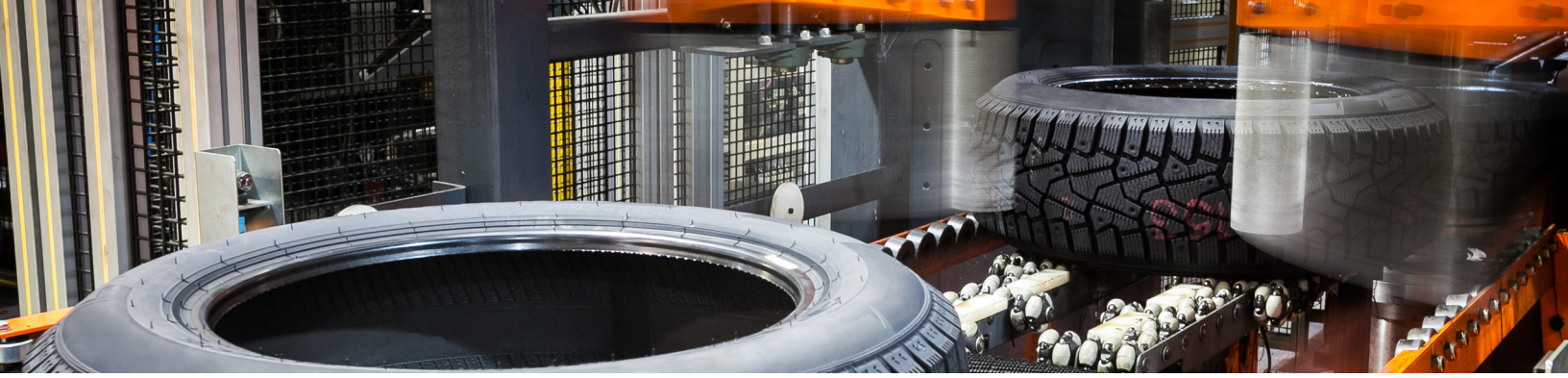
Honeywell

THE POWER OF **CONNECTED**

TIRE UNIFORMITY MACHINES FOR TIRE MANUFACTURING

An Application Note



Background During final processing, tire uniformity testing uses key equipment machines to assure tire quality. This testing is mainly utilized as a fully automatic on-line uniformity test examining size deviation, bulge, and depression tests for all kinds of tires, such as radial truck tires, passenger tires, and light truck tires.

A tire is a lay-up of fabric layers, rubber strips, and steel wire. These individual components are assembled on a collapsible drum, inflated to the toroidal shape, and vulcanized in a mold. As each layer is applied, dependent on the component and its purpose, some overlap may be required to maintain the integrity of the tire casing under pressure – called a 'join'. This join may cause vibration that can impact the smooth ride and lead to passenger discomfort.

Uniformity testing machines measure both the Radial Force Variation (RFV) and the Lateral Force Variation (LFV). RFV indicates the change in force when the tire rotates under varying load conditions, and LFV represents the steering effort pull in either the left or right direction. Based on these two measures, the machines then ascertain where final grinding or cutting can optimize the tire before a final grade is applied on the finished tire. Without a uniform, properly balanced tire/wheel, a vehicle would rattle and shake. Tire uniformity testing machines are extremely important since they help provide a smooth ride. And for tire manufacturers, producing the most uniform tire allows for a higher grade of tire to be sold.

Model 6443 Series load cell

Model 6443 Features

- Compact size
- 0.1 % linearity and hysteresis, respectively
- Simultaneous dual-axis readings
- Minimal crosstalk
- ±0.05 % of rated output repeatability
- 2 mV/V ±0.25 % (nominal) output @ rated capacity

The Solution

Honeywell Model 6443 Series load cells are a straingage based transducer with unique features that were designed for use on tire uniformity machines. The X-Y force sensor is constructed using two strain-gage bridges, mounted at 90º, isolated by a flexure system. The complete two-component system, including flexures, is machined from one specially engineered metal billet to provide both structural strength and minimized crosstalk between the two bridges. This unique sensor has excellent linearity characteristics of 0.1 % and 150 % overload capability.

There are several different standard load cells used based upon the side and radial load requirements of the machine.

Figure 1. OEM Part Number Cross Reference

OEM Part	Honeywell Part	OEM Part	Honeywell Part
001 925-0042-00	6443-500/1K	001 511-3694-00	6443-105
001 510-8255-00	6443-106	001 511-6700-00	6443-123

Mounted with one load cell on the top and the second on the bottom fixture of large inertia load wheel, they measure the side and radial loading of the tire contacting the load wheel, and provide feedback to the final grinding and evaluation stages of tire production.

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

⚠ WARNING
PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING
MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

For more information

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008926-1-EN | 1 | 05/17
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