

**POSITION PAPER**

# **YOUR RADIO IS ONLY AS RELIABLE AS THE BATTERY THAT POWERS IT**



**MAKE SURE IT'S PROVEN TOUGH.**

# IF YOUR BATTERY ISN'T WORKING, YOU'RE NOT WORKING.

On the manufacturing line or the fire line, at a crash site or a construction site, you rely on a two-way radio that operates continuously – that won't stop when it's dropped, won't break when it's shaken, or won't fail when it's shocked by static electricity. Whether you're in public safety or private enterprise, radio batteries that can't handle the rigors of the real world aren't a bargain. Because when a radio battery dies and your radio stops, you can't do your job.

We understand that uninterrupted communications are business-essential and mission-critical. There is no margin for error and no room for malfunction. And we know that other leading radio battery brands don't deliver what we do. Highly reliable, high-performing batteries that are proven tough. Time after time. Test after test.

## **OUR RADIOS AND BATTERIES PERFORM OPTIMALLY TOGETHER. BY DESIGN.**

Unlike aftermarket battery brands, Motorola batteries are designed and developed as an integral component of our two-way radios. No other aftermarket battery manufacturer can offer that certainty and compatibility with Motorola radios. We engineer, manufacture and test to stringent specifications to make sure our batteries withstand the most unforgiving environments. So you can be confident our radio batteries perform reliably, when you need them most.

We also offer "intrinsically safe" (IS) batteries that are approved for use with the Motorola intrinsically safe approved radio unit. We can only ensure the continued certification and compliance of our radios with the use of Motorola approved intrinsically safe batteries.



## **ADVANCED IMPRES™ BATTERIES AND CHARGERS**

Along with our standard Motorola radio batteries, we also offer our exclusive IMPRES "smart energy" system. This exclusive battery technology provides adaptive reconditioning and end-of-life display to maximize your talk-time and battery cycle life – all automatically. You can safely leave batteries on the IMPRES charger without damaging them and keep your batteries fully charged. So you can be confident they are always ready and your radio is ready to work, right when you need it.

Motorola IMPRES batteries and chargers also enable the implementation of our industry-exclusive IMPRES Battery Fleet Management System. A software application that enables unprecedented data collection and analysis allowing you to better manage the health and status of your IMPRES batteries.

# WHAT'S THE ANATOMY OF A TOUGH BATTERY?

**Every Motorola battery is designed and manufactured to meet our demanding standards.** Here's why our batteries surpass the rest:

## PREMIUM CELLS

We only use premium-grade cells so you get higher capacity, longer cycle life and a wider temperature range (from as low as -30°C to as high as 60°C). Our cells are so uniform and well made, you can count on the same high energy, high number of charge cycles and lasting durability in virtually every battery.

## FLEXIBLE COPPER CIRCUITRY

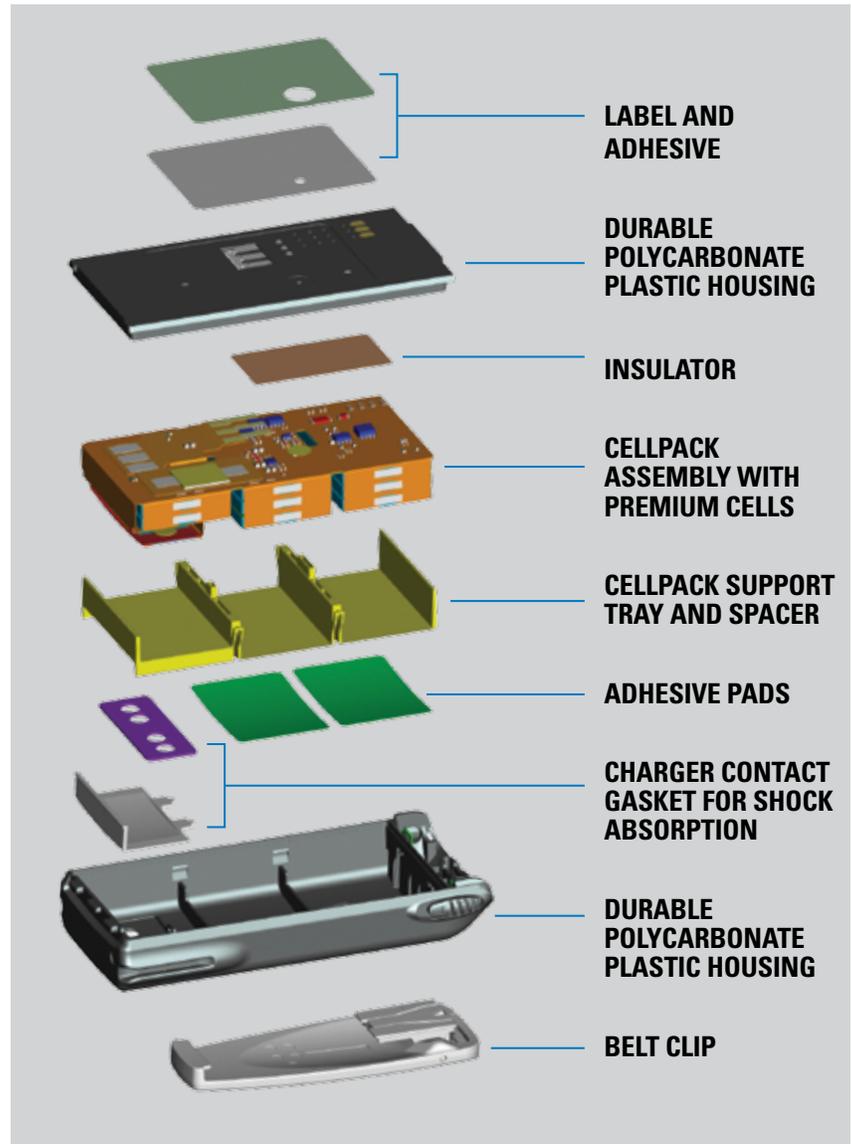
Unlike the thin wires used for some internal battery connections in the brands we tested, we use circuit boards and other more reliable means to make electrical connections between components in our batteries. So, when the radio gets dropped, our batteries can tolerate higher levels of impact force.

## SHOCK- ABSORBING PADDING

We choose shock-absorbing materials to protect the cell pack and circuitry. By dampening shock and vibration inside the battery, we reduce the negative effects of sudden impact. Other brands we tested eliminated padding, which can mean their batteries are more easily damaged during a drop.

## DURABLE POLYCARBONATE PLASTIC

For our battery housings, we specify only polycarbonate plastic for optimal protection and performance. Our housings are strong, robust and designed to "bend and flex" when dropped.



Every component of our battery is built tough from the inside out. We start with premium cells, add shock absorbing spacers and materials and complete the design with a durable polycarbonate plastic housing. Even the belt clip is designed to absorb some impact when a battery is dropped. Finally, we complete our battery design with state-of-the-art computer-controlled assembly equipment. All of this is done to help ensure you have a battery that performs in even the toughest conditions.

# DROPS. SHAKES. SHOCKS. WE TOOK ON THE WORST AND PERFORMED THE BEST.

**We proved how tough we were five years ago and are proving it again.**

Our batteries were put through the paces and lab-tested against competitive batteries. Can other manufacturers match the standards we achieved?

Thirty samples of each battery type were randomly selected and scrutinized: Motorola, Honeywell, Power Products and Multiplier. All are compatible with our most popular two-way radios.

Three critical tests were conducted: Drop, Vibration and Electrostatic Discharge. These replicate real-world situations that occur most often during typical battery use. The result? Once again, Motorola batteries surpassed the others in durability, performance and surviving electrostatic discharge.



## TOUGHER THAN THE REST IN THE DROP TEST

**A firefighter scrambling up a ladder.** A supervisor walking the assembly line. A hospitality manager making rounds at a hotel. Whether you set it down or clip it on, one thing is certain: every radio gets knocked or dropped, over and over. Will it work when you pick it up? Is the battery tough enough?

### TEST PROCEDURE

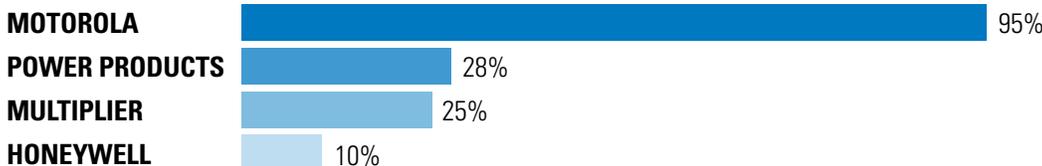
Using the same test set-up the U.S. military does for its equipment (MIL810F Method 516.5), each battery was attached to a Motorola radio and dropped four feet onto concrete. Each surface of the battery went through seven cycles of being dropped once on all six sides – for a total of 42 impacts.

### PASS/FAIL CRITERIA

Each battery was inspected and failed if they experienced the following problems: cracking or splitting open, damage to the radio connection or an inability to charge.

### RESULTS

95% of Motorola batteries passed the test.



# TOUGHER THAN THE REST IN THE VIBRATION TEST

**A construction crew jack hammering a road.** A maintenance worker handling heavy equipment. Engine 36 racing to a structure fire. Whether you place it on the seat or put it on a belt, one thing is certain: every radio gets shaken, repeatedly. Will it work when you pick it up? Is the battery tough enough?

## TEST PROCEDURE

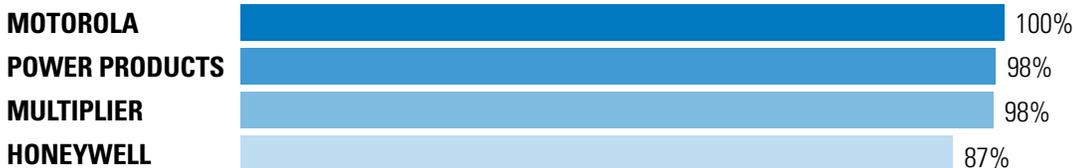
Using the same test set-up the U.S. military does for its equipment (MIL810F Method 514.5), each battery was tested for its ability to withstand sine vibration (regular, repeating pattern) and random vibration – for a total of 12 hours.

## PASS/FAIL CRITERIA

Each battery was inspected and failed if they experienced the following problems: cracking or splitting open, damage to the radio connection, an inability to charge or a failure to discharge.

## RESULTS

100% of Motorola batteries passed the test.



# TOUGHER THAN THE REST IN THE ESD TEST

**A dockworker unloading a semi.** A construction worker operating a crane. An officer getting in and out of a squad car in cold weather. Whether you carry it or clip it, one thing is certain: every radio is exposed to static electricity when you least expect it. Will it work when you pick it up? Is the battery tough enough?

## TEST PROCEDURE

Using the same standards set by the International Electro-technical Commission (IEC6100-4-2), electrostatic discharge tests were conducted for both contact discharge (10 discharges each at three different voltages, up to 8kV of both positive and negative polarity) on each battery contact and for air discharge (10 discharges each at five different

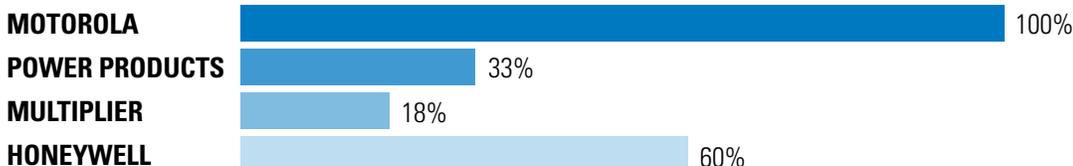
voltages, up to 15kV of both positive and negative polarity) per the standard.

## PASS/FAIL CRITERIA

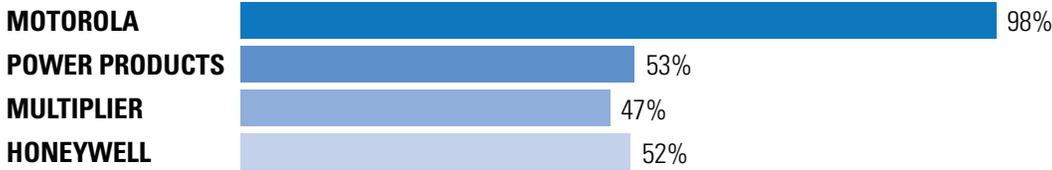
Each battery was inspected after every 10 discharges and failed if it did not charge or power up.

## RESULTS

100% of Motorola batteries passed the test.

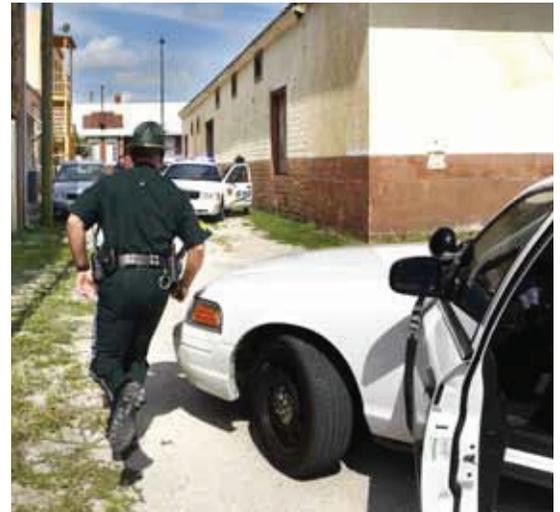


# TOUGHER THAN THE REST, NO MATTER THE TEST



## HAZARDS THAT HARM OTHER BATTERIES WON'T AFFECT OURS.

**Knocks. Drops. Shocks. Vibration. Static.** If your radio gets banged on a ride, rattled by heavy equipment or shocked by static electricity, our batteries will stay true and stand tough. These rigorous lab tests prove that Motorola radio batteries perform robustly and reliably, despite the toughest conditions. What's more, we stand behind every battery we build. (See [www.motorola.com/proventough](http://www.motorola.com/proventough) for details)



## WE WON'T COMPROMISE ON PERFORMANCE. WHY WOULD YOU?

**Communication breakdowns are frustrating and unproductive.** And downtime can be dangerous when information doesn't get through. Help protect the safety of your workforce and the success of your projects by using high-quality Motorola batteries. Protect your system investment with long-lasting, rigor-tested Motorola batteries designed specifically for our radios and engineered precisely to our standards.

Whether you're a police officer on the street or a supervisor on the factory floor, count on our 80 years of engineering expertise to keep communications going strong. Your responsibilities are tough enough... make sure your radio battery is too.

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