

Daily Thermetrics, a division of Daily Instruments Corporation, is internationally recognized for its excellence in designing, engineering, manufacturing, and delivering superior products to the demanding needs of our customers. The engineering staff and personnel at Daily Thermetrics are highly trained and dedicated to solve the problems and meet the challenges presented by the Refining & Petrochemical Industry. Clients around the world have relied on Daily Thermetrics' experience and expertise for over 35 years. Daily Thermetrics' world headquarters is in Houston, Texas, USA.



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VSS™ MAGNETIC Vessel Skin Sensors
Removable Magnetic Attaching Vessel Surface Temperature Measurement

VSS™ MAGNETIC Vessel Skin Sensors
for Coke Drums, Reactors, Tanks, and Piping



MAGNETIC VESSEL SKIN SENSORS (VSS™)

Effortless Surface Temperature Profiling for Vessels



AVOID HEADACHES: VESSEL SKIN TEMPERATURE MEASUREMENT

Refiners operating reactors, vessels, and tanks which are susceptible to temperature related integrity issues *should* employ the use of external surface temperature sensors for **hot-spot monitoring**.

Historically, identifying reliable methods to increase vessel skin temperature monitoring without increased risk to the integrity of the vessel (most commonly the avoidance of welding sensors directly to the vessel's surface) have proven challenging. Attempts have been made to **avoid welding to the vessel's surface while still accurately measuring surface temperature**, but each option has proven to contain significant drawbacks.

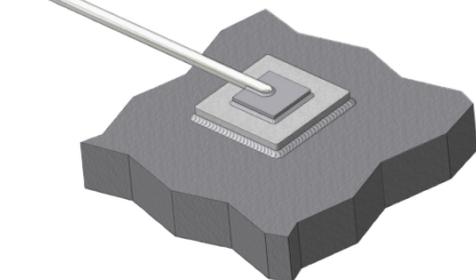
The dilemma is how to install a reliable and accurate surface temperature measurement device while also meeting these three criteria:

- AVOID WELDING TO VESSEL SURFACE POST VESSEL FABRICATION -
- SIMPLIFY REPLACEMENT OF SENSOR AS REQUIRED -
- ACHIEVE DIRECT SURFACE TEMPERATURE CONTACT -

COMMON VESSEL SURFACE SENSORS

The following are **cheap, unreliable sensor designs** that have historically been used to monitor vessel surface temperatures. These **standard industrial sensors will require replacement over time; both designs below create unnecessary challenges for replacement.**

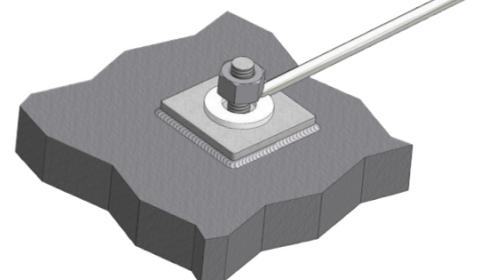
TYPICAL / COMMON WELDED "PAD TYPE" SENSOR



INSTALLATION: Pad is welded to the vessels surface during vessel fabrication or on-site under costly conditions and against mechanical best practices. Vessel insulation commonly covers this sensor.

REPLACEMENT METHOD: Pull back insulation, grind off or leave in place failed sensor; weld new pad type sensor at or near original location.

TYPICAL / COMMON BOLT-ON "WASHER TYPE" SENSOR



INSTALLATION: During vessel fabrication, a threaded stud is welded to vessel surface. Washer is placed over stud and bolted down. Vessel insulation commonly covers this sensor.

REPLACEMENT METHOD: Pull back insulation, un-bolt failed sensor; bolt new washer type sensor onto threaded stud.

THE BEST MAGNETIC SKIN SENSOR, GUARANTEED.

Unsurpassed in reliability and accuracy for real-time monitoring of temperature variations on ferritic vessel surfaces, **Daily Thermetrics' Magnetic VSS™** is the **best solution for increasing sensor density** without compromising the integrity of the vessel surface.

The **Magnetic VSS™** installs within seconds and provides optimum contact of the sensor to the vessel surface for the life of the sensor. When the job calls for **superior heat transfer**, accurate temperature measurement, and the ability to exchange sensors without successive welding, refiners turn to Daily Thermetrics and the Magnetic VSS™.

The **Magnetic VSS™ proprietary design allows for effortless replacement of the sheathed sensor without the need to remove vessel insulation or hot-work.**



VSS™ SUPER MAGNET

Rated to maintain superior contact with the vessel surface up to 1004°F (540°C) for continuous operation



PROPRIETARY SPRING ASSEMBLY

Specially engineered to maintain continuous, direct contact of the probe tip to the vessel surface



SHIELDED EXTENSION

Provided at customized/specified lengths to allow connection to remote heads and junction boxes

APPLICATION: DELAYED COKE DRUMS

Refiners seeking to increase the surface temperature monitoring on their coke drums without having to weld sensors to the surface will find the Daily Thermetrics' Magnetic VSS™ sensors to be a reliable and trouble-free solution.

As coke drums have historically been prone to hot-spots on isolated sections of the vessel, refiners with the capability to better profile the drum's surface can better defend against integrity issues.

APPLICATION: HIGH TEMP / HIGH PRESSURE REACTORS

Hydroprocessing reactors, especially those using expensive zeolite catalysts are prime candidates for the **MAGNETIC VSS™** sensor. Such a vessel requires a strong presence of internal, "catalyst bed measurements" in order to monitor the performance of the reactor.

One of the most significant limitations to operating temperature maximums of these applications is the temperature limits of the vessel walls. Monitoring these vessel walls will continue to become an increasing concern for refiners as demand for pushing the limits of the unit to increase profitability increases.

Employing the Magnetic VSS™ can assist in more reliable monitoring of such vessels.