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Comparing Types of Liquid Tire Ballast

Saturday 24 January, 2009 5:01 pm | **Tractor & Implement Operating** | Mr. K

So after thinking about it and considering the reasons to ballast your Kubota's tires, you might find yourself wondering what liquid makes the best ballast. There are a few options available and depending on your climate, budget and access to some of these liquids in *bulk* quantities.

Liquid Ballast Comparison Table

Type	Cost	Freeze Resist	Weight vs. Water	Safe?	Availability
Water	free	none	+0%	very safe	wide
Calcium Chloride	low/high*	-50F	+40%	corrosive	wide
Ethylene Glycol Antifreeze	medium	-40F	+0%	toxic	wide
Propylene Glycol Antifreeze	high	-40F	+0%	safe	wide
Windshield Washer Fluid	low	-20F	+0%	toxic	wide
Methanol	medium	-15F	+0%	very flammable	wide
Beet Juice	very high	-35F	+30%	very safe	dealer network
Polyurethane Foam/Flat Fill	very high		+20-50%	very safe	dealer network

**using CaCl2 is low cost if containment tubes are already available and installed, otherwise this is a high cost option*

Water

Water has been used as ballast inside the rear tires of tractors operated in warmer climates for years. In geographical locations where freezing occurs, an additive is necessary to prevent the water from becoming an ice block inside the tire. Ballast that does freeze inside the tractor will make those tires unstable and general operation of the tractor unsafe. Water is the least expensive form of liquid ballasting and weighs 8.3lbs per gallon.

Advantages

- readily available
- no cost
- safe to use – non-toxic, non-flammable
- easy to install into tires

Disadvantages

- not suitable for cold climates

Calcium Chloride

Calcium chloride, *CaCl2*, in powdered form can be mixed with water to produce a liquid that will resist freezing up to -50F, depending on the strength of the concentration. Calcium chloride weighs about 11.5lbs/gallon mixed, so more ballast weight is achieved in the same volume, allowing a heavier ballast. This type of liquid ballast is a highly corrosive mixture so care must be taken in handling this product. CaCl2 should be installed into tubes regardless of whether or not the tire on the tractor is tubeless. Without being contained in a tube the mixture will *rust the rim flange* area right out.

L Series Clutch Repair Pricing
New Owner of a Used Kubota?
Oil in your Coolant?

Tractor & Implement Operating

10 Tips to Save Wear on your Clutch
6 Reasons to Liquid Ballast Tires
Cold Weather Starting Tips
How to Ballast Tires
How to Clear Snow with a Snow Blade
How to Engage Differential Lock
How to Install Tire Chains
How to Prevent Diesel Gelling
How to Remove a Front End Loader
Starting Fluid and Your Kubota

Gray Market

10 Gray Market Tractor Myths
Discovered it's a Gray Market Kubota?
L1-R Series: Reverse Kubotas
Part Numbers – Air Filter
Part Numbers – Fuel Filter
Part Numbers – Oil Filter
ZEN-NOH and Kubota P1: Partnership
ZEN-NOH and Kubota P2: Importation
ZEN-NOH and Kubota P3: Lawsuits
ZEN-NOH and Kubota P4: Loopholes
ZEN-NOH and Kubota P5: Fallout

Paint & Painting

Kubota Paint Part Numbers
Paint Reducers and Kubota Paint
Rattle Can Paint Job: An Example
Rattle Can Paint Job: Part 1
Rattle Can Paint Job: Part 2
Rattle Can Paint Job: Part 3
Rattle Can Paint Job: Part 4

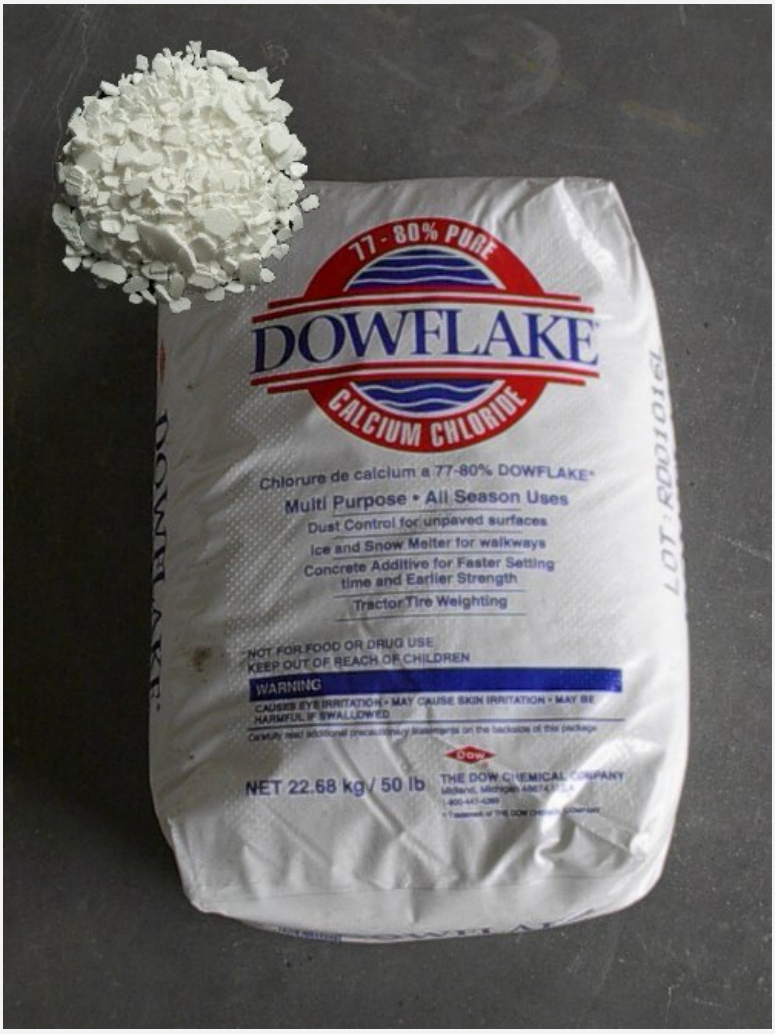
Looking for tonneau covers?

Advantages

- easily obtained in large quantities
- high weight/volume ratio (almost 40% more than water alone)
- very high freeze resistance

Disadvantages

- care taken when used – corrosive mixture
- must be installed into tubes – extra cost
- if installed without tubes corrosion/rust of the rim will occur
- puncturing a tire filled with CaCl2 will spray rust-causing mixture everywhere, damaging sheet metal and vegetation



A typical 50lb bag of calcium chloride with inset image showing powder consistency.

Ethylene Glycol Antifreeze
Antifreeze, mixed 50/50 with water, and installed into your Kubota's rear tires, will provide the same amount of weight per gallon as water and will resist freezing to approx -40F. Ethylene glycol antifreeze is classified by Canada's *Environmental Protection Agency* as hazardous waste after it reaches the end of its useful life. Care must be taken when disposing of this type of ballast – and in the case of a tractor tire, there will be a lot of mix to deal with.

Advantages

- easily obtained in large quantities
- high freeze resistance
- safe to mix – non-flammable but is toxic if ingested

Disadvantages

- hazardous to the environment, animals and people – care must be taken regarding its disposal
- could get costly if your only source is 1 gallon jugs at a Walmart

Propylene Glycol Antifreeze
Propylene glycol is known as a non-toxic or people/animal friendly antifreeze. Besides its

antifreeze properties, it is actually used in many cosmetics, pharmaceuticals, shampoos and as a food additive. Dow, who manufacturers 35% of the world's supply of of propylene glycol, reports that in the United States, 22% of production is used for antifreeze or de-icing. When installed into your tires as a ballast in a 50/50 mix, expect similar properties to ethylene glycol, high freeze resistance with ballast weight similar to that of water alone. AMSOIL makes this type antifreeze available by the gallon or 55 gallon drum.

Advantages

- easily obtained in large quantities
- high freeze resistance
- safe to humans, animals and vegetation, non-flammable, non-toxic and biodegradable

Disadvantages

- more costly than plain old toxic ethylene glycol – sources we used, quoted prices of 33%-120% more per gallon

Windshield Washer Fluid
Washer fluid, installed right from the jug is freeze protected to about -20F and provides about the same ballast weight properties as water does. Washer fluid has some of the same chemicals in it that antifreeze does, but at milder concentrations. Disposing of gallons and gallons of washer fluid, as in the case of tire ballast, would require care.

Advantages

- easily obtained in large quantities
- low cost
- adequate freeze resistance
- no mixing required – use as is, non-flammable but is toxic

Disadvantages

- hazardous to the environment, animals and people – care must be taken regarding its disposal

Methanol
Methanol is *highly flammable* and if you decide to use this product it *must* be mixed with water to make it so you do not blow yourself up while mixing it, installing it, or driving your tractor with it in there. Depending on strength of mixture, methanol and water is good to around -15F temperatures. We are not recommending the use of methanol and water because of the danger – but it is an option available for tire ballasting.

Advantages

- easily obtained in large quantities
- adequate freeze resistance

Disadvantages

- extremely flammable
- mixing required with water
- hazardous to the environment, animals and people – care must be taken regarding its disposal

Beet Juice
Beet juice, a liquid byproduct made from de-sugared sugar beets. This food grade product is available in the US under the trade and brand name, RimGuard. This liquid weighs about 30% more than straight water and resists freezing to about -35F. Best of all, it will not solidify until the temp drops to -50F. Natural, non-corrosive, safe to the environment and humans. If beet juice is available in your location, we believe this your best bet – safe to use and provides extra ballast weight.

Advantages

- high weight/volume ratio (about 30% more than water alone)
- very high freeze resistance
- anti-rust properties
- a natural product – environmentally friendly and safe

Disadvantages

- may not be available in all locations

Polyurethane Foam/Flat Fill
This ballast method is essentially a run-flat polyurethane fill that is injected into the tire through the valve stem. Two liquid components are pumped into the tire and they react with one another so that 24-36 hours later, you are left with a solid rubber core – the air inside the tire is completely displaced. The term "foam" is a bit misleading – the core is actually very much a black solid. It is sometimes called foam because air bubbles are injected into the mix to control the density of the end product.

This ballast method obviously adds *serious* weight gains to each tire and also has the nice benefit of eliminating flat tires and associated repair costs. Because the tire is run-flat there is no risk of corrosive/toxic ballast spraying all over your tractor and scorching vegetation if you do spring a leak. You will have to find a dealer near you that performs this service (Brannon Tire in Stockton, California for example).

Advantages

- high weight/volume ratio (about 20-50% more than water depending on type of fill)
- cannot freeze
- tire is run-flat
- simple – have it done once, ballasted forever

Disadvantages

- may not be available in all locations
- high cost – prices range around $0.95-1.25 lbs injected, or $300+ per tire
- tire must be cut off rim after tread wears out – best for new or nearly new tires
- if performed on steering tires, heavy duty weight gains will put more stress on steering components
- no air in tires to absorb humps and bumps so you will get a very rough ride – could be jarring for long distance travel

Have experience using some of these ballast types? Write us a comment below!

Service Department Vic

Related Articles
6 Reasons to Liquid Ballast your Kubota's Tires
How to Ballast your Kubota's Tires

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13 Comments »

Brian Said,
February 6, 2009 @ 9:42 pm

Vic,

I am thinking about foam for my L2350DT tires. What do you think about foam?

Thanks.

Jamie Said,

February 7, 2009 @ 2:43 pm

You have left out the best fluid for filling tires, non-toxic propylene glycol antifreeze available for RVs and boats. It has the same weight as water, anti freeze properties but is not toxic like auto antifreeze. It is far and away the best.
J.

Mr. K: Yes you are right! We've updated the article to include propylene glycol. Thank you for the heads up, much appreciated.

Vic Said,
February 7, 2009 @ 5:40 pm

Brian,

Foam as a selant against leaks?

Service Dept Vic

Vic Said,
February 7, 2009 @ 5:42 pm

Hi Jamie,

Yep! Sounds like that will work too!

Service Dept Vic

Brian Said,
February 8, 2009 @ 10:04 pm

Check out http://www.brannontire.com/foamfill.htm for example.

Foam filled tires primarily reduce flats but also can add several hundred pounds to read depending on tire size. Some of the negatives that I've seen include that they tend to rut the ground more and can cause more wear on steering components.

What do you think?

Thanks.

Brian.

Vic Said,
February 9, 2009 @ 6:47 pm

Brian,

Mr. K. schooled me on foam filling tractor tires earlier today. He said something along the lines of me being "old school" and "out of the loop", what ever that means!

Price may be a bit of a drawback, $1.25lb installed. Having 300 pounds of ballast is gonna hurt the old wallet! Thanks for the update.

Service Dept Vic

Mr. K Said,
February 9, 2009 @ 9:58 pm

Personally, I think foam filled tires might not be a bad idea. Sure it's plenty of $, but you have run-flat tires that are nearly hassle free plus the benefits of extra weight that leads to increased stability and traction. No worrying about a heavy duty salt solution spraying out all over your tractor if you get a flat. Brian, if you have a dealer/shop near you that performs this service, get a quote and update us on more exact pricing if you could. Much appreciated.

Brian Said,
February 9, 2009 @ 10:28 pm

Here in Magnolia, TX–just north of Houston. $0.95 installed over 100 pounds–McCurdy tires.

I am interested in the run-flat aspect plus the weight would be great.

Thanks.

Mr. K Said,
February 10, 2009 @ 3:39 pm

Hey Brian, price sounds about right – adjusted for exchange rate I think us Canadians pay about the same amount. I'm going to add "foam/flat fill" to our ballast chart as well – thank you for the heads up.

Cesar Said,
June 17, 2009 @ 8:39 am

Here in Corpus Christi, the one dealer and seems like the only one is charging $1.73 per lb. Sure would like to find another dealer.

Jim Said,
September 6, 2009 @ 5:54 am

One thing to remember on foam filled tires is that you will lose all of the "cushion" that air gives you. I know we are talking about tractors, so a smooth ride is not really a concern, but if you have to drive your tractor long distances, it might be something to consider. I sell custom wheelchairs and we use foam filled tires for maintenance reasons, as someone with a spinal cord injury (quadraplegic) will not be able to fix a flat. However, others with who are paraplegics (paralysis from waist down) are able to fix a flat, don't want foam filled tires b/c of the rough ride. Foam filled tires would work fine for me b/c my tractors rarely leave my little 5 acre place, but for some of you the rough ride may get old if you have larger areas you cover. Just offering something else to think about.

Mr. K Said,
September 6, 2009 @ 11:33 am

Good point Jim! I'll add that to our list under foam fill.

DAVE WAYLAND Said,
January 30, 2010 @ 12:57 pm

SIRS
I HAVE INVENTED A VERY SAFE LIQUID TIRE BALLAST CALLED –BIO-TIRE BALLAST– IT'S BEEN AVAILABLE FOR 2 1/2 YRS IN THE NORTHWEST– IT IS SOLD BY MANY MID-COMPACT TRACTOR DEALERS UP AND DOWN I-5 THROUGH WASH,OR,ALSO IN MONTANA,IDAHO–SOME OF YOUR KUBOTA DEALERS HAVE MY PRODUCT AND DO THEIR OWN TIRE LOADING –MY BIGGEST DEALER BY FAR IS THE LES SCHWAB TIRE CO. OUT OF PRINEVILLE OR. I DONT HAVE A WEB SITE AS YET WITHIN TWO WEEKS I WILL — UNTIL THEN I INVITE YOU TO LOOK AT LES SCHWAB'S WEB SITE FOR INFO ON MY PRODUCT OR YOU CAN E-MAIL ME FOR MORE INFO. I HOPE I CAN GET AN HONORABLE MENTION FROM YOU ABOUT MY PRODUCT SO THE FOLKS OUT THERE WILL KNOW THAT THERE IS SOMETHING SAFE,EASY AND BIODEGRADABLE IN THE NORTHWEST AND IS HEADING EAST

DAVE WAYLAND

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