

HM TODAY



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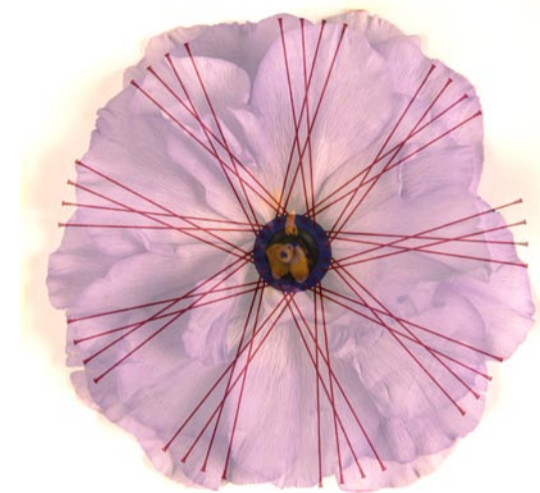
Premium Wheels



Today's trend in bicycles is customization. Bike assemblers offer 'à la carte' specification for components, and wheels with other-than-regular spoke patterns, for instance paired spokes, spokes in groups of three or four. The customer may fancy a flower-like configuration. The technical possibilities to build such wheels exist, and it probably means that variations in spoke patterns are not only a temporary hype, but a lasting trend. To true these patterns, the truing machine needs not only sophisticated software, but it must be flexible as well, and preferably adapt automatically for each wheel. The fact that one can switch to another pattern makes only sense if one

actually does switch. In practice, a bike manufacturer who has the right wheelbuilding layout for variation, will use it. His different models will have different wheels and lacing patterns. But production of relatively small series (even a one-off custom model is a real possibility) only makes sense when the conversion from one pattern to another doesn't require elaborate re-tooling and tuning. Holland Mechanics truing robots perform the adaptation to another wheelsize, wheel type or lacing pattern automatically. They have the efficiency for mass production with the flexibility for custom units.

The Flower Effect



Spoke patterns with GST (Group Spoked Technology) wheel designs with spoke groups of 2,3,4 or 6 spokes, may cause new and unexpected problems for the wheelbuilder. See it this way: instead of an even distribution of the spoke holes along the rim (which means an even distribution of the tension), there is now an alternation of plain sections of rim and sections with a number of holes at short distance of each other. Within each group of spokes, the middle ones tend to be over-tightened (pulling the rim section inward), and at the same times the plain sections bulge. The wheel as a whole is said to suffer from the 'flower effect'. Riding such a wheel is like riding on cobblestones. Holland Mechanics developed special controlling software. If you face this quality problem ask Holland Mechanics.

From volume to customized

Holland Mechanics started in the early 'seventies as a new company, fully dedicated to mechanical wheelbuilding. It started because skilled wheelbuilders were scarce and for many bicycle assemblers it was a continuous logistic problem to get wheels made in time. First step was the development of reliable automatic machinery for the volume production of wheels. Holland Mechanics helped the American mass bicycle makers like Huffy and Murray automate their wheel assembly. Both have now stopped production in the USA while mass production has shifted to the Far East.

Bicycle assemblers in the western world can only survive when they make undisputed high quality, and/or custom-made bicycles. This requires wheelbuilding equipment with different characteristics: the possibility to include quality elements, and the flexibility to have great variation (in wheel sizes, spoke patterns, hubs) within the production. Holland Mechanics, still fully dedicated to mechanical wheelbuilding, are continuously developing new modules to cope with these new requirements.



Premium Wheel Holland Mechanics introduce the Premium Wheelset: a new quality standard. Premium wheels contain the best available components, and are made with the best lacing and truing technology, with HM's Q-assets like Q-lock nipple locking agent, Q-lets under the nipple head to prevent the nipple from 'biting' in the rim material (needing undue torque to true) and Q-tape printable rim tape. All Q-assets mean 'invisible' quality, but it can be named and used as a selling aspect. HM has a luxury wheel bag (like the pro's use) for assemblers who want to promote their 'best quality' wheels.



QCover A new quality improvement is the Q-cover: a rubber cap that fits seamlessly around the spoke and over the nipple and rim. It comes in various colours, and it will keep the nipple clean for easier repair. It will keep water out of the rim cavity.

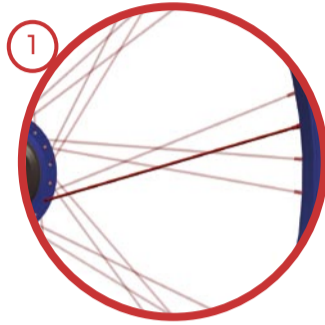


Premium QTape Adhesive cotton rim tape is ultra light and thin. It protects the inner tube. The top layer of the rim tape can also be used to imprint with, for instance, a bar code so that every individual wheel can be registered and traced for liability purposes. Production data for each wheel are stored anyway with computer-controlled truing, so the identification is a logical next step for the quality manufacturer.

Inside Information

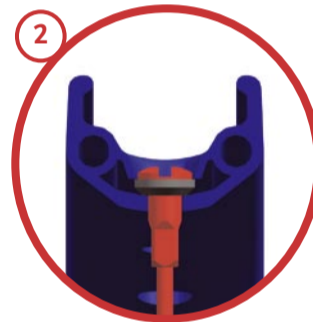
1. Spoke Tension

An evenly tensioned spoke pattern is the first step towards quality wheels. Even the best rims, hubs and spokes can break if they don't fit properly, get slack. During lacing and truing, it is most important to prevent any undue friction between spoke, nipple and rim. For some combinations of materials, an eyelet between rim and nipple is a good measure, one can lubricate the thread of the spoke and nipple (most nipples can be supplied in pre-oiled versions). A locking agent will also act as lubricant before polymerizing.

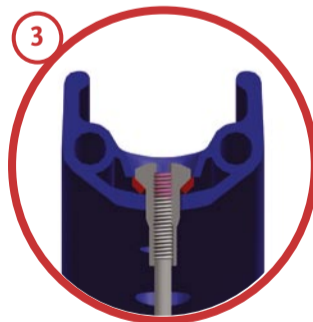
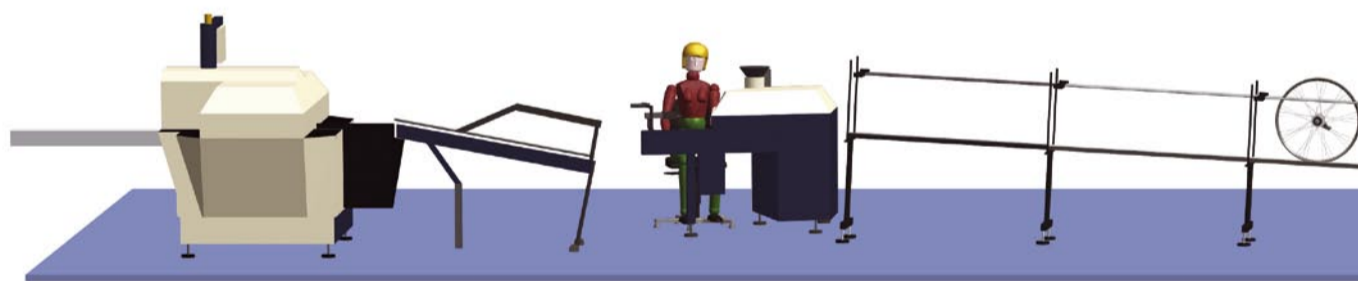


2. QLets

Friction between bolts and bolted elements is commonly known by machine builders as 'underhead friction'. Depending on the material of the spoke, nipple and the rim, there may occur a form of underhead friction in wheelbuilding. With 36 spokes, it is damaging to wheelbuilding consistency if the friction between nipple and rim shows great variation. It depends, among others, on the finish of the nipple head and the edges of the spoke holes. When it occurs, a tiny concave washer between nipple head and rim is a good solution. The Q-let washers HM supplies are made of stainless steel.



2



3. QLock – Thread Locking compound

Every nipple tends to unwind, with the repetitive impacts over the years. A real improvement of wheel quality and wheel life is locking the nipple thread. With stiffer rims (for the special lacing patterns, and for smooth road or track use), the wheel passes on more vibrations that tend to unscrew the nipples. Applying a locking compound before truing costs only cents per wheel. Wheels can be re-trued if necessary – the locking agent will keep part of its effect.

Q-Lock seals the nipple and spoke so that no moisture can ever penetrate – it is a perfect protection against corrosion.

4. QTrued

The advanced automatic truing software HM QTrue can true wheels up to 0.2 mm height and side deviations. The newest QTrue version in combination with Wheel ID is the most sophisticated truing software for normal and special wheels.



5. QTape – Adhesive rim tape

Q-Tape is applied automatically, it lies always perfectly straight in the rim bed and always covers all nipple heads effectively. The Q-Tape never creeps around. Premium Q-Tape is a soft 15 mm wide cotton tissue with a printable layer on top. Premium Q-Tape saves 9 grams vs the Standard PP version.

HOLLAND MECHANICS INSIDE



7. Proper truing

Whether it is a regular 32 or 36 spoke job or any other pattern like 8 x 2 paired, 9 x 3, 9 x 4, radial, every wheel must be trued within the required tolerance, both for unroundness and for side deviation. HM robots perform this routine with highest consistency, and speed. Usually, it takes no more than one 'round'.

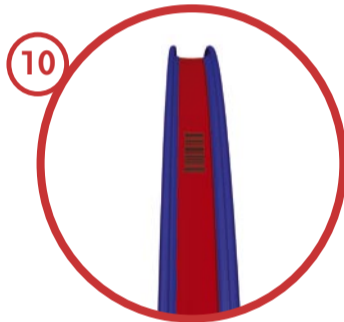
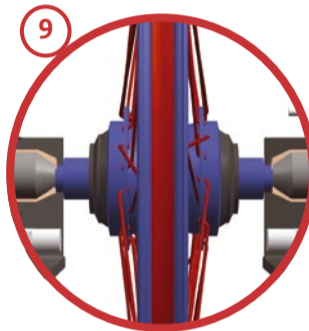
8. Tyre Centering

With HM tyre mounting machines, the tyre will automatically be centered; there will be no wheels with a tyre wobble.



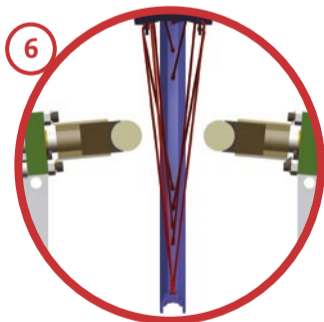
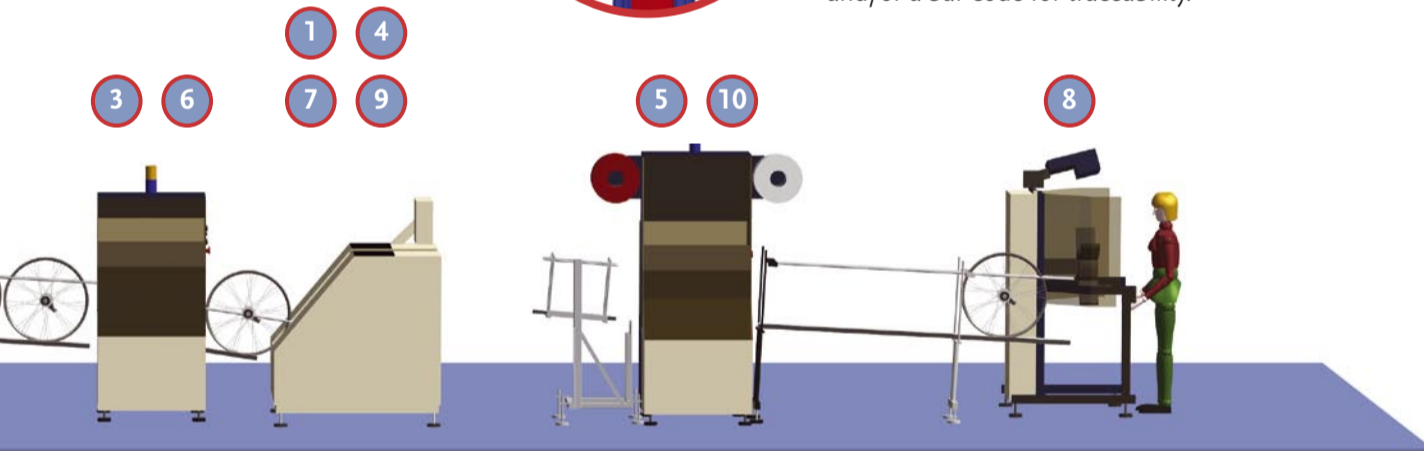
9. In Center Wheel

Holland Mechanics have developed a wheel centering module which establishes the mathematical axis of the wheel and corrects axle deviations.



10. Track & Trace

The rim tape may be printed with your own logo and/or a bar code for traceability.



6. Stabilizing

Depending on the components and the lacing patterns, it may make sense to 'stabilize' the wheel between lacing and truing. Soft pressure on the lacing network will pull even the last spoke head in optimal position in the flange, nipples may find best position in the rim and any undue stress on the spoke network will be relieved before truing.

3+6. Wheel Safety: QLock Application in combination with automatic Seating and Stress Relieving gives you the safest wheel.



11. Optimum Spoke Nipple Alignment: Holland Mechanics also make rim production equipment with a patented spoke hole punching system for perfect rim alignment (dimpled nipple seats) and perfectly round and finished spoke holes. Rims made with HM punching machinery are a basis for perfect and lasting wheels.

Central Robot Control



THE DIGITAL DASHBOARD FOR YOUR WHEELSHOP

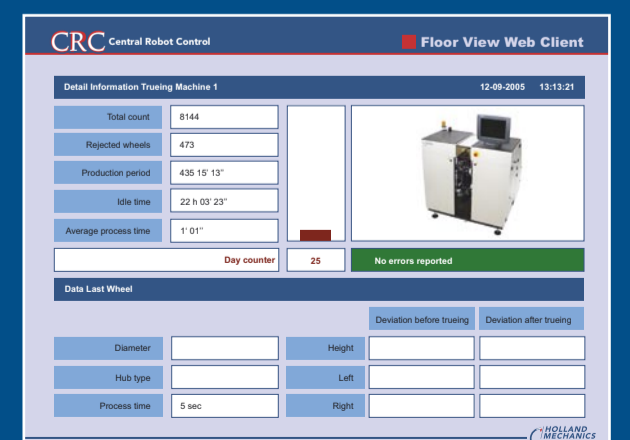
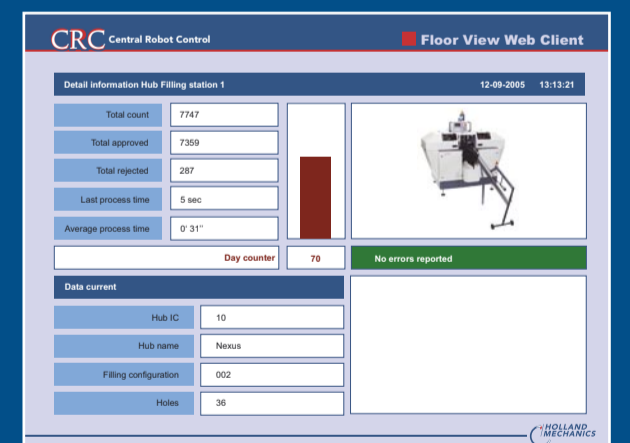
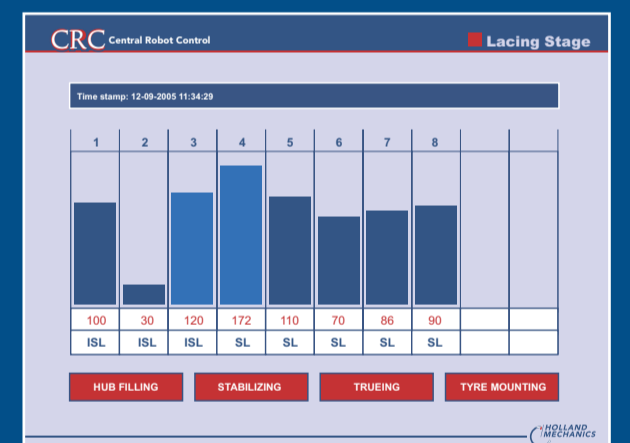
With today's global economy the bicycle industry must work smarter and more productive. Also the wheelshop is constantly in search for ways of getting inefficiencies out of every step in the wheelbuilding process. Many years ago we already saw that Flexible Wheelbuilding™, which was innovated by Holland Mechanics, is the only way to survive. Next to our new machine developments, which improves efficiency, we introduce this year Central Robot Control™. With CRC you can fine-tune your production flow.

Central Robot is a concept where the Master Truing Robot gets all relevant production data from the wheelbuilding line. This information is stored and analyzed by a special developed software program: Central Robot Control™.

CRC exists of the following modules:

- Real time Dashboard view
- Process Optimization
- Process Control
- Process Monitoring and Analysis
- Wheel Quality Control
- Reporting

CRC™ is a real time web-based application which runs on the newest Robot Twin Computer Controlled. The Master Robot TCC can be connected directly to your local area network and production information can even be viewed at another location through a standard web browser.



Special lacers for Sparta Ion electric bike

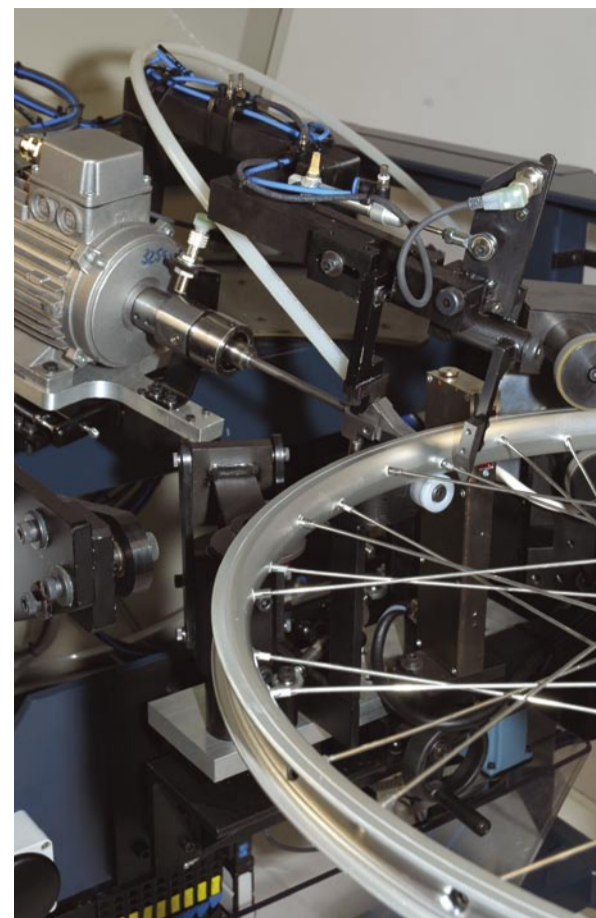
Holland Mechanics has built a couple of special lacers for Sparta, the Dutch manufacturer of the Ion, an electric bike with hub motor in the rear wheel. As the distance between the rim and the hub is short, the spokes have an outward angle as well as an angle in the plane of the wheel caused by the crosswise lacing pattern.

In view of the required strength of the wheel and a carefree technical life expectancy, it was considered necessary to bring each spoke nipple in perfect alignment with the matching spoke.

In the standard ISL lacing machine, the spoke nipples were fed perpendicular on the tangent plane of the rim, and they automatically moved in the right direction when the nipple thread met the spoke thread. But with such 'extreme' angles as the Sparta



Ion motor wheel the risk of a misplaced nipple was considered too big. So the nipple feed got a two-axis movement mechanism. In the pictures, you can see the nipple feed unit pointing 'north-west' and in the next picture 'north-east', for two crossing spokes on the same side of the wheel. The nipple feed unit will tilt up and down for the lower and upper spoke screen, respectively. Of course, the machine is somewhat more complicated than the standard ISL, and lacing takes a bit more time per wheel (tilting the unit is a matter of seconds) but both Sparta and Holland Mechanics are convinced it is worth the trouble.



Mechanical wheelbuilding: for all markets, nearly all products

Mechanical wheelbuilding has conquered production for all demanding markets. One of the most important steps in bicycle assembly is wheelbuilding: the quality of the bicycle as a whole and its technical lifetime are heavily dependent on a good wheelset. And for a good wheelset, one needs good components – rim, hub, spokes, nipples. But the actual wheelbuilding itself is nearly as important. Of course, a wheel can be built by hand, but you need two scarce things to make a good wheel: skill and time.

Mechanical wheelbuilding does not require great skills: once the operator knows the routine, attention is the only thing needed to lace a proper wheel. Lac-

ing and truing a wheel by hand in the fastest routine takes some twenty minutes for an easy, straightforward layout wheel. But top mechanics making top wheels for demanding road racers need at least an hour to lace, true and fine-tune a wheel. An operator with a Holland Mechanics wheelbuilding line (automatic hub fill, lacing is done by the operator on an intelligent lacing machine, stabilizing and truing are fully automatic) can make up to 60 wheels per hour, that's nearly 500 per 8-hour shift. Even in low-wage economies, a wheelbuilding line will save time, and money.

But there is another advantage. Wheels built with lacing and truing machines are more consistent in

quality than their handbuilt counterparts. Ten years ago, the top road racing mechanic could still claim that his handbuilt wheels had smaller tolerances, and were better than the mass product. Today, progress in mechanical wheelbuilding is such, that the claim that wheels built by hand and with ultimate care be better than machine built is no longer valid. The wheel truing machine can not only true the wheel on linear measurements, but also on maximum variance in spoke tension. Measuring the tension continuously during the truing process, one can give in maximum and minimum spoke tensions as a truing parameter. Truing by hand, that's technically impossible.

2005 / 2006 INTERNATIONAL SHOW CALENDAR

DATE	EVENT	LOCATION	H/M APPEARANCE	BOOTH NUMBER
1 sep. until 4 sep.	Eurobike	Friedrichshafen, Germany	✓	A5-104
15 sep. until 18 sep.	IFMA	Cologne, Germany	✓	U10-T11
16 sep. until 19 sep.	EICMA Bici	Milan, Italy	✓	
26 sep. until 27 sep.	Interbike Outdoor Demo	Boulder City, USA		
28 sep. until 30 sep.	Interbike, International Bicycle Expo	Las Vegas, USA	✓	1450
30 sep. until 4 oct.	Salon International du Cycle	Paris, France		
7 oct. until 10 oct.	EXPO-VELO	Brussels, Belgium		
15 nov. until 20 nov.	EICMA Moto	Milan, Italy		
2 dec. until 4 dec.	Shenzhen Int'l Bicycles & Sporting Goods Show	Shenzhen, China		
3 dec. until 11 dec.	Bologna Motor Show	Bologna, Italy		
12 jan. until 22 jan.	Brussels Int'l Car & Motor Show	Brussels, Belgium		
29 jan. until 1 feb.	ISPO Winter	Munich, Germany		
16 feb. until 19 feb.	FietsRai	Amsterdam, The Netherlands		
16 feb. until 19 feb.	MotoRai	Amsterdam, The Netherlands		
8 mar. until 11 mar.	Taipei Int'l Cycle Show	Taipei, Taiwan	✓	
11 mar. until 12 mar.	Bike.Market.Future	Bremen, Germany		
13 mar. until 16 mar.	ISPO China	Shanghai, China		
10 apr. until 13 apr.	Taipei Int'l Sporting Goods Show	Taipei, Taiwan		
17 apr. until 20 apr.	China Bicycle & Motor Fair	Shanghai, China	✓	
19 may until 22 may	Auto- Motorcycle & Parts Show	Taipei, Taiwan		

Hidden quality

Belgian rim maker company Exal makes exclusively quality rims – a small company in a high labour cost – production region can only survive with special and custom-made products. These are in high-end sports, like rims for high-end mountainbikes, for both disc brake and rim brake applications, high-end road racing and, a new development, heavy-duty wheels for electric bicycles. A common place for the electric motor in electric bicycles is in the wheel, which means a big hub with a 26" rim, necessarily a crosswise spoke pattern and steep angles between rim and spoke. What's often seen is that the nipple positions itself more or less perpendicular with the tangent of the wheel, and that the spoke bends next to the nipple in the direction of the spoke hole in the hub. Or: spoke holes a size too big so that the nipple can tilt in its aperture. Both 'solutions' are a disaster for wheel life. Exal makes heavy-duty rims with spoke holes dimpled in any direction specified (see also article Sparta Ion on this page).



Left: dimpled holes, straight line from nipple to hub. Right: spokes bend just beyond the nipple.