

**THE RUGGED
REALITY
OF MOBILE
COMPUTERS**

WHY REAL-WORLD DURABILITY DEFINES THE FUTURE OF SUPPLY CHAIN MOBILITY

In environments characterized by toughness and high stakes, the demand for genuinely rugged mobile solutions has never been greater. The global market for rugged handheld devices is projected to grow to \$10.6 billion by 2033, reflecting a CAGR of 4.28%¹, underscoring the critical role these devices play in the industry.

In transportation and logistics, rugged handhelds and tablets are used an average 3.5 days per week, while mobile printers are employed daily by 37% of workers, with 74% using them at least a few times each week². This reliance on mobile devices highlights the significant impact of their downtime. Unplanned downtime poses a major concern, costing the world's 500 largest companies 11% of their revenues—equivalent to a staggering \$1.4trillion, according to a 2024 Siemens report³. This financial burden parallels the annual GDP of a major industrial nation like Spain.

The term 'rugged' is often overused in the mobile computing sector, reduced to marketing catchphrases and ambiguous specifications. However, in industries where downtime leads to chaos, ruggedness is not simply a buzzword; it is the cornerstone of operational continuity.

Businesses operating in warehouses, retail backrooms, logistics centers, and demanding temperature-controlled supply chains depend on real-world durability—rigorously tested in concrete environments—to define the mobile computers of the future.

THE HARSH ENVIRONMENTS WHERE MOBILE COMPUTERS LIVE

Modern supply chains function in unforgiving spaces that subject every piece of electronic equipment to its core challenges. Concrete floors present a constant threat, with potential to damage housings and screens upon impact. Cold-chain environments introduce harsh temperature fluctuations that can lead to condensation and screen fogging, while exposure to oils, chemical sprays, and grease can degrade seals and plastics. Lastly, unpredictable handling creates thousands of tiny impacts over a device's lifespan. Therefore, if a device is not designed to withstand these daily conditions, it cannot be deemed truly rugged; instead, it is merely a temporary solution.

“As industries evolve and the demand for operational efficiency intensifies, rugged mobile solutions have become essential. At Honeywell, we consider durability not merely a feature but a core design principal. Our commitment to reducing field failures and enhancing operational efficiency enables our technology to tackle industrial challenges and boost productivity. This philosophy empowers our customers to thrive amid uncertainty, supporting their resilience in an ever-changing landscape. With the rugged mobile solutions market projected to grow significantly, investing in durable technology is more critical than ever.”

TAYLOR SMITH,
CHIEF MARKETING OFFICER, HONEYWELL
PRODUCTIVITY SOLUTIONS AND SERVICES

[1. Rugged Handheld Devices Market Size & Forecast 2033, IMARC](#)

[2. The Mobility Mandate: Navigating Device Chaos & Strategic Automation in a New Digital Era, 2025, SOTI](#)

[3. The True Cost of Downtime 2024, Siemens](#)

LAB-TESTED RUGGED VS. REAL RUGGEDNESS

It is important to differentiate between various standards of ruggedness, as not all ruggedness is created equal. Many devices marketed as 'rugged' depend on controlled lab tests that fail to encapsulate the realities of fast-paced industrial workflows. Lab-tested ruggedness often reflects cosmetic and controlled studies, such as drop tests performed onto protective vinyl mats or laminate flooring. These tests frequently involve controlled drop angles and low-impact scenarios in predictable indoor environments with stable temperatures and fresh, untested batteries. In contrast, real ruggedness is uncovered in unpredictable and brutal settings where devices face extreme challenges.

Real ruggedness is exemplified by scenarios such as 1.5-meter drops onto harsh concrete, repeated impacts on all edges and corners, and long-term structural strain caused by forklift vibrations. Devices must also cope with transitions between extreme temperatures, which can lead to condensation failures due to moisture exposure, as well as repeated interaction with dust, moisture, oils, gloves, and chemicals. The takeaway here is clear: while lab-controlled ruggedness may appear impressive on specification sheets, it is the real-world ruggedness that reveals the true durability of devices within industrial settings.

THE IMPORTANCE OF DROP-TO-CONCRETE STANDARDS

Real-world operations rarely involve gentle falls onto soft surfaces. The reality faced by warehouse and logistics operators is tough concrete, which imposes considerable demands on rugged mobile computers. Examples of real-world drop scenarios include dropping devices from forklifts directly onto warehouse cement, knocking against pallet corners during hurried picking, and accidental slides against sharp racking edges. If a device can endure padded floor 'rugged tests' but fails during a single fall onto concrete, it ultimately results in costly downtime and hampers operational reliability. Therefore, manufacturers must engineer mobile solutions that are prepared for the harsh realities of concrete floors, as failures in these conditions can have persistent consequences.

SLIM TOUCHSCREEN DEVICES: WHERE CONSUMER DESIGN MEETS INDUSTRIAL TOUGHNESS

Sleek touchscreen mobile computers are increasingly popular in warehouses and retail environments, largely due to their smartphone-like aesthetics and user-friendly interfaces. However, these devices often fall short in performance and resilience without proper reinforcements. The challenge of consumer-style designs stems from the larger displays, which have higher surface areas, increasing the threat of shattering. Compact frames may compromise structural integrity, making them less capable of absorbing impacts. Furthermore, consumer-grade glass typically lacks sufficient resistance to industrial impacts.

Rugged smartphones, while sharing technological commonalities with handheld computers, illustrate the need for tailored solutions in specific sectors. Although these smartphones are designed for durability, recent trends show that rugged smartphone revenues dipped in recent years, indicating their niche yet critical applications⁴. For environments that demand high data capture capabilities, rugged handheld computers remain predominant.

⁴ [Strategic Insights 2025: Enterprise Mobility & the Connected Worker](#)

To foster real ruggedness in these devices, essential reinforcements are necessary, including chemically strengthened glass paired with laminated film for shatter resistance, shock-proof designs with reinforced corners, and durable materials. Swappable batteries are vital for maintaining performance in cold-chain environments, alongside effective ingress protection to guard against dust, moisture, and oil sprays. When these devices are thoughtfully engineered, sleek touchscreen models can seamlessly integrate into industrial workflows, marrying convenience with robust ruggedness.

KEYPAD MOBILE COMPUTERS: THE WORKHORSES WITH EXTREME DURABILITY

In environments characterized by gloves, grime, and extreme conditions, touchscreen solutions may not always be practical. In such cases, traditional industrial keypad mobile computers continue to dominate operations in freezers, cross-docks, and high-intensity facilities. The key advantages of keypad mobile computers lie in their durable mechanical keypads, which allow for tactile operations under gloves or in dusty environments. Their robust protective housings are specifically designed for repeated falls onto concrete, while expanded batteries ensure longevity in multi-shift schedules. Moreover, these devices exhibit thermal resilience, aiding their operation between freezer and ambient conditions smoothly. Ultimately, keypad mobile computers excel not through sleek appearances, but through relentless functionality in demanding conditions where other devices may falter.

FORKLIFT-MOUNTED MOBILE COMPUTERS: THE PINNACLE OF RUGGED ENGINEERING

Few devices endure the level of punishment faced by those mounted on forklifts. These forklift-mounted devices underscore the importance of real-world testing for ruggedness due to the daily challenges they encounter. Continuous vibrations from constant forklift movement, extreme cold from freezers coupled with condensation risks, and high-impact jolts when crossing dock plates or potholes create a grueling environment. Additionally, consistent exposure to daily chemical cleaning, dirt, and warehouse dust tests their durability.

Engineering solutions for real-world forklift challenges involves features such as heated displays designed for low-temperature operation, shatterproof screens with sunlight visibility for operations transitioning between indoor and outdoor settings, and industrial I/O systems that can absorb mechanical vibrations without failure. Importantly, mounting mechanisms are engineered to protect internal electronics from shock absorption. A standard consumer device retrofitted for forklift use is prone to failure; therefore, only industrial-grade machinery, purpose-built for these challenges, can ensure reliability and performance.

TAILORED RUGGEDNESS: A SOLUTION FOR EVERY ENVIRONMENT

Different industries, facilities, and operations have unique requirements, indicating that a device rugged enough for a retail store's backroom may fall short when faced with the rigors of an outdoor cold-chain warehouse. Bespoke rugged solutions thus play a critical role in enhancing operational resilience. Examples include slim touchscreen devices for rugged transport, logistics workflows, and keypad models designed for heavy-duty handling in freezers. Additionally, forklift-mounted terminals optimized for operational endurance contribute toward fewer workflow disruptions and increased operational throughput offering a competitive edge that no business should ignore.

CONCLUSION: THE RUGGED REALITY TRUMPS RUGGED MYTHS

As we look beyond 2026, the definition of ruggedness in mobile solutions is set to evolve significantly. Authentic ruggedness, not lab-choreographed ratings, will become the standard for validating a device's claim to reliability and durability in the field. Honeywell is proud to lead this evolution as a strategic partner for supply chain efficiency. Our foundation is built on testing data, practical engineering, and real-world adaptability. In considering options for mobile computing, it's vital to remember that concrete floors, forklift vibrations, and chemical sprays do not factor in marketing buzzwords.

By embracing true ruggedness, businesses can ensure their operations remain reliable and efficient, regardless of the challenges they face in ever-evolving industrial landscapes



Trust Honeywell, where we prioritize designing rugged solutions for the realities of operational demands rather than mere labels.

This is the Rugged Reality where Honeywell leads.

For more information

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