

INDUSTRY RECOMMENDED PRACTICES

TPMS Recycling Guidance

PURPOSE:

Tire Pressure Monitoring System (TPMS) sensors and Tire Mounted Sensors (TMS) are increasingly being incorporated into commercial, passenger, and light truck tires to support tire pressure monitoring, temperature monitoring, vehicle telematics, tire identification, and other advanced sensing applications. Most passenger cars and light trucks use sensors mounted inside the tire either at the base of the valve stem or bonded to the wheel barrel. Some TPMS/TMS devices, however, are permanently affixed to the tire innerliner, while others are contained within removable boots, housings, or encapsulated containers. These permanently affixed sensors are generally found in commercial tires and vehicles.

Many of these devices contain lithium-ion or other battery technologies that may present safety concerns if damaged during tire processing, recycling, shredding, or retreading operations. Improper handling may create fire, thermal, environmental, or equipment damage hazards within used tire enclosures, tire recycling facilities, and retread facilities.

This guidance is intended to assist tire dealers, retreaders, recyclers, processors, and service personnel with the identification, removal, storage, and disposal management of TPMS/TMS devices containing batteries.

TPMS RECYCLING GUIDANCE:

Used TPMS/TMS Devices

Defective TPMS devices containing lithium-ion or other integrated batteries mounted inside the tire at the base of the valve stem or bonded to the wheel should be removed by the tire dealer at the time of new tire installation. The defective device should be stored in metal containers intended for battery recycling and never left in tires designated for disposal or recycling.

TPMS/TMS devices containing lithium-ion or other integrated batteries permanently affixed to the tire should be removed from tires prior to storing, disposal, recycling, shredding, processing, or retreading operations whenever practical to do so safely.

INDUSTRY RECOMMENDED PRACTICES

Tire manufacturers, tire dealers, scrap tire processors, recyclers, and retread facilities should implement procedures to identify tires containing permanently affixed TPMS/TMS devices before such tires enter processing equipment, shredders, cutters, balers, or other mechanical systems.

Used TPMS/TMS devices containing batteries should be managed as universal waste in accordance with applicable federal, state, and local environmental regulations and waste management requirements.

Used TPMS/TMS devices should never be disposed of in general trash containers or mixed with municipal solid waste streams.

Personnel responsible for tire inspection, repair, recycling, retreading, or disposal operations should be trained to recognize TPMS/TMS devices and understand proper handling and removal procedures.

TPMS/TMS devices permanently attached to the tire innerliner may require specialized removal procedures to minimize damage to the tire structure or innerliner when the tire is intended to remain in service.

Sensors installed within removable boots, housings, or encapsulated containers may require specialized tools or manufacturer-recommended procedures for safe extraction and handling.

Care should be taken during demounting, cutting, or removal operations to avoid puncturing, crushing, cutting, overheating, or otherwise damaging battery-containing sensor units.

Damaged, swollen, leaking, overheated, burned, or otherwise compromised TPMS/TMS devices should be isolated from other materials and managed in accordance with applicable hazardous or universal waste handling procedures.

Used TPMS/TMS devices should be stored in designated collection containers intended for battery recycling or universal waste management until transferred to an approved recycling, reclamation, or disposal provider.

Storage containers used for TPMS/TMS collection should be maintained in a manner that minimizes accidental crushing, short-circuiting, water intrusion, contamination, or exposure to excessive heat sources.

Facilities generating used TPMS/TMS waste should maintain reasonable housekeeping and fire prevention practices in storage and accumulation areas.

Tire processing facilities should communicate with suppliers, haulers, generators, and customers regarding expectations for TPMS/TMS removal and handling procedures to reduce the likelihood of battery-containing devices entering the scrap tire stream unknowingly.

Processors receiving whole scrap tires should consider implementing inspection procedures to identify potential TPMS/TMS-equipped tires before processing activities begin.

RFID tire identification devices or similar tire-mounted components that do not contain batteries are not included within the scope of this guidance.

Additional Considerations

- Tire manufacturers and sensor manufacturers may utilize differing attachment methods, sensor configurations, and battery technologies. Service personnel should reference applicable manufacturer service information whenever available.
- Some TMS devices may be embedded beneath tire components or adhered directly to the innerliner, making them less visible during normal inspection procedures.
- Lithium-ion battery damage may create thermal events or fires if batteries are crushed, punctured, shredded, overheated, or exposed to incompatible materials.
- Facilities should review applicable emergency response and fire prevention procedures associated with battery-containing waste materials.
- EPA guidance documents related to universal waste management may provide additional information regarding accumulation, labeling, transportation, and recycling requirements for battery-containing devices.

Disclaimer

This document is intended solely as an industry reference and informational guidance document. It does not replace manufacturer instructions, safety procedures, environmental regulations, or legal requirements. Users of this guidance should review and comply with all applicable local, state, provincial, and federal laws, regulations, ordinances, and environmental requirements related to the handling, storage, transportation, recycling, disposal, and management of TPMS/TMS devices, batteries, universal waste, and scrap tire materials. Requirements may vary by jurisdiction and may change over time.

ENSURE ADHERENCE TO STATE BATTERY EPR (EXTENDED PRODUCER RESPONSIBILITY) LAWS IN LOCATIONS WHERE THEY ARE APPLICABLE.

WHEN REFERENCING THIS RECOMMENDATION, BE SURE TO FOLLOW ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS RELATING TO THIS SUBJECT.