

# Helsinki, Finland

## 4-5 February 2020



ROBOT VERSUS TRADITIONAL VERSUS ROCK & ROLL

by Filip Claus



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# ALGIET FOUNDED IN 1945 BY JOZEF DE CEUSTER

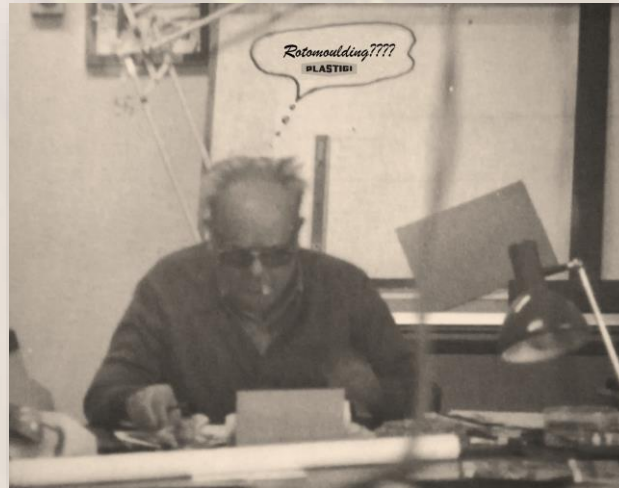


# PLASTIGI FOUNDED IN 1963

JOZEF DE CEUSTER



JOZEF DETILLOUX



## PLASTIGI 1963 - 1990

HUGO DETILLOUX



GEORGES CLAU



# PLASTIGI – ZWEVA GROUP 1990 - PRESENT

STEFAN CLAUS

PIETER VAN 'T VEER

FILIP CLAUS



## LOCATIONS



Lenskensdijk - Herentals



Hannekenshoek - Herentals

Scheveningseweg -  
Den Haag

Europark Houthalen



# ROBOT VS TRADITIONAL VS ROCK & ROLL

ROBOT PROJECT STARTED  
IN 2012  
SINCE 2016 HERENTALS



TRADITIONAL STARTED 1963  
SINCE 1994 HERENTALS



ROCK & ROLL STARTED 1984  
SINCE 2014 HOUTHALEN



**ZVEV**

**PLASTIGI**

**ZVEV**  
ENVIRONMENT



# TYPE OF PRODUCT - TRADITIONAL

## Type of products

- Simple shape barrel and containers
- Technical products
- Visible and Design product
- Industrial product, double walled (heavy duty)
- Multi layer (more difficult, expensive) ●

## Size (max) products

From 0.5 L - 5.000 L

Dia 1.6-2 m Length 2,5-3 m

## Product Weight

0.1 kg - 200 kg

## Mould Weight (max)

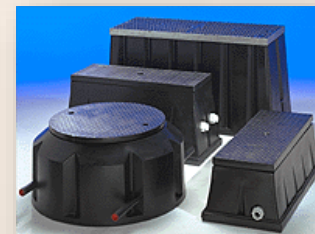
2.500 kg

## Production Series

1 Piece

Normal min serie 50 Pieces

Large series over 10.000 Pieces and more







# TYPE OF PRODUCT - ROBOT

## Type of products

- Simple shape barrel and containers
- Technical products
- Visible and Design product
- Double walled (heavy duty)
- Multi layer (easy with a lot of option) ●

## Size (max) products

From 0.5 L - 1.000 L

Dimension 1 m x 1 m x 1 m

## Product Weight

0.1 Kg - 35 kg

## Mould Weight (max)

350 - 400 kg

## Production Series

Min serie 100 Pieces

Large series over 10.000 – 50,000 Pieces





# TYPE OF PRODUCT – ROCK & ROLL

## Type of products

- Simple Round Tanks ●
- Multi layer (easy 3 layers) ●

## Size (max) products

From 1.500 L - 10.000 L

Dimension Dia. 2.5 m Length 5 M

## Product Weight

70 - 350 kg

## Mould Weight (max)

2.500 kg

## Production Series

Min serie 1 Pieces

Large series 10 – 5.000 Pieces



## TRADITIONAL MACHINE

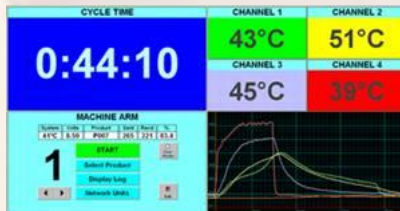
Standard on machine

- Oven temperature control + time



Not standard on machine

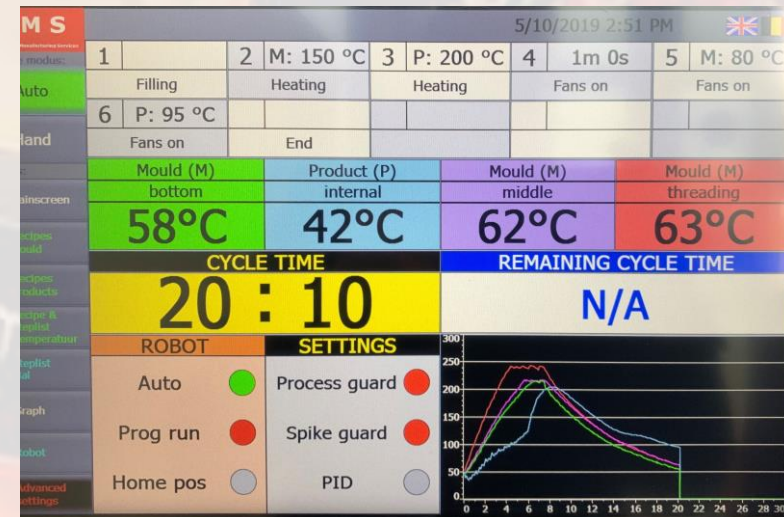
Internal air temperature by separate device: templogger



## ROBOT & R&R

Standard on machine

- Mould temperature control
- Internal air temperature control



## TRADITIONAL MACHINE

- Minor compared to our other production machine types
- Temperature control if available, not in every mould
- Multiple arms on machine influence time of dismantling
- Multi moulds on 1 arm / sometimes 8
- Not always dismantling on the same time/temperature

Average tolerance we work with is between 1% and 2 % depending on size and shape of the product

± 0.01 cm/cm - ± 0.02 cm/cm

## ROBOT

- Process completely temperature controlled
- Always dismantling on the same temperature

Average tolerance we work with is between 0.2% and 0.5 % depending on size and shape of the product

± 0.002 cm/cm - ± 0.005 cm/cm

## R&amp;R

- Process completely temperature control
- Always dismantling on the same temperature

Average tolerance we work with is around 1% due big size and shape of the product

± 0.01 cm/cm

**TRADITIONAL MACHINE**

- Filling mould: By hand
- Closing mould: By hand
- Multi Layer: Dropbox / 2<sup>nd</sup> shot, arm reverse to fill position (**more complex**)
- Cooling: Ventilator / internal air cooling / water or mist
- Opening mould: By hand

Can be further automatized but expensive also due the fact of the oven temperature (over 300° C).

Safety/handling, compared to our other machines, robot and R&R is less.

**ROBOT**

- Filling mould: Automatic
- Closing mould: Automatic
- Multi Layer: 3 or more shots automatic on temp or time control.
- Cooling: Ventilator / closed water circuit on the mould / internal air cooling / water / venturi
- Opening mould: Automatic

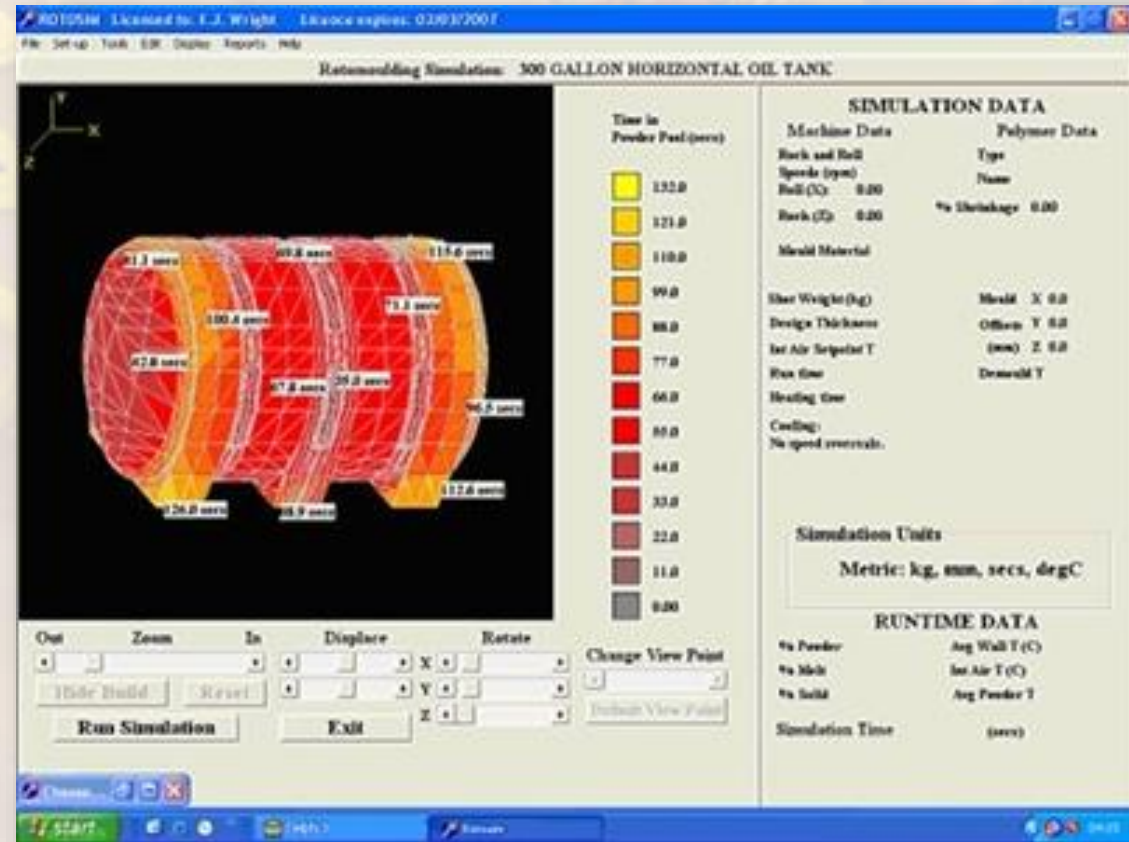
Due the fact that we don't need an oven we can use a lot of standard parts available on the market, automatic closing clamps, vortex, standard valves, control contacts,.....

**R&R**

- Filling mould: By hand / hopper
- Closing mould: By hand
- Multi Layer: 2 extra shots automatic on temp or time control
- Cooling: Ventilator / internal air cooling
- Opening mould: By hand.

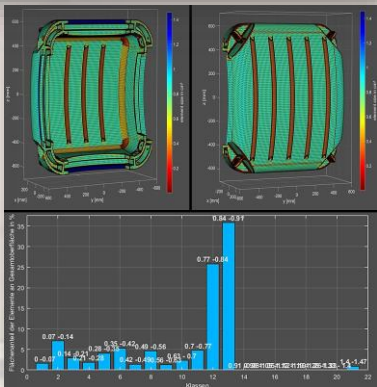
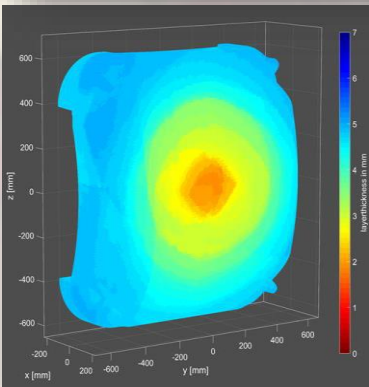
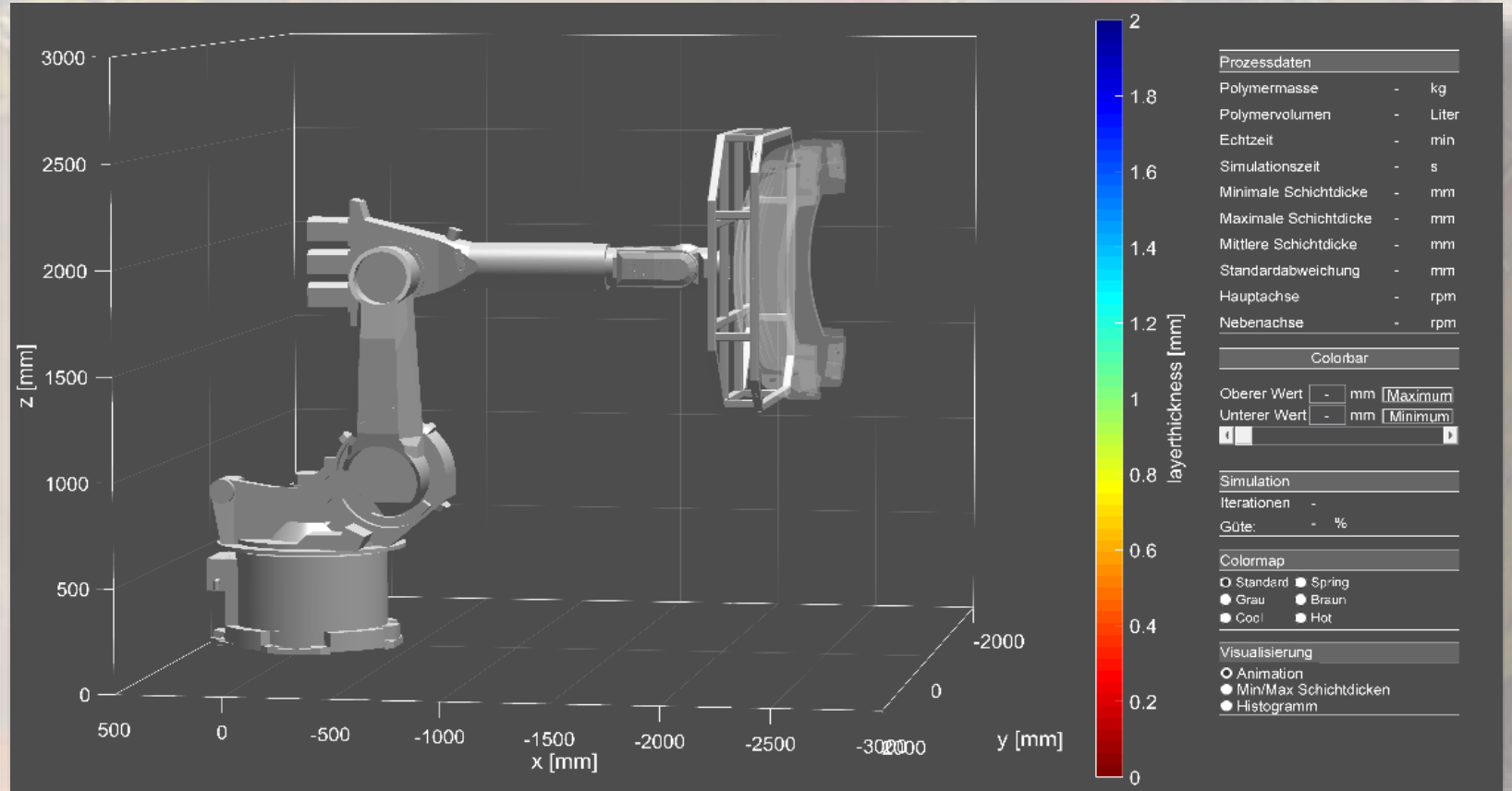
# AVAILABLE SIMULATION ROTOSIM

## TRADITIONAL MACHINE & R&R



# AVAILABLE SIMULATION ROBOSIM

## ROBOT



Product with 7 mm wall thickness with a PIAT of 200° C

#### OVEN ROTOSPEED FERRY INDUSTRIES 370

- Aluminium mould 6 on 1 arm
- Oven heated by oil burner, indirect heating
- Cooling air/water

#### ROBOT FANUC AMS 350

- Aluminium mould 2 on 1 robot
- Direct electric heating.
- Water cooling system on the mould surface
- Cooling air and internal air cooling

#### R&R PLASTIGI/AMS

- Aluminium mould 1 on 1 R&R
- Direct heating by propane line burners
- Cooling air and internal air



**TRADITIONAL MACHINE****Quantity 1 mould 24 hours**

- 7 mm / 13.5 kg / mould
- 15 pieces / mould
- Oven time 28 min
- Cooling time 29 min
- Dismantling 4 min (arm 25 min)

**Labour (Trimming excluded)**

- 3 Operators 1 Machine

**ROBOT****Quantity 1 mould 24 hours**

- 7 mm / 5.5 kg / mould
- 48 pieces / mould
- Oven time 12 min
- Cooling time 13 min
- Dismantling complete robot arm 4 min  
(Automatic no operator involved)

**Labour**

- 1 Operator 5 robots (can handle 10)  
spare time trimming

**R&R****Quantity 1 mould 24 hours**

- 7 mm / 70 kg / mould
- 28 pieces / mould
- Oven time 19 min
- Cooling time 20 min
- Dismantling complete machine 5 min

**Labour**

- 1 Operator 2 R&R machines spare  
time trimming

**TRADITIONAL MACHINE**

- Energy / heating oil: 0.1769 Euro / Kg Pe
- Labour : 0.45 Euro / Kg Pe
- Total Cost of both E/L: 0.6269 Euro / Kg Pe

**ROBOT**

- Energy / electricity: 0.0491 Euro / Kg Pe
- Labour : 0.15 Euro / Kg Pe
- Total Cost of both E/L: 0.1991 Euro / Kg Pe

**R&R**

- Energy / propane: 0.0937 Euro / Kg Pe
- Labour : 0.2 Euro / Kg Pe
- Total Cost of both E/L: 0.2937 Euro / Kg Pe

### Our conclusion of the way we want (have) to produce in our rotational moulding plants:

- A production system that uses less energy by direct heating
- Driven by an environmental responsible energy source (electricity generated by solar panels/wind mills/hydropower,...) (we also have to take into account that fossil fuels as gas and oil will be banned in EU for process heating systems in the near future).

In the Netherlands they already started to ban gas at industrial zones for heating production processes

- A temp-controlled production system for a better-quality product (internal air temp measuring and mould temp measuring)
- Automatic dismantling, opening moulds, dismantling piece, closing moulds
- Automatic material weighing and filling of the moulds
- Less employees on the work floor

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When we add all of this up, we automatically come to the robot production system we are using now. Today we can produce up to about 1000 Litres and maximum size of +- 1 m x 1 m x 1 m. We are perfectly able to run these products with the 5 production robots we have for the moment, next to 1 dismantling robot and 2 trimming robots. In 2021 we will produce 70% of our production with robots.

# LARGER SIZE PRODUCTS

Once we want to manufacture larger sized products, the weight of the mould gets critical. We then come in a robot range that's less standard and more expensive, but still doable. Robots up to 2000 and 3000 kg are available already and running at this moment in Roto moulding.



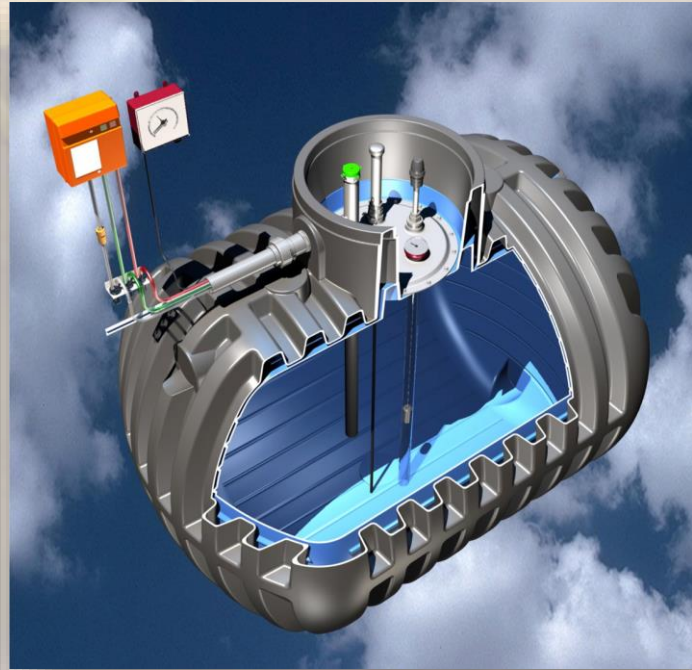
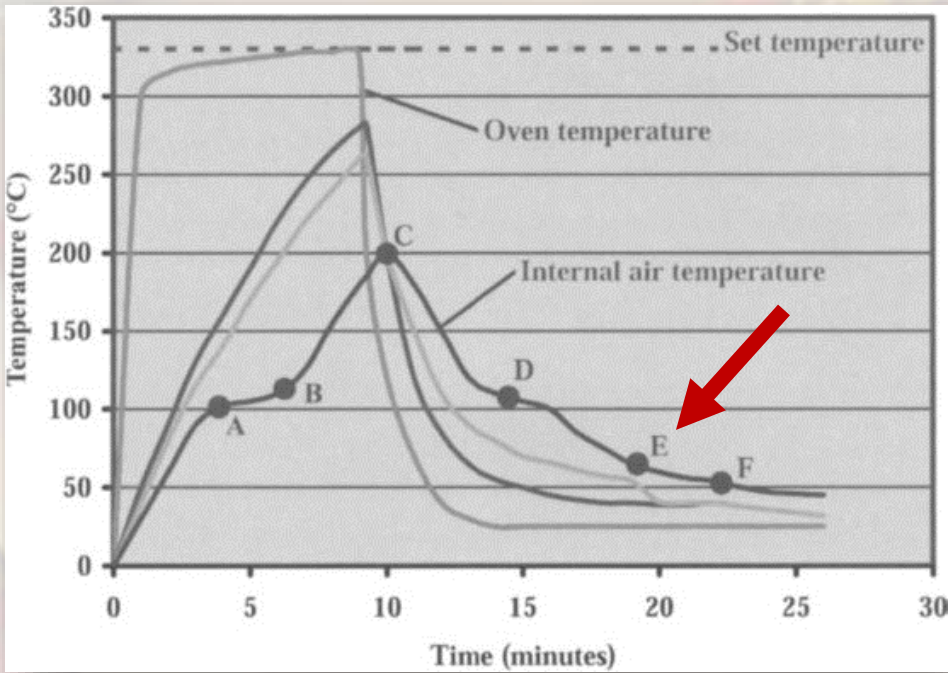
We also can conclude that R&R is a good way to produce large round tanks at a good price and with good quality.



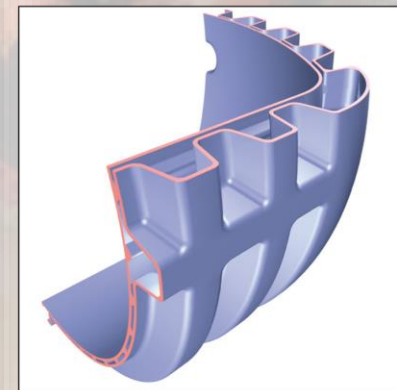
# ROBOT VS TRADITIONAL



# ROTO MOULDING COURSE

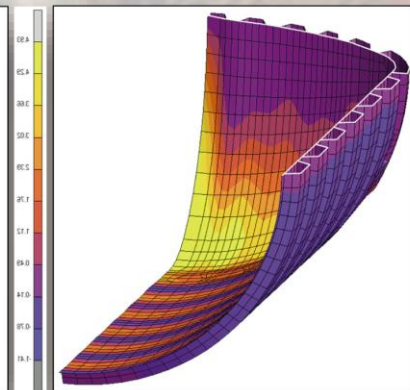


## TWINWALL TECHNOLOGY



Unique Patented Design

## COMPUTER AIDED DESIGN



In Built Strength and Security



# PARTICIPATION ARM MEETINGS

1



2



3



4



5



6





Thank you for your attention

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