

# FAILURES AND DAMAGE ON CAST OR FORGED PARTS

**Unique expertise in cast or forged components and parts**



## Your expectations

**You are a user, contractor, machinist or manufacturer of cast or forged parts, and you are facing a problem with one of these parts:**

- The surface quality or dimensions are not compliant with your specifications
- The machining did not go the way it should have (tool wear or breakage): you have doubts about the material and want to know if the part can be put into service without risk.
- Damages appear while the part is running: oxidation, excessive wear, cracking or even breakage: you want to determine the reason(s) of this failure (design? material development or shaping? stress during service?)
- Following a breakdown, you are concerned about other parts in service that may have come from the same batch.

In any case, you want to know what the root causes are and who is responsible for the damage.

## Our solutions

**Thanks to their experience in the forging and foundry industries, Cetim's experts can assess and resolve your problems:**

- Carry out a full assessment of your issue
- Based on the analysis results, they can propose a course of action and assist you in their implementation
- Check the compliance with your specifications (material, surface condition, design) and assess the criticality of the defects found

**In the case of an in-use part, an on-site intervention can allow to:**

- Consider the environment and operating conditions to make initial recommendations/repairs
- Decide whether to accept or reject the part, based on the results of advanced non-destructive testing methods

**In the case of proven damage or failure, Cetim's experts, using high-performance laboratory equipment, will be able to:**

- Determine the cause of the breakdown: pre-existent defect, non-compliant material with the specifications or incompatible with its use
- Interpret the results of the investigations and identify any defects (porosity, moulding sand inclusions, forging fold, etc.) or heat treatment anomalies

**Thanks to their experience in forging and casting processes and their applications, the experts will provide**



**you:**

- Proposals for more relevant and effective solutions (alternative alloys, tool modifications or optimization, etc.)
- Support in implementing on-site corrective measures and adequate controls to prevent any recurrence of the problem

**Furthermore, the use of digital tools (process simulation or structural calculation softwares) will enable to:**

- Predict the occurrence of the defect
- Assess the defect impact on the part during use
- With the support of fracture mechanics, Cetim experts will be able to determine the role of the defect in the initiation and propagation of cracks under cyclic or static stresses

Cetim can also help draft specifications for the purchasing of parts and help to find the best suited suppliers to produce the parts, based on their size and quantity.

## Your benefits

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Cetim specialises in the mechanical behaviour of structures and equipment during operation. As an independent and impartial technical research centre, it is recognised by legal experts and insurance companies.

In the specific case of [Failure Analysis](#), Cetim brings together specialists in forming processes, non-destructive testing, simulation, materials, assemblies, etc.

With over 50 years of experience, it handles nearly 1,500 new failure cases each year, taking a comprehensive, multi-skilled approach in all areas of mechanical engineering (aeronautics, automotive, energy, etc.), for metallic, plastic and composite materials and on all types of equipment or components.

Finally, Cetim provides more than 600 Cetim Academy® training sessions benefiting from Qualiopi certification, to enhance the skills of your staff.



**Question and Answer Service**  
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