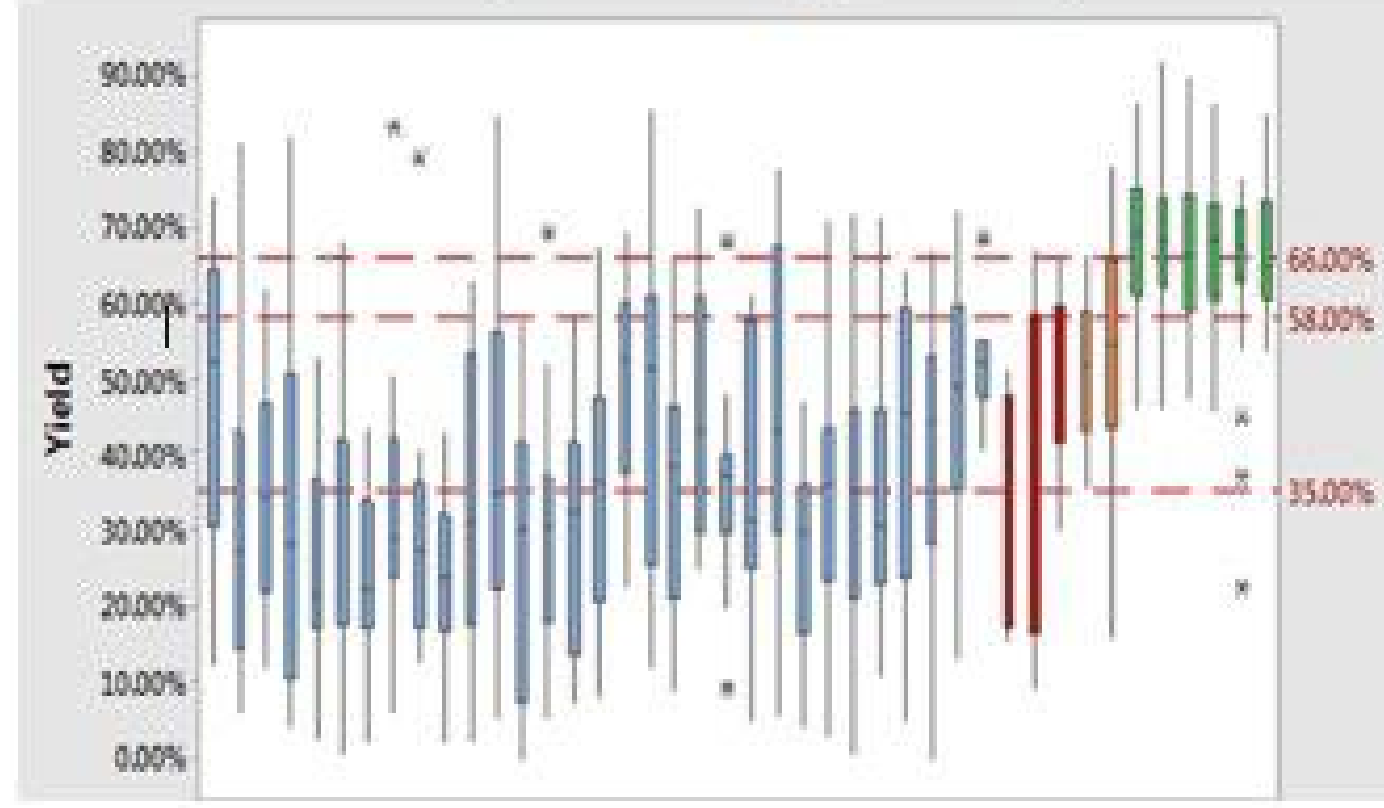


Control

Soft Benefits:

- Yield and output improvement confirmed
- Waste reduction
- Reduced line intervention
- Production team morale increase
- Improved process knowledge
- Improved communication within the Business Unit
- Improved teamwork
- Improved knowledge sharing process with the Business Unit.
- Improved CI culture within the Business Unit

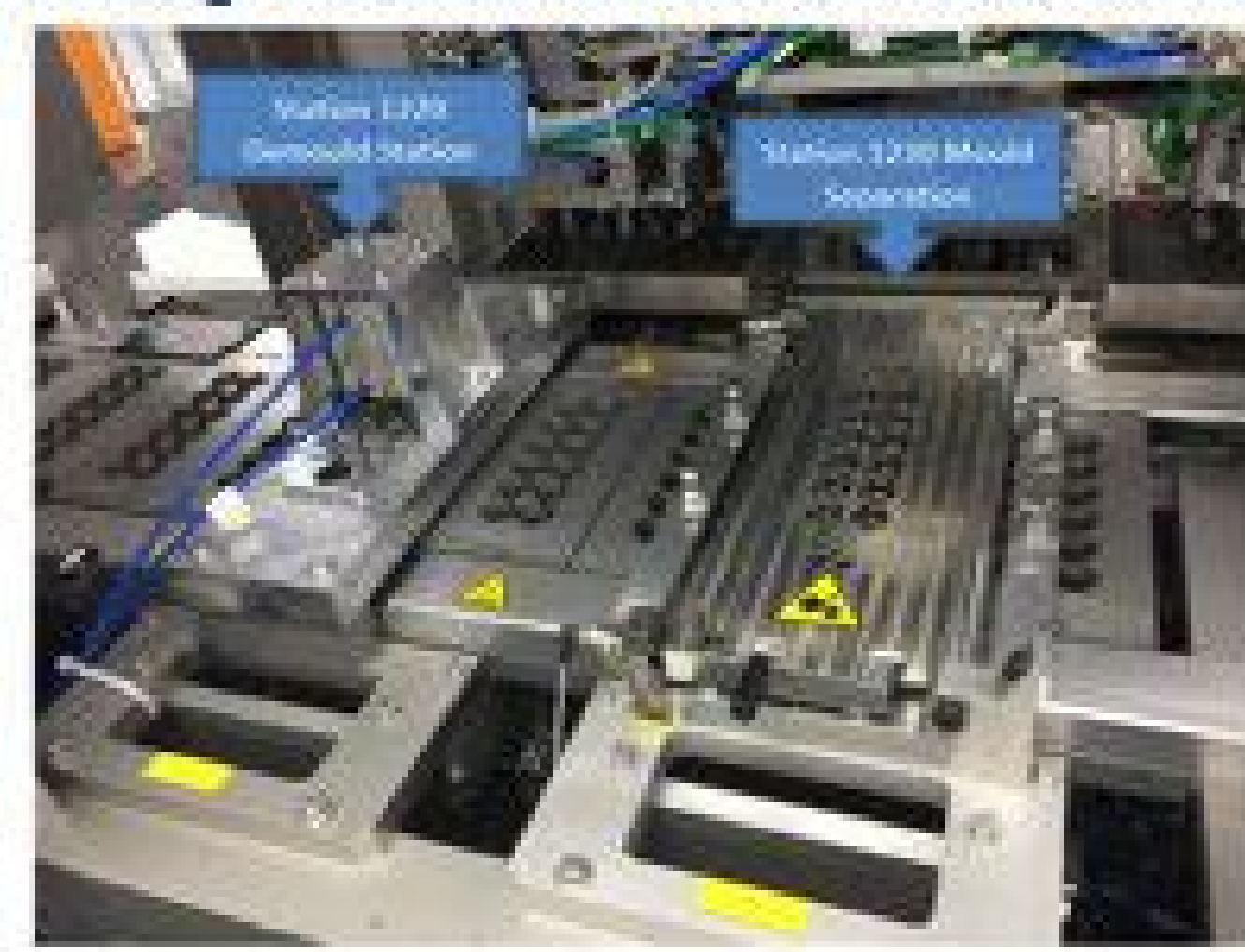
Demoulder Yield positive change after implementation



Pre change Demould & Delens Module Stations

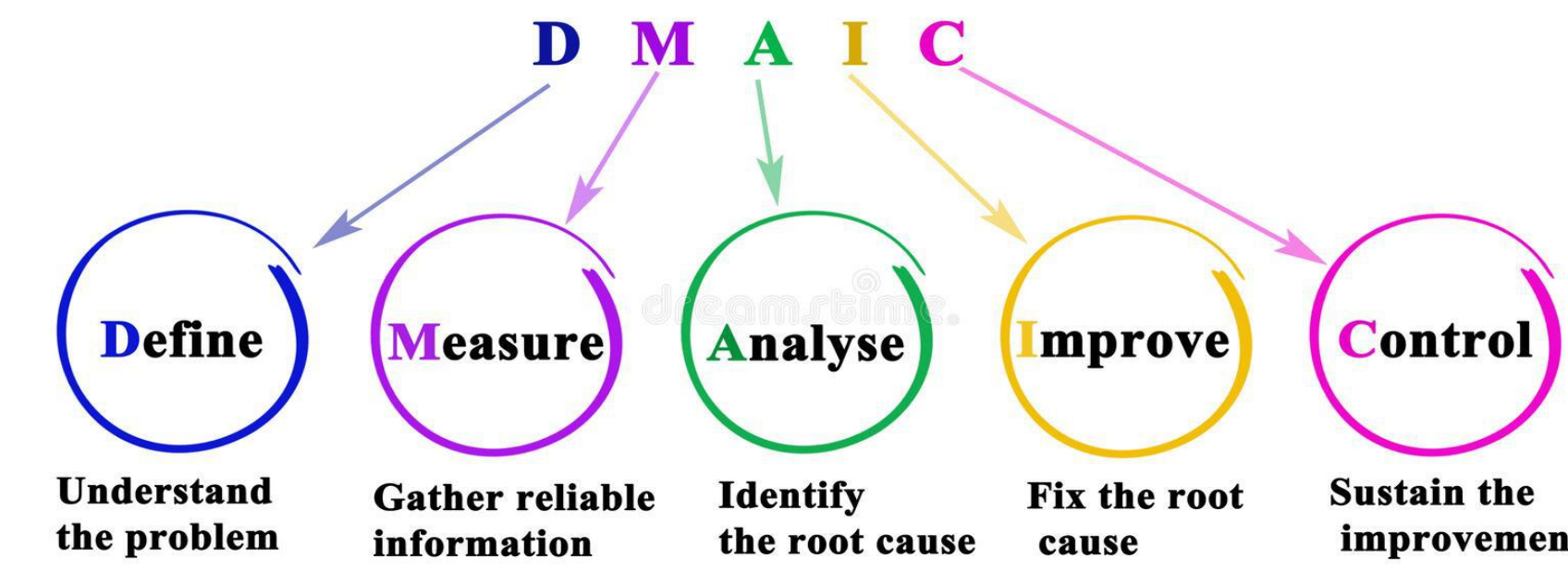


Post Change Demould & Delens Module Stations



Project background

The purpose of this project was to improve poorly performing production line in CooperVision. The problem was with Demoulder machine which separated two previously injection moulded parts to remove the contact lens formed inside them. Due to product change and associated with it mould change design, line was underperforming with 35% average yield. DMAIC Improvement methodology was used in this project to investigate and find a solution to the problem.



DEFINE

Project Aims and Objectives

AIMS

- Provide a cost-effective solution to the problem.
- Make sure the project does not affect the lens quality.

Objectives

- Review Previous attempts to fix the problem.
- Identify possible solutions.
- Create risk assessment for any changes.
- Test solutions prior installation on the line
- Implementing the solutions
- Data analysis of new solution and process control
- Product quality check after change is completed

Project Benefits

- Average yield doubled – from 35% to 82%
- Output increased by 235,000 lenses/month

MEASURE

What has been already completed?

- Heating station settings were tested to the highest and lowest possible within process validated tolerances. Small 3% average yield improvement was recorded.
- Heating temperatures were tested above lower tolerances with bad results.
- Machine process cycle time were changed with not clearly visible improvements.
- Batches created on this line were processed on demoulders on other lines. All batches were successfully demoulded with 85% yield and above.

Improve

Three solution proposals were presented to stakeholders. Weighted Decision Matrix to select solution 1 from the list:

1. Mechanical Press solution based on "hand cracker" tool used to open the moulds for lens testing purposes
2. Installation of powerful heater to improve heating on current demoulder station
3. Mould upright to change demoulder so the moulds are process in upright position to improve demoulding process.

Testing rig consisted of two main parts:

- Top plate which holds 12 inserts which apply the mechanical pressure on the male moulds loosening and opening joint between both moulds.
- Bottom plate with anvils which work as resistance to top plate. When top plate with inserts applying pressure to the moulds, bottom plate resisting it and anvils put all this pressure to bottom edge of the female mould.

Test outcome:

- 99% yield of lenses present on male mould was achieved during testing
- No bruising due to the demould mould process has been identified at lens inspection

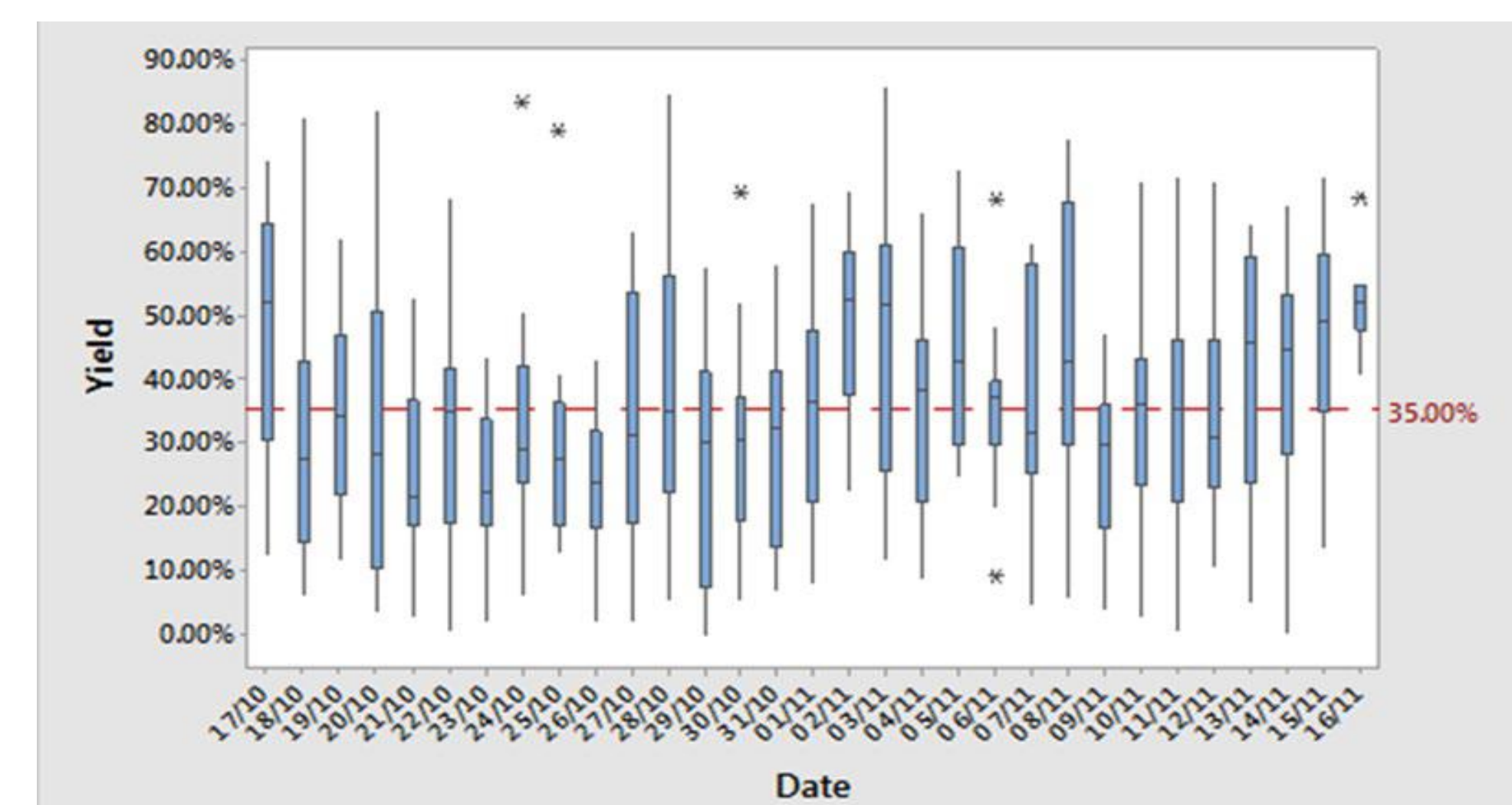
Successful demould using testing rig



Analyse

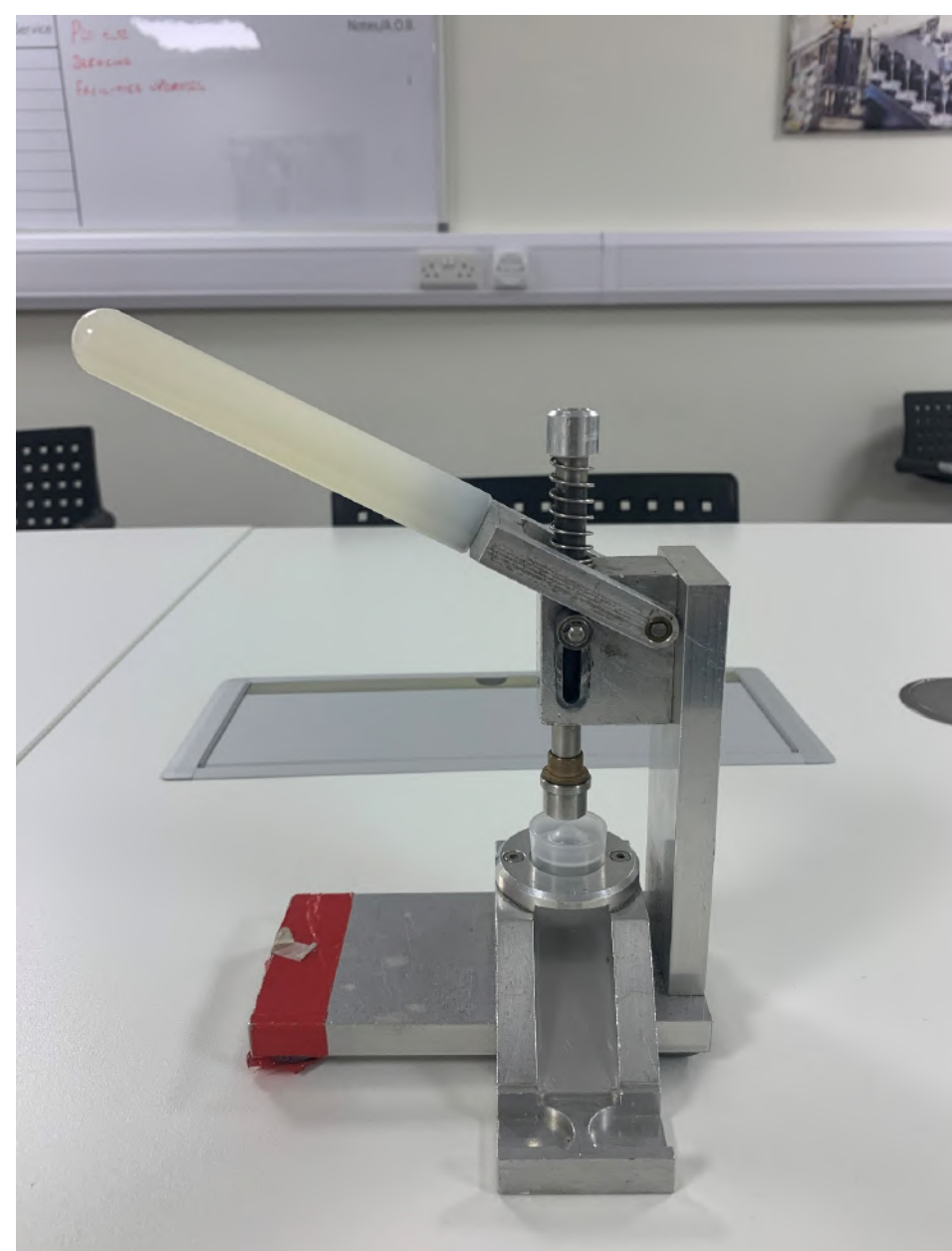
Analyse stage was important part of the project as it narrowed down the problem from whole production line to just one module and its two demoulder stations. Project Leader used many tools like In Frame/Out of Frame, Priority Matrix, Fishbone Diagram to find the root cause of the problem. Heating station 1220 is not suitable for new mould design and need to be improved. At this stage the low yield performance was confirmed as 35% average.

Prior implementation demoulder baseline performance



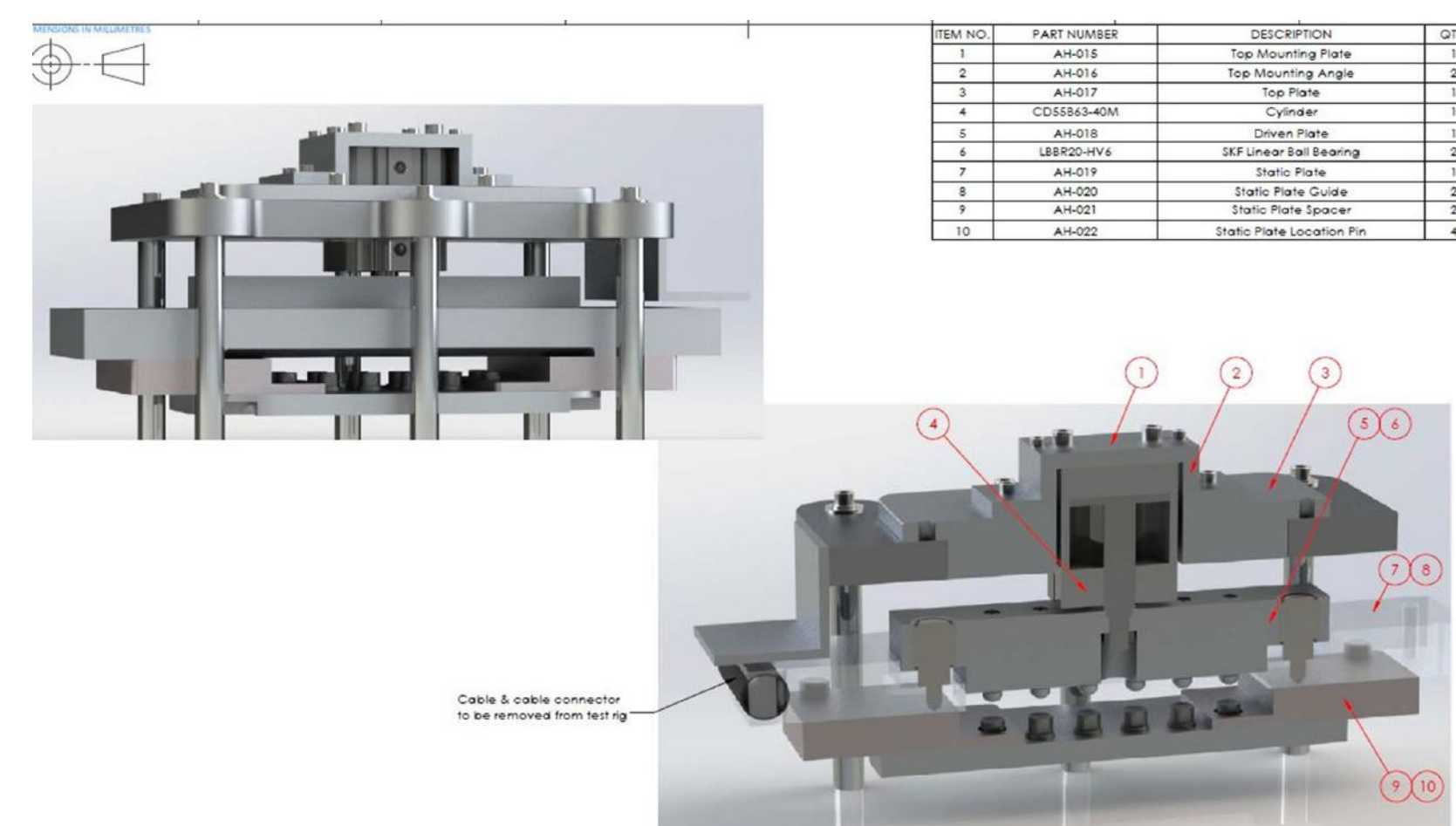
"Hand cracker" - Bright Spark Idea Origin

The idea originated during Measure stage where it was observed that production Operators using "hand cracker" to successfully demould Lenses for testing purposes. Instead of heating hand force was used to spit female and male mould.



Offline testing rig Design

Offline testing rig was designed to prove the concept. It was built to replicate hand cracker and adopt it to the production Demoulder machine where 12 moulds are demoulded in one machine cycle. The test was successful with 99% yield.



Final Design implemented on the line

Final design and built was completed based on the test rig. The difference was only the bottom plate which is supported by cylinder to move up and down. It could not be stationary due to demoulder line cycle movements.

