

HOW TO CONTROL YOUR WHEEL QUALITY

Good wheel,



Bad wheel

Lean manufacturing is becoming a common practice in our industry. Bicycle factories are constantly looking for the most cost effective bike production. The product managers and purchasers are investigating in-house and OEM production. But how do you track the quality of these lean manufactured bicycles?

Do you know where, how and on which machinery the wheels of these bikes are made? These are three very important aspects which have their long term influence on quality.

Wheel specifications used by external wheel builders are often limited to a list of components, like the rim, spokes, nipples and hub. As a customer it is easy to check visually if the components specified have been used. However, it is NOT possible yet to check afterwards how the wheel has been made; let alone how the production process was handled. How do you determine the quality of the purchased wheels? This problem has become a hot topic with the ever increasing popularity of special-design wheel sets. They are even more difficult to make, let alone to check their quality visually.

The number of parameters that are used for the determination on whether a wheel is good or bad, is much bigger than at any other bike component. Next to the rim and hub, the torque applied on each spoke has to be set and checked properly before you can call it a quality wheel set. It is impossible to control every individual wheel with its single hub, rim, 36 spokes and 36 nipples. Even when the specification list shows quality components the wheel quality is difficult to judge.

So in fact it is possible that with cheap components and good machinery you can make a good wheel and with quality components and bad machinery you can

make a bad wheel. The know how and the production equipment makes the difference.

When you manufacture or outsource 10.000 bicycles you have to check 20.000 rims, 20.000 hubs, 720.000 spokes and 720.000 nipples. This process is so complex, therefore it is impossible to guarantee good quality without excellent production equipment.

Holland Mechanics wheelbuilding equipment checks all spoke characteristics in one run: on dimensions (truing sideways, height and "in center") and on spoke tension. A full run takes just sixty seconds. All variables can be set within a range of less than ten percent. On top of that the stabilizer minimizes the risk of spoke failure. This process gives a kind of "massage" to the spokes which result in good nipple seating and a stronger spoke neck. So if you see the HM Stabilizer machine in a factory then you will know they take care of your quality. Nowadays you also see the Stabilizer with integrated Rimtape application. The HM Rimtape is called QTape which will give less flats because it is self-adhesive and automatically applied in center of your rim bed (covering the spoke holes).

With the current increased focus on outsourcing we notice a growing demand for know how on wheel building. Wheel builders and OEM product managers are looking to set standards for quality wheels. Holland Mechanics is designing and developing wheel building machinery for over four decades. Our knowledge base

From the editors

After twenty years, Jos van Doornik recently officially stepped back at Holland Mechanics to be succeeded by us; his sons Maarten en Wouter van Doornik. Our grandfather Gerard developed the first wheel building machine back in 1970 and as he was always looking for quality improvement and more efficient production methods, he gave automated wheel building a big push. At that time he was the Dutch importer of Raleigh bicycles. When he retired he returned his agency to Raleigh. Despite retiring he founded a new company in 1973: Holland Mechanics. In 1988 our father Jos joined the company with the introduction of the JIT machines. As former MD of Raleigh during the heydays of the TI Raleigh cycle team in the Tour de France, he contributed to Holland Mechanics with lots of experience from the bicycle industry. Despite his retirement he will remain active on a strategic level and his experience is still of great value to us.

As a directors team of two we will strive to extend our grandfather's legacy. Our mission is: Providing High Quality wheelbuilding Solutions to increase and improve our customer's position in his unique market. Our factories in Europe and Asia can offer tailor made solutions and standard machinery. We are able to serve all market segments, from extreme high-end where fashion meets wheel design up to entry level machinery for mass production where output and consistent quality are the key requirements.

We hope you will enjoy this edition of HM Today.

Maarten & Wouter van Doornik

is frequently consulted by OEM product managers and wheelbuilders.

Productmanagers should not only specify the quality components but also the Holland Mechanics wheelbuilding equipment for their wheels. This doesn't matter if it is manufactured inhouse or OEM. More and more product managers and purchasers are demanding a Holland Mechanics made Quality Wheel in their bicycle.

E-BIKE SPECIAL

See the inner pages for the latest news on E-Wheel Production.





E-WHEEL TECHNOLOGY

E-Rims: Perfect spoke nipple alignment



The difficulty with E-Wheel production is the combination of the large hub motor with a standard rim. This way the nipple will not be in line with the spoke. Therefore the rim manufacturers like Rodi, Exal, Remerx and Buchel have invested in the latest Holland Mechanics punching technology for E-rim Solutions. This is done on the High Speed Punching machine whereby they punch



and dimple the rim under an angle. With the so called E-Rims all components are in line with each other. Perfect alignment of nipple and spoke makes the construction of the wheel much stronger.

E-Hub

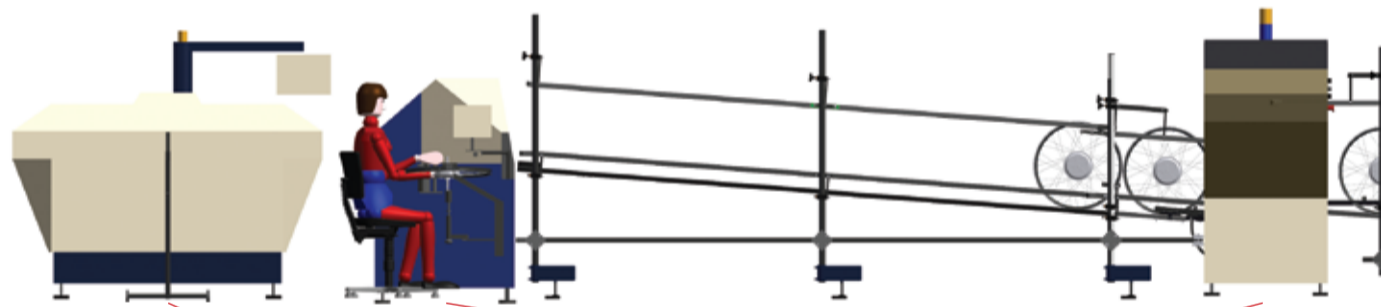


The trend of the E-Bike is towards Hub Motor, these motors generate high torque at low speed and are highly efficient. The Hub Motor is connected with an electric wire to the battery and the control

panel. Most Hub Motors have a wire connector which makes it easier for wheelbuilding. Holland Mechanics also made a solution for wires which come directly out of the axle.



The special line for E-Bikes. The InLine Lacing and Tightening machine has a tilt and turn mechanism for optimal nipple contact during lacing. For the big and heavy electro hubs it is important to stabilize the wheel and to lock the nipples, which prevents nipple loosening. After the QLock Application System the wheel will be finished by the E-bike adjusted Robot.



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E-WHEEL PRODUCTION



Step 1: HFS-E

The HFS-E is specially engineered for E-Bike hubs. Next to the HFS-E we have also the standard hubfillers which fill 36 spoked hubs within 32 seconds. More than 70 Automatic Hubfillers are sold around the world.

Step 2: IL Lacing & Tightening

E-Wheels do have large spoke angles. During Lacing & Tightening it is important that the nipple gun is standing in line with the nipple & spoke. Therefore we have developed the IL, which stands for Inline Lacing. The IL has a special tilt & turn technology whereby the nipple gun will be perfectly positioned in front of the nipple. The IL can also be equipped with QLets, for better nipple seating and less friction. Also we have a new option, QLube for perfect lubrication of nipples (see page 4).

Step 3: Locking & Stabilizing QLAS

The QLock Application System is the machine for Stabilizing and Locking the nipple. With the today's weight of the E-Wheel and E-Bike there is more risk that the nipple will come loose during cycling. Therefore it is important to Stabilize and Lock the nipple for a Maintenance Free Wheel.



The trend for 2009 is Coloured Wheel Design. Colour is reputed to be the first aspect of a product that consumers are drawn to and also for many designers it is one of the fundamental elements of the design process to be considered. The four wheel components, rim, hub, spokes and nipples, are specified in separate colours which will result in a harmonious custom wheel design. Wheel components are available in colours like red, green, blue, silver, black, smoke and even gold. A Coloured Design Wheel which is popular nowadays combines a black rim and spokes with a red hub and red nipples. Holland Mechanics has three major developments which makes it possible to automate Coloured Wheel Production:

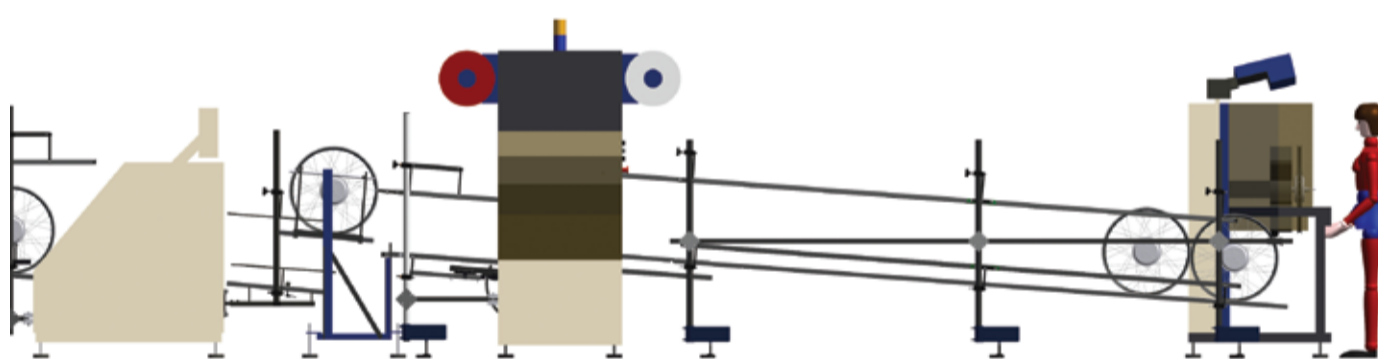
- **Automatic Nipple Selector:** the HM Lacing & Tightening machines can be equipped with the ANS option whereby the machine will automatically select a certain nipple. This way you can lace a wheel with blue and red nipples or with brass and aluminum nipples. One famous American wheel manufacturer is using our Inline Lacer with ANS whereby they use silver brass nipples on the drive side and black alloy nipples on the non-drive side.



- **Scratch Free Trueing:** the Holland Mechanics Outside Trueing Robot is trueing wheels on the nipple head. This way coloured nipples will not be damaged because they are not touched on the square side. There are now even nipples on the market without a square, these must be trued from the outside and they make a statement for "Scratch Free Trueing".



- **Inverted Nipple Design:** with the trend to Fashion Wheels the spoke colours and rim colours become more important. For some designers the nipple does not fit in their Coloured Wheel Design so they choose an invisible nipple. These so called Inverted or Hidden nipples are automatically trued by the "Inverted Nipple Gun".



Step 4: Trueing Robot SG-E

The newest Trueing Robot is capable of all large E-Wheel Hubs which are now on the market. Holland Mechanics has developed special features like Actuators and ACCU which makes it easier to true the E-Wheels. The latest E-Wheel solution is the "Wire Catcher" whereby the Robot can handle wheels whereby the wire is coming out of the axle.

Step 5: Rimtaper QTAS

The QTape Application System is not only a solution for E-Wheel Production but for all bicycle factories who want to save costs. The automatic application of rimpaper was developed for saving labour costs. Now we see that most savings are coming from logistics. See article "Maximizing Flexibility and Minimizing Stock" on page 4. The Rimpaper can also be placed before the Trueing Robot, then the Stabilizing Units will be integrated.

Step 6: TMC Tyre Mounting & Centering

The TMC Tyre Mounting & Tyre Centering machine is clamping the rim on 4 points. This way the E-Wheel hub is floating so that re-trueing (after tyre fitting) is not necessary. The TMC is the only Tyre Mounting machine equipped with Tyre Centering Rolls which automatically center the tyre around the rim. With the TMC's ergonomic position the operator has a perfect view on the production line. This way the operator will be involved in the total production line.

Maximizing flexibility, minimizing stock



Critical consumers who are willing to pay extra for their bicycles are driving the European bicycle industry to shift from mass production to small series or even single unit production. The USP of European manufacturers is consistent, high quality and flexible production. Set-up time for assembly lines and machinery has been cut to a minimum. The necessity to focus on smaller series is the result of the current market situation. The consumer market is splitting into a low price mass produced segment served by the Far Eastern suppliers and a segment that caters for consumers that want the very best, including tailor-made products. For this segment the producer has to be close to the market. With tailor-made or customized production, extra emphasis is put on the need to limit stock and Just-In-Time delivery procedures for suppliers.

Holland Mechanics has noticed the huge effect of this efficiency-improving strategy on wheel building facilities. Many wheelbuilders did need to increase their output while keeping their flexibility as well. This is a major operation, requiring strict agreements on Just-In-Time deliveries of rims, spokes, nipples and hubs.

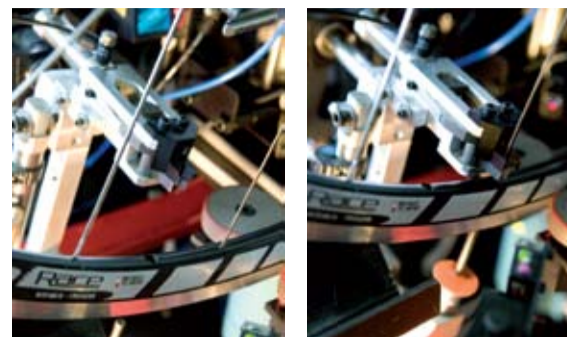
Holland Mechanics has even taken the next step in maximizing production flexibility with a system called 'One Piece Flow'. Regardless of the specification, each wheel produced is unique. This production method targets the growing demand for customized bicycles; a trend that's on the rise with on-line product configura-

tion where the consumers are able to custom-order their own bicycle. It's no longer the OEM who determines which models are made, but the consumer who orders the bicycle. Holland Mechanics designed an all-new operating platform to handle this: the 'One Piece Flow' production module for building tailor-made wheels.

The 'One Piece Flow' production system requires strict supply chain management. To ease handling logistics Holland Mechanics have developed a rim taper. It is a good example of how an engineering company is able to oversee the whole process and not just individual steps. The automatic rim taper is an important addition to the whole production process. It speeds up the production time of a wheel and allows for stock to be kept to a minimum. The QTape is supplied on a reel of 1500 meters with the "One Size Fits All" method, so the purchaser has to order just one type of rim tape on a roll instead of many different sizes and widths. Holland Mechanics has even supplied automatic rim tapers to customers in Lithuania and the Czech Republic. The added value is the huge savings in logistic costs that can be achieved by stocking just one type of rim tape. If you print a list of your stock of rim tape, you will see what you can save.

Besides stock savings, the rim taper makes it possible to add a unit to print a bar code, logo, production data, and the Holland Mechanics quality mark. This allows easy track and traceability and recognition of the wheel quality.

TCS: Strongest Spoke Design



The Torsion Control Spoke, which is designed by the Holland Mechanics R&D department, is the strongest spoke design. The secret is in the unique square just above the thread. With this square it is possible to hold the spoke during tightening and truing, so that it prevents the spoke for wind-up. The TCS Spokes can easily be tightened to more than 200kg without wind-up. The Holland Mechanics Robot can be equipped with special "TCS Spoke Grippers" which hold the spoke in place automatically. The other advantages of the TCS Spoke Grippers is that the Bladed spokes are always 100% in the aerodynamic position.



HM Finance

Premium Lease®

The Holland Mechanics Finance department is now offering the Holland Mechanics "Premium Lease". In more than 25 countries throughout Europe, the Americas, and Asia Pacific we can offer a Premium Lease for the leasing of your Holland Mechanics machines. Because we know our customers and our product we can most of time offer a more attractive lease than your local leasing company. Please look at our website for more information about Premium Lease or contact one of our sales managers.

QProducts Update

New QProduct, QLube; Holland Mechanics has now the option to lubricate the nipples in the Lacing & Tightening machines. During the transportation of the nipple we automatically "shoot" a small drop of oil on the nipple, to make lacing smoother and reduce friction. So no extra handling and no more dirty pre-lubrication of the nipples in a container with oil. The solution for a LEAN and CLEAN process.



Weight Saving QLets; Next to the quality increase of QLets they can also save about 88% of the Eyelet weight, this way you save almost 50 gram. As the QLets and Eyelets are placed on the outer side of the wheel this is a huge weight saving.



High Pressure QTape; With the Holland Mechanics automatic rim taping machine HT it is now also possible to apply a dual layer of rim tape to make wheels resistant to very high tire pressures. By application of a Poly Propylene basis layer followed by a Premium cotton tape, we are able to resist a tire pressure up to 12 BAR.

DATE	EVENT	LOCATION	BOOTH NUMBER
04 sep. until 7 sep.	Eurobike	Friedrichshafen, Germany	A5-104
18 sep. until 21 sep.	IFMA	Cologne, Germany	E 029/Hall 7.1
24 sep. until 26 sep.	Interbike	Las Vegas, USA	—
4 nov. until 09 nov.	EICMA Bici	Milan, Italy	—
20 feb. until 22 feb.	Moscow International Trade Show	Velo Park Moscow, Russia	—
17 mar. until 20 mar.	Taipei International Cycle Show	Taipei, Taiwan	—
27 mar. until 29 mar.	China North International Cycle Show	Tianjin, China	—
04 may. until 09 may.	China International Bicycle & Motor Fair	Shanghai, China	—