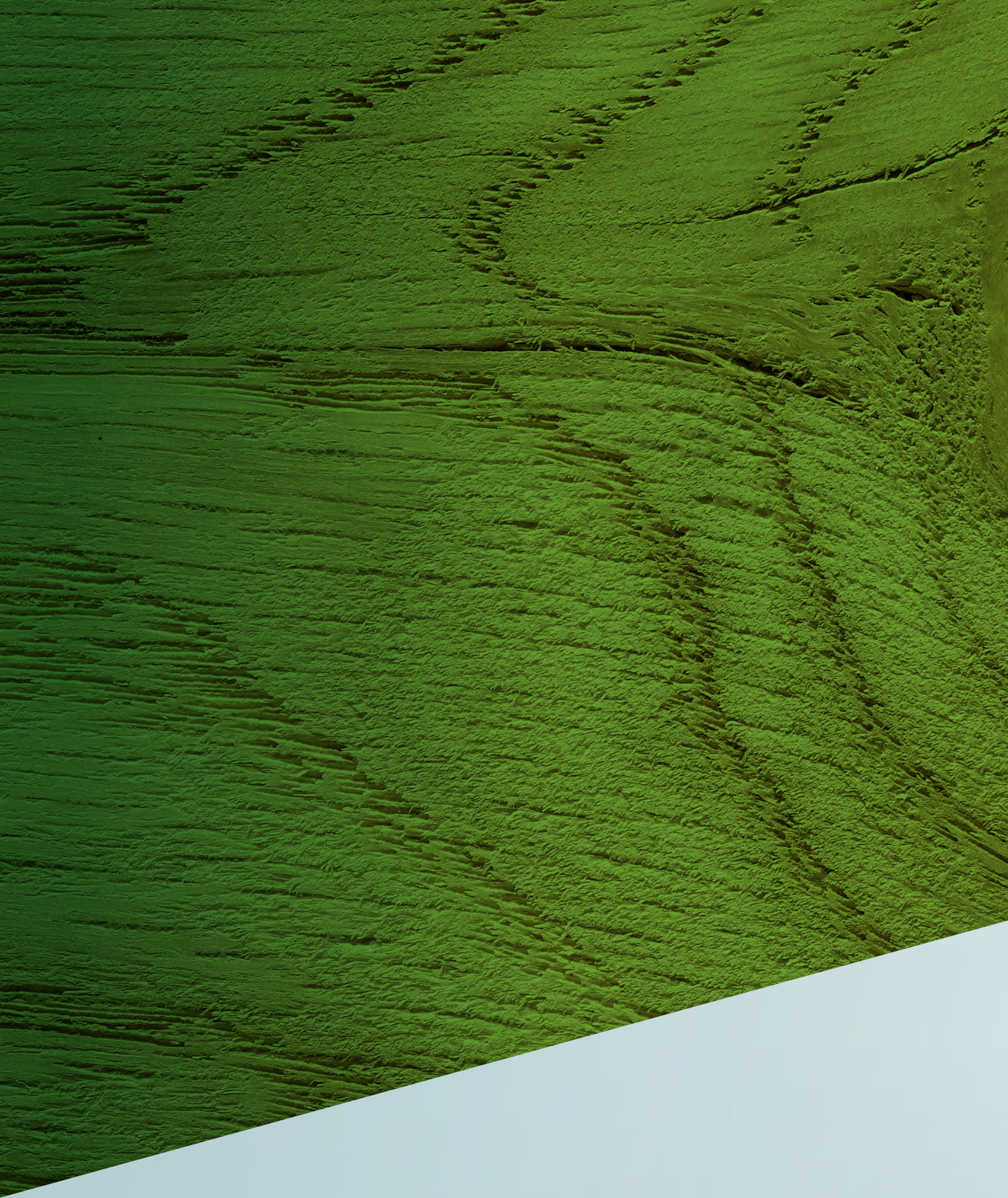
Other benefits:

- Just-in-time delivery of saw blades
- Availability at short notice
- Warehousing of saw blades by WINTERSTEIGER

Helpdesk on call service.

This service underlines our high level, global service commitment to our partners and ensures first-class support even outside our normal business hours.





WINTERSTEIGER
Thinking about tomorrow.



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