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A novel approach to cracking criteria in continuous casting

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An overview is given of the ongoing RFCS project SHELL-CRACK. The project offers a new paradigm for the prediction, detection and correction of hot-cracks and surface defects during casting based on Pilot/Lab scale thermo-mechanical experiments combined with numerical simulations. This innovative approach considers not only “material”properties but also specific “process”information to achieve new/extended cracking criteria for the whole process from microstructure to caster size. These enhanced criteria are validated, tuned and put to the test in a series of plant trials where advanced quality sensors are used to correlate defects to parameters such as mould temperature, surface quality and micro-structure features. This approach could prove particularly useful to assess the role of different trace elements (i.e. impurities) arising from increased use of lower-quality scrap sources and/or DRI-HBI from fossil free processes. Thus, SHELL-CRACK will deliver a complete set of tools to enhance current production but also prepare European casters for the new challenges posed by alternative ironmaking methods as envisaged in the new Green Deal. This project has received funding from the Research Fund for Coal and Steel under grant agreement No 101156718.

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