

SCHOOL OF

**INDUSTRIAL AND INFORMATION ENGINEERING**

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Industry 4.0 Track

**Production for Made in Italy Laboratory**

**Industrial Case Marelli-2021**



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# Industrial Case Marelli-2021

## Information on the production system

The screen printing area consists of 7 lines (SP1, SP2, …, SP7):

* SP1, SP2, SP3 are screen printing “flat” machines, older model with lower production capability (e.g. cycle time)
* SP4 and SP5 are screen printing “cylindric” machines, newer model with higher production capability (e.g. cycle time)
* SP7 is a manual loading screen printing machine, with very low production capability (e.g. cycle time). It is dedicated to all the products for a single client.
* SP6 is a screen printing machine dedicated to the printing of a particular ink layer (protective layer) for some of the products. When not required to be printed on SP6, the protective layers are printed on the other machine.

A picture containing graphical user interface

Description automatically generated

**SP 1**

**SP 2**

**SP 3**

**SP 4**

**SP 5**

**SP 6**

**SP 7**

## Information on the production system

Cycle time

Products processable

OEE

Setup time

Parts are assigned to one of the lines and processed in lots.

The lines in the system are characterized by the following data:

1. Number of stations (if relevant): it provides the number of steps needed to process a sheet, each step is operated in a station. Always: foils loader (automatic or maual), screen printing head, oven, foils stacker.
2. Class of processable products. Information is available in table “Products and machines” in the following structure.



1. Setup time: time needed to setup the machine independently from the product to be processed.
2. Cycle time: it is the time span from the instant a sheet enters in a station until the next one can enter. (correct)
3. Management policies: information related to the way each line is managed, e.g., maintenance, dependence of the cycle times from internal organization, etc.

## Information on the products/processes

Products to be processed are characterized by the following information

1. Dimension of the lot as number of sheets
2. Assignable lines: lines capable of processing the lot
3. Number of ink layers: it entails the number of passes the parts will flow through the line for the different layers to be printed.
4. Figures per sheet: it is used to estimate the number of sheets that must be processed to obtain the desired number of parts.
5. Cycle time

All the information on products, such us number of ink layers and figures per sheet are available inside the “Scheda di lavorazione” of each single code, see example below.



## Information on planning

The logistic planner can see the customer requirement per each week at least 4 weeks in advance. Some clients (Corbetta also produce for other Marelli plants) can modify requirements two weeks before actual requirement date.

Starting from client requirement logistic planner define the actual planned production on the same document, see example below from “Required and planned”. This part take in consideration all the process from screen printing to final visual check.



In the screen printing area the production is planned using a daily document as the example below from “Daily planning”.

