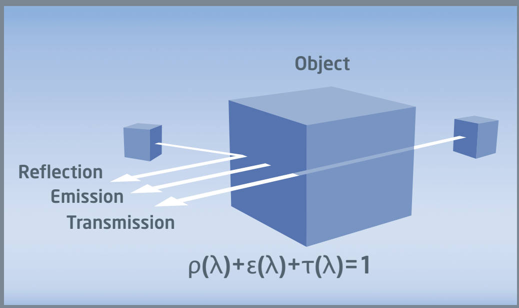
HSTV

High-speed Surface Temperature Visualization

Example measurement surface (picture above)

What can HSTV do?

- Detects infrared radiation from a surface in a temperature range from 300 to 1200 °C
- Determines temperature through radiation
- Works without contact or thermal inertia
- Measures the temperature, for example, of the washcoat in a catalytic converter during dynamic vehicle operation
- Provides flexibility as it can be used at any point in the catalyst or other components
- Visualizes temperature distribution on the surface being measured



Properties of a solid-body radiator

What do you need HSTV for on the combustion engine?

Reducing costs

- Reduced aging, lowering the quantity of precious metal for the catalytic converter

Protecting components

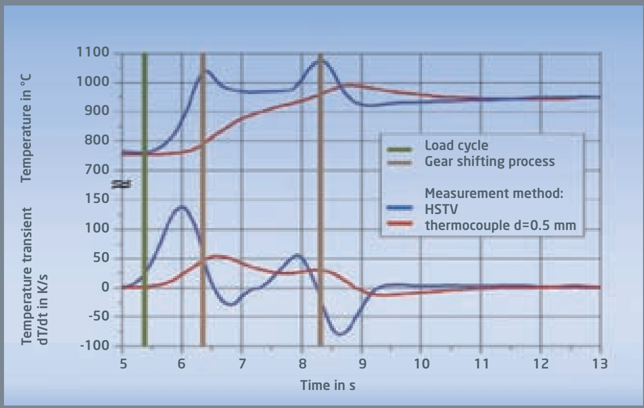
- Avoidance of damage, such as cell melting, cell cracking and stress cracking
- Measures to prevent down sliding monoliths in catalysts and particle filters

Reducing emissions

- Specific calibration of catalyst heating functions on cold start
- Reduced fuel consumption (enrichment necessity) at full load

Optimizing drivability

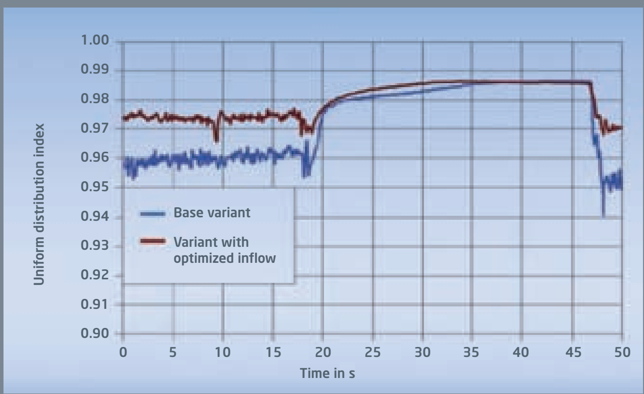
- Decreasing gear shift time
- Calibration of full-load - overrun - full-load transitions



Surface temperature in the catalytic converter during full-throttle accelerartion (example applications)

With HSTV, the true surface temperature curve of the catalyst for dynamic spark-ignition engine acceleration is plotted (e.g. load-cycle change or shifting process, see graph on the left) whereas the thermocouple used here only delivers a delayed and suppressed reading signal as a result of its thermal inertia.

Component thermal cycling over time is also shown with absolute precision with HSTV.



Uniform distribution of temperature on the end face of the catalytic converter

Using HSTV to display temperature distribution permits calculation of a uniform distribution index. The base (in the graph on the left) exhibits a much poorer distribution of temperature at high exhaust-gas volumetric flow (up to the 18th second) than the variant with optimized inflow. In the subsequent phase with low volumetric flow (up to the 47th second) the uniform distribution indices for both variants converge again.

Used on the particle filter, it is possible to display and assess burn-out during regeneration on a spatially resolved basis.

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