



## Milvent Vent with Valve protects the battery pack

Simulation Testing for different conditions.

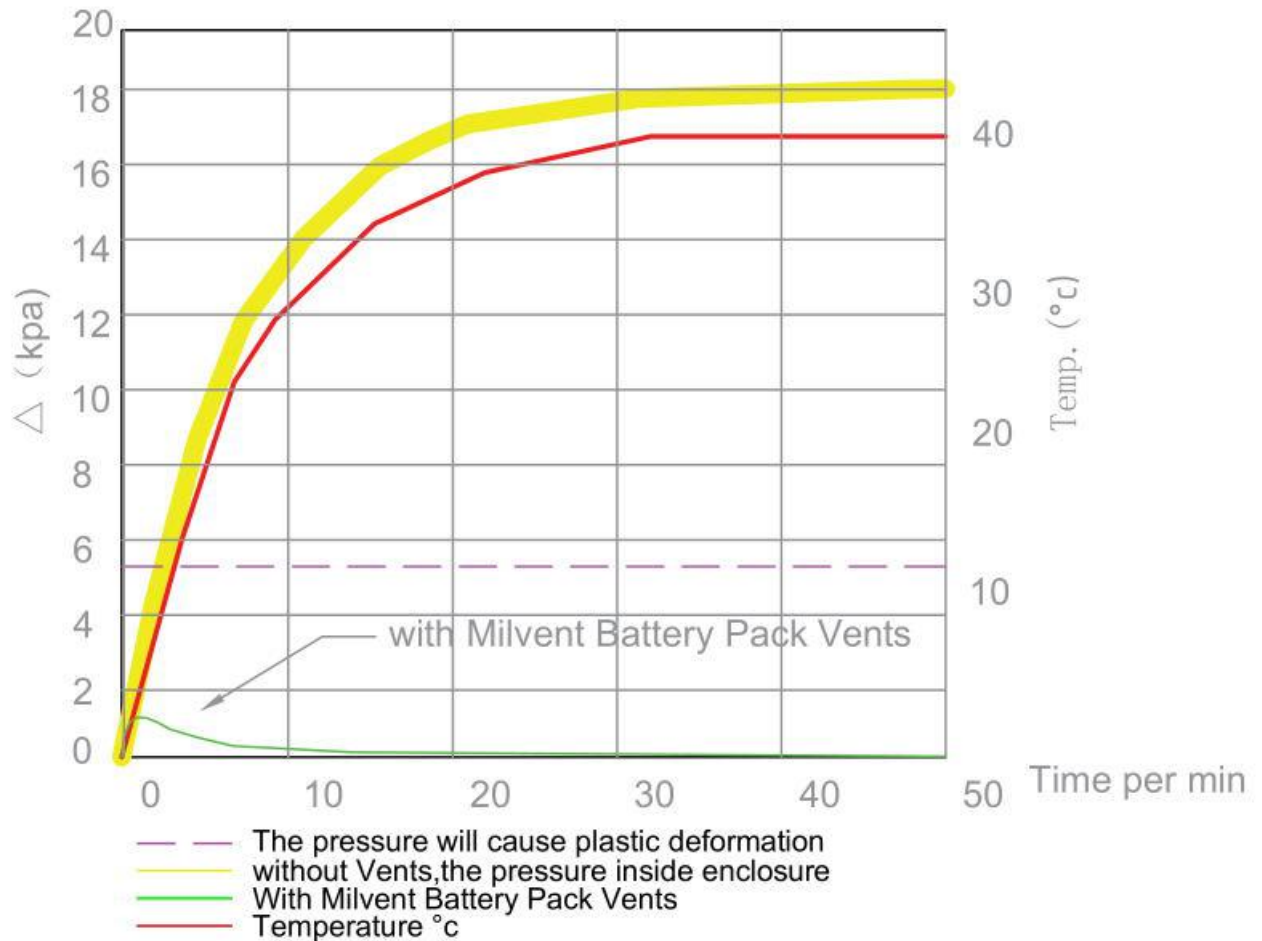
Allow release of excess pressure within the full EV battery pack enclosure

With the development of electronic products and new energy vehicles, consumers have an increasing demand for power supply and energy storage, and have a higher and higher demand for environmental protection new energy products. Batteries gradually replace lead-acid batteries and are widely used in the fields of electronics, new energy vehicles and energy storage.

New energy lithium battery is one of the most important core components of new energy vehicles Power lithium battery refers to the lithium battery applied in power drive system, such as automobile lithium battery, man-machine lithium battery, power tool lithium battery, geological exploration, environmental monitoring, automobile model, airplane model, self-balancing automobile lithium battery, etc. Compared with ordinary consumer lithium batteries, the requirements of power lithium batteries are generally more special, high energy density, high volume energy ratio, wide temperature range, support high rate of discharge, longer cycle life, more safe. This requires high reliability of the battery, which can adapt to various harsh external environments, such as different temperature and pressure changes.

## Milvent's Vent with valve has three Stages of protection for the battery

**Stage 1:** The passive venting function can balance the pressure inside and outside the battery pack product, while preventing the dust and water.



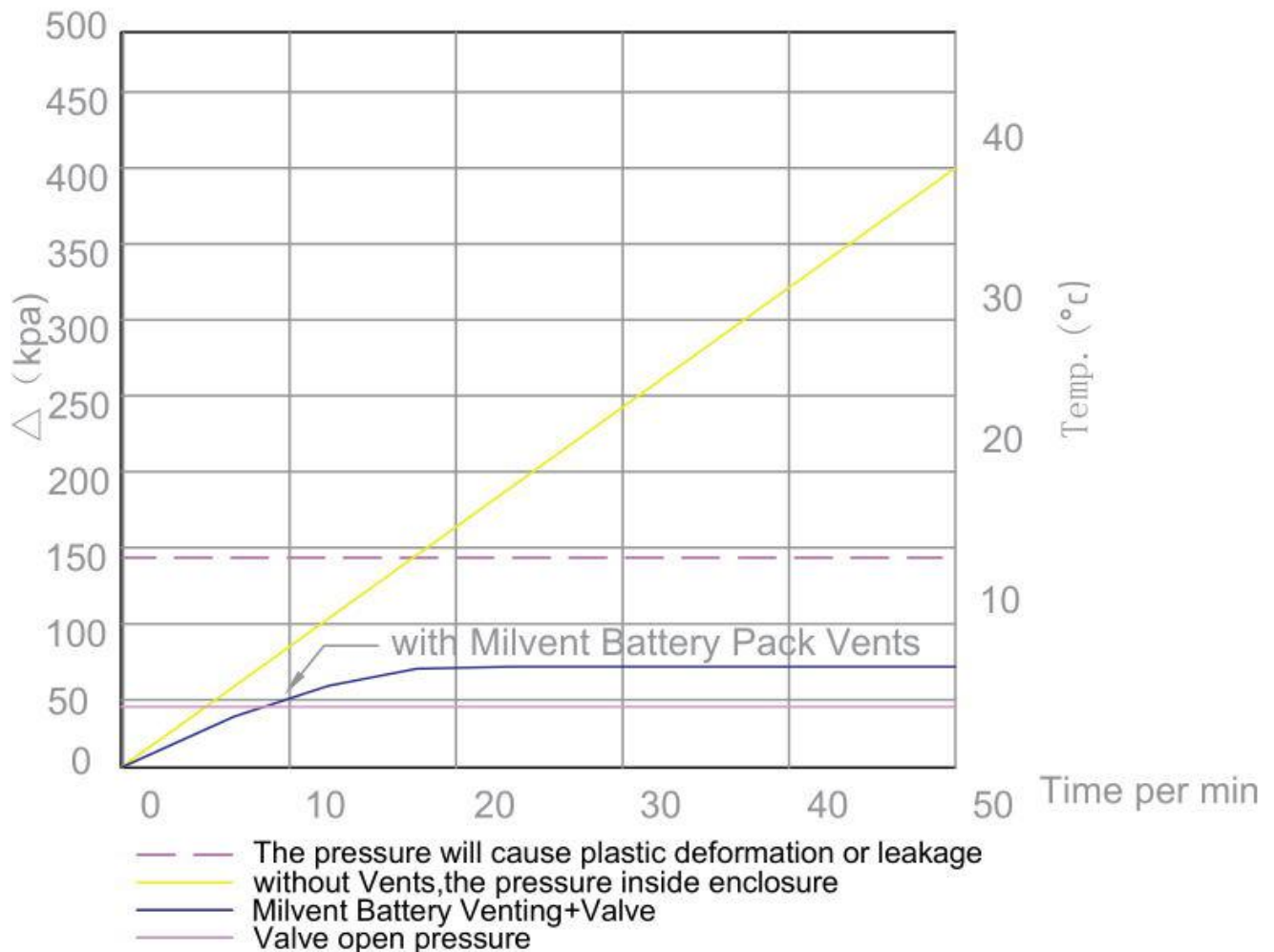
PIC 1. Curve changes under normal operation.

This curve simulates an environment with a rise of 50°C within 50 minutes. It simulates the situation of starting a car on high speed in cold weather. Under the condition of airtight, the internal pressure will reach about 18KPA. (Battery Pack Size: LxWxH=2148x1444x355mm). Battery Pack Housing material is Aluminum.

With **Milvent's battery pack vents with Vent with valve**, the differential pressure can be quickly reduced to less than 1kPa



**Stage 2:** when the temperature in the battery pack rises rapidly and the pressure and heat accumulate rapidly, the Vent with valve is actively started and the valve is opened  
To discharge excessive pressure and protect the battery.

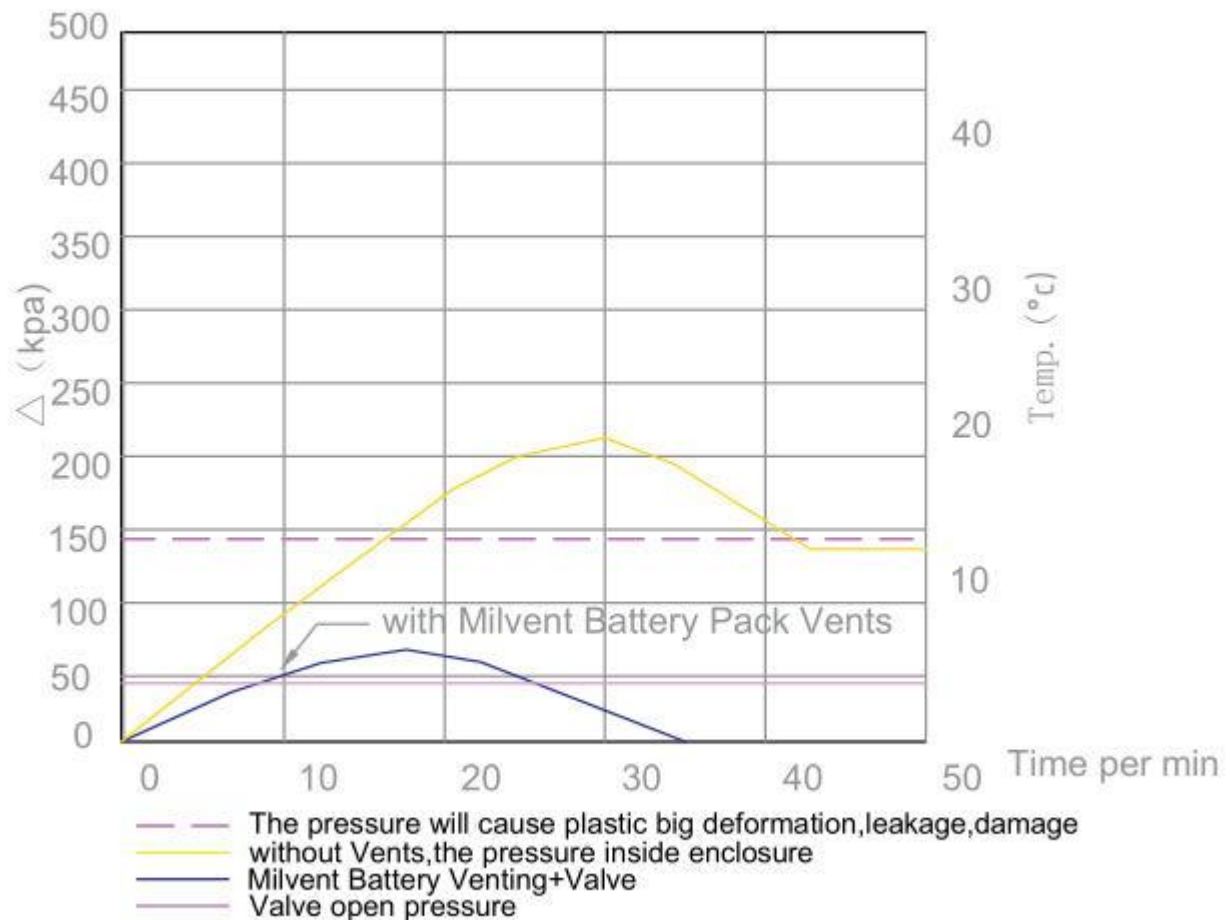


PIC 2. The internal curve changes when the battery heats up rapidly for a long time

This curve simulates rapid temperature rise for a long time in the case of out-of-control battery heat, and the pressure exceeds the pressure tolerated by the battery pack shell by 150kpa. The battery pack will burst if the battery pack is not vented quickly.

**Milvent battery pack Vent with valve** is fit for above application, and the internal design has the function of active ventilation + passive ventilation valve. In the case that the passive ventilation cannot meet the requirements of ventilation, the active ventilation valve can be opened to provide additional pressure for exhaust. It can be seen from the simulation curve that the pressure is about 70KPA, far less than the pressure value of 150kpa. Can effectively protect the battery pack.

**Stage 3:** When the pressure returns to normal, the valve of stage 2 will resume and close and be ready at any time. Active ventilation continues.



**PIC 3. Rapid temperature rise of short time battery and normal internal curve changes.**

This curve simulates the situation of rapid temperature rise in a short time under the condition of out-of-control battery heat, pressure exceeding 150kPa tolerated by battery pack housing, and then resuming normal operation.

**Milvent battery pack Vent with valve** is fit for above application, and the internal design has the function of active air vent valve, which can be reused: it can be opened and then closed as the battery pack pressure returns to normal, to continue the next repetition work.

**Milvent's Vent with valve** breaks through the design and improves the destruction-type design on the market. When the battery pack gets out of control and returns to normal in a short time, Milvent's battery pack Vent with valve can be reused.

From the practical application of the battery case is more complex, also may occasionally heats up quickly and then return to normal, not a momentary short more than normal pressure, the battery is not continue to use, as our mobile phone batteries, sometimes running program is overmuch, cause overload battery heating up too fast, but excess load program operation, mobile phone batteries will be back to normal, the temperature of the battery also can continue to use.



Milvent's battery Vent with valve is **designed to be reusable** to protect the battery against complex and changing conditions.

From the perspective of technology development, automotive power battery technology is the bottleneck technology that restricts the industrialization process of electric vehicles.

With the industrialization of electric vehicles gradually thorough, and key enterprises are intensify efforts to the development of power battery industry, based on new materials and structure of the ratio can power battery technology has become a global focus and enhance the vehicle power battery safety, life, low temperature characteristics of lower cost is the direction of the industrial technology development. So it is very important to use the Vent with valve with high reliability.

Currently Milvent battery pack venting with Vent with valves are available in both plastic and metal materials. Please feel free to consult us, we will provide professional services.



Milvent team