

ONE TIME APPLICATION • LIFE LONG TIRE PROTECTION

# LIQUITUBE<sup>®</sup>

"THE ORIGINAL LIQUID INNER TUBE"<sup>®</sup>

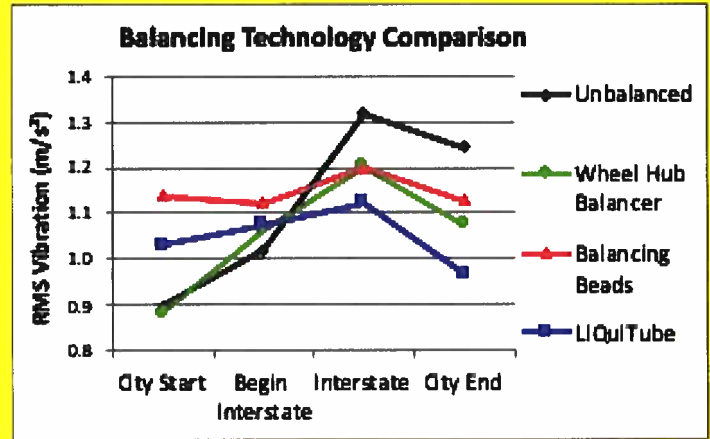
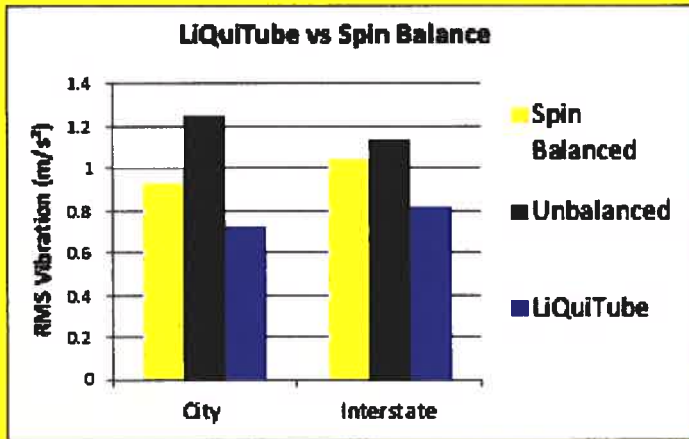
#1220-2047 47 OZ BAG  
GOOD FOR ALL SEMI TIRES  
22.5"-24.5"

#1220-2032 32 OZ BAG  
USE WITH 47 OZ BAG FOR SUPER  
SINGLES & FLOAT TIRES

Dealer Pricing

## BALANCER & SEALANT

### TESTED AND PROVEN: BEST POSSIBLE DYNAMIC BALANCE



### ✓ MAXIMIZE RIDE COMFORT

Remains liquid and constantly adjusts to dynamically balance entire wheel assembly.

### ✓ REDUCE DOWNTIME

Seals all sources of air loss including punctures up to 3/4" in heavy ply industrial tires.

### ✓ EXTEND LIFE OF TIRES & VEHICLES

Maintains proper air pressure, balances, and keeps tires running cooler.



### Proper Balance & Inflation

Even Wear, Reduced Heat, Better Performance  
for up to 30% Longer Tire Life and  
Increased Fuel Economy

### Puncture Protection

Save Thousands by Reducing: Road Side Service  
Calls, Towing, Tire Repairs, Tire Replacement,  
Additional Blowout Vehicle Damage



1. LiQuiTube is ready to use and is homogeneous. No shaking, mixing, or stirring is necessary. LiQuiTube pumps directly from the container into the tire. LiQuiTube is: Effective for the life of the tire with one treatment, shelf life is indefinite... more than 10 years. LiQuiTube pays for itself repeatedly in flat tire prevention, extended tire life, balancing the tires, proper inflation maintenance, cooling effect by heat transference, downtime of the equipment and operator, and fuel savings by operating tires at the proper air pressure (1% – 2% more fuel efficient).
2. LiQuiTube is 100% water soluble if clean-out is ever needed for recapping casings, or if a section or boot patch is needed.
3. LiQuiTube is non-corrosive to wheels and will not affect tire components or steel cords in the tires. LiQuiTube passed the corrosion test to satisfy the United States Postal Service requirements on both aluminum and steel wheels. LiQuiTube does not affect any major tire company's warranties.
4. LiQuiTube is the top dynamic tire balancer in U.S.A. for truck tires. As the tires wear, LiQuiTube continues to balance the tires. 47 – 50 ounces per tire is what we recommend for 11 x 22.5 tires or similar size metric truck tires. A semi-truck tire loses 30 lbs. in weight in its lifetime. LiQuiTube continues to balance as the tire weight changes.
5. It differs across the U.S.A. depending on the geographic area and the industry, however, the average cost of a flat truck tire, if the tire can be repaired and no towing is needed, runs approximately \$548.42. If the tire needs to be replaced, which is often the case, and the tire size is 11 x 22.5, the average cost goes up to \$1,000.
6. LiQuiTube helps to maintain proper air pressure. This is a great benefit. A properly inflated truck tire, according to Michelin and other tire companies, increases the tires life by 20% - 50%. Running a tire constantly underinflated by only 20% reduces tire life by 30%.
7. LiQuiTube takes care of ALL air loss problems in a tire and wheel assembly: porosity leaks, hairline cracks in wheels, bead and rim leaks, and of course, puncture leaks up to 5/8" in heavy ply commercial and industrial truck tires.
8. MSD Sheets information: No recorded flash point, readily biodegradable, ships worldwide as a class 55 non-hazardous product (CERCLA, Comprehensive Environmental Response Compensation and Liability Act). There are **no DOT Regulations for using LiQuiTube**, it is not a marine pollutant, and all components of LiQuiTube are exempt from TSCA (Toxic Substance Control Act) inventory requirements. See the current SDS Sheets attached.
9. LiQuiTube has been tested to 397°F for 24 hours with no flash or burning. This test was completed to assure companies that recap tires will have no problems in recap chambers. Recap chambers only reach 280°F max for 2-1/2 – 3-1/2 hours. If recapping is necessary, the tires should simply be rinsed out with a low-pressure water hose.
10. The EPA in California, one of the strictest states for environmental problems, tested the LiQuiTube Formula and found it to be **"not environmentally hazardous"**.
11. At present, LiQuiTube sells directly to more than 50 trash and refuse related haulers in the U.S.A. These direct sales do not consider the 100's of truck centers, tire centers, and service shops that sell LiQuiTube to the trash hauling industry.
12. Show the endorsement videos from your computer: go to Google, [www.liquidtube.com](http://www.liquidtube.com)... Home page, click on Media, click on Testimonials. There are 4 videos we took with cell phones at trade shows. Three of the four are talking with trash haulers; the first one is fantastic on equipment that was tremendously heavy.
13. We have an A+ Better Business Rating and have never been less than that. We take care of our customers.

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**BALANCER & SEALANT**

## NEW, LiQuiTube Balancer & Sealant Bags

LiQuiTube has created a new packaging system that will streamline and simplify the tire sealant installation process for the customer or the commercial tire dealer.

INTRODUCING – LiQuiTube Balancer & Sealant Bags! \* A “no-mess” way to get LiQuiTube into heavy-ply truck tires! Same proven product, same results. No pumps, no mess.

\* Simply throw these bags of LiQuiTube into the tire, mount the tire to the rim and fill with air to the proper psi. Centrifugal Force from driving will cause the bag to burst and distribute LiQuiTube evenly inside the tire.

The two bags available are the 47-ounce bag and the 32-ounce bag and these two bags can be used on any tire from an 11R22.5 to an 11R24.5 and some Super Single 22.5” tires. The application would be 1 – 47 oz. bag per 11R22.5 – 11R24.5 tire and 1 – 47 oz. bag plus 1 – 32 oz. bag per Super Single 22.5” tire.

After testing, LiQuiTube feels comfortable saying that if a heavy duty, over-the-road tire requires an application amount that is within +/- 10% of the 47-ounce bag or 79 ounces (47 oz. + 32 oz. bag) it will not compromise performance.

This allows tires to be treated by a single 47 oz. bag that have application amounts that fall within a range of 42 oz. to 52 oz. For the wide base tires that require both the 47 oz. + 32 oz. bags, this allows tires to be treated that have application amounts that fall within a range of 71 oz. to 87 oz.

LiQuiTube recommends that the initial installation is performed on a single tire to ensure that desired performance is achieved before installing in multiple tires. For tires that require amounts outside of this range or are used for off road applications LiQuiTube still recommends installing LiQuiTube via traditional methods such as the 5-gallon pail and pump.

Contact: Robert Davido, Toll Free: (855) 567-8378

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ONE TIME APPLICATION • LIFE LONG TIRE PROTECTION



July 2020  
Retail  
Pricing

## BALANCER & SEALANT

### ITEM DESCRIPTION

#### 47 OZ BAG

FOR ALL SEMI TIRES  
22.5" - 24.5"

**PART# 1220-2047**

6 BAGS PER CASE



MRP RETAIL

\$23.99 (EACH)

\$143.94 PER CASE

#### 32 OZ BAG

2ND BAG FOR SUPER  
SINGLE & FLOAT TIRES

**PART# 1220-2032**

6 BAGS PER CASE



MRP RETAIL

\$19.99 (EACH)

\$119.94 PER CASE

### ✓ MAXIMIZE RIDE COMFORT

Remains liquid and constantly adjusts to dynamically balance entire wheel assembly.

### ✓ REDUCE DOWNTIME

Seals all sources of air loss including punctures up to 3/4" in heavy ply industrial tires.

### ✓ EXTEND LIFE OF TIRES & VEHICLES

Maintains proper air pressure, balances, and keeps tires running cooler.



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**LIQUITUBE**  
 "THE ORIGINAL LIQUID INNER TUBE"

**EXTREME**  
**OFF-ROAD**  
**TIRE SEALANT**

**FOR EXTREME**

- MINING
- EARTH MOVING
- LOGGING
- MILITARY

- ✓ Seals 1/2" Punctures in All Tubeless Tires
- ✓ Seals 1 1/2" Punctures in Heavy Ply Industrial Tires

**Extreme Environments Demand Extreme Performance!**

**Permanently Seals Punctures, Bead, and O-Ring Leaks**

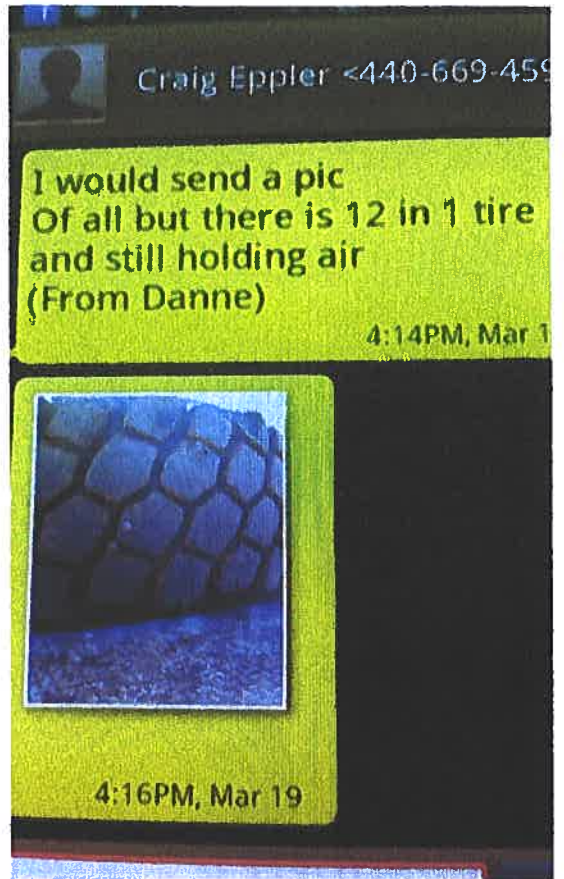
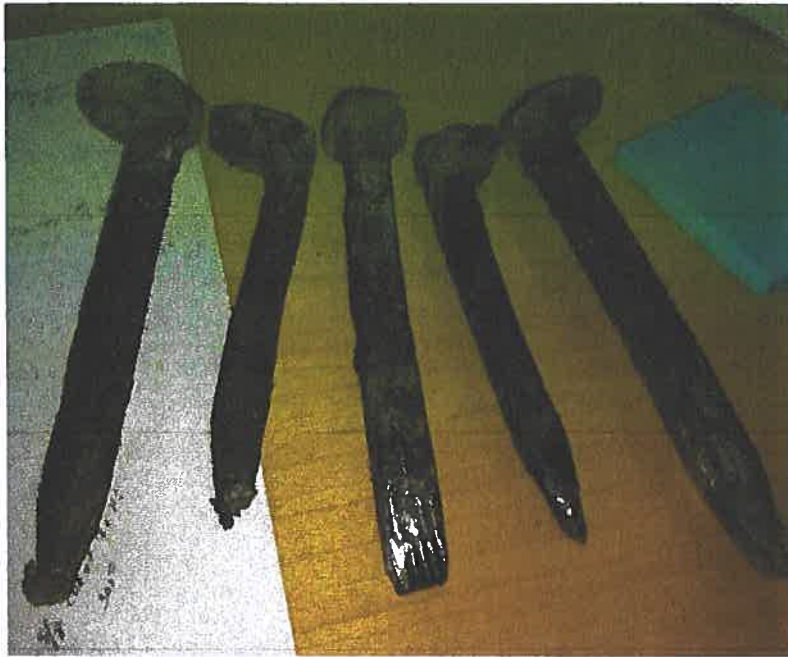
**Maintains Air Pressure**

**Reduces Downtime**

**Extends Tire Life!**

## Common Tire Application Amounts

Tire	Sealant	Tire	Sealant	Tire	Sealant	Tire	Sealant
ATV	1/4 gal	Road Grader	1.25 gal	24-35	3.5 gal	41.25/70-39	6 gal
11L - 16	3/4 gal	14.9-24	1.5 gal	23.10-26	2.5 gal	45/65-45	7 gal
10 - 16.5	3/4 gal	16.9-24	2 gal	28.00-26	3 gal	24.00-35	3.5 gal
12 - 16.5	3/4 gal	20.5-25	2 gal	30.50-32	4 gal	27.00-49	5 gal
14 - 17.5	1 gal	29.5-25	3.5 gal	23.50-25	2.5 gal	59/80-63	15 gal



This image is from Lee's Tires in Fresno, CA, and these came out of a P275/95-22.5 tire. His only note to me was "In one of our tires filled with LiQuiTube. Thanks LiQuiTube!" He is very pleased with our product and is doing a great job selling it. Lee's Tires is an official recapper for Michelin.





## LiQuiTube for Skid Steer Loaders!

### Tire Sizes:

**12 x 16.5 = 82 ounces**

**10 x 16.5 = 65 ounces**

**14 x 17.5 = 102 ounces**



**Contact: Robert Davido at (855)567-8378 or Cell: 717-587-8599 or email:**

**[robert@globalpreventivesolutions.com](mailto:robert@globalpreventivesolutions.com)**





**Common Commercial Truck Tires Using LiQuiTube Tire Sealant:**

11 R 22.5 WOULD TAKE 45 OUNCES

11 R 24.5 WOULD TAKE 47 OUNCES

315 / 80 R 22.5 WOULD TAKE 53 OUNCES

385 / 65 R 22.5 WOULD TAKE 64 OUNCES

LOW PRO 295 R 75 22.5 WOULD TAKE 46 OUNCES

LOW PRO 275/ 80 R 22.5 WOULD TAKE 43 OUNCES

445/ 150 / R 22.5 WOULD TAKE 70 OUNCES

**Question:**

What does it cost you if you have to repair or replace a tire?

How much is the cost for down time and missing your delivery appointment?

What does it cost in equipment damage when a tire blows out?

Add all that up and compare it to an investment of \$400.00 which includes a 5 gallon pail (that's 640 ounces) of LiQuiTube & a pump!

And if you purchase 3 pails the pump is Free. And the shelf life is 30 years.

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LiquiTube Industries, LLC  
Best Designs, Inc.  
11521 Kevin Lane  
Carterville, IL 62918  
4/22/2014

### LiquiTube Premium Tire Sealant Use in Steer Tires

LiquiTube Premium Tire Sealant will aid heavy duty tire balance when used according to the following specifications:

1. The tire must be in one of these two categories
  - a. A 10 ply or heavier tire designated for heavy duty or work use (i.e. not a light duty passenger tire)
  - b. A tire on a 19.5 inch or larger rim with a minimum full tire height of 29.5 inches or taller.
2. The correct high speed application amount of LiquiTube is installed in the tire.

In The Code of Federal Regulations Section 10(a)(10) of Appendix G to Subchapter B, The Department of Transportation states that a vehicle does not pass an inspection if it has a tire on any steering axle of a power unit with a boot, blowout patch or other ply repair.

The Federal Highway Administration (FHA) has stated that a nail hole repaired by using self-curing compounds or procured rubber inserts or stems, with a repair unit on the inside of the tire, is not prohibited by Section 10(a)(10) of Appendix G. LiquiTube is a self-curing compound and repairs on the inside of the tire.

In general, tire companies shy away from any alterations to steer tires because if a tire fails in the drive or trailer position, the driver will not typically lose control of the vehicle. Third party testing shows that treating tires with LiquiTube Premium Tire Sealant makes the tires less likely to fail adding to the overall safety of the vehicle.

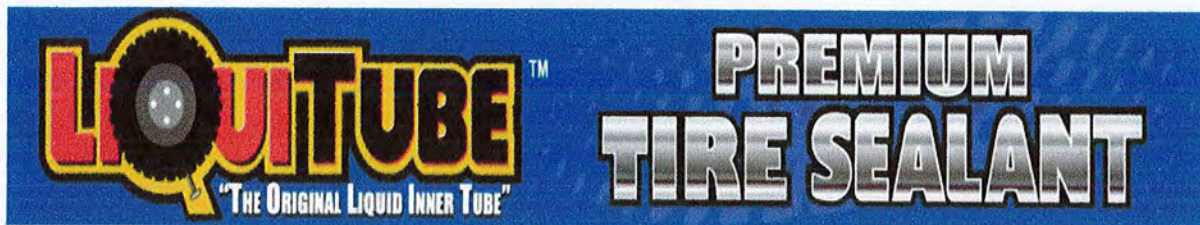
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LiquiTube Premium Tire Sealant Effect on Tire Manufacturer Warranties

Consumers are protected from deceptive warranty practices by the Magnuson–Moss Warranty Act United States federal law, (15 U.S.C. § 2301 et seq.).

15 U.S. Code § 2302 - Rules governing contents of warranties states that the warrantors cannot require that specific branded parts be used with their product in order to retain the warranty. This prohibits tire manufacturers from requiring that specific tire sealants (or other filling materials) have to be used with their tires for the warranties to be valid.

15 U.S. Code § 2304 - Federal minimum standards for warranties states that the warrantor can void the warranty if they can show, “that the defect, malfunction, or failure of any warranted consumer product to conform with a written warranty, was caused by damage (not resulting from defect or malfunction) while in the possession of the consumer, or unreasonable use (including failure to provide reasonable and necessary maintenance).” For LiquiTube to void the warranty in this manner, it would have to be shown that the addition of LiquiTube to the tire caused damage that resulted in the defect, malfunction, or failure. Third party testing of LiquiTube by Smithers Scientific Services, Inc. found that LiquiTube does not degrade tire components, does not rust steel wire tire cords, and acts as a heat sink which allows for cooler tread shoulder temperatures which can be shown to extend tire component life. LiquiTube also passed additional Aluminum and Steel Corrosion Tests showing that the tire sealant does not degrade wheels.



**LiQuiTube is not like any other tire sealant on the market and I will explain why.**

All the other tire sealants are made through cold-mixing, while LiQuiTube is made through a heat mix process treatment, which means the product never separates. It also never needs to be mixed, stirred, or shaken, and is Guaranteed to remain liquid and effective for the life of the tire. We know this from over 30 years of experience.

Because LiQuiTube is viscous and employs an adhesive, it coats all parts of the tire, sealing punctures, and also rims and bead leaks. It also stays in place, and will not migrate to the bottom of the tire, even when the tire sits still for long periods.

**Here are some other key facts:**

\*LiQuiTube is 100% water soluble for easy clean out. (And does not affect the rubber like other tire sealants in some cases are almost impossible to remove and stressful.)

\*It is Non-flammable and Non-hazardous. (And is in over 118 countries worldwide)

\*We add 5 rust corrosion inhibitors, so that we can guarantee that our product will never pit or rust ANY rim for the Life of the tire.

\*We add an adhesive agent so that our product coats the tire and rim, meaning that it will seal punctures, rim and bead leaks, and side wall leaks such as dry rot and weather cracking.

\*We use a high- quality ethylene glycol so that the product does not freeze until lower than 50 degrees below zero.

\*We use expensive and various sizes and types of fibers so that we can seal larger punctures (up to 1" inch in heavy ply tires) (Others can only seal up to 1/4 inch in any tire.)

\*We also have a sealant that can be used in both off-road and over the road tires and equipment.(And other sealants can't be used for both off road and over the road)

\*LiQuiTube will seal up to a 3/4" puncture in a heavy ply tire (18 ply tire) and 5/8" puncture in a Skid steer (14 ply tire) and 1/2" puncture in an 11x22.5 (10 ply tire) plus 3/8" puncture in an ATV tire (6 ply tire)

**Please contact me Robert Davido at (855)567-8378 or my cell: 717-587-8599 or email at [robert@globalpreventivesolutions.com](mailto:robert@globalpreventivesolutions.com)**

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# TOTAL TIRE MAINTENANCE

"RUN SAFER AND LONGER WITH LIQUITUBE"

- ✓ LIQUITUBE BALANCES TIRES 10 PLY AND UP FOR THE LIFE OF THE TIRE
- ✓ LIQUITUBE KEEPS TIRES PROPERLY INFLATED 24/7 AND COOLS TIRES UP TO 35 DEGREES, MAKING TIRES LAST LONGER
- ✓ LIQUITUBE SEALS UP TO  $\frac{3}{4}$  INCH PUNCTURES IN INDUSTRIAL TIRES
- ✓ LIQUITUBE WILL NOT HARM RIMS OR TIRES
- ✓ LIQUITUBE WASHES OUT WITH WATER AND WILL NOT HARM THE ENVIRONMENT
- ✓ LIQUITUBE REDUCES DOWNTIME OF EQUIPMENT AND MANPOWER
- ✓ LIQUITUBE REQUIRES JUST ONE APPLICATION FOR THE LIFE OF THE TIRE
- ✓ LIQUITUBE IS GUARANTEED TO WORK

LiquiTube Premium Tire Sealant is guaranteed to save more money than it costs. If a company is willing to test LiquiTube in 10% to 25% of its fleet, then the product they purchase will be backed



by a product replacement or **money back guarantee**. The company needs to be able to track average tire life, cost of tire repairs, cost of downtime, average fuel usage, and other costs associated with tire failure such as damage to vehicle caused by blow-outs. The vehicles being tested need reliable tracking data for a full average tire life both without sealant and with LiquiTube Tire Sealant. The test will be complete when the tires reach the end of their life due to tire failure or tread depth. The testing company can consider the test a success and end the test early if the data shows LiquiTube Tire Sealant has paid for itself before the full life of the tires has ended.

The testing company should be able to see large savings in the following areas:

1. Close to 95% reduction in tire repairs
2. Time savings in tire pressure checks and adding air pressure to tires
3. Less tire failures caused by small leaks leading to underinflation which causes premature tire failure
4. Longer tread life due to proper inflation and cooler operating temperatures
5. Less driver and equipment downtime
6. Better fuel efficiency due to proper inflation
7. Less vehicle damage due to blow-outs

Mark Shasteen

CEO

LiquiTube Tire Sealant

Email: [Mark@LiquiTube.net](mailto:Mark@LiquiTube.net)



# PREMIUM TIRE SEALANT

## TIRE SHOPS / RETREAD PARTNERS

GOODYEAR COMMERCIAL TIRES  
EAST BAY TIRE  
K TIRE, LLC  
FLYNN'S OMAR COMMERCIAL TIRE  
RX TIRE  
BEST ONE TIRE AND SERVICE  
SNIDER FLEET SOLUTIONS- GA  
SNIDER FLEET SOLUTIONS  
GUNTER TIRE  
RABEN TIRE  
DLS TIRE CENTERS  
NORWICH TIRE SERVICE  
FORKLIFT TIRES OF MICHIGAN  
SUPERIOR TIRE  
GOLIGHTLY TIRE  
GRUBS TIRE SERVICE  
JB TIRE  
GCR TIRE CENTER / BMS  
TIRE SHOP  
GCR TIRE / JOSH EVERHART  
KK TIRE SERVICE LLC.  
PARRISH TIRE CO.  
TF TIRE & SERVICE  
SAM'S TRACTOR TIRES  
DIRT CHEAP TIRE AND AUTO  
MOOSES TIRE  
GOLDEN STATE TIRE  
JACK'S TIRE AND OIL INC.-001  
SLICKS TIRE  
RON'S TIRE FACTORY  
GCR TIRES - FERNDAL, WA.  
ECONOMY AUTO & TIRE  
FORKLIFT TIRES INC.  
SIX ROBBLEES' INC.  
ROUTE 1 TIRE  
SERVICE TIRE TRUCK CENTER

C & S TIRE  
WHITELAND TIRE  
GCR TIRE- WEST VALLEY  
REDBURN TIRE COMPANY  
WADE TIRE SERVICE  
S BRYANT TIRE CO.  
HEINOLD & FELLER TIRE COMPANY  
ROGERS TIRE PROS  
CARROLL'S TIRE WAREHOUSE  
BR TIRE  
K & M TIRE INC  
CLEARFORK TIRE  
STALEY'S TIRE  
ST. LUCIE TIRE & BATTERY  
PURCELL TIRE- MO  
WAREHOUSE TIRE INC.  
TIRE FACTORY  
CLARK TIRE  
KENDA RUBBER INDUSTRIAL CO. LTD.  
LEE'S SERVICE  
DLS TIRE CENTER  
SUPERIOR TIRE SERVICE  
INDUSTRIAL TIRE SERVICE  
BEST DRIVE TIRE  
FORK LIFT TIRES, INC.  
T.P. TIRE  
CROSS MID-WEST TIRE  
BEGGS TIRE & WHEEL  
BEST ONE TIRE 02  
AVA TIRE  
BIG BRAND TIRES  
GALVAN TIRE  
WASCO TIRES  
AAA TIRES  
PJ's TIRES

\* These are just some of our partners. There are multiple locations for a lot of them.

\* Some of these partners are just 1 or 2 locations.



**ENVIRONMENTALLY  
SAFE**

**TEAMING UP TO SAVE  
OUR PLANET!**



**ONE TIME APPLICATION • LIFE LONG TIRE PROTECTION**



# **BALANCER & SEALANT BAGS**

## **Commercial Semi Truck Tire Research**

### **BALANCE**

1. Maximize Ride Comfort, Reduce Downtime, Extend the Life of Tires and Vehicles in ONE EASY STEP.
2. "How Balancing Truck Tires Helps the Bottom Line", (HDT Truckinginfo) May 1, 2019, by Asa Sharp. Asa Sharp credentials: Tire Engineer and marketing manager for Goodyear for 36 years. He is a longtime active member of ATA's Technology & Maintenance Council, a member of the S.2 Tire and Wheel Study Group, a TMC Silver Spark Plug recipient, and today he does independent consulting. The facts taken directly from the article: "Balancing wheels on commercial vehicles is not only very much alive, but also is likely to grow rapidly in the next few years. A typical 295/75R22.5 drive tire loses just over 30 pounds between when it is new and when it is removed for retreading at or near the industry average of 6/32 tread depth remaining. This means the initial balance correction becomes less accurate as the tire wears – and often actually creates imbalance in later tire life. The most desirable material for balancing would be non-toxic, have no attachment issues, not corrode or otherwise harm the tire or wheel surfaces contacted, and would be adaptive to compensate for the rotating mass reduction as tires wear in order to maintain correct balance through the entire tread life, along with the variations in load, speed, and road conditions that the tires experience. These materials are typically placed inside the tire when mounting and essentially re-balance the rotating assembly each time the vehicle rolls after a stop. It is also worth noting that major truck tire manufacturers now recommend balancing tires for optimum performance, recognizing that unbalanced assemblies can contribute to irregular wear and shortened removal mileages. Stay ahead of the curve to improve fuel economy and consider balancing all tires, but especially trailer tires, with adaptive internal balancing materials. The cost is comparable to, or often less than traditional balancing."
3. Additional costs for not balancing fleet truck tires: CSA (Compliance, Safety, Accountability) violations, Uneven tread wear, Premature replacement, Increased fuel consumption, Vibration causes loss of stability and control, Increased driver fatigue, Can cause U-joint problems, Additional stress on other components such as tie rods, brakes, wheels and tires can prematurely break down due to improper balance. (Service Tire Truck Centers). "Among the leading causes of CSA violations nationwide and a top 3 annual expense for virtually every truck on the road, TIRES command a lot of attention, maintenance and dollars." Balancing act: "When does commercial tire balancing make sense?" (Twitter.com Jason Cannon ... Equipment)
4. The cost of NOT BALANCING your tires far outweigh the cost of balancing them. (Service Tire Truck Centers)
5. Well balanced steer tires last roughly 30% longer. (Service Tire Truck Centers)
6. Truck wheel balancers can reduce tire heat 8%-10%. (Centrimatic website)
7. Several TMC (Technology & Maintenance Council) Type II fuel economy tests conducted by different companies have shown a fuel economy advantage of an average 2.2% for tractor-trailers with 18 wheels using internal adaptive balancing versus unbalanced (but typical) assemblies with no exhibited ride issues. (TMC RP 1111)

8. "Imbalances also can contribute to sub-optimal steer tire performance. Balancing wheel assemblies reduces the damage vibration causes on lights, bearings, U-joints, and other suspension parts, resulting in reduced down time and lower maintenance costs." (Mike Manges, Manager of Goodyear's commercial and off-highway tire communications ... From Equipment Article Balancing Act: "When does commercial tire balancing make sense")

### **UNDERINFLATION**

9. Properly inflated semi-truck tires can increase tire life as much as 20%-50%. A 40% underinflated semi tire will be lost to service due to underinflation. (Michelin Truck Tire Service Manual)
10. "While proper inflation is the single most important thing you can do to maximize the safe wear of your tires, balancing – a far more uncommon and often controversial practice – can set your truck up for savings and increased efficiency before a new set of tires ever touches the highway." (Twitter.com ... Jason Cannon ... Equipment"
11. "We estimate about 80% of the roadside tire failures are a direct result of creeping air-loss." (Curtis Decker manager product development Continental Tire)
12. "10% underinflation has a 1% to 2% impact on fuel economy." (trucking info.com, Overdriveonline)
13. Running a tire constantly underinflated by 20% will reduce tread life by 30%. (Overdriveonline).
14. A truck tire will lose approximately 2% of its inflation pressure each month. (Curtis Decker manager product development Continental Tire article "Are you putting enough air in your steer tires" HDT Truckinginfo)
15. Each year a typical tractor/trailer will experience one roadside service call due to tire failure caused by tire underinflation. (Michelin Auto Inflate Video)

### **PUNCTURE PROTECTION**

16. There is a significant cost associated with tire related roadside service calls. The average delay of a roadside service call is 2 to 2 ½ hours. (Fleet Equipment ... "How do you properly determine tire cost" May 9th 2016)
17. Driver downtime per flat tire \$ 91.32, vehicle downtime \$ 117.00, Tire change per flat tire \$ 130.10 (Fleet Financials). These costs can be multiplied depending on how long it takes to get the repair or replacement completed.
18. "Changing a truck tire ... labor \$ 300.00, service call ... \$ 199.99, \$ 12.50 ... to take the lug nuts off and put them back on, hourly costs to the location of the truck, (which can change on weekends, holidays, or the hours of the service center). The cheapest tire we could find at the truck stop for replacement of a blown trailer tire ... \$ 540.00. With labor costs, service call and mileage the total cost was ... \$ 1,000.00." (Truckers Reports) ... "Paraphrased and condensed from the article."
19. "After a tire blows out on a semi-trailer you start searching for \$ 1,000.00. This is about how much a service call and a new tire will cost you." (Quora.com October 25, 2019).
20. Based on the costs of #14, #15, #16, above, a tire repair on a semi-truck or trailer, if towing is not involved, with a two-hour service call cost approximately \$ 548.42. Add to this the fact stated by Michelin # 13 that every semi-tractor/trailer will experience one roadside service call due to tire failure caused by underinflation.
21. Average mileage cost is approximately \$ 105.00 per hour from the time the service truck leaves the service center until the time it returns.

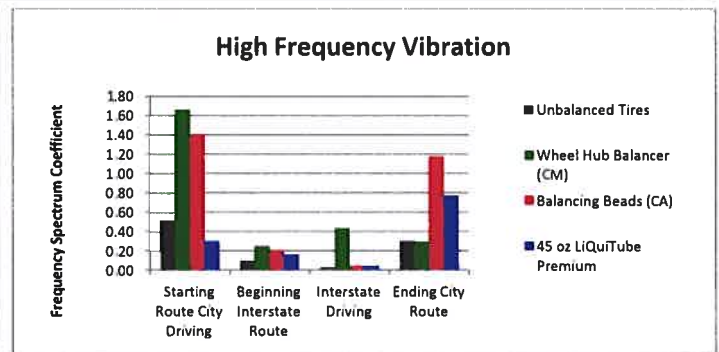
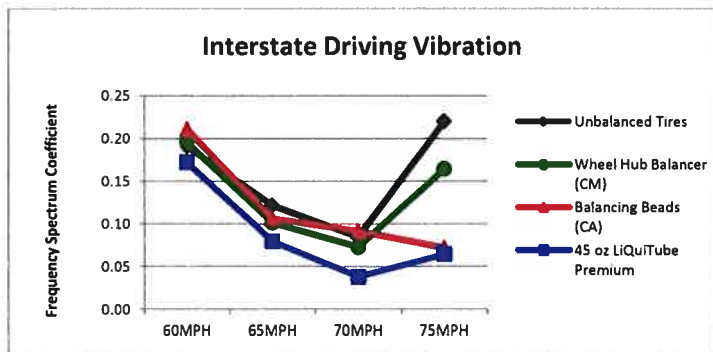
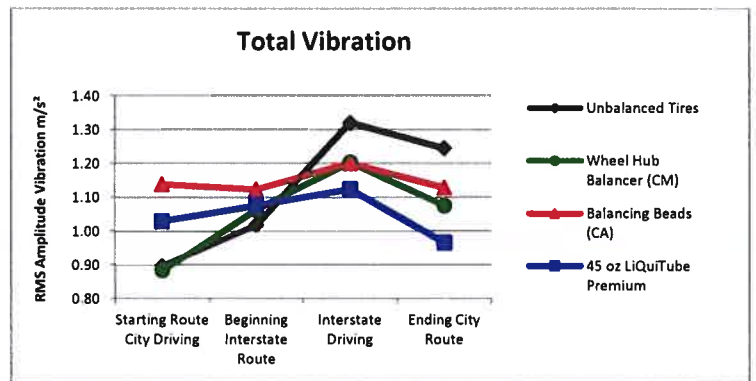
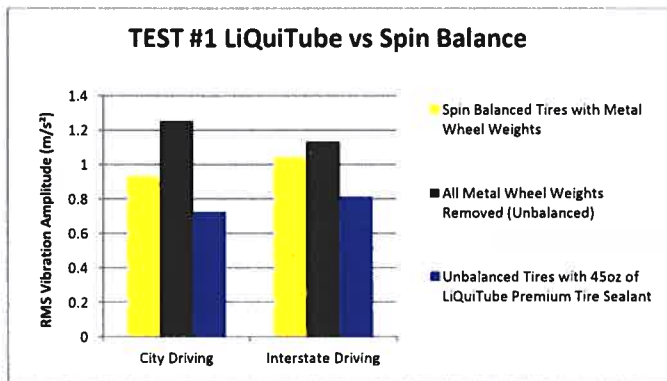
***The above statistics prove the fact that there is a tremendous market for LiQuiTube Balance and Sealant Bags. One product stops all these profit robbing costs for semi-truck operation.***

## TEST SUMMARY

CERTIFIED BY DR. KAMBIZ FARHANG, PHD

PROFESSOR OF MECHANICAL ENGINEERING, EXPERTISE IN VEHICLE DYNAMICS, SIUC

On June 10<sup>th</sup> and June 19<sup>th</sup>, 2019, vibration data was collected on three semi tractors with four separate vibration sensors under various configurations and driving conditions to study the capabilities and performance of common tire balancing technologies and their effect on driver and cab vibrations. Unbalanced tires were compared with spin balanced tires with metal wheel weights, wheel hub balancers, balancing beads, and liquid tire sealant. Data was recorded in city driving conditions with low speeds, turns, and frequent stops. Data was then also recorded in highway and interstate driving conditions. The testing was performed on both Goodyear 295/75R 22.5 Fuel Max LHS Steer Tires and Michelin 275/80R 22.5 X-Line Steer Tires. The results were as follows:



Within the scope and limitations of the tests performed, the following statements can be made:

- For the purpose of balancing tires in order to reduce vehicle cab vibration, **LiQuiTube outperformed all other tested balancing technologies** in both low speed city and high speed interstate driving conditions. LiQuiTube reduced vibration **22% more than spin balanced tires** with metal wheel weights. LiQuiTube reduced vibration **8.5% more than wheel hub balancers**. LiQuiTube reduced vibration **11% more than balancing beads**.
- Once the coating of LiQuiTube was in place, the tire continued to stay balanced at both high and low speeds.
- The greatest reduction in vehicle vibration from LiQuiTube was experienced during prolonged high speed driving on the interstate. Since interstate driving is predominantly what most semi-truck tires experience, it is reasonable to base LiQuiTube's tire life cycle performance on this phase of operation.
- LiQuiTube should extend the life cycle of both tires and vehicles** since it balances tires and reduces vehicle cab vibration.



Best Designs, Inc.  
11521 Kevin Ln  
Carterville, IL 62918

TIRE BALANCE  
EFFECT ON VEHICLE VIBRATION

EVALUATION OF  
LIQUITUBE PREMIUM  
TIRE SEALANT #01314

CERTIFIED BY:  
DR. KAMBIZ FARHANG, PHD, PROFESSOR OF MECHANICAL ENGINEERING  
EXPERTISE IN VEHICLE DYNAMICS, SIUC

*Kambiz Farhang*

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I. INTRODUCTION AND BACKGROUND

On June 10<sup>th</sup> and June 19<sup>th</sup>, 2019, vibration data was collected on three semi tractors with four separate vibration sensors under various configurations and driving conditions to study the capabilities and performance of common tire balancing technologies and their effect on driver and cab vibrations. The sensors measured accelerations along the three major axes: up and down, forward and back, side to side. The up and down axis data was used for evaluating vibration due to wheel and hub assembly balancing technologies. Unbalanced tires were compared with spin balanced tires with metal wheel weights, wheel hub balancers, balancing beads, and liquid tire sealant.

II. TEST INITIATION AND PROCEDURE

The test vehicles were configured with the balancing technology to be tested. Vibration sensors were secured to the interior of the cab to eliminate recordings of sensor movement due to bouncing and rocking. Data was recorded in city driving conditions with low speeds, turns, and frequent stops. Data was then also recorded in highway and interstate driving conditions.

Details of the test structure are outlined below:

Number of Test Vehicles: 3

Type of Test Vehicles: Freightliner Semi Tractor without Trailer

Tires Used:  
Test #1  
Goodyear 295/75R 22.5  
Fuel Max LHS Steer Tires  
Load Range H 3,000 Kg 6,610 Lbs.

Test #2  
Michelin 275/80R 22.5  
X-Line Steer Tires  
Load Range 2,800 Kg 6,175 Lbs.

Vibration Sensors Used: Samsung Galaxy 7E, 8+, 9 Running VibSensor

1. TEST #1 Spin Balanced with Wheel Weights vs. LiQuiTube Premium Tire Sealant

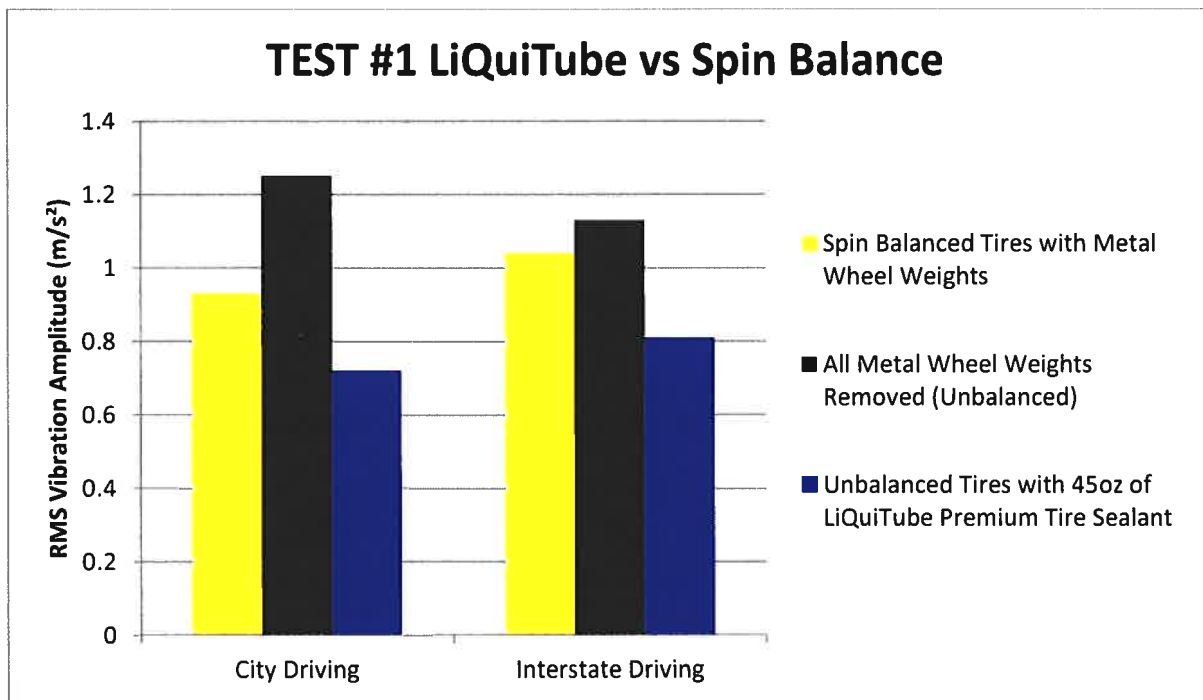
Brand new steer tires were initially spin balanced with wheel weights added for optimum tire balance. The vibration sensors were secured to the floor board of the cab above the steering axle. Vibration data was collected in two driving scenarios outlined above. After the initial run, the wheel weights were removed and vibration data was collected on the same two driving scenarios. After the second run, 45 ounces of LiQuiTube Premium Tire Sealant was added to the steer tires and the vibration data was collected on the same two driving scenarios.

DATA ACQUISITION

Acceleration data was captured on the up and down axis in meters per second squared. The raw data was normalized around zero to remove the acceleration of gravity from the readings. The root-mean-square (RMS) amplitude of the vibration data about zero was then calculated. These RMS values allow the relative vibrations of the different balancing technologies to be compared. The lower the RMS value, the lower the overall vibration.

TEST #1 DATA

Technology	City Driving RMS Value (m/s <sup>2</sup> )	Interstate Driving RMS Value (m/s <sup>2</sup> )
Spin Balanced Tires with Metal Wheel Weights	0.93	1.04
All Metal Wheel Weights Removed (Unbalanced)	1.25	1.13
Unbalanced Tires with 45oz of LiQuiTube Premium Tire Sealant	0.72	0.81





## 2. TEST #2 Wheel Hub Balancer vs. Balancing Beads vs. LiQuiTube Premium Tire Sealant

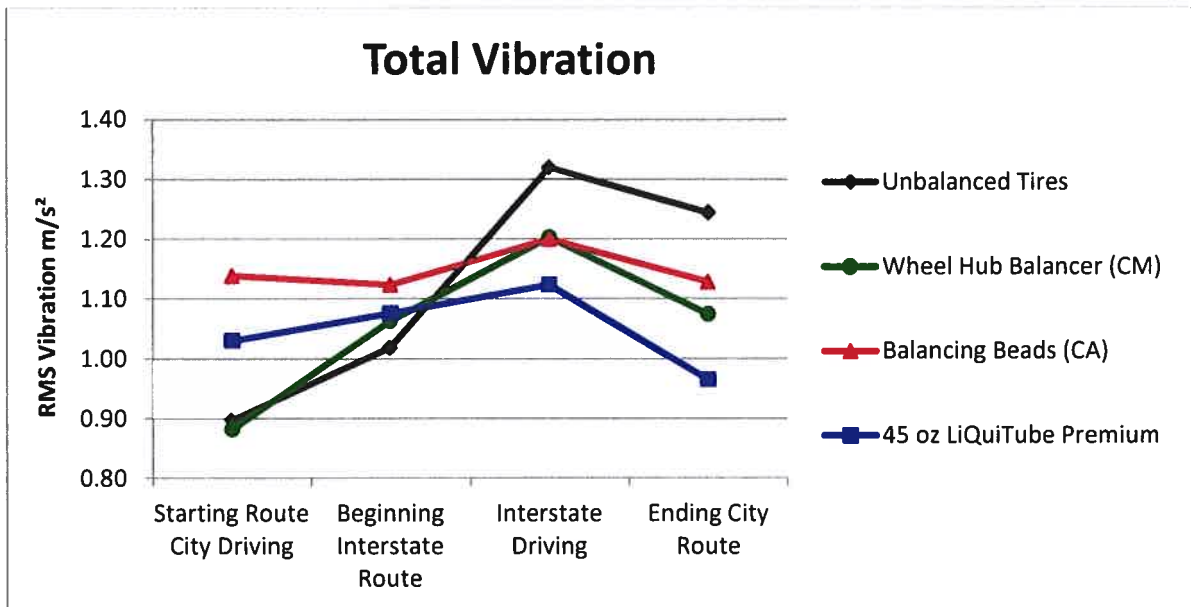
Brand new steer tires were mounted on wheels without any balancing done. The wheels were then mounted onto the test vehicle. The vibration sensors were secured to the floor board of the cab above the steering axle. Vibration data was collected in two driving scenarios outlined above then repeated on a return trip. After the initial run, Wheel Hub Balancers (CM) were attached to the test vehicle, and the test run was repeated. After the second run, the Wheel Hub Balancers were removed and a package of Balancing Beads (CA) was installed in each of the steer tires, and the test run was repeated. For the final test, the balancing beads were vacuumed from the tires and 45 ounces of LiQuiTube Premium Tire Sealant were added to each of the steer tires, and the test run was repeated.

### DATA ACQUISITION

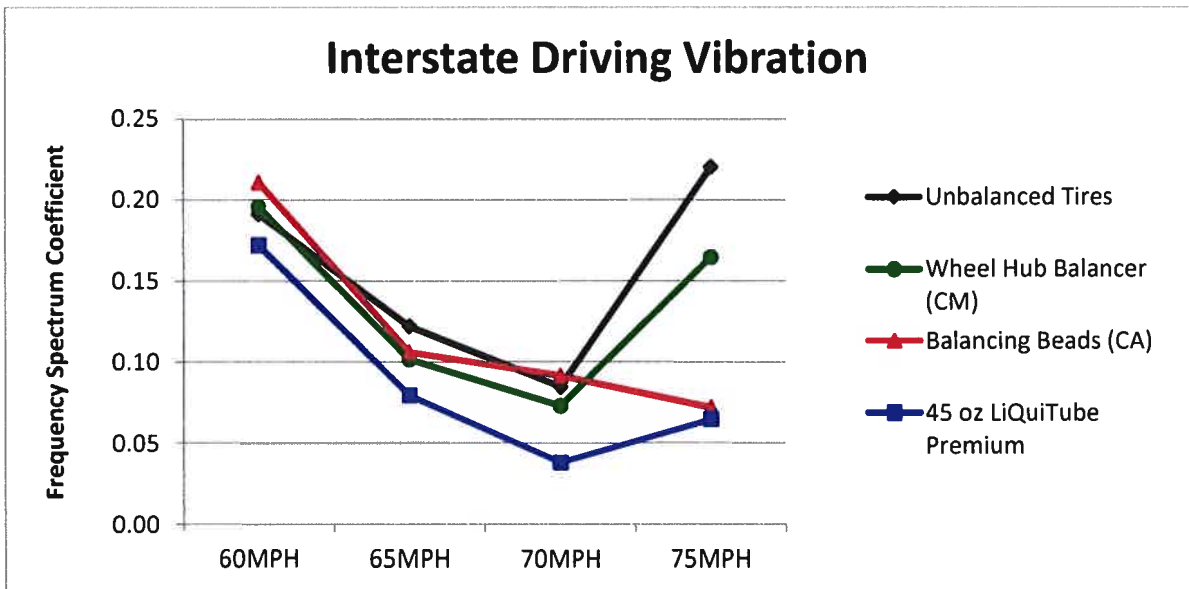
Acceleration data was captured on the up and down axis in meters per second squared. The raw data was normalized around zero to remove the acceleration of gravity from the readings. The root-mean-square (RMS) amplitude of the vibration data about zero was then calculated. These RMS values allow the relative vibrations of the different balancing technologies to be compared. The lower the RMS value, the lower the overall vibration. Additionally, vibrational spectrum analysis was performed on the vibration data to calculate the frequency spectrum coefficients (see Appendix A). These coefficients allow the relative magnitudes of vibrations at different frequencies for the different balancing technologies to be compared. Knowing the circumference of the tires being tested, these frequencies can be correlated to speeds of the test vehicles based on revolutions per second of the tires. Again, the lower the Frequency Spectrum Coefficient, the lower the magnitude of vibration at that frequency.

TEST #2 DATA

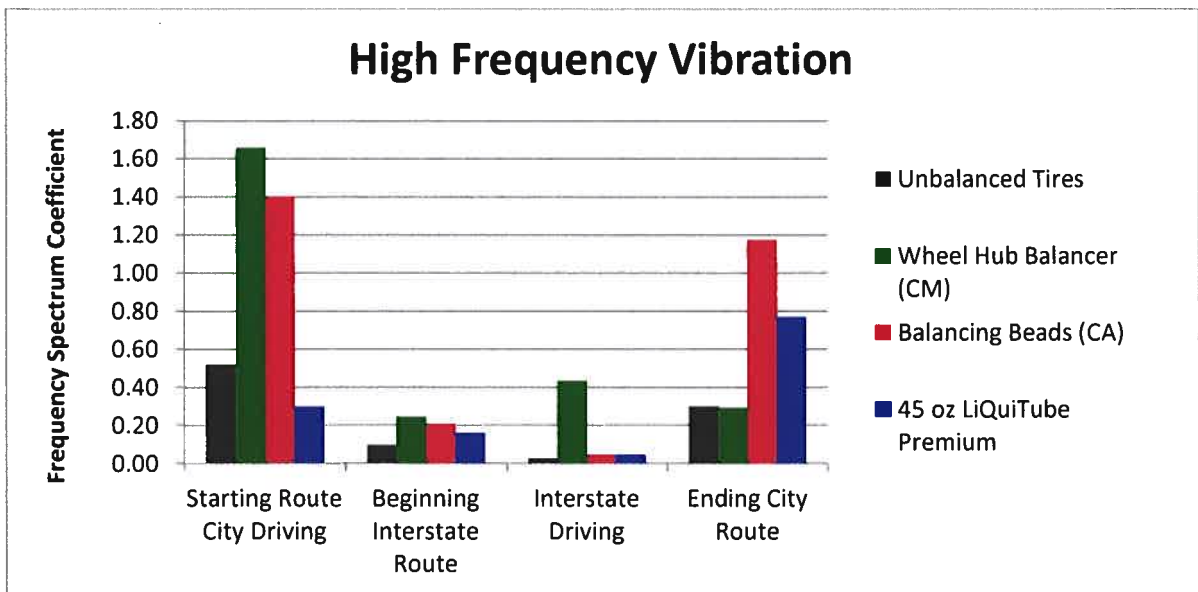
RMS Vibration (m/s <sup>2</sup> )				
Technology	Starting Route City Driving	Beginning Interstate Route	Interstate Driving	Ending City Route
Unbalanced Tires	0.90	1.02	1.32	1.24
Wheel Hub Balancer (CM)	0.88	1.06	1.20	1.07
Balancing Beads (CA)	1.14	1.12	1.20	1.13
45 oz LiQuiTube Premium	1.03	1.08	1.12	0.96



INTERSTATE DRIVING VIBRATION (Spectral Coefficients)				
Technology	60MPH	65MPH	70MPH	75MPH
Unbalanced Tires	0.19	0.12	0.08	0.22
Wheel Hub Balancer (CM)	0.20	0.10	0.07	0.16
Balancing Beads (CA)	0.21	0.11	0.09	0.07
45 oz LiQuiTube Premium	0.17	0.08	0.04	0.06



HIGH FREQUENCY VIBRATION (Spectral Coefficients)				
Technology	Starting Route City Driving	Beginning Interstate Route	Interstate Driving	Ending City Route
Unbalanced Tires	0.52	0.09	0.02	0.30
Wheel Hub Balancer (CM)	1.66	0.25	0.43	0.29
Balancing Beads (CA)	1.40	0.21	0.04	1.17
45 oz LiQuiTube Premium	0.30	0.16	0.04	0.77



### III. RESULTS

#### 1. TEST #1 RESULTS

LiQuiTube Premium Tire Sealant #01314 reduced vehicle cab vibration in both city driving and interstate driving conditions better than spin balanced tires with wheel weights. In city driving conditions vibration was reduced by 22.6% over the spin balanced tires while in interstate driving conditions vibration was reduced 22.1% over the spin balanced tires. Compared to unbalanced tires in city driving conditions, LiQuiTube Premium Tire Sealant #01314 reduced vehicle vibration by 42.4% while spin balanced tires only reduced vibration by 25.6%. Compared to unbalanced tires in interstate driving conditions LiQuiTube Premium Tire Sealant #01314 reduced vehicle vibration by 28.3% while spin balanced tires only reduced vibration by 8%.

#### 2. TEST #2 RESULTS

None of the balancing technologies seemed to show a significant reduction in vibration in low speed city driving conditions compared to an unbalanced tire. As the test vehicle began its interstate driving, there was still no significant reduction in vibration compared to the unbalanced tires. At prolonged high speeds of continued interstate driving all three balancing technologies sustained significant vibration reductions over unbalanced tires. The wheel hub balancer and the balancing beads both reduced vehicle cab vibration by around 9% while LiQuiTube Premium Tire Sealant #01314 reduced vehicle cab vibration by 15.2%. As the test vehicle returned to city driving conditions after the prolonged high speeds of interstate driving, all three balancing technologies continued to outperform unbalanced tires. Compared to unbalanced tires, the balancing beads reduced vibration by 8.9%, the wheel hub balancer reduced vibration by 13.7%, while LiQuiTube Premium Tire Sealant #01314 reduced vibration by 22.6%.

Looking at the frequency spectrum coefficients, the data shows that LiQuiTube Premium Tire Sealant #01314 reduces vibration due to tire revolutions at interstate speeds greater than both wheel hub balancers and balancing beads at speeds from 60 to 75 mph. The high frequency spectrum analysis shows that both wheel hub balancers and balancing beads produce spikes in high frequency vibration that unbalanced tires do not have. This may imply that these technologies trade some lower frequency vibrations for higher frequency vibrations.

#### IV. CONCLUSION

Within the scope and limitations of the tests performed, the following statements can be made:

1. For the purpose of balancing tires in order to reduce vehicle cab vibration, LiQuiTube Premium Tire Sealant #01314 outperformed all other technologies tested including: spin balanced tires with metal wheel weights, balancing beads, and wheel hub balancers.
2. LiQuiTube Premium Tire Sealant #01314 took a little bit of time to spread out, coat and balance the tire, but once the coating was in place, the tire continued to stay balanced at both high and low speeds.
3. The greatest reduction in vehicle vibration from **LiQuiTube Premium Tire Sealant #01314 was experienced during prolonged high speed driving on the interstate**. Since interstate driving is predominantly what most semi-truck tires experience, it is reasonable to base LiQuiTube's tire life cycle performance on this phase of operation.
4. LiQuiTube Premium Tire Sealant #01314 should extend the life cycle of both tires and vehicles since it balances tires and reduces vehicle cab vibration.

## APPENDIX A

### Explanation of Power Spectral Density:

Power spectral density of a discrete time variable,  $x_n = x(n\Delta t)$  is found using the formula

$$S_{xx}(\omega) = \frac{(\Delta t)^2}{T} \left| \sum_{n=1}^N x_n e^{-in\omega\Delta t} \right|^2$$

Where,  $N = n\Delta t$ .

Since the signal is acceleration and has the unit of  $m/s^2$ . We have the following unit for  $S_{xx}(\omega)$ :

$$S_{xx}(\omega) = \frac{(s)^2}{s} \left| \sum_{n=1}^N \frac{m}{s^2} \right|^2 = m^2/s^3$$

Physically this means **power per unit mass** as the following analysis of units shows.

**Physical Interpretation:** Power in metric system is in the units of Watts or Joules per second.

$$W = J/s$$

In mechanical system 1 Joules is one Newton times 1 meter. Thus  $J = N m$ . One Newton is 1 kilogram of mass times 1 meter per square second, i.e.  $N = kg m/s^2$ . Substitution results in

$$J = (kg m/s^2)m = kg m^2/s^2$$

Substitute this in the expression for Watts to find

$$W = kg m^2/s^3$$

Thus, we can write

$$\frac{W}{kg} = m^2/s^3$$

This is the same unit as the power spectral density of the acceleration signal.

# SAFETY DATA SHEET

NOTICE: Judgment may be based on indirect test and technical literature. The OSHA Hazard Communication Standard only requires SDS's and special labeling for materials defined as "HAZARDOUS"; see 29 CFR 1910.1200 (c). This document may be about a product which is NOT hazardous but is provided as information for our customers. See references for information.

## SECTION 1. IDENTIFICATION

Product Identifier: LiquiTube Premium Tire Sealant Product Use: Tire Sealant Manufactured for: LiquiTube Industries, LLC. 11521 Kevin Lane Cartersville, IL 62918	Product Identification # (PIF): 01314 Emergency Telephone #: 1-800-255-3924 General Information #: 618-985-4445 Date Prepared: July 31, 2014 Revised: May 14, 2019
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## SECTION 2. HAZARD(S) IDENTIFICATION



Signal Word: **WARNING**

Hazard Statement	Category	Code	Hazard Class
Harmful if swallowed	4	H302	Acute Toxicity, Oral
May cause damage to organs through prolonged or repeated exposure	2	H373	STOT, Repeated Exposure

Precautionary	Code	Statement
Prevention	P260 P264 P270	Do not breathe mists/vapors/sprays. Wash thoroughly after handling. Do not eat, drink or smoke or smoke when using this product.
Response	P314 P301+P311 P321 P330	Get medical advice/attention if you feel unwell (Repeated exposure) IF SWALLOWED: Call a POISON CENTER or doctor/physician. Specific treatments: See Section 4 First Aid Measures. Rinse mouth.
Storage	None	None
Disposal	P501	Dispose of contents/container in compliance with all Federal, State/Provincial and local laws and regulations.

**Hazards not otherwise classified:** May cause eye and skin irritation. Inhaling airborne mists/sprays of product may cause respiratory irritation. Overexposure may cause central nervous system depression. May be harmful or fatal if swallowed – based on product use, exposure is unlikely. Pregnant women should avoid exposure.

## SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Common Name	CAS #	Concentration Range %
1,2-Ethanediol	Ethylene glycol, EG	107-21-1	45 – 49

## SECTION 4. FIRST AID MEASURES

**Eyes:** Flush well with water for at least 15 minutes, holding eyelids open. Remove any contact lenses and continue rinsing. Seek medical attention if irritation persists.

**Skin:** Wash with soap and water. Remove contaminated clothing and launder before reuse. If irritation develops and persists, seek medical attention.

**Inhalation:** Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. If breathing is difficult, have a trained person administer oxygen. If respiration stops, have a trained person administer artificial respiration by way of pocket mask equipped with one-way valve or other proper respiratory device – Do NOT use mouth-to-mouth method if victim inhaled material. Call a physician.

**Ingestion:** Call a POISON CENTER or doctor/physician immediately. If completely conscious and aware, wash out mouth with water. Give two glasses of a slurry of activated charcoal in water to drink. Never give anything by mouth to an unconscious person. Do not induce vomiting unless instructed to do so by medical personnel. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

**Note to physician:** It is estimated that the lethal oral dose of ethylene glycol to adults is of the order of 1.0 ml/kg. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis. An effective intravenous antidote for physician use is 4-methylpyrazole.

## SECTION 5. FIRE-FIGHTING MEASURES

**Flash Point:** >200°F (>93°C)

**Flammability:** Class IIIB Combustible Liquid

**Extinguishing Media:** Foam, dry chemical, carbon dioxide fire extinguishers, water spray. Do not spray water directly on fire. Use water spray to cool containers.

**Specific hazards arising from chemical:** In a fire, or if heated, a pressure increase will occur and the container may burst.

**Hazardous combustion products:** Carbon monoxide and carbon dioxide.

**Firefighting protective equipment:** Wear a self-contained breathing apparatus with a full face piece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment.

**Sensitivity to static discharge:** This product is not sensitive to static discharge.



**SECTION 6. ACCIDENTAL RELEASE MEASURES**

**Personal Precautions:** Use personal protective equipment (Section 8). Eliminate all ignition sources. Ventilate area. Do not eat, drink or smoke or smoke when handling this product. Do not breathe fumes/mists/vapors/sprays. Wash thoroughly after handling.  
**For Small Spills:** Spilled material may be slippery. Avoid dispersal of material and runoff into soil, waterways, drains and sewers. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Wash walking surfaces with water to reduce slipping hazard. Dispose of contaminated absorbent material in accordance with local, state and federal regulations.  
**For Large Spills:** Large spills cannot occur due to packaging.

**SECTION 7. HANDLING AND STORAGE**

**Handling:** Use personal protection equipment (Section 8). Use with adequate ventilation. Do not breathe mists/vapors/sprays. Do not handle around sources of ignition. Avoid use during pregnancy. Never use welding or cutting torch on or near drum (even empty) because product can ignite explosively. Do not pre-mix with other chemicals. Do not eat, drink or smoke or smoke when using this product. Wash thoroughly after handling.  
**Storage:** Keep away from heat, flame, or sunlight. Keep from freezing. Keep container closed when not in use. Protect from physical damage. Store away from strong oxidizing agents, strong acids and strong bases.

**SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

Ingredient	CAS #	OSHA/PEL	ACGIH/TLV	STEL
Ethylene glycol	107-21-1	50ppm	100mg/m3	Not established

**Engineering Controls:** Provide adequate ventilation. Observe occupational exposure limits and keep the risk of exposure to a minimum.

**Personal protective equipment:**

- Eye: Safety glasses with side shields or splash proof goggles.
- Skin: Chemical resistant (impervious) gloves. Normal materials handling clothing. Boots.
- Respirator: Use NIOSH approved protection with organic vapor cartridge if PEL is exceeded, or if mists/vapors/sprays are generated.
- Clothing: Normal materials handling clothing.
- Other: Use in a well ventilated area. Do not eat, drink or smoke while handling. Wash thoroughly after handling.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	White, opaque liquid	Upper/Lower flammability limits	Not determined
Odor	None	Vapor pressure	<0.1mmHg @ 20°C
Odor threshold	Not determined	Vapor density (Air = 1)	>1
pH	8.5	Specific gravity (water = 1.0)	1.020 g/ml
Melting point	Not determined	Solubility	Dispersible in water
Freezing point	-26°F to -30°F	Partition coefficient (n-octanol/water)	Not determined
Boiling point	Not determined	Auto-ignition temperature	Not determined
Flash point	>200°F (>93°C)	Decomposition temperature	Not determined
Evaporation rate (n-butyl acetate=1)	<1	Viscosity, #5 @ 20rpm Brookfield	4500 – 6000cps
Flammability	Class IIIB Combustible	VOC by weight	Exempt

**SECTION 10. STABILITY AND REACTIVITY**

**Reactivity:** Not reactive under normal conditions.  
**Chemical stability:** Stable under normal, ambient temperature and conditions.  
**Possibility of hazardous reactions:** Hazardous polymerization will not occur.  
**Conditions to avoid:** Heat, flame and sparks. Keep from freezing. Do not mix with other chemicals  
**Incompatible materials:** Avoid strong oxidizing agents, strong acids and strong bases.  
**Hazardous combustion products:** Carbon monoxide and carbon dioxide.

**SECTION 11. TOXICOLOGICAL INFORMATION****Toxicity:**

- Oral (LD50 Rat): >2000mg/kg
- Dermal (LD50 Rabbit): >3500mg/kg
- Inhalation (LC50 Rat): >2.5mg/L

**Skin corrosion/irritation:** Not classified. May cause skin irritation.  
**Serious eye damage/irritation:** Not classified. May cause eye irritation.  
**Respiratory or skin sensitization:** Not classified. Inhaling airborne mists/sprays of product may cause respiratory irritation. Overexposure may cause central nervous system depression.  
**Germ cell mutagenicity:** No data available  
**Carcinogenicity:** NTP/IARC/OSHA Carcinogen: No  
**Reproductive toxicity:** NOAEC = 60 ppm (Inhalation, dose = 0 – 1000ppm for 10 days, 6hr/day). Symptoms: Maternal toxicity, malformations were observed. Fertility/embryotoxicity classification not possible from current data.  
**STOT-single exposure:** Not classified  
**STOT-repeated exposure:** May cause damage to organs through prolonged or repeated exposure. Can cause harm to kidneys, blood, nerves, liver and lungs. May be fatal if severely overexposed by ingestion.  
**Aspiration hazard:** Not classified  
**Ingestion:** May be harmful or fatal if swallowed – based on product use, exposure is unlikely.  
**Likely routes of exposure:** Eyes, skin  
**Interactive effects:** Pregnant women should avoid exposure.

**SECTION 12. ECOLOGICAL INFORMATION**

Toxicity:

96h LC-50 (fish): >100ppm  
 96h EC-50 (invertebrates): >100ppm  
 48h LC-50 (algae): >100ppm

Persistence and degradability: Expected to be readily biodegradable

Bioaccumulative potential: Low potential.

Mobility in soil: Soil mobility not determined. This product is dispersible in water and may spread in water systems.

Other adverse effects: None known.

**SECTION 13. DISPOSAL CONSIDERATIONS**

Disposal of Wastes: All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations.

Contaminated Packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied. Do not cut, drill, grind or weld on or near the container.

RCRA: Not applicable.

**SECTION 14. TRANSPORT INFORMATION**

United States DOT:

Not regulated

IATA and IMDG:

Not regulated

Marine Pollutant (IMDG Code): Not listed

Transportation in bulk (IMDG - Annex II of MARPOL 73/78 and IBC Code): Not offered in bulk for transport overseas.

**SECTION 15. REGULATORY INFORMATION**

TSCA: All components of this product are on the TSCA inventory or are exempt from TSCA inventory requirements under 40 CFR 720.30.

SARA Section 302: The components of this product are either not regulated or regulated, but present in negligible concentrations.

SARA TITLE III Section 311/312:

Immediate (Acute) Health	Yes	Fire Hazard	No
Delayed (Chronic) Health	Yes	Reactive Hazard	No

SARA Title 313: This material contains the following chemical components with known CAS numbers subject to reporting requirements (40 CFR 372): Ethylene Glycol CAS# 107-21-1, % by wt. = 47%.

CERCLA: This product has a reportable quantity of 10,000 lbs. (Ethylene Glycol), but is not considered a Hazardous Substance since the quantity does not equal or exceed the RQ in one package (49 CFR 171.8, definition of "Hazardous Substance").

United States Right-To-Know: Ethylene Glycol CAS# 107-21-1 – Massachusetts, New Jersey and Pennsylvania.

Proposition 65: This material contains the following ingredients for which the state of California has found to cause cancer, birth defects or other reproductive harm: Ethylene glycol CAS# 107-21-1.

RCRA: Not applicable.

**SECTION 16. OTHER INFORMATION**

Date Prepared: May 14, 2019 – SDS updated to meet revision #5 GHS requirements.

Hazard Ratings (HMIS): Health 2, Flammability 1, Reactivity 0. Personal Protection Rating to be supplied by user based on use conditions.

Carefully read all instructions on label before handling this product.

Keep out of reach of children.

"FOR INDUSTRIAL USE ONLY"

Abbreviation	Full Name/Explanation
ACGIH	American Conference of Government Industrial Hygienists
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CNS	Central Nervous System
CFR	Code of Federal Regulations
DOT	Department of Transportation
EC	Effective Concentration
GHS	Globally Harmonized System
HMIS	Hazardous Material Information System
LC	Lethal Concentration
LD	Lethal Dose
NA	Not Applicable
ND	Not Determined
NE	Not Established
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
RCRA	Resource Conservation Recovery Act
SARA	Superfund Amendments and Reauthorization Act
STEL	Short-Term Exposure Limit
STOT	Specific Target Organ Toxicity
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
VOC	Volatile Organic Compounds

The information contained herein is based on data available to us and is believed to be correct. We make no warranty, however, expressed or implied regarding the accuracy of these data or the results obtained from the use thereof.

Regulatory Standards: DOT TITLE 49, Code of Federal Regulations 172.101: Parts 100 to 177, Revised 10/1/92.

SUPER FUND AMENDMENTS REAUTHORIZATION ACT OF 1986, TITLE III TOXIC SUBSTANCE CONTROL ACT LIST (TSCA)- INGREDIENTS LISTED. REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES NATIONAL TOXICOLOGICAL PROGRAM (NTP) REPORT OF CARCINOGENS INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) MONOGRAPHS, OCCUPATIONAL SAFETY & HEALTH REGULATIONS. CODE OF FED. REGS. FOOD & DRUG, 21 PARTS 170 to 199, Revised 4/1/91, 173.310.