

VMI GROUP RETREADING

04-May-2018

Retreading

Business Challenge

Retreading TBR Tires in Europe

- Price pressure / low priced new tires
- Quantity and quality of casings
- Find good personnel and provide training

Difficult if focus on tire price reduction; the price for a new tire vs a retread; when the price gap is getting small and the quality of the cheap new tires continuous to increase

Instead maintain high quality of retreads, ensure customers keep coming back

Retreading

Retread Customers

Fleet owners:

- Reliability of deliveries
- Total operating costs

Example 18 Ton curtain sider, 80 000 Km per year

Depreciation, Insurance, Taxes	1/3
Driver	1/3
Running cost	1/3

Running Costs

Fuel, oil, add blue	72%
Tires	6%
Maintenance, repairs	22%

- Fuel efficiency and reliability is more important than the mere price of a tire
- The tread has a large affect on the overall rolling resistance of the tire

VMI Group

We make machines

VMI is famous for tire building machinery

- High quality tires for PCR and TBR
- High output Machines
- Highly automated

Use this know how in building retreads



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VMI Retreading Machinery

For Retreading VMI focus:

- Cushion gum application (Smearing)
- Optional with integrated Builder (pre-cured tread)

Other suppliers already offer:

- Various testing equipment (example Shearographic)
- Computer controlled buffing

Retreading Automation

A retread is different from a new tire

- Tires are mixed (size, brand, type)
- Casings vary, each has a different history
- 1st retread, 2nd, or ...
- Many treads to choose from
- Customers with different goals (highway, city, mining)

High-Mix, Low-Volume production

Need machines to work with – continuously adapt to - product variations

Cushion Gum Extruder

Smearing

Principle of Cushion Gum extrusion (smearing) has been proven:

- Over 20 years experience in production
- Single pass to apply the cushion gum
- Hot cushion gum
- Including skive filling
- Shoulder shaping (wingformers)

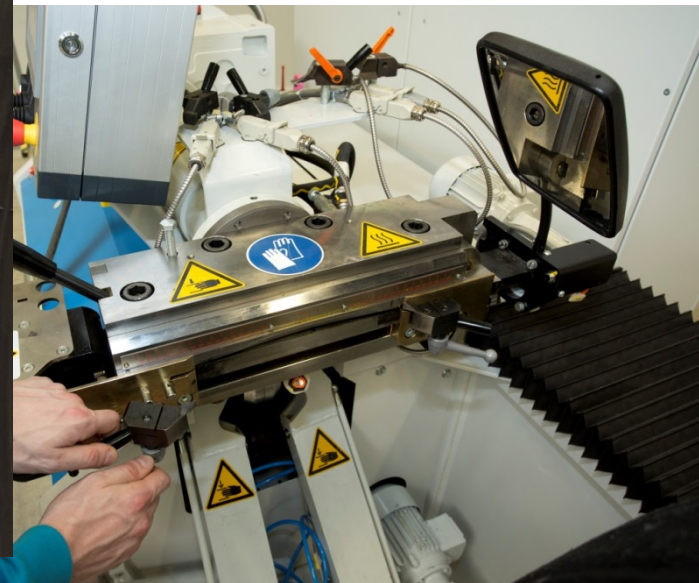


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Cushion Gum Extrusion

Wingformers for Shoulder shaping



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Tread applicator

On the same machine immediately after applying cushion gum
Cushion Gum still hot, sticky and clean

Design for:

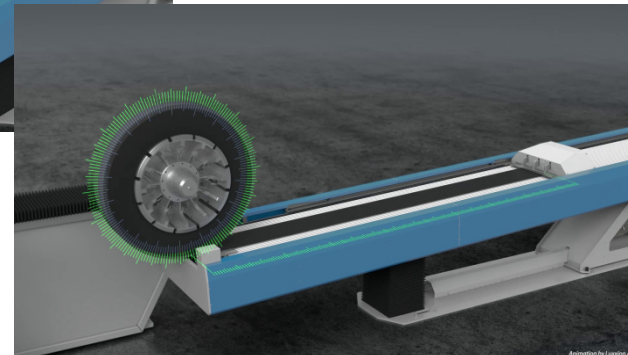
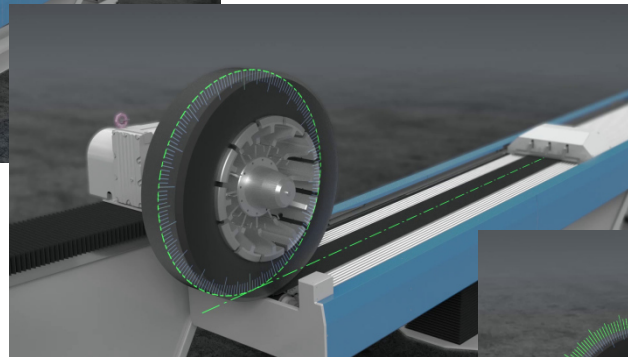
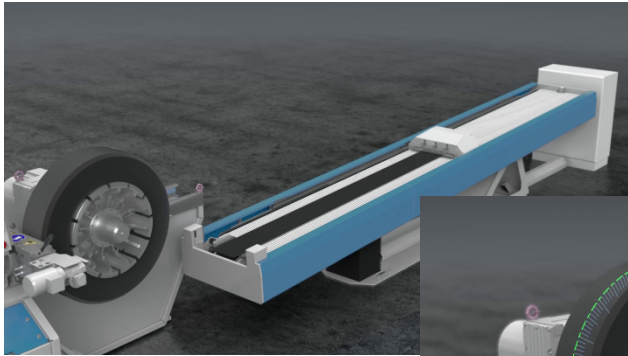
- Pre-cured tread (cold process)
- Splice with pattern matching (requires stretching)

Main points:

- Tread in the center of the tire
- Tread in a straight line on the tire (no snaking)
- Good splice matching
- Balanced tread stretching

Tread applicator

Adjustments

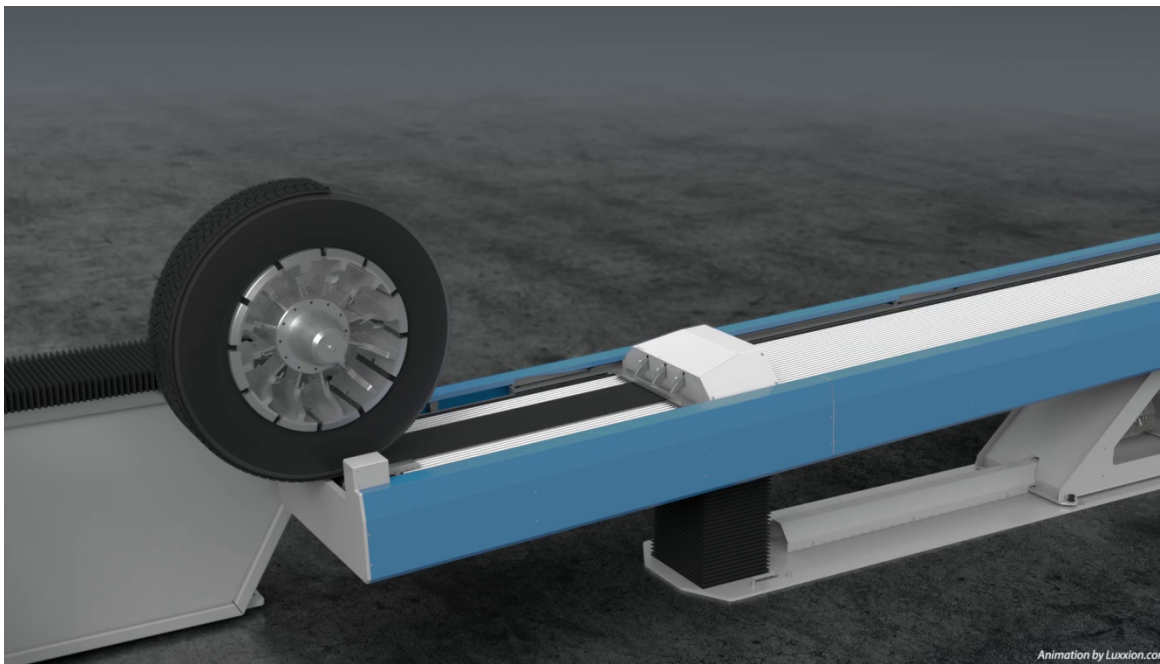


Controls in the applicator:

- Prepare the tread on the table
- Align the tread center to casing
- Stretch the tread to match the casing circumference

Tread applicator

Application



Follow the tire circumference speed to complete the application.

Stitcher Unit



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Automation

So there are modules for:

- Cushion gum extrusion
- Tread application
- Stitching

We still need information required for control:

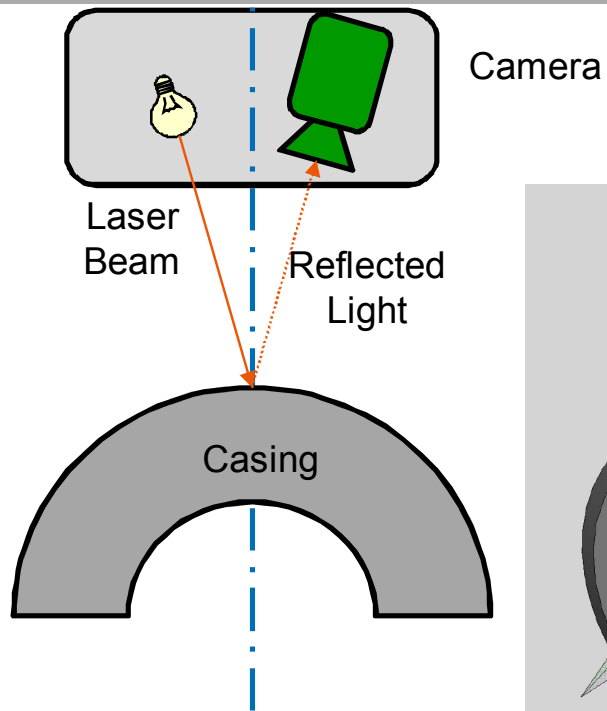
- Tire diameter, width and center
- Tread length, width and thickness

To adjust for example:

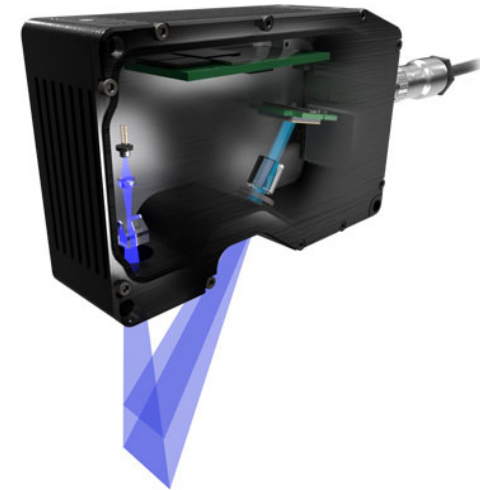
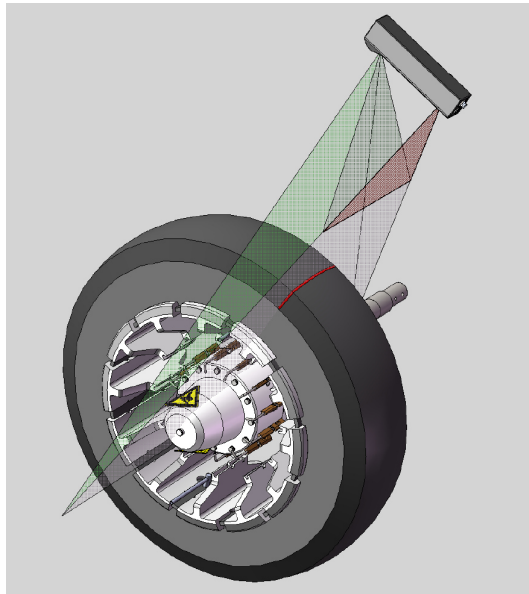
- Wingformer positions
- Center to center alignment
- Stretching and application speed

Tread Applicator

Tire scanning camera



The camera is actually a: Laser light and camera in a single box



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Camera Scan

Laser Line



Laser scan to measure:

- Casing Width
- Center
- Diameter

A special software algorithm is designed to calculate the position of the shoulders and then to calculate the center line



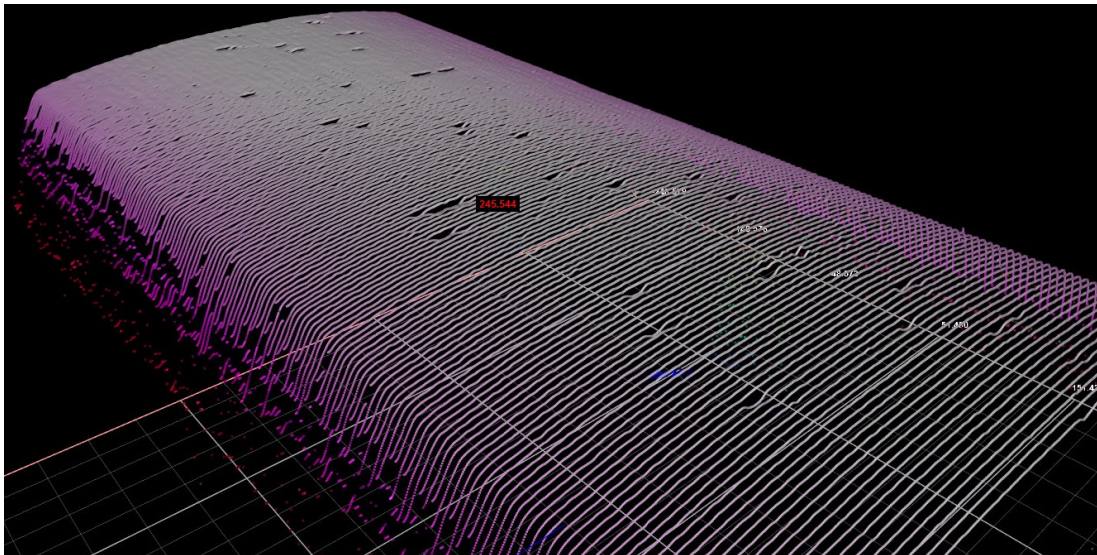
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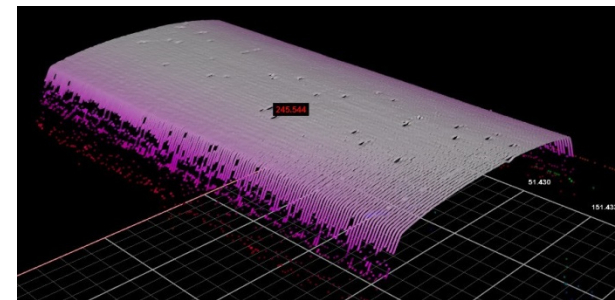
Camera Scan

Camera Picture

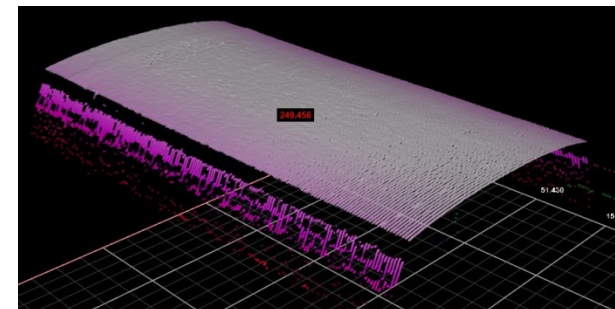
The scan signal from the camera. Note the skive holes on several scan lines.



Before cushion gum extrusion.



With cushion gum, before Tread application.



RETRAX Builder

Automatic Cushion gum extruder and Tread Applicator

- Automatic Centering of the tread to the casing
- Automatic length checking and stretching
Error message if tread length out of range
- Fast
- Automatic stitcher
- High product quality



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**THANK YOU
FOR YOUR
ATTENTION**

Flexible
Innovative,
Inspired,
Dedicated