GRADUATION ASSIGNMENT: EMERGING MATERIALS RESEARCH PROJECT

3D PRINTING OF SELF HEALING MATERIALS

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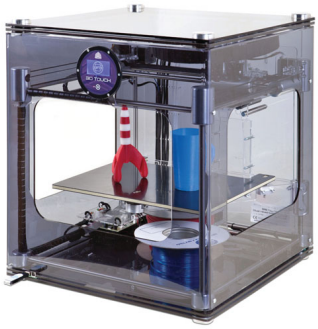
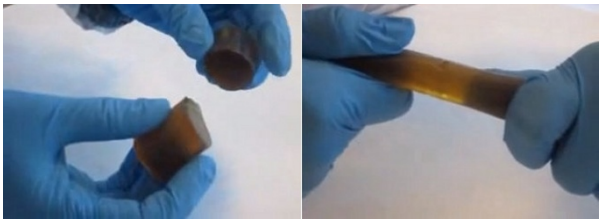
INTRODUCTION

During the past years Additive Manufacturing (AM), also known as 3D printing, has been showing a shift from the application of rapid prototyping towards the production of end products. The possibility of creating complex shapes using 3D printing provides many new opportunities for product design as for example in terms of lightweight structures, custom geometry and new functionalities.

While AM nowadays has many capabilities and a growing amount of products are being produced in this manner, the new and interesting developments are in the integration of functional materials in the printing process. In the current project we will focus on the special class of self-healing polymers. These are polymers that can regain their bonding strength in the order of seconds to minutes after cut or broken surfaces are brought together. The Spanish company Cidetec develops and produces such polymers and is interested to see if these can be used in the 3D printing process.

This will open up a completely new field of applications of products in which you can open and close surfaces and in which you can endlessly reposition and fix external elements.





CONTEXT

This project will be performed at the IDE Applied Labs. The Spanish company Cidetec will supply and if necessary modify the self-healing materials.

YOUR ASSIGNMENT

You will first develop a way to be able to print the self-healing polymers with one of our 3D printers in the lab. At the same time, you are challenged to find meaningful applications and choose one of them to make a functional demonstrator or prototype.