

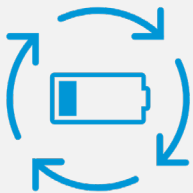


Infosheet

# Mitigating Swelling In Lithium-ion Batteries with HP Battery Health Manager

HP and other technology manufacturers have moved to the use of lithium-ion polymer batteries due to their increased energy density, light weight, and outstanding ability to charge quickly and efficiently. While delivering several benefits to end-users, lithium-ion polymer batteries may swell over time, raising concern with end-users and IT departments.

HP Battery Health Manager is a simple and effective way to help mitigate key factors that can accelerate battery swelling of lithium-ion polymer batteries in your environment.



Accelerated Lifecycle Stress Testing has shown that HP Battery Health Manager can help mitigate battery swelling

## Understanding Battery Swelling in Lithium-Ion Batteries

As with all batteries, lithium-ion polymer batteries are consumable and will chemically degrade over time, eventually needing to be replaced. As lithium-ion batteries age, a small amount of gas is generated within the battery cell, leading to swelling. Battery swelling is inherent in lithium-ion battery technology and, in most cases, is very minimal over the life of the battery.

Battery swelling is not a direct safety issue and the battery will continue to function normally as the battery swells over time. As an industry-wide standard and best practice, the battery casing is designed to undergo significant expansion. While a measured amount of battery degradation and swelling over time is normal, there are specific factors that can accelerate this process. This acceleration can result in the battery swelling to the point that it impacts or deforms the notebook chassis. Battery swelling can be accelerated by multiple factors including long-term exposure to a high state-of-charge and elevated temperatures.





## High State-of-Charge: Key Factor that Can Accelerate Battery Swelling

One of the primary factors that can accelerate swelling in lithium-ion batteries is keeping the battery in a high state-of-charge over a long period of time. A battery is considered to be in a “high state-of-charge” when it is continuously connected to AC power and the charge level remains between 90% -100%. Keeping a lithium-ion battery consistently in a high state-of-charge creates additional stress on the battery which can accelerate battery swelling.

## Using HP Battery Health Manager to Help Mitigate Battery Swelling

The HP Battery Health Manager is a BIOS-level setting available in most HP Business Notebooks. It is designed to help mitigate the exposure of the notebook battery to key factors that can accelerate battery swelling over time such as high state-of-charge and long-term exposure to elevated temperatures. HP recommends that customers enable HP Battery Health Manager to one of the two options below based on usage and/or the age of the notebook.

### Let HP Manage My Battery Charging

**What Does It Do:** Dynamically changes how the notebook charges the battery based upon usage conditions and temperature over time.

**When Should You Use It:** Ideal for a new notebook or notebooks less than a year old that are used in a mixed-use environment (where the notebook is regularly taken off AC power).

### Maximize My Battery Health

**What Does It Do:** Limits the maximum state-of-charge on the notebook battery to 80%, resulting in minimal stress on the battery.

**When Should You Use It:** Ideal for notebooks more than a year old or where the notebook is continually plugged into AC Power for long periods of time (i.e., remote workers).

	Let HP Manage My Battery Charging	Maximize My Battery Health
Mixed Use Environments (AC / Battery)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Notebooks < than 1 year	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Notebooks That are Always on AC Power	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Notebooks More than 1 Year	<input type="checkbox"/>	<input checked="" type="checkbox"/>



## Changing HP Battery Health Manager Settings: Multiple Ways To Update Settings Across Your Install Base

Customers that do not have HP Battery Health Manager in their BIOS should update their BIOS immediately to the latest version available on [www.hp.com](http://www.hp.com). By updating to the latest BIOS, HP Battery Health Manager will automatically be enabled to *Let HP Manage My Battery Charging*, providing a first line of defense against those factors that can accelerate battery swelling over time.

To see the minimum BIOS requirements required to enable HP Battery Health Manager, visit <https://support.hp.com/us-en/document/c06179452>.

## Stay Protected with HP Battery Health Manager: Update Your BIOS to the Most Current Version

Customers with HP Battery Health Manager in their BIOS can update their Battery Health Manager Settings manually or by using a number of Microsoft or HP client manageability tools. It is important that customers proactively enable the recommended settings in the HP Battery Health Manager based upon the usage and/or the age of the notebooks in their install base.



*While newer systems from HP have the HP Battery Health Manager enabled at the factory, older notebooks will require these settings to be manually enabled to ensure your install base is protected*

Enabling HP Battery Health Manager is simple to do and can be done using any of the following utilities:

1. HP Client Management Script Library (CMSL)
2. HP Manageability Integration Kit (MIK) for SCCM
3. HP Bios Config Utility (BCU)
4. HP Battery Health Manager BIOS Setting Update
5. HP Image Assistant (HPIA)
6. HP System Software Manager
7. HP Client Updates Catalog
8. HP Support Assistant
9. Microsoft PowerShell and WMI
10. Windows Update KB (KB4583263) <sup>1</sup>
11. Manually via F10

Contact your HP Account Team to learn more.

## Improving Lithium-Ion Battery Technology

HP is working with our battery cell suppliers and industry experts to develop new approaches to help reduce accelerated swelling in lithium ion batteries. This collaboration includes the development and implementation of new and improved charging algorithms, enhanced battery cell supplier qualifications, and the investigation of new battery chemistries that are more resistant to battery swelling.

<sup>1</sup> Changes Default setting from “Maximize My Battery Duration” to “Let HP Manage My Battery Charging” on older systems with HP Battery Health Manager. Windows Update KB4583263 will not update the BIOS.

