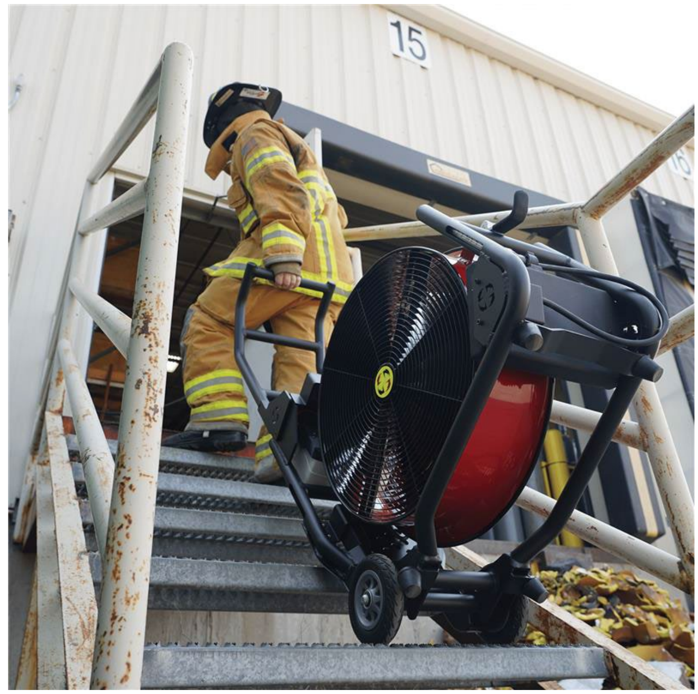
Upgrading Wheel Durability for SuperVac's Firefighting Fans



Customer Background

SuperVac is an original equipment manufacturer (OEM) specializing in portable, battery-operated fans primarily used by firefighters. These high-performance fans are deployed at critical points on fire scenes to manage smoke removal / ventilation, backdraft control, flashover protection, and rapid drying. Designed for portability, the fans feature wheeled frames for quick and easy transport.

Product link: SuperVac Battery-Operated Fans

Application Challenge

SuperVac's fans operate in some of the most extreme and unpredictable environments. The wheels, a key component of the unit's mobility, are exposed to harsh treatment including:

- Being dropped from fire trucks to the ground during rapid deployment
- Dragged up and down stairs or over uneven terrain
- Used in low-visibility, high-stress environments where collisions with walls and curbs are common
- Subject to urgency-driven handling, prioritizing speed over careful transport
- Exposed to tipping forces from firefighter hoses and direct impact from high-pressure water streams
- View SuperVac's product testing procedures

Such demanding conditions resulted in frequent wheel failures. The most common issue was cracking or breaking of the plastic hubs due to repeated impacts.

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The Solution: Dual-Durometer Urethane Wheels by Dynatect

SuperVac's original wheels used plastic hubs with a rubber overmold sourced from a low-cost vendor in Taiwan. To improve durability, Dynatect partnered with SuperVac to redesign the wheels using a dual-durometer urethane construction:

- **Outer Layer (Softer Urethane):** Provides improved grip and smoother rolling
- **Inner Layer (Harder Urethane):** Absorbs and distributes impact forces, reducing stress on the hub

This upgrade significantly enhanced wheel durability and performance. SuperVac's testing confirmed that Dynatect's solution outperformed the previous design in all key metrics. The value and performance justified the higher unit cost.

Overcoming Barriers to Adoption

One challenge in switching to the Dynatect solution was the upfront cost of tooling. Dynatect addressed this by offering a flexible pricing structure that amortized a portion of the tooling cost into the per-piece price—helping SuperVac manage initial investment.

Results

In 2023, SuperVac fully converted to Dynatect's wheel solution. Today, they use over **10,000 wheels annually**, benefiting from significantly improved reliability and reduced failure rates in the field.