

Steel coil change project

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- Arcelor Mittal Constructions Geel. Arcelor is a multinational for converting steel coils into steel profiles used in roofs, floors and ceilings.

- The main production line in the factory is the sandwich panel line. A sandwich panel consists of two plates of steel. Between the two plates, a foam is injected. These sandwich panels are mainly used in walls and roofs.

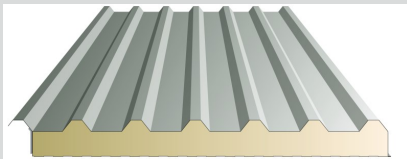


Figure 1: Sandwich panel [1]

Situation



Figure 2: Decoiler



Figure 3: Question mark

- These panels are the biggest income but there have been some problems. The line comes time to time to a stop. The process takes too long so the company loses money during the downtime of the sandwich line. The goal for this project is to increase the working speed of the machines so the line can run fluently.

- The first problem which encountered; was time it takes to switch the coils of the mandrel.

- A second problem was that the buffer pit ran out. This is a direct effect of the problem above. The line is too slow.

Problem

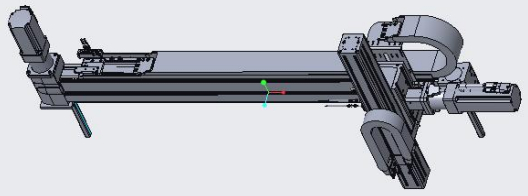


Figure 5: Spot welder

Mechanical design

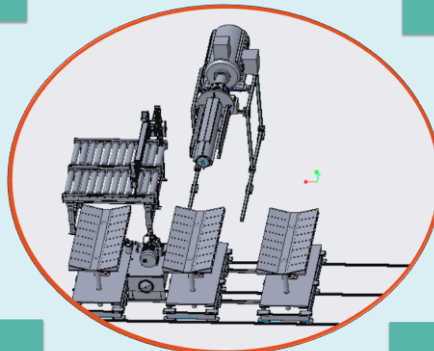


Figure 6: Main Assembly

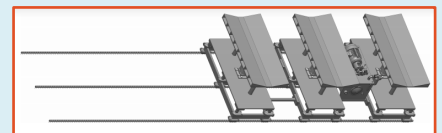


Figure 4: Buffer coil

Main Targets

- The first thing that will be noticed is the supply of several coils at once. This gives a buffer so there is continuous a coil ready to install on the mandrel. The steel coils are installed on the mandrel (figure 2) by a hydraulic lift (figure 4). Due to the lift, the mandrel can slide into the hole of the coil. After the mandrel will expand so it clamps itself in the coil so the coil can turn around. Now the steel coil can unroll, the steel is directed to the foaming process. Therefore the end of the previous coil is welded (figure 5) on the new coil. Now the coil is ready to be foamed and profiled.

- More automatization to decrease the time needed
- Prevent any downtime
- Trying to minimise the costs



Figure 5: Goals

Supervisors / cosupervisors: Prof. dr. ir. Michael Daenen
 Prof. dr. ing. Karel Kellens
 Ing. John Bijmans

[1] <https://bouwproducten.hardeman.nl/shop/dak/geel/sandwichpanelen/do/2287/pir-hell-end-dak-paneel-32-1000-br-bop-lengte-gemaakt-alle-klouren-b>