

Technical note

Effects of soak back on pressure measurement

What is Soak Back?

Soak back occurs when an object or device under test releases heat, either of its own accord, or due to removal of a cooling medium. Common examples include automotive engine compartments, areas within close proximity to braking systems, aircraft engines and stationary engines.

In a vehicle, undergoing testing at a Proving Ground, the engine bay will rapidly heat up when the vehicle is stopped since there is no airflow over the engine and other components under the hood. This heat build-up is commonly referred to as Soak Back.

How does this affect pressure sensors?

The pressure sensor needs to survive the soak back temperature extremes. This includes the pressure sensing element, the electronics and the electrical connector or cable. Pressure sensors which can operate at temperatures rated to at least 250° F (~125° C) are normally required.

In addition to survivability, the accuracy of the sensor over temperature, it's compensated range, is an important consideration. This is especially true when a test continues, say after a 30-minute stop, since the temperature will have increased significantly in the area around the pressure sensor and will then decline rapidly as the cooling medium returns, creating a thermal transient; another potential error source.

Important factors to consider are;

- The compensated temperature range
- The accuracy over this temperature range
- The thermal transient response characteristic of the sensor

Lack of consideration of the above may lead to erroneous pressure measurements.

How do Druck address these requirements?

Druck has a broad experience in both aerospace and automotive applications addressing soak back concerns. The Druck range of Aerospace, Motorsport and the new ADROIT 6000 series have been designed to provide a high accuracy over a wide compensated temperature range whilst incorporating a rapid thermal response characteristic. Druck sensors have minimal thermal lag between the pressure and temperature signals used in the compensation electronics, making them ideal sensors for applications with soak back and temperature transients

You can read more here - [Download white paper.](#)

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