INTRODUCTION

Additive manufacturing (AM) is part of the 4th industrial revolution. Optimising the process will allow engineers to realise previously impossible designs, expanding the realm of possible applications. The trends in industry towards AM and 3D printing have motivated our interest to simulate such processes. One AM method is Selective Laser Sintering (SLS), in which objects are produced by depositing successive layers of powder particles (plastic, metal, ceramics, or glass), and sintering parts by selectively scanning the powder bed with a laser, as shown in Fig.1. The technology is used in various fields, e.g., industrial design, automotive, biotech, aerospace and many other.

EXPERIMENTS

- In-house experiments will be conducted to take into account the rapid surface melting and sintering process in SLS.
  - Sintratec kit, see Fig.3, is used for the experimental trials.
  - Initial control parameters: laser speed, chamber temperature, surface temperature, layer thickness, number of primeters, perimeter offset, hatch offset, and hatch spacing.
- Industrial validation and case-study experiments of the method are conducted in collaboration with other organizations and institutes.

RESULTS

Preliminary work:

Contact model for sintering[1-2]

Deposition method[3]

Heat dissipation[4]

REFERENCES