Resource Recovery

Managing tyres at resource recovery centres

Tyres are classified as a combustible material that could create a fire hazard if not stored correctly. Operators should comply with the Environment Protection Authority Victoria's (EPA's) *Waste Management Policy (Combustible Recyclable and Waste Materials)*.

Key points

- Three main types of tyres are used in Australia: passenger, truck and off-road tyres.
- Whole tyres are banned from landfill
- We need a strong and diverse market for tyre-derived products to encourage more tyres to be recovered.
- Various acts, regulations, standards and guidelines apply to tyres at resource recovery centres and transfer stations.

Tyres in Australia

Each year, approximately 1.5 million passenger car tyres (known as equivalent passenger units or EPUs) are unaccounted for in Victoria – potentially illegally dumped or stockpiled.

Australian vehicles use three main types of tyres:

- **Passenger tyres:** used on passenger vehicles, motorcycles and caravans, as well as trailers for domestic use.
- **Truck tyres:** used on buses, light and heavy commercial vehicles, prime movers, trailers and semitrailers and firefighting vehicles.
- **Off-road tyres:** used on machinery or equipment in areas such as agricultural, mining, construction and demolition.

The composition and type of tyre may vary slightly depending on the manufacturer and size or type of tyre, but they are generally one-half rubber (natural or synthetic), one-fifth carbon black and one-fifth steel, with minor proportions of textiles and other additives.

Potential hazards

If not managed correctly, tyres can pose hazards to human health and the environment. Rubber tyres are made of very combustible compounds, including carbon, oil, benzene, toluene, rubber and sulfur. Tyres are not easy to ignite because they are designed to absorb the heat generated by the friction of road contact.

But if tyres are ignited, their ability to absorb heat makes it difficult to extinguish the fire. The high carbon content and steel cords serve as a heat sink, absorbing and storing heat within the tyre. Although extinguishment cools the tyre from open flaming to a smouldering stage, the stored tyre heat can re-ignite the tyres or other materials.

Other health risks can include vermin, snakes and mosquitoes using old tyres as a breeding ground.

Regulations

Some of the acts, regulations, standards and guidelines that apply to the safe handling, storing, transferring, transporting and recycling of tyres are listed below.

Occupational health and safety (OHS)	› Occupational Health and Safety Act 2004 › Occupational Health and Safety Regulations 2007 › Compliance code: Hazardous manual handling (WorkSafe Victoria, 2018) › Liquid storage and handling guidelines (EPA publication 1698) › Tyre fitting – storage of new tyres: A health and safety solution (WorkSafe Victoria, 2010) › Code of practice: The storage and handling of dangerous goods (WorkSafe Victoria, 2013)
Environmental	› Environment Protection Act 1970 › Environment Protection (Industrial Waste Resource) Regulations 2009
EPA waste management policies	› Waste Management Policy (Combustible Recyclable and Waste Materials) › Management and storage of combustible recyclable and waste materials – guideline (Publication 1667.2, October 2018)
Dangerous goods storage	Dangerous Goods Act 1985
Australian standards	AS2419.1:2017 – Fire hydrant installations: System design, installation and commissioning
Fire safety guidelines (Country Fire Authority and Metropolitan Fire Brigade)	› Fire services guideline – Open air storage of new or used tyres (2014) › Fire services guideline – Indoor storage of new or used tyres (2014) › Fire safety guideline – Control of Fire Water Run – Off (2018)

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Handling tyres

Follow the correct safe manual handling and management procedures when handling large or heavy tyres (refer to WorkSafe Victoria's code of practice: The storage and handling of dangerous goods).

Storing tyres

Tyre storage should meet the EPA's *Liquid storage and handling guidelines* (publication 1698), which replaces the Bunding guideline (publication 347). While tyres are not classified as a liquid, it is necessary to contain or isolate a site from the groundwater and stormwater system at times of high risk (such as fire and fire water/foam run-off) and give additional time to contain, clean up or manage pollutants and prevent liquids from leaving the site.

Minimise the size of the storage pile to restrict the fuel available in the event of a fire. Tyre stacks inside a building should not exceed 3.7 m in height or 30 m2 in area.

The following boundary perimeters are required:

- **Building without sprinklers:** minimum of 3 m between stacks and building structures.
- **Building with sprinklers:** minimum of 2 m between stacks and 1.5 m between stacks and building structures.

Maintain a minimum clearance of 1 m along paths of travel to exits or firefighting equipment access. Stored tyres must be 1 m clear of the roof or any structures attached to the roof.

Unless your licence or local regulator prescribe different requirements, tyre stockpiles stored externally should:

- not exceed 3 m in height due to potential for instability
- be no more than 6 m wide and 20m in length (arranging tyres in long 'thin' piles will help firefighting operations)
- not exceed 360 m^3 in total volume of tyres contained in a pile.

Selecting a storage site

When selecting a site to store tyres, consider:

- impermeable soil, or adding a sealed/bunded surface
- situating the site away from surface watercourses and other combustible materials
- flat, level ground where possible.

If tyres are stored outside, keep them at a suitable distance from any infrastructure and ensure the site is large enough to account for separation distances and allow for future expansion.

Facility operators should liaise with all relevant authorities and interested parties over proposals for new storage sites as part of the risk assessment process. This includes:

- Metropolitan Fire Brigade
- Country Fire Authority
- appropriate planning authority, usually local council
- EPA Victoria
- WorkSafe Victoria.

Emergency risk procedures

Operators must carry out a fire risk assessment to determine all fire hazards at the site, the likelihood that a fire will occur, and the consequences of a fire incident in terms of fire safety, property protection and the environment.

Operators should develop and document an emergency and fire plan as well as emergency procedures. Operators must be appropriately trained and forklift operators should be trained to use Self Contained Breathing Apparatus.

Ensure all equipment is maintained and easily accessible to contain and manage emergency incidents.

For further information refer to *Best practice guidelines for tyre storage and fire and emergency preparedness* prepared by Tyre Stewardship Australia.

Your fire hydrant must comply with Australian Standard (AS2419.1) or meet the requirements of the Country Fire Authority or Metropolitan Fire Brigade. Refer to the fire safety guidelines listed under *Regulations*.

Transporting tyres

Nationally, tyres are listed as a 'controlled waste' in List 1 of Schedule A of the National Environmental Protection (Movement of Controlled Waste between States and Territories) Measure 2004 (Controlled Waste NEPM).

The Controlled Waste NEPM has a national system to track the transport movements of controlled waste between states and territories and nationally recognised licences for interstate transporters. While, the interstate transport of tyres is regulated via this legislation, no federal control exists for storing tyres.

Record keeping

Keep records of all tyres received and sent from your facility for recycling. This enables tracking of material for resource recovery from the site, as well as helping managing on-site volumes being stored.

Record keeping should include:

- recording tyres received at the gatehouse
- monthly stocktake of tyre material stored on-site to not exceed the recommended maximum number (photographs or videos could be used to support this)
- recording the number and weight of tyres collected from the site by approved contractors.

In case of emergency, records need to be maintained often enough for data to be accurate, as far as reasonably practicable. For sites with regular, small fluctuations in material volume, a range or average may be adequate.

Disposing of tyres

Landfilling tyres should be considered as a last resort. EOLTs cannot be landfilled whole. They must be shredded into pieces no greater than 250 mm in any direction.

Waste tyres must not be buried or burned as fires can generate hazardous smoke, which can cause a health risk through the inhalation of particles and chemicals.

Reusing or repurposing tyres

Certain tyres can be retreaded or repaired to extend their useful life. Retreading a tyre returns them to a safe and usable quality by removing the residual tread and adhering new tread to the old tyre casing.

Repurposing tyres helps reduce the number of tyres in storage and ending up in landfill, where they take up valuable space due to their large volume and being non-biodegradable.

Tyres can be put to a new use in building, rural or recreational situations including:

- converting into a swing for play or using as exercise equipment for athletic programs or parks
- using rows or stacks of tyres as barriers in motor racing circuits as an added safety measure
- applying them as an affordable alternative building material used in the framework of sustainable housing
- using them to weigh down covers on silage stacks or grain bunkers.

The EPA discourages using tyres as tree guards due to fire risk. For more information on reusing waste tyres in agriculture refer to the EPA's *Using waste tyres on farms and other private property (publication 1652, April 2017)*.

Tyres that are no longer suitable for use due to wear or irreparable damage can be recycled by shredding rubber into various sizes such as granulate or crumb/powder and extracting valuable materials such as steel and textiles for other uses.

Markets for end of use

EOLTs can be reprocessed into a form suitable for use in the following products and applications:

- mats and tiles such as industrial and agricultural mats, multipurpose tiles and wheel clocks made from over 75 per cent post-consumer rubber
- traffic management products
- garden hoses
- roads
- sporting surfaces such as soft fall playgrounds, athletics tracks and synthetic grass fields
- tile adhesive
- alternative fuels to fossil fuels
- shoe soles
- automotive components
- building products including adhesives, roofing and insulating materials
- coatings/sealants
- containers for hazardous waste
- industrial products such as conveyer belts.

Tyres and the circular economy

Sustainability Victoria is actively promoting a transition to a circular economy and reducing reliance on raw materials in production processes by continuously cycling materials of all types back through supply chains.

Rising vehicle registrations and a subsequent increase in new tyre sales are increasing the number of EOLTs. EOLTs are estimated to exceed 63.3 million equivalent passenger units (around 506,000 tonnes) by 2024–25.

A strong and diverse market for tyre-derived products (TDPs) in Australia will stimulate further recovery of EOLTs to limit stockpiling and illegal dumping. Promoting existing and emerging opportunities to use TDPs in value-add ways across Australia will help build this market. For example, using TDPs for road, rail and civil construction and engineering, in high-end polymers and a new breed of water-resistant explosives.

The *National market development strategy for used tyres* sets out a five-year approach to improve market conditions to better manage EOLTs and drive the growth of a domestic TDP market. It was developed by SV and the Department of Environment and Heritage Protection (EHP) in Queensland, and co-funded by SV, EHP, the Department of Water and Environmental Regulation in Western Australia, the New South Wales Environment Protection Authority and Tyre Stewardship Australia.

For more information

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