

# Lufkin France **Detecting** burns by noise

Lufkin France has changed its gear grinding burn detection method in order to face environmental requirements. Consequently, the Nital etching process was advantageously replaced with Barkhausen noise measurement, a non-destructive testing method.



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## OUR CLIENT

**Corporate name**  
Lufkin France

**Activity**  
Manufacturing of transmission parts and components for turbine driving systems

**Activity sector**  
Mechanical industry

**Workforce**  
280

**F**or a long time, Lufkin France has applied the acid chemical etching method, also referred to as "Nital etching", to detect overheating defects or burns located on the ground surfaces of gear wheel teeth. With this method, the overheated areas likely to weaken the structure of the analysed material, hence reducing its service life, are made visible to the naked eye. However, Nital etching involves heavy operations, not to mention the environmental risks. *"Some customers require the detection of residual stresses in the underlayers, for 100% of the ordered parts (e.g. EDF for "nuclear" projects), which is unachievable with the*

*chemical method, and others require us to make sure that we do not cause any surface burns creating tempered areas due to grinding operations",* explains Marcel Argenton, quality manager. Consequently, Lufkin France has decided to replace Nital etching with the ferromagnetic measurement process (or Barkhausen noise method) which ensures better detection of burns and is simpler to implement, while allowing quicker analysis of the data collected.

## Exciting the material

Lufkin France had no in-house experience of this technology and relied on Cetim's non-destructive testing experts to

obtain the necessary training and define a suitable testing procedure.

The Barkhausen noise method is a simple process: the part to be tested is placed in an electromagnetic field which generates a structural modification of the area of the part subjected to the field. A probe detects a "noise" produced by this excitation and the result is displayed on a screen. A low noise level indicates that the material was not damaged, while to the contrary, a high noise reveals a change of state in the structure. Now, this change from Nital etching to ferromagnetic inspection has been successful and Lufkin France, still with Cetim's assistance, is moving up another gear by trying to adapt its NDT tool to helical gear teeth and to make the inspection of 100% of the components produced in its French Haute-Saône plant of Fougerolles automatic.

## Cetim's asset

Cetim's experts implement a whole set



of state-of-the-art non-destructive testing methods, thanks to their recognised

expertise and significant facilities and means.