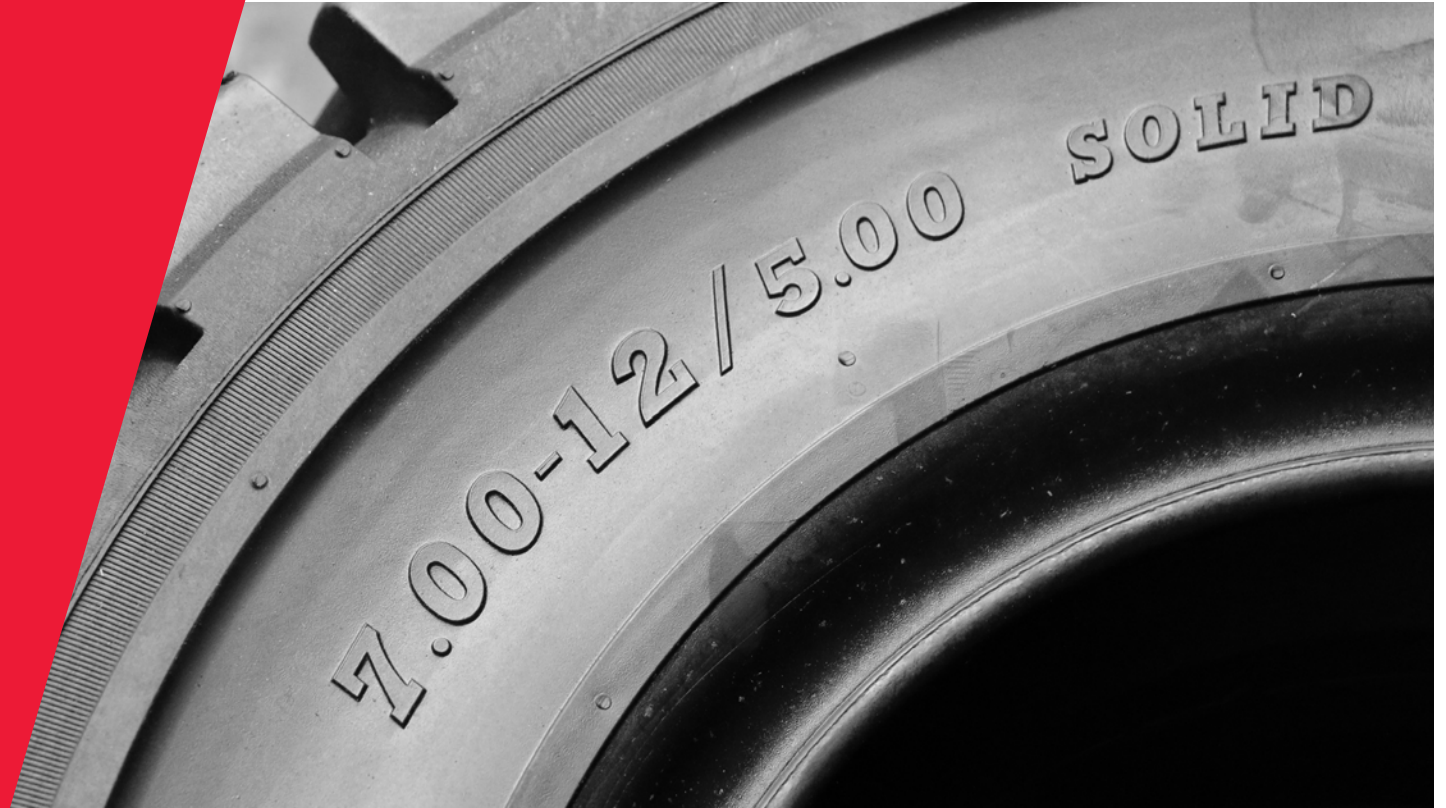


FORKLIFT TIRES:

THE SECRET TO PRODUCTIVE FORKLIFTS



Getting Started.



Forklift tires aren't all black, round and created equal. They can be expensive, blow out at the worst time, and cause downtime. However, when properly maintained, your forklift tires can reduce fuel consumption, increase safety in the workplace and improve productivity.

Our comprehensive forklift tire guide – compiled by our tire specialists – will help you keep your forklift productive. It all starts with the tires.

TABLE OF CONTENTS

1

Forklift Tire
Types

2

Tire Comparison
Charts

3

What are Forklift
Tires Made of?

4

How to Read Forklift
Tire Sizes

5

How to Choose the
Right Forklift Tires

6

Getting the Most Out
of Your Tires

7

When to Replace
Your Tires

8

Cost Reduction
Recommendations

CHAPTER 1

Forklift Tire Types



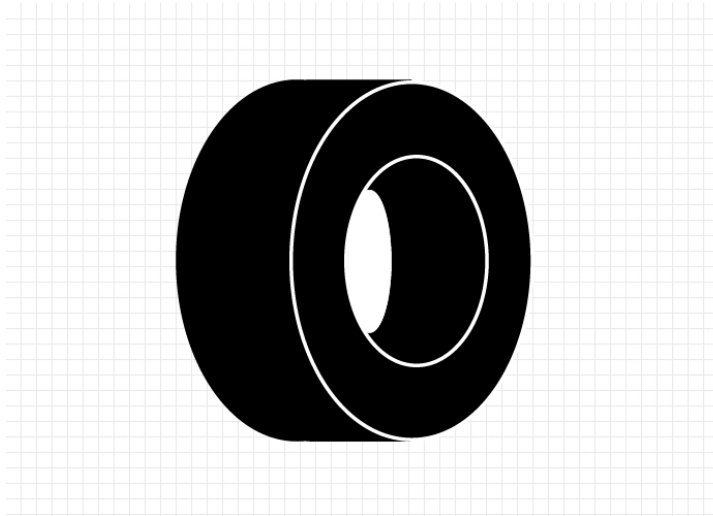
FORKLIFT TIRE TYPES

Chances are, you've dealt with forklift tires before. But if you're new to forklifts, or just want to learn more about different types of forklift tires, you're in the right place.

There are several different types of forklift tires. Each has their own benefits, each is suited to different work environments and, usually, your forklift is designed with a specific tire in mind.

CUSHION/PRESS-ON TIRES

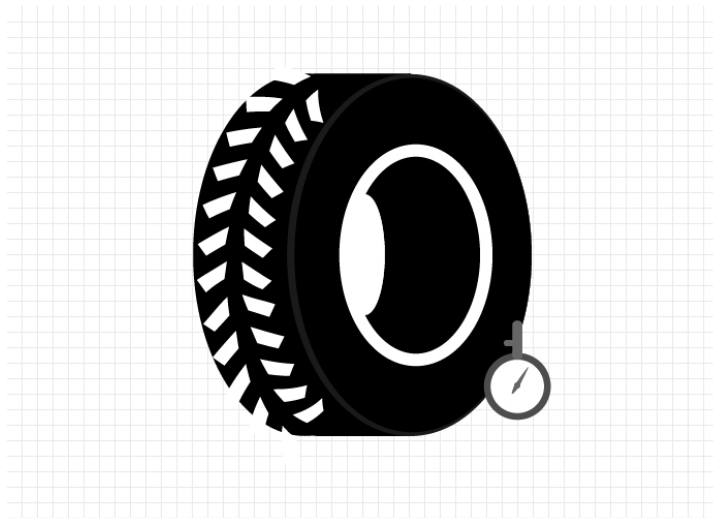
Cushion tires (also known as press-on tires) are made of solid rubber molded to a steel band. The rubber can either be traction or smooth. These tires are very durable and are best suited for indoor or light outdoor use on smooth surfaces.



PNEUMATIC TIRES

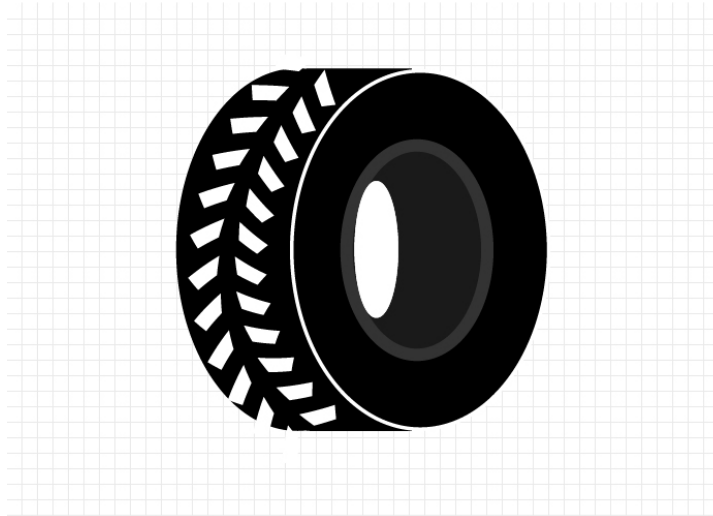
Pneumatic tires are similar to a car tire. They are made of traction rubber and filled with compressed air. Some companies fill their pneumatic tires with foam to avoid the upfront cost of solid pneumatic tires.

Although less costly, we don't recommend filling pneumatic tires with foam because it increases pressure on the casing, making it less sustainable long term. Pneumatic tires can be used indoors and outdoors as long as the work area is free of sharp objects.



SOLID PNEUMATIC TIRES

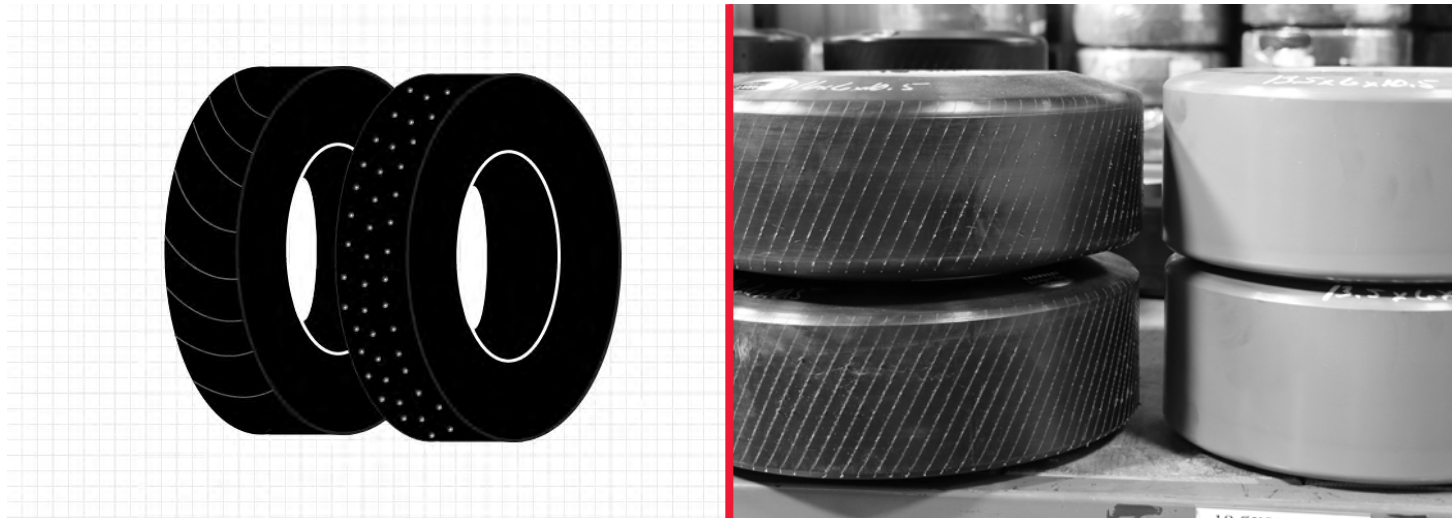
Solid pneumatic forklift tires are made out of solid rubber. These tires are very durable and can't be punctured or deflated, which makes them ideal for industries with sharp debris like recycling centers or lumberyards.



POLYURETHANE TIRES

Polyurethane tires are lightweight and more resistant to splitting, tearing or chunking out under a load than rubber tires. They combine good traction with low-rolling resistance. Polyurethane tires generally experience about twice the lifespan of rubber tires and should be used indoors only for light applications like warehousing.

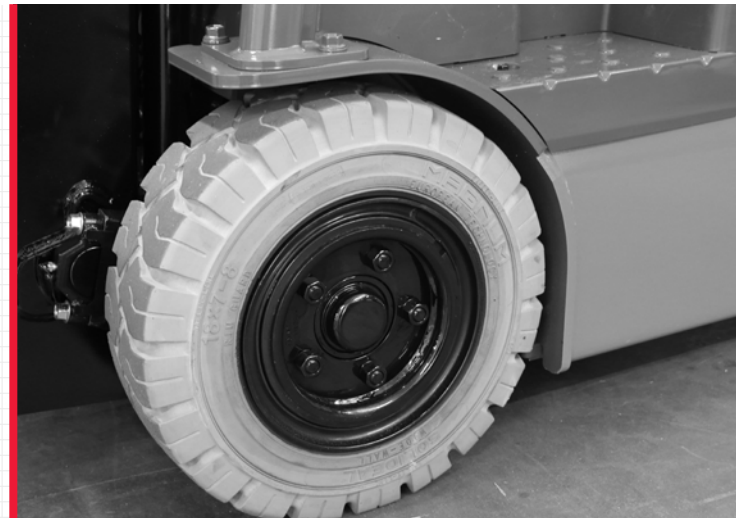
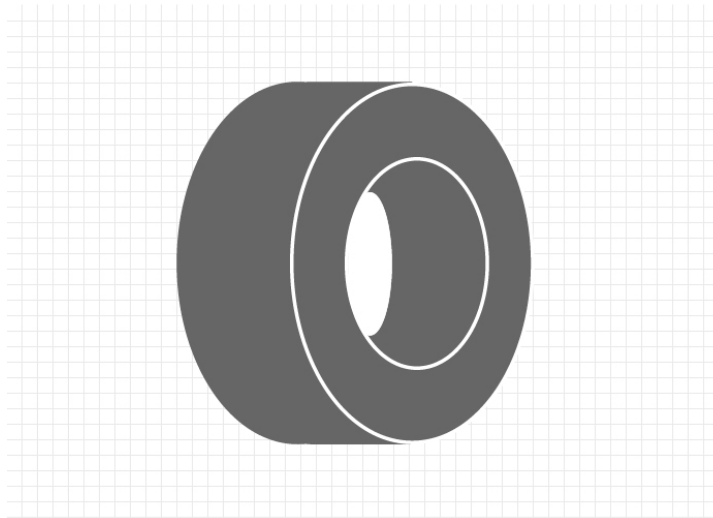
These tires will wear more easily in a heavy usage indoor environment so consider cushion tires if your application requires high usage.



NON-MARKING TIRES

Non-marking tires are made with hydrated silicas and special additives for eliminating black marks on floors. They are available for pneumatic, solid pneumatic and cushion tires.

These tires have a short life span and are prone to cause static electricity, which means they require an anti-static strip on the forklift.



Watch our [quick video overview](#) on understanding the difference between forklift tires.

CHAPTER 2

Tire Comparison Charts



TIRE COMPARISON CHARTS

Each forklift tire type has their own benefits and drawbacks. The ideal tire for you depends on where you'll be using the forklift, how long you need the tires to last, and what you're willing to pay.

See the tire comparison charts below to get a snapshot of the advantages and disadvantages of each tire type.

PNEUMATIC VS. SOLID PNEUMATIC

TIRE TYPE	INDOOR	LIGHT OUTDOOR	ROUGH-TERRAIN OUTDOOR	DEBRIS IN WORK AREA	LIFESPAN	DURABILITY	COST
Pneumatic	✓	✓	No	No	Medium	Medium	\$
Solid Pneumatic	No	No	✓	✓	Long	High	\$\$

CUSHION VS. POLYURETHANE

TIRE TYPE	INDOOR	LIGHT OUTDOOR	ROUGH-TERRAIN OUTDOOR	DEBRIS IN WORK AREA	LIFESPAN	DURABILITY	COST
Cushion	✓	✓	No	No	Medium	High	\$
Polyurethane	✓	No	No	No	Long	High	\$\$

These comparison charts are based on general data. Lifespan, durability and cost will depend on the application, operator and usage.

CHAPTER 3

What are Forklift Tires Made of?



WHAT ARE FORKLIFT TIRES MADE OF?

Your forklift tires could be made of polyurethane resins or rubber. They might contain carbon black or hydrated silicas. Some forklift tires even have steel wires embedded in them. It all depends on your tire type.

We broke it down so you can see exactly what your forklift tires are made of:

PRESS-ON TIRES

Cushion press-on tires are made of solid rubber molded to a steel band. Unless they're non-marking they will contain carbon black. That's what causes the black marks on floors. Meanwhile polyurethane press-on tires are made of – you guessed it – polyurethane resins. Along with synthetics and synthetic blends.

SOLID PNEUMATIC TIRES

Solid pneumatic tires are designed for durability. It starts with steel bead wires on the shoulder of the tire. Then there's a hard rubber compound base. Following that is the nylon carcass – it's a section of steel belts. In the event the tires are speared, the nylon carcass offers damage protection. There's a soft rubber core to aid in operator comfort and reduces operator fatigue. Finally the tread – the wearable part of the tire. It's made of an abrasion resistant rubber compound.

NON-MARKING TIRES

Non-marking variations are made of a blend of natural rubber with hydrated silicas and special additives. Carbon black is removed to eliminate marks on floors.

CHAPTER 4

How to Read Forklift Tires Sizes



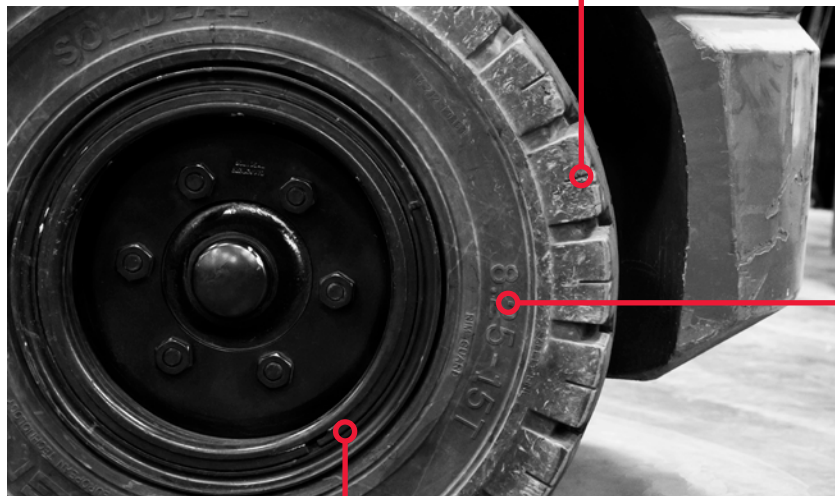
HOW TO READ FORKLIFT TIRES SIZES

Whether you're the forklift operator or the plant manager. Having a basic understanding of forklift tires is essential to staying productive and efficient.

The basic components of your forklift tires are:

Tread/Traction

Raised rubber that comes in contact with the ground



Sidewall

Shows important tire information like the tire brand, size, tire type, and wear line (J 60 line)

Rim

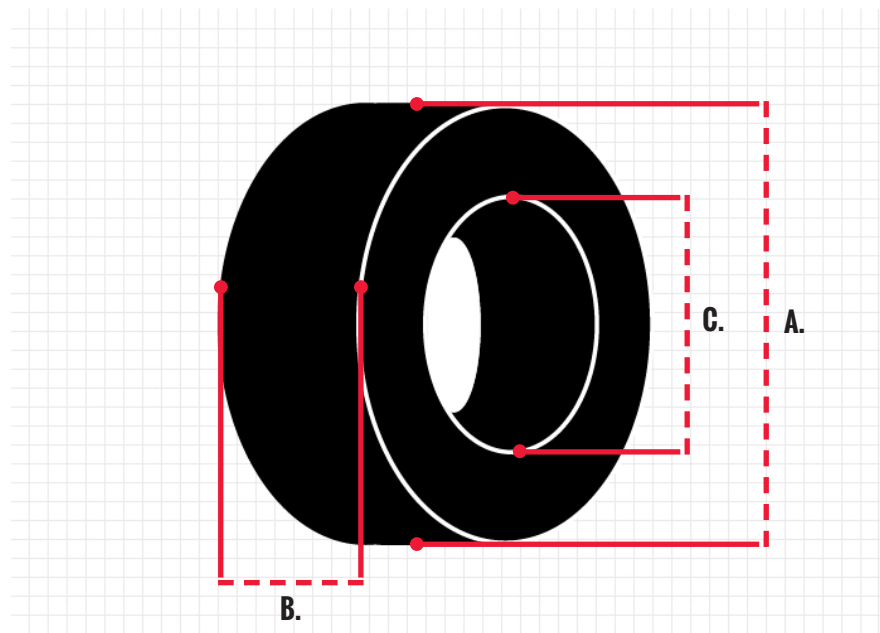
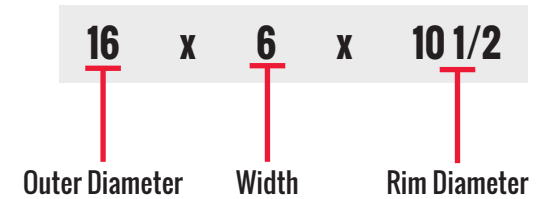
Metal portion of the wheel that holds the tire in place

READING FORKLIFT TIRE SIZES

You can find your forklift tire size on the sidewall of the tire. If you don't see the size there, you can always check the operator's manual or call your local forklift dealer with the model. They should be able to tell you the tire size for your model forklift.

Depending on the type of forklift tire you're dealing with, the tire size will be noted differently.

Press-on tire sizes are shown as the Outer Diameter x Width x Rim Diameter.



A. Outer Diameter

Height of the tire outside diameter (OD)

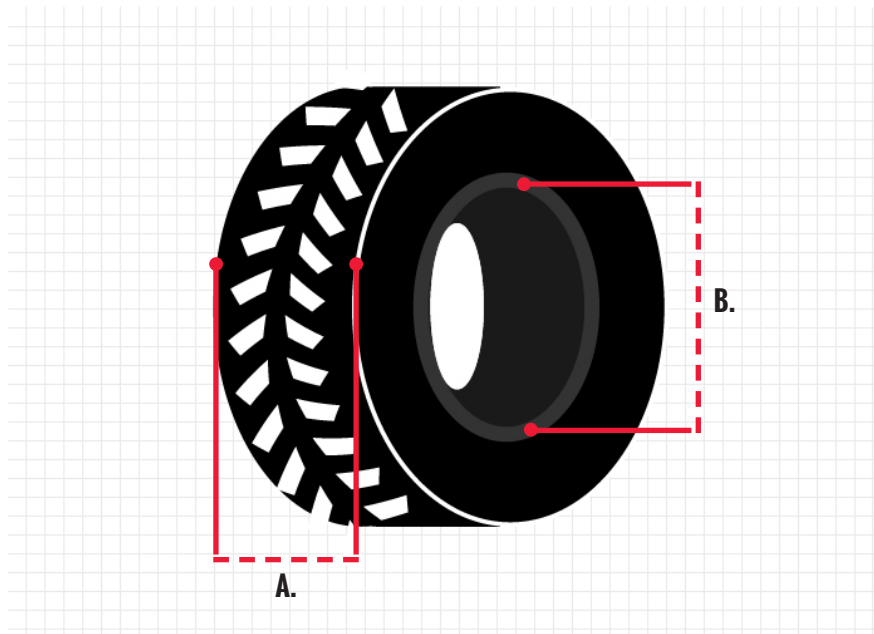
B. Width

Width of the tire

C. Rim Diameter

Rim inside diameter (ID)

Pneumatic or solid pneumatic tires sizes are noted as the Width x Rim Diameter.



A. Width

Width of the tire

B. Rim Diameter

Rim inside diameter (ID)

Generally, your forklift will have a recommended size, but you can purchase a different size, within reason, depending on your preference and application. Check your forklift's manual and with your local dealer for appropriate tire sizes.

HOW TO MEASURE FORKLIFT TIRES

If you need to measure your forklift tire size grab your average tape measure.

1. **Measure the outer diameter**, make sure you're placing the tape measure at the center of the tire and run the tape measure east to west.
2. **Measure the rim diameter**, stay in the center of the tire but only extend the tape measure to each edge of the rim.
3. **Measure the width of the tire**, simply position the tape measure on the part of the tire that would make contact with the ground and run the tape measure from edge to edge.

Remember, for press-on tires you need to measure the outer diameter, the width of the tire, and the rim diameter. For pneumatics or solid pneumatics measure the width and the rim size.

CHAPTER 5

How to Choose the Right Forklift Tires



HOW TO CHOOSE THE RIGHT FORKLIFT TIRE

Take into consideration your application, forklift and work environment when choosing a tire type.

Quick Tip: Your forklift's wheels and frame are generally designed for a specific tire type (usually pneumatic or cushion), so it's best to verify with your local dealer and your forklift's manual if you want to go with a different tire type than what is recommended.

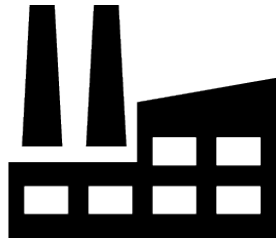
You'll often be able to switch from smooth cushion to traction cushion, or pneumatic to solid pneumatic tires, but it is rare you can go from a cushion tire to a pneumatic tire and vice versa.

When it comes time to replace the tires, ensure **both sides of the forklift are the same tire type**. The front and back tires can differ, but both front tires and both back tires must be the same type.

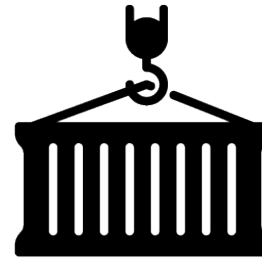
For example, you can't have a smooth cushion tire on the front right and a traction cushion tire on the front left. Instead you'd have two smooth cushion tires in the front and two traction cushion tires in the back.

APPLICATION RECOMMENDATIONS

Different applications require different forklifts, and therefore different tire types. We've outlined some common applications below with our recommendations. Make sure to check with your forklift dealer to confirm that our recommendations suit your situation.



Indoor applications that have no debris on the floor surface are best suited for cushion tires. In this environment, cushion tires last longer, provide increased maneuverability and improve traction.



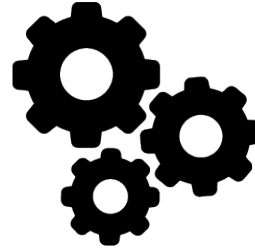
Outdoor and rough-terrain applications generally use pneumatic or solid pneumatic tires since they offer better traction and increased stability on uneven, loose terrain.



Applications like **warehousing**, that frequently use order pickers will often use polyurethane tires, since they can improve upon the expected battery life of the machine and provide additional stability and traction.



Cold environments or environments with consistently wet floors typically use polyurethane tires with micro grips (small, raised dots) or razer sipes (narrow, diagonal grooves) since they provide increased traction and braking ability.

























If your environment experiences standing oil or **consistent oil spills**, consider using polyurethane tires, which will resist the oil and experience less breakdown.



Sensitive applications, such as food, paper or printing are often required to use non-marking tires since standard tires contain carbon black. This creates a fine dust particle during use that can cause cross-contamination issues.

INDUSTRY STANDARDS

Your industry may also be a deciding factor when it comes to choosing the right forklift tires.

 Agriculture: Solid Pneumatic	 General Manufacturing: Cushion
 Airport: Solid Pneumatic	 General Warehousing: Cushion
 Beverage: Polyurethane	 Intermodal/Port: Solid Pneumatic
 Brick, Block & Pipe: Solid Pneumatic	 Lumber: Solid Pneumatic
 Cold Storage: Polyurethane	 Mining: Solid Pneumatic
 Concrete: Solid Pneumatic	 Oil & Gas: Solid Pneumatic
 Distribution: Polyurethane, Cushion	 Paper: Non-Marking Cushion, Polyurethane
 Factory: Cushion	 Rail Yard: Solid Pneumatic
 Food Processing: Non-Marking Cushion, Polyurethane	 Retail: Cushion
 Food Storage: Non-Marking Cushion, Polyurethane	 Shipping Containers: Solid Pneumatic
 Forging & Casting: Solid Pneumatic	 Steel/Metals: Solid Pneumatic

These industry standards may change depending on the specific work environment and the application. Check with your dealer to confirm the best option for your situation.

CHAPTER 6

Getting the Most Out of Your Tires



GETTING THE MOST OUT OF YOUR TIRES

A tire in good condition will increase your forklift's efficiency, improve productivity and reduce operator fatigue. Plus, getting the most out of your tire means a better bottom line and a safer workplace.

So how can you keep your tires in good condition? It starts with operator education, but it also depends on your tire type and your environment.

OPERATOR EDUCATION

Poor operator habits are one of the most influential causes of reduced tire life. These basic reminders for operators can increase safety in the workplace and improve the life of the tire.

Operators Should Not:

- Spin the tires
- Overload the vehicle
- Run over debris

Operators Should Avoid:

- Quick starts
- Quick stops
- Excessive speed
- Sharp, aggressive cornering

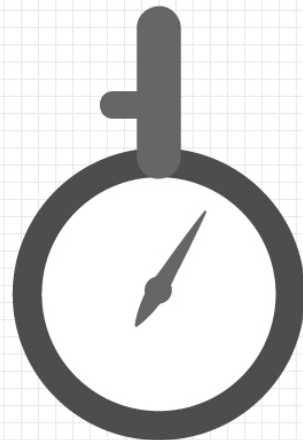
AIR PRESSURE

You should check the air pressure on your pneumatic tires before each use. If that isn't possible, try to **check daily**.

Quick Tip: You can find the recommended PSI on the sidewall of the tire.

Higher temperatures increase air pressure, and lower temperatures decrease air pressure. That's why you should check your tires' air pressure often. Since temperatures can change in short periods of time regardless of the season, this is a year-round responsibility.

Why does air pressure matter? Under-inflated tires lead to poor traction, which can cause accidents. Over-inflated tires can cause a blowout, which causes downtime and profit loss. Checking the air pressure is an easy way to avoid more serious problems that reduce productivity.



WINTER RECOMMENDATIONS

Winter brings challenges when it comes to outdoor forklift operation. The snow and ice that come with the colder temperatures cause slippery conditions and reduced traction. Often, forklift tire chains are the primary defense for reduced traction, but they aren't your only option.

Reduced traction is a major concern as snow and ice accumulate. You can get stuck easier than you might expect. When compared with a personal vehicle, a forklift is much heavier - even without a load - which makes sufficient friction even more essential when operating your forklift in slippery conditions.

The best way to get better traction is to increase the surface area connecting with the ground.

We recommend you use **pneumatic tires instead of solid pneumatic**. Pneumatic tires have more flex than solid pneumatics which increases the surface area contacting the ground and improves traction.

Quick Tip: Make sure you consistently check the tire pressure of your pneumatic tires. Under-inflated tires can contribute to poor traction, and over-inflated tires could lead to blow out.

Check your tread. It may seem obvious, but make sure your tires' tread isn't worn away. Your tires won't be able to grip the ground without it. If the tread is completely worn away, it's time to replace the tires.

Use forklift tire chains. While forklift tire chains aren't your only option, they are a great defense against slippery conditions and poor traction. Tire chains are available for both pneumatic and solid pneumatic tires.

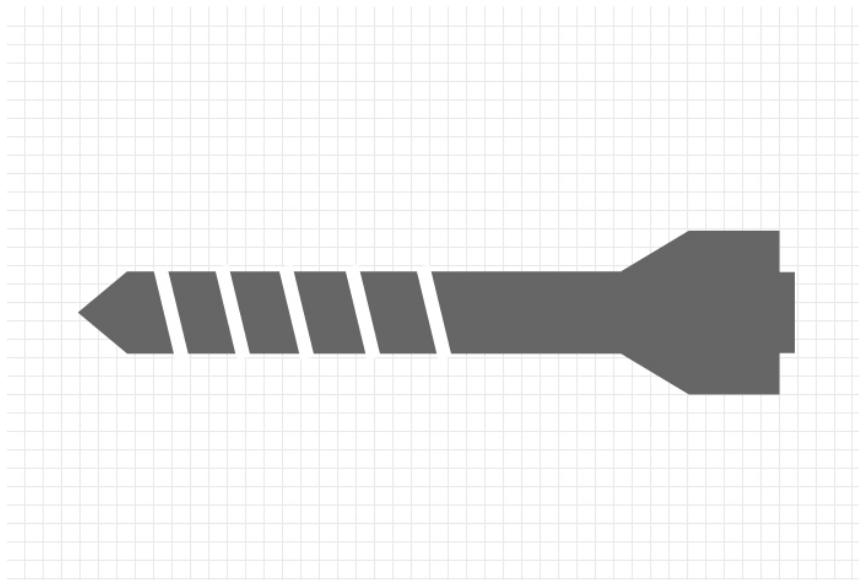
Use them only when the snow and ice make it dangerous to operate or when conditions cause inefficiency or reduced productivity.

Quick Tip: Tire chains aren't suitable for all circumstances since they can damage your tires and the ground if used on a dry, flat surface like asphalt.



Apply forklift tire studs. Studs can be screwed into the tread of your solid pneumatic tires to help alleviate icy conditions. We recommend using studs with a solid carbide tip which are stronger and more durable.

Don't worry, after removing the studs the tire won't be damaged and you can re-use the studs at a later date.



Spread a sand-salt mix. Salt won't affect your tires, but it can cause the metal components in your forklift to rust. Instead of pure salt we recommend you use a sand-salt mixture.

CHAPTER 7

When to Replace Your Forklift Tires



WHEN TO REPLACE YOUR FORKLIFT TIRES

Not replacing forklift tires at the appropriate time can lead to reduced fuel efficiency but that isn't the worst of it. Tires in poor condition cause operator fatigue, which leads to mistakes and can be dangerous for others in the area. Extensive damage can also be done to your equipment if the tires aren't replaced in time.

It's clear that replacing your forklift tires at the right time is important but **how do you know when they need replacing?** Forklift tires – like automotive tires – don't have a specific time frame for replacement. Instead you replace your forklift tires when they are worn or damaged.

Watch our [quick video overview](#) on checking your tires for wear and damage.

CHECKING YOUR TIRES FOR WEAR & DAMAGE

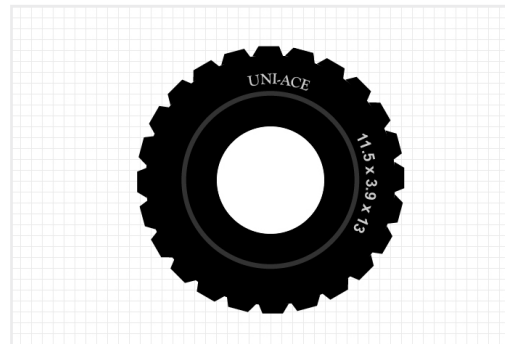
Regularly inspect your forklift tires to check for wear and damage. Your operators should include this in their pre-operation inspections. They'll be able to catch issues before they become a serious problem which is good for their safety and your bottom line.

To determine if your forklift tire should be replaced, there are a few areas to check:



WEAR LINE OR SAFETY LINE

Many tire manufacturers provide a wear line (J 60 line) on the tire. If the rubber has been worn down to the line, it's time to replace the tire.



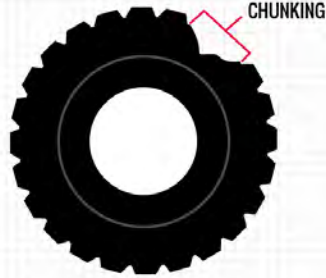
LETTERING

Another way to check for tire wear is on the sidewall of the tire. Once the tire reaches the top of the numbering or lettering on the sidewall, the tire needs replacement.



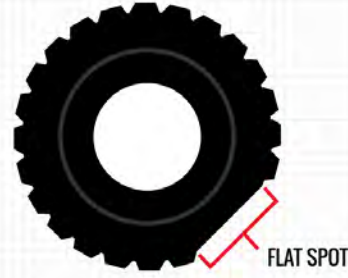
TREAD

Similar to a car tire, visually check the tread height on the tire to determine if the tire needs replacing. If the tire is balding, replace it.



CHUNKING

Chunking occurs when the tires are repeatedly running over debris and cause large pieces to fall off the tire. This can cause a bumpy ride for the operator, increasing fatigue and therefore mistakes. Damage to the load or product may also occur as a result of chunking



FLAT SPOTS

Sometimes flat spots can appear on the tire caused by spin or aggressive braking. This creates an uneven and uncomfortable experience for the operator. You can prevent flat spots by training operators on appropriate speeds and braking procedures.



RADIAL CRACKING

Radial cracking can occur when heat builds up within the tire often due to overloading the machine. If you're consistently seeing radial cracking on your pneumatic or cushion tires, consider using a larger or wider tire to spread the weight of the load over more area.

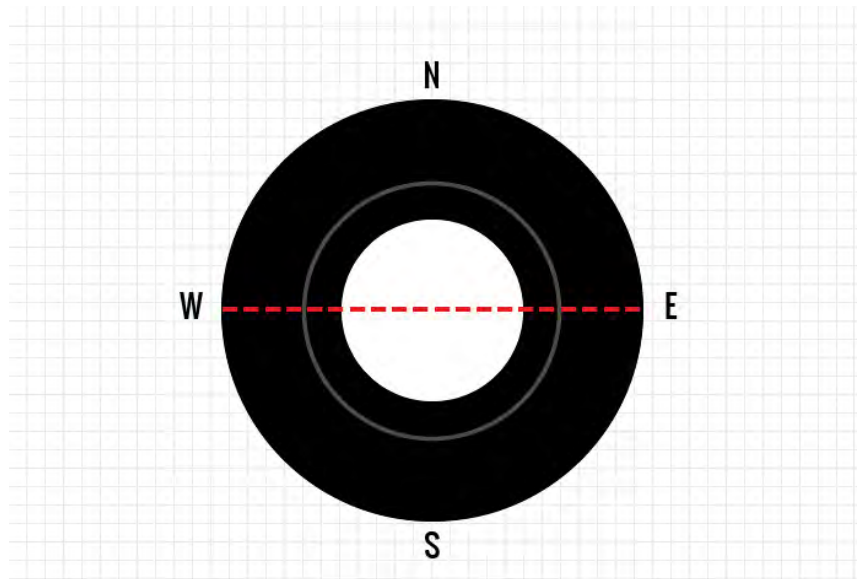
Heat buildup is also caused by traveling long distances with no weight on the forks. In these situations the counterweight rests on the steer tires instead of being evenly distributed.

TIRE REPLACEMENT BASED ON YOUR TIRE TYPE

Wear and damage can look different depending on the type of tires you have. Let's start with cushion tires.

Use the two-inch rule. If the tire has lost two inches or more from its original height, it needs replacement.

Quick Tip: The tire's original height or outer diameter can be found on the sidewall of the tire.



When measuring the tire's wear, picture the tire as if it's a compass, with the top of the tire as north. Take measurements across the center of the tire from east to west. Measurements may be skewed if you take them from north to south because the tire flattens under the weight of the forklift.

Check for damage where the band and the tire meet.

Bond failures occur on cushion tires when the rubber has separated from the metal band. If you can stick a screwdriver or a knife into the separated area, it is time to replace the tire.



Visually inspect the tread.

For traction cushion tires, visually check the tread as there is no definitive tool to help determine tread wear. When 25-30% of the available tread is worn, the tire should be replaced.



Let's move on to solid pneumatic tires.

If there are no obvious signs of damage, go by the amount of wear. When solid pneumatics have lost 75-80% of the available tread, they should be replaced. Though this rule works for most cases, you'll want to take your operators and your application into consideration.

Finally, we'll go over wear for polyurethane tires.

One of the more common signs of wear on poly tires is radial cracking. This occurs when heat builds up within the tire material and escapes through the exterior of the tire. Polyurethane tires with radial cracking are ready for replacement.

BENEFITS OF REPLACING YOUR FORKLIFT TIRES

Newly replaced tires offer benefits like reduced fuel consumption, maximized efficiency and increased traction.

Additionally, new tires will reduce shock, creating a better ride for the operator and it also leads to **reduced operator fatigue**.

New tires can **lower maintenance costs**. Similar to a bicycle in a higher gear, newly replaced tires can cover the same distance in fewer rotations. This means that drivetrain components will experience less wear.

CHAPTER 8

Cost Reduction Recommendations



COST REDUCTION RECOMMENDATIONS

Replacing your tires can be costly. Though it's a necessary expense, there are a few ways you can reduce your costs.

Choose smooth over traction.

When possible, use smooth cushion tires rather than traction tires. This switch can increase the consumable rubber by 7-12%. Plus, you'll experience increased traction as long as water or other liquid debris is not present.

Get high rubber resilience tires.

Tires with high rubber resilience benefit from low-rolling resistance. Switching to these tires can typically reduce fuel consumption in LP gas forklifts by up to 15% and extend the working hours between charges for electrics.

Upsize your tires.

Upsizing your tires can provide several benefits including:

- Longer tire life
- Increased traction
- Increased stability
- Increased shock absorption

You'll also experience cooler running tires. Plus, your load carrying capacity will increase as the weight is spread out along the tire. On average, increasing tire size by one inch translates to 800 pounds in additional load carrying capacity.

Replace pneumatic with solid pneumatic tires.

We often recommend switching from pneumatic to solid pneumatic tires. This does not necessarily apply to winter conditions. However, in many situations replacing your pneumatic tires with solid pneumatic tires can:

- Improve tire life by two to three times
- Increase stability
- Reduce downtime (no flats)

Before making these changes, verify with your tire dealer that your equipment, facility and application will see these benefits.

Now it's Time to Increase Your Productivity

From basic tire components and choosing your forklift tires to getting the most out of your tires and reducing your costs, by now you should be a forklift tire expert. Now it's time to start using that knowledge to increase your forklift fleet's productivity!

