

Claas

# Noise analysis

## in view of eliminating cab noise

Aiming to ensure that the next generation of tractors is even quieter, the German manufacturer has opted for operational transfer path analysis.



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### OUR CUSTOMER

**Corporate name**  
Claas

**Activity**  
This German family business has been specialised in the design, manufacturing and distribution of farming equipment such as tractors and combine harvesters since 1913.

**Turnover**  
3.8 billion euros in 2015

**Workforce**  
11,500 employees worldwide

Despite the fact that noise levels in its machinery cabs are already well below the standard requirements in this respect, the German manufacturer Claas is aiming to take things a step further with its next generation of tractors. The acoustic service at its development centre in Vélizy (78) is focusing on operational Transfer Path Analysis (TPA), for this purpose. This technique can be used to determine the contribution of the active forces and the propagation paths of vibrations and noise at a given location. «*This is a particularly complex method*

*to implement, and we do not yet hold enough experience in this field, so we decided to opt for the support of experts in view of assimilation for future use*», explained the Acoustic Quality Customer Services Manager for Claas Tractor, Isabelle Raye.

### A 2-phase study

On this basis, the operational transfer path analysis was entrusted to Cetim. Phase 1: identify all components contributing noise and all transfer paths. No factor must be omitted in order for the results to be conclusive. Phase 2: assess noise and vibrations. Around

sixty sensors (accelerometers, microphones, pressure sensors) were fitted on a tractor. A series of measurements were taken in around forty operating configurations for the tractor, at various engine speeds, and involving various hydraulic systems such as assisted steering or hydraulic distributors. All of the measurements were processed using specific software. Using the results, Cetim notably determined that the noise heard in the cab is mainly structure-borne (with the transfer path determined) and that resonance exists in some hydraulic circuits and parts. Several modifications were recommended on this basis and assessed at a future stage.

### Cetim's asset

Cetim skills in terms of acoustic studies: calculating and



interpreting hydraulic phenomena, equipment instrumentation,

organising series of measurements and proposing anti-noise solutions.