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ADDITIVE MANUFACTURING ACADEMY
TO BOOST TRAINERS' COMPETENCES IN INDUSTRY

Summary

Selection of Parts

Project Number: 2021-1-IT01-KA220-VET-000033365

Course Content

The online course explores an area that requires much further insight and research to push additive manufacturing processes to a higher level, that being materials.

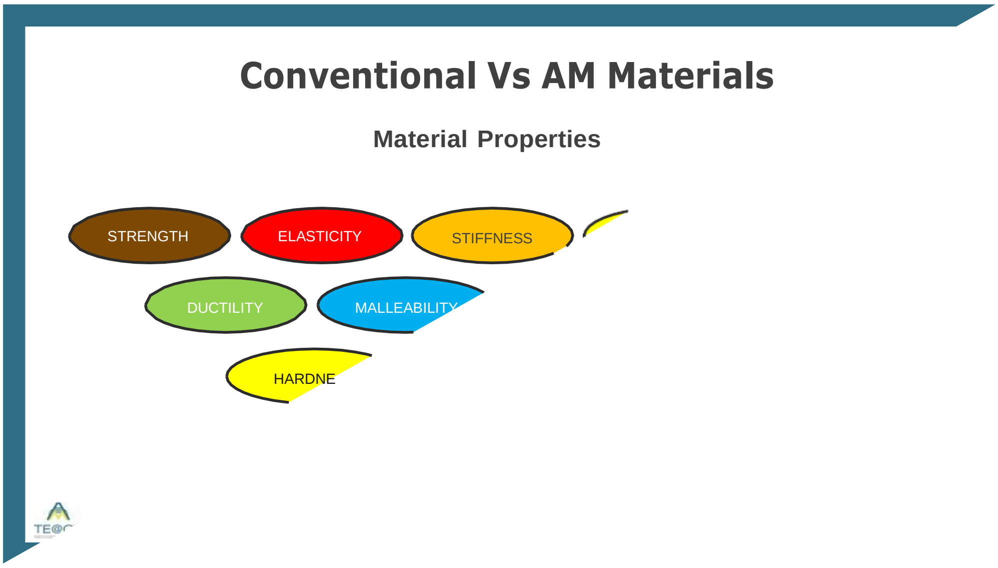
Conventional Vs AM Materials

Short Description

One of the most significant advantages of traditional manufacturing, compared to 3D printing, is that it offers a wide range of material selections and the process is also more established. Materials for traditional manufacturing technologies have already undergone years of development in terms of both processing and required product properties. In addition to this solid database of materials, the industry has defined material standards and specifications through globally accepted and used norms. With AM, there is still a gap to close in terms of development, standardization and qualification of materials.

Conventional versus AM Materials

In processes like machining, the material is a known quantity. A part starts as a billet, or perhaps a forging or casting. Its shape is then changed in the machining process, but its inherent material properties are already set.



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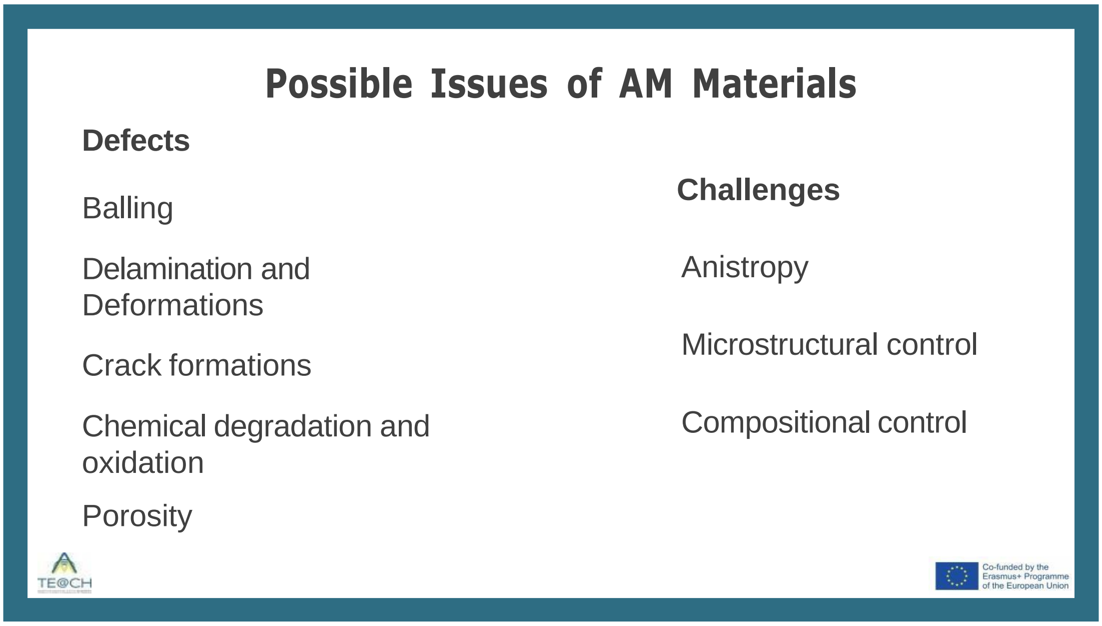
Possible Issues of AM Materials

These different materials and AM processes, like other forms of processes, have certain defects that can affect the print quality.

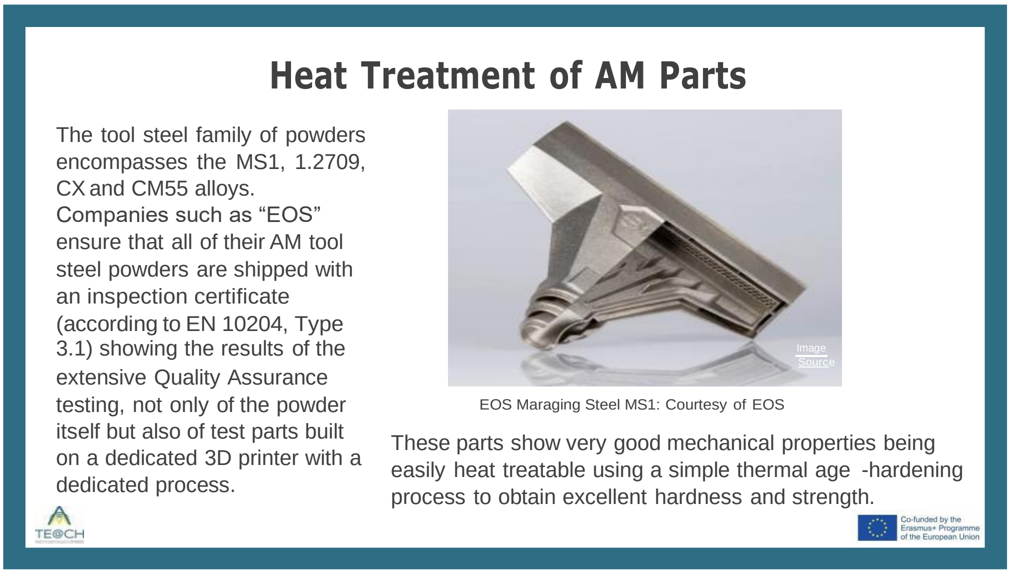


The materials development for AM processes is facing challenges including anisotropy, microstructural control, compositional control, as well as others and further research and development are required to move forward at a pace that matches the demand for such processes.

Notes

Heat Treatment of AM Parts

Heat treatment can be used to optimize the properties of 3D printed products, adding extra features such as heat resistance or tensile strength.



The main goal of heat treatment is to stabilize the metallic microstructure and balance material properties. The types of heat-treat cycles used vary depending on both the alloy and fabrication method, but all of them play an important role.

AM in the Circular Economy

Additive manufacturing is also seen as a powerful enabler of circular economy, which aims at reducing resource consumption while boosting business opportunities. No waste production and reduced physical inventories are just few examples of how AM could positively contribute to CE goal.

Additive Manufacturing can help aid and accelerate the Circular Economy. A circular economy links material, design, manufacturing, product and end-of-life in a continuous, sustainable loop and 3D printing has roles to play in every step.

Notes

For further information please

Contact us via the Faculty of Engineering & Technology, ATU Donegal.

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