# Working with Dell Rugged devices in real-world situations

**Example user communities:**

Field services

Manufacturing & warehousing

Government & public safety

Oil & gas

Healthcare

Sports & recreation

## A Principled Technologies research report based on publicly available information

What do the people who use and review Dell Rugged tablets and laptops think about how these ruggedized computers perform in the field? At Principled Technologies, we researched publicly available testimonials, data, and reviews, across a myriad of use cases to find out.

While most people might assume that manufacturers primarily design rugged devices for use in extreme weather conditions, the market is much more diverse than that. For example, healthcare workers need devices that can withstand multiple daily decontamination rituals and survive accidental drops.[1] And the PGA TOUR uses Dell Rugged Tablets to share precise shot information with fans using the mobile app.[2]

In an interview with Jean-Paul Velazquez, a solution architect and senior advisor at Dell Technologies, FedTech reports, "The rugged devices initially drew interest from the military, but eventually were seen as the ideal devices for those working in unpredictable conditions in the field. The devices are designed to survive being dropped, coming in contact with water or being exposed to the elements, Velazquez says." In the article, Velazquez also offers the example of an employee in the field testing soil samples: "The main concern was how to clean the dirt and mud off the 12-inch notebook the employee was using."[3]

Melissa Arnot, a mountain climber who has summited Mt. Everest multiple times, took a Dell Rugged device on her 2014-2015 climbs because of the performance advantages the Dell technology brought to "mission-critical work on the snowy peaks of the Himalayas."[4]

Intrigued? Read on for a detailed look at what Dell Rugged devices offer as well as the benefits a wide range of people have realized by choosing these tablets and laptops.

## Some group experiences

**Field services –** Rapid access to dispatch, job order, and other pertinent product or service delivery information is imperative to perform services in this vector. In one use case we found: "SHI [Software House International] assessed the needs of the [nation's fastest growing utility damage-prevention] customer's environment – both in the field and on the network - and weighed the options of several rugged laptop manufacturers. After a one-month evaluation by the company's field technicians, the customer declared Dell the winner."[5]

**Manufacturing and warehousing –** Whether we're talking about machine operators, floor supervisors, production engineers, quality controllers, or inventory/logistic workers, reliable tech is vital to automated and manual operations. For example: "Mobile computing problems in the warehouse can place undue stress on employees and operations. Whether it's connectivity or ergonomic issues, mobile technology in the warehouse can quickly hinder productivity rather than help employees work more efficiently when not strategically planned out."[6]

### The rugged devices we researched

**7220 Rugged Extreme Tablet**

This 12-inch tablet is built for the harshest environments, whether that's at a desk, in a vehicle, or in the field.[9]

**7220EX Rugged Extreme Tablet**

This 12-inch military-grade armored tablet is durable and resilient, with the ATEX and IECEx certifications required in potentially explosive environments.[10]

**5420 Rugged Laptop**

This 14-inch laptop is built to handle demanding tasks. It is the lightest (4.9 pounds) of the laptops we reviewed and includes an outdoor-viewable screen.[11]

**5424 Rugged Laptop**

The main differences between the 5420 and the 5424 laptops are that the 5424 is loaded with multiple expandability options and is slightly heavier (5.5 pounds vs. 4.9 pounds).[12]

**7424 Rugged Extreme Laptop**

This 14-inch military-grade armored laptop is built for tough jobs in hazardous environments.[13]

**Government and public safety** – When you're provisioning active-duty military personnel or civilian agency professionals in disaster zones, tech downtime can be life-threatening. Sanjoy Datta, Senior Systems Analyst for the LAPD, has this to say, "Compared to its competitors, Dell gives us excellent products at great pricing with superb service. And Latitude is an amazing line of products. It's really an unbeatable solution."[7]

**Oil and gas** – According to Dell, "No different to other industries, the Agriculture, Chemical, Manufacturing and Oil & Gas sectors are undergoing a digital transformation. There's a demand to train more skilled workers in these fields, along with a growing desire — and often regulatory need — to continuously modernize equipment so that engineers and field workers can operate safely and efficiently. Reliable, durable Dell Rugged devices are often a must have in these specialist roles."[8]

## Certification meanings

**MIL-STD-810G/H certification**: Devices that have this certification have gone through a variety of environmental durability tests (e.g., altitude, high and low temperatures, rain, humidity, salt fog, and dust.)[14]

**IP (ingress protection) ratings:** This rating is, according to The Enclosure Company, "used to define levels of sealing effectiveness of electrical enclosures against intrusion from foreign bodies (tools, dirt, etc.) and moisture."[15]

**IP53-rated**: Limited dust and splashing water protection.[16]

**IP65-rated**: Dust tight and protected from pressurized jets of water.[17]

**ATEX and IECEx certification**: Standards for durability in potentially explosive atmospheres.[18]

Figure 1: The Dell Rugged Laptop family. Source: Dell Technologies.

## What makes a device rugged?

There's no single definition for what makes a device rugged. Every manufacturer measures their rugged devices against slightly different tests and standards. Brian O'Connell, a business.com writer, summed up semi-rugged and fully rugged devices nicely:

**Semi-rugged devices** are business-oriented computers with "all the same components as you'd find in a non-rugged model, but those components are often better protected. For instance, you'd likely find a spill-resistant keyboard on a laptop and a thicker case."[21]

**Fully rugged devices** go through more rigorous testing to make sure they withstand extreme temperatures, can be dropped, and "are impervious to water or dust."[22]

Dell documentation shows that Dell has "a unified team of engineers and testers whose sole job is to take Dell Rugged to the breaking point, then figure out how to improve it. It's what we call "testing to fail"–going beyond the baseline industry standards to find the true limits of our products, because we know the rugged market is unique and your customers' experiences don't fit squarely into a check box. The team shares best practices, lessons learned and other knowledge to enhance the overall strength of our product portfolio."[23]

All the Dell tablets and laptops in this report include:

- FirstNet Ready™ badges (FirstNet is a service that provides highly secure and prioritized network access to first responders)
- USB-C® connectivity
- Outdoor-readable screens
- Glove-touch capability
- RGB backlit keyboards
- Webcams with privacy shutters
- Intel® processors
- Intel 802.11ac Wi-Fi[24]

According to Dell, all Rugged devices go through rigorous testing at the Dell Rugged testing facility to ensure durability before they go to market.[25] These devices are also independently certified to MIL-STD-810G/H and IEC ingress protection standards.[26]

## The "problem" with outdoor-readable screens

Our research shows that having an outdoor-readable screen is not all about brightness—it's about finding the balance among brightness, reflectivity, and backlight.[19] All Dell Rugged devices balance brightness and backlight with an anti-reflective treatment, which makes them outdoor-readable.[20]

## Dell Rugged Extreme Tablets

Having a rugged tablet that is more portable and weighs less than a typical rugged laptop is a boon for many sectors. This is especially true for users who are typically on foot, such as field service and military personnel who may have payload considerations they must also keep in mind. These fully rugged, IP65-rated Dell Rugged Extreme Tablets weigh in at between 2.9 and 3.6 pounds —that's half the weight of a Latitude 7424 Rugged Extreme Laptop! Plus, these Dell Rugged Tablets come with quad-core CPUs and LCD outdoor-readable displays. Their anti-glare and anti-smudge 1,000-nit polarized displays are also glove-touchable.[33]

### Latitude 7220 Rugged Extreme Tablet

According to the "A year with Dell's powerful and very rugged 12-inch tablet" Rugged PC Review, the Latitude 7220 Rugged Extreme Tablet is a "very competent tablet solution with enough performance and connectivity, very good expandability, and an excellent optional detachable keyboard that we highly recommend."[34] According to AnandTech, "The tablet not only offers Wi-Fi 5/6 and Bluetooth (which can be hardware disabled for military-bound devices), but also can include an optional Qualcomm Snapdragon X20 4G/LTE modem…"[35] They continue, "Dell's Latitude 7220 Rugged Extreme can be configured to cover all the [security] bases. The tablet has a fingerprint reader, Dell's ControlVault advanced authentication, Intel vPro® remote management, a TPM 2.0 module, optional encryption for SSDs, and NIST SP800-147 secure platform."[36]



Figure 2: Latitude 7220 Rugged Extreme Tablet.
Source: Dell Technologies.



Figure 3: Latitude 7220EX Rugged Extreme Tablet.
Source: Dell Technologies.

### Latitude 7220EX Rugged Extreme Tablet

Natalia Snow, a reviewer at TabletGuide, writes that this tablet ensures the safety of engineers and professionals working in agriculture, chemical manufacturing, oil and gas, and other potentially explosive environments.[37]

According to TechRadar Pro, the Latitude 7220EX Rugged Extreme Tablet is "an upgrade on some of Dell's previous similar devices with a more up-to-date processor, and more protection."[38]

## Certification specs for the Latitude 7220 and 7220EX Rugged Extreme Tablets

### MIL-STD-810G/H survival list

Transit drop (48"/1.22m; single unit; 26 drops), operating drop (36"/0.91m), blowing rain, blowing dust, blowing sand, vibration, functional shock, humidity, salt fog (with rubberized keyboard), altitude, explosive atmosphere, thermal extremes, thermal shock, freeze/thaw, tactical standby to operational.[27,28]

### Safe temperature ranges

**Usable in these temps:** (on AC power): -20°F to 145°F (-29°C to 63°C).

**Unhurt, but non-operational in these temps:** -60°F to 160°F (-51°C to 71°C).[29,30]

### Battery overview

**Primary lithium-ion battery:** 34-Whr, 2-Cell with ExpressCharge. These batteries are user-replaceable and dual hot-swappable.

**Secondary lithium-ion battery:** 34-Whr, 2-Cell.[31,32]

## Latitude Rugged and Rugged Extreme Laptops

Among others, teams working to help regions recover from natural disasters, collect agricultural samples, or locate fugitives need mobile computers. These Dell laptops all come with up to quad-core CPUs and 14-inch LCD anti-glare displays. Their keyboards are sealed, and the devices come in fully rugged and semi-rugged models.[42]

AnandTech says, "When it comes to performance and general capabilities, all the [Rugged] laptops offer the same set of features. All three models are similarly end-to-end secure and manageable, their key differences are in levels of protection against extreme handling or environments. All of them can survive a drop or two and operate under thermal extremes, yet the Rugged Extreme model is more fit for such things than the remaining two. All the new units are also compatible with existing infrastructure supporting Latitude Rugged machines, so industrial, military, and other customers can buy the new laptops knowing that they can easily replace their predecessors and will not require any additional hardware-related investments."[43]

### Latitude 5420 Rugged Laptop

Windows Central has this to say about the IP53-rated Latitude 5420 Rugged Laptop, which was their rugged pick in 2019: "Rocking an Intel Core i3-7130U processor, 8GB DDR4 RAM, 1080p display, a hot-swappable 51Whr battery, and a 128GB PCIe M.2 hard drive, this laptop is designed for serious computing in the field."[44,45]

*"Get access to the high-capacity and nationwide LTE network with FirstNet Ready™ Dell notebooks."—Dell[46]*



Figure 4: Latitude 5420 Rugged Laptop. Source: Dell Technologies.

*"The Dell Latitude 5420 Rugged offers an extremely bright display and long battery life in a chassis that can withstand the harshest elements." —LaptopMag[47]*

## Certification specs for the Latitude 5420 Rugged Laptop

### MIL-STD-810G/H survival list

Transit drop 36"/.91m; single unit; 26 drops, operating drop (36"/0.91m), blowing dust, vibration, functional shock, humidity, altitude, thermal extremes.[39]

### Safe temperature ranges

**Usable in these temps:** -20°F to 140°F (-29°C to 60°C).

**Unhurt, but non-operational in these temps:** -60°F to 160°F (-51°C to 71°C).[40]
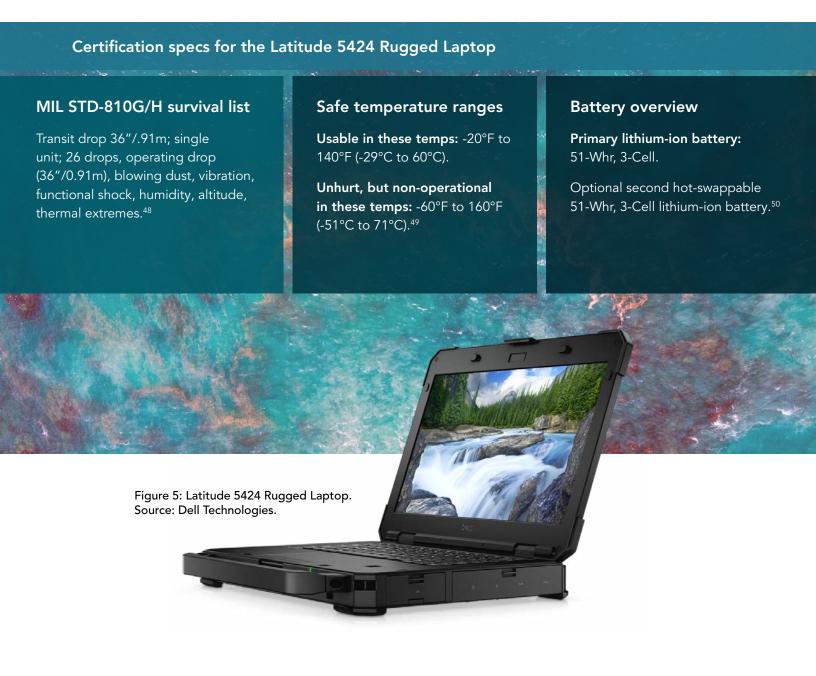
### Battery overview

**Primary lithium-ion battery:** 51-Whr, 3-Cell.

Optional second hot-swappable 51-Whr, 3-Cell lithium-ion battery.[41]

*"The 1,920-by-1,080-pixel touch screen is the Dell's best feature—it's exceptionally bright, with sky-high contrast and colors that pop. White backgrounds glow like ski slopes on sunny days. Viewing angles are wide and details are crisp."—PCMag[53]*

## Latitude 5424 Rugged Laptop

This semi-rugged, IP53-rated laptop is suitable for work where a waterproof device is not necessary. Dell says this device is "loaded with multiple expandability options", such as a DVD RW or Blu-ray drive, multiple storage bays, and PCMCIA or ExpressCard.[51] We also found you can also order an optional Direct-View outdoor readable display with an optional glove-capable capactive touchscreen, which senses when a gloved fingertip is touching the screen.[52]

## Certification specs for the Latitude 5424 Rugged Laptop

### MIL STD-810G/H survival list

Transit drop 36"/.91m; single unit; 26 drops, operating drop (36"/0.91m), blowing dust, vibration, functional shock, humidity, altitude, thermal extremes.[48]

### Safe temperature ranges

**Usable in these temps:** -20°F to 140°F (-29°C to 60°C).

**Unhurt, but non-operational in these temps:** -60°F to 160°F (-51°C to 71°C).[49]

### Battery overview

**Primary lithium-ion battery:** 51-Whr, 3-Cell.

Optional second hot-swappable 51-Whr, 3-Cell lithium-ion battery.[50]



Figure 5: Latitude 5424 Rugged Laptop. Source: Dell Technologies.

## Latitude 7424 Rugged Extreme Laptop

This fully rugged, IP65-rated laptop is purpose-built for first responders and field services. It includes FHD (full high definition) display resolution on an outdoor-viewable screen, and the glove-capable touchscreen is responsive, even if the user is wearing protective gear.[57]

Sam Medley, a reviewer at NotebookCheck, found that "Port selection is excellent. […] Every port is kept behind dust-tight and water-resistant doors." And, "Wireless connection speeds and strength leave no complaints. Send and receive rates are speedy, and connections are rock steady. We experienced no dropped signals up to about 35 meters through two interior walls and an exterior brick wall."[58]



Figure 6: Latitude 7424 Rugged Extreme Laptop.
Source: Dell Technologies.

## Device deployment and management

According to information on the Dell website, "Dell Technologies Unified Workspace is a portfolio of solutions focused on simplifying the PC lifecycle environment with modern solutions for deployment, security, management and support. Give your employees seamless, hassle-free experiences with industry leading expertise from VMware, SecureWorks and Dell, no matter where they work."[59]

Get complete support for all your hardware and software needs, including 24x7x365 priority access to expert technicians, with Dell Technologies Support Services.[60]

## Certification specs for the Latitude 7424 Rugged Extreme Laptop

### MIL-STD-810G/H survival list

Transit drop 72"/.91m, 60"/1.52m, 48"/1.22m; single unit; 78 drops, operating drop (36"/0.91m), blowing rain, blowing dust, blowing sand, vibration, functional shock, humidity, salt fog (with rubberized keyboard), altitude, explosive atmosphere, solar radiation, thermal extremes, thermal shock, freeze/thaw, tactical standby to operational.[54]

### Safe temperature ranges

**Usable in these temps:** -20°F to 145°F (-29°C to 63°C).

**Unhurt, but non-operational in these temps:** -60°F to 160°F (-51°C to 71°C).[55]

### Battery overview

**Primary lithium-ion battery:** 51-Whr, 3-Cell.

Optional second hot-swappable 51-Whr, 3-Cell lithium-ion battery.[56]

Figure 7: The Dell Rugged Laptop family. Source: Dell Technologies.

## Conclusion

Dell claims that Rugged devices are "Built to withstand the world's harshest environments while maintaining the highest levels of performance and connectivity."[61] When the Reidsville, NC PD needed to replace their existing patrol-car laptops (which took up significant room, were too cumbersome to remove and use outside the vehicle, and made emergency passenger-side exiting difficult), the city replaced the laptops with Dell Rugged Tablets. Now, the officers have more room and use the tablets to take pictures.[62] Rhonda Wheeler, director of IT for the City of Reidsville, says, "Like everything I've used from Dell in over 20 years, the Rugged Tablet is extremely reliable and comes with excellent tech support. The environmental performance is excellent."[63]

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