

## **Fracture toughness characterization of welds by using mini-CT specimens: FRACTESUS project findings**

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### **Abstract:**

This work provides an overview of mini-C(T) specimen technology, which may be used to characterize the fracture behaviour of steels by using miniaturized 0.16T (4 mm thick) CT specimens. Thus, mini-C(T) specimens are significantly smaller than conventional fracture specimens and allow testing a large number of specimens with limited material. The approach has been systematically validated in a number of steels, mainly (but not only) nuclear grades in both irradiated and non-irradiated conditions, and covering both base materials and welds. On this last case, mini-C(T) approach is of particular importance, as it allows the local fracture toughness of the weld bead to be specifically characterized.

The research shown here summarizes the results obtained within the European project FRACTESUS, which lasted from 2020 to 2024, and gathers the main conclusions obtained during these four years of intense research.

### **Short bio:**

Sergio Cicero is Full Professor of Materials Science and Metallurgical Engineering at the UC. He has published more than 250 documents in journals and conference proceedings, and presented more than 90 works at national and international conferences. He is associate editor of the *J. of Mech. Behav. Mater. (De Gruyter)* and *Alex. Eng. J. (Elsevier)*, member of the editorial board of *Mater. Des. Process. Commun. (Wiley)*, *Int. J. Struct. Integr. (Emerald)*, *Front. Mater. (Frontiers)* and *Metals (MDPI)*.

Concerning research projects, he has participated as Principal Researcher in a number of initiatives, including 4 international projects undertaken within the European 7th Framework Programme (HIPERCUT) and Horizon2020 (INCEFA-PLUS, INCEFA-SCALE, FRACTESUS).

These initiatives have been accompanied by a strong national and international presence, being, among others, Vice-President of the Spanish Society of Structural Integrity (SEIE-GEF) and Vice-Chair of ASME Spain Section.