# TURTLE FIRE SYSTEMS, LLC

system that provides continuous, targeted cooling directly to the source of a fire, whether beneath an electric vehicle, battery rack, or deck surface

## *the challenge*

Electric vehicle (EV) fires pose unique and growing challenges across the global supply chain. On land, first responders face extreme heat, toxic gases, and complex battery designs that hinder direct cooling. At sea, these hazards are magnified.

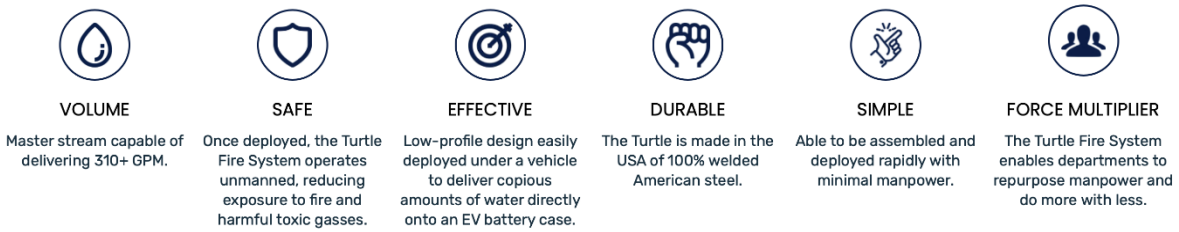
Crews on ferries and roll-on/roll-off (RORO) cargo vessels often have limited firefighting training, minimal protective gear, and constrained water resources.

As maritime transport of EVs expands, the risk of onboard thermal runaway events grows. A single battery failure can quickly escalate, spreading horizontally from vehicle to vehicle and threatening both cargo and vessel integrity. Traditional suppression methods are often insufficient: deck sprinklers deliver indirect cooling, and manual intervention exposes crews to toxic vapors and dangerous temperatures.

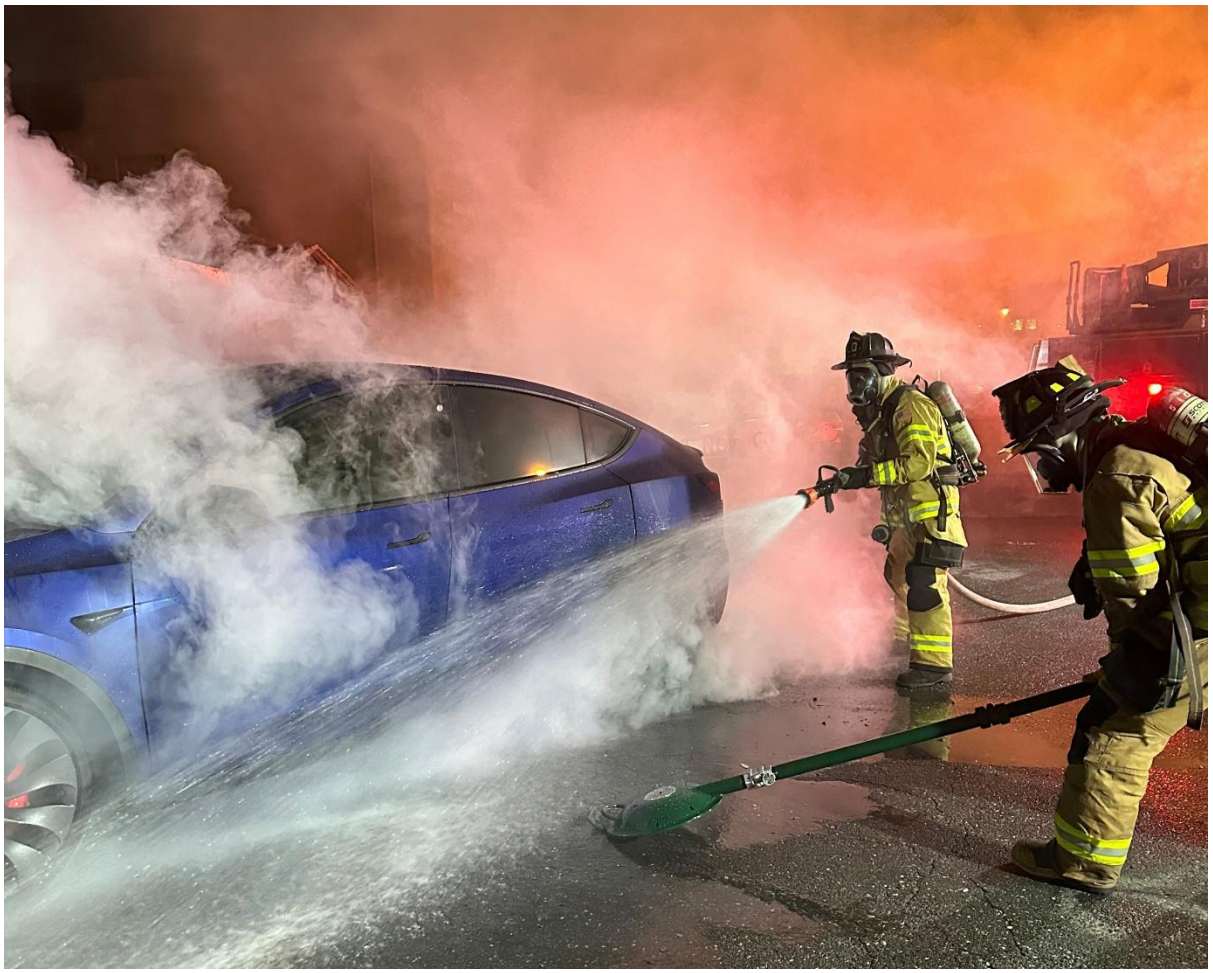
There is an urgent need for a simple, effective, and adaptable solution that allows ship crews - many of whom are not firefighters - to safely control EV fires, reduce heat transfer to the vessel, and protect passengers, cargo, and the ship itself until full suppression can be achieved.

## *the innovation*

The **Mini Turtle Fire System** - including its specialized adaptation, the **Maritime Mini**, made from stainless steel with brass couplings - was designed to meet this exact need. The system provides continuous, targeted cooling directly to the source of a fire, whether beneath an electric vehicle, battery rack, or deck surface.

For maritime use, the Mini Turtle Fire System can be fixed-mounted or connected to a vessel's existing 1.5" handline coupling. Its flow rate of **150 gallons per minute (GPM)** is optimized to provide effective cooling while minimizing listing risk and maintaining vessel stability. On land, the standard Mini Turtle Fire System operates up to **310 GPM**, allowing flexible response across different environments.



The patented dome shape and 360° flow pattern ensure full coverage of battery casings and surrounding surfaces. Once positioned, the unit delivers a stable, even spray without requiring constant repositioning—reducing exposure for crew members and containing horizontal fire spread. Constructed from powder-coated stainless steel with a slide plate and reinforced handle system, the device is durable, manoeuvrable, and compatible with both marine and land-based firefighting equipment.

Designed for ease of use, the Maritime Turtle can be rapidly deployed under vehicles on ferries or cargo decks, mounted as a designated EV "sprinkler zone," or positioned near high-risk areas such as welding operations to provide immediate water flow in case of ignition.

*how it was implemented*

The original Turtle Fire System was conceived and developed by firefighters to bring practical, real-world solutions to modern fire hazards. Since its launch, it has been adopted by **municipal, military, airport, and industrial fire departments** and integrated into emergency response plans at multiple **automotive manufacturing facilities worldwide**.

Following its proven success in land-based operations, the Turtle Fire System is now being adapted for **maritime environments** in collaboration with ship safety professionals, marine fire brigades, and Coast Guard representatives. These industry subject matter experts (SMEs) are exploring the use of fixed and portable Maritime Mini units aboard vessels carrying electric vehicles.

These discussions have identified several viable configurations:

- Fixed installations in designated EV cargo lanes on ferries or RORO vessels
- Portable handline deployment for vessel crew or fire watch personnel
- Stationary units near hot work zones to contain sparks or flare-ups immediately

This adaptable implementation reflects our focus on bridging the gap between land-based firefighting innovation and maritime cargo safety.

*result*

Turtle Fire System products have already proven their effectiveness in multiple controlled EV burn tests and **several real-world deployments**. Results demonstrated rapid heat reduction, decreased firefighter re-entry time, and improved safety outcomes.

In early trials and demonstrations for the maritime sector, the **Maritime Mini** has shown equal promise. The system enables crews with limited firefighting experience to apply cooling water directly to the ignition source without entering hazardous areas. It also reduces deck surface temperatures and slows horizontal flame spread between vehicles - critical advantages for preventing escalation and protecting both cargo and hull integrity.

These outcomes directly support the goals of the freight and logistics industry: preserving vessel stability, reducing cargo loss, and protecting human life. Ongoing engagement with vessel operators, ship safety teams, and marine fire brigades continues to show how the Maritime Mini provides a simple, reliable method for improving safety across varied maritime operations.

*conclusion*

The Turtle Fire System was created to make firefighting safer, smarter, and more accessible. Its evolution into the Maritime Mini exemplifies our commitment to adapting proven technology to emerging hazards in global transport. By empowering vessel crews to act quickly and confidently during high-risk incidents, the system safeguards personnel, passengers, cargo, and the ship itself.

Beyond the immediate firefighting application, the Turtle Fire System contributes to the broader goals of the TT Club Innovation in Safety Award: collaboration, learning, and continuous improvement in safety culture. We are proud to share our work with the international cargo and logistics community and remain committed to refining our technology in partnership with the maritime industry.

We believe that innovation is only meaningful when it saves lives, protects assets, and makes the world safer for those who move it.

LINK: https://www.turtlefiresystems.com/

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TT Club is the established market-leading independent provider of mutual insurance and related risk management services to the international transport and logistics industry. TT Club's primary objective is to help make the industry safer and more secure. Founded in 1968, the Club has more than 1100 Members, spanning container owners and operators, ports and terminals, and logistics companies, working across maritime, road, rail, and air. TT Club is renowned for its high-quality service, in-depth industry knowledge and enduring Member loyalty. It retains more than 93% of its Members with a third of its entire membership having chosen to insure with the Club for 20 years or more.

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