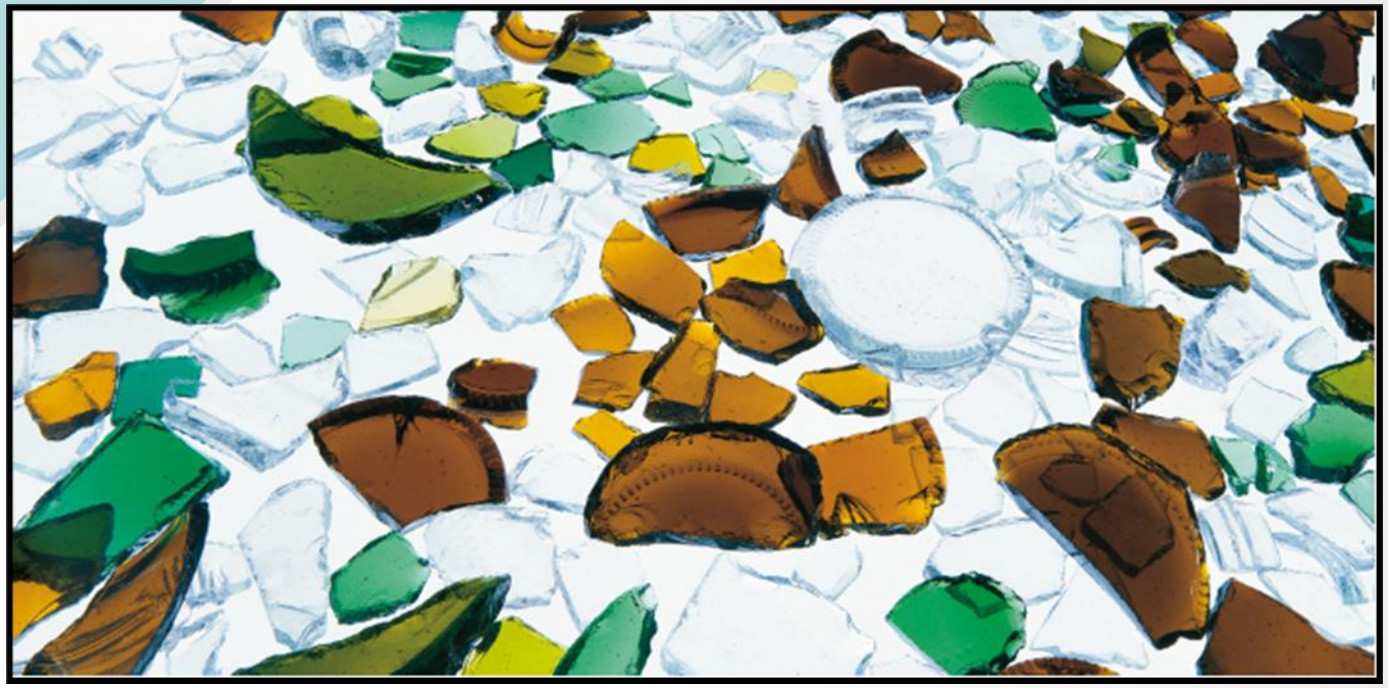


WASTE GLASS PROCESSING

STATE OF ART BOTTLE PROCESSING

C.CHOPIN

22/09/21

COMTAMINANTS

KSP

- 1 - Porcelain
- 2 - Ceramic
- 3 – Stone

Organic

- 1 – Paper, cardboard
- 2

Magnetic and no magnetic

Bi

GLASS RECYCLING OBJECTIVE

::Increase qu
pieces numb
tonne, …

:: Take off :

1 - Big pieces

2 - Aluminium, Magnetic, …

3 - Organic, plastic, …

4 - Vitroceramic

5 – special glass : lead glass, wired glass

:: Increase
recycling b
flint in Fra

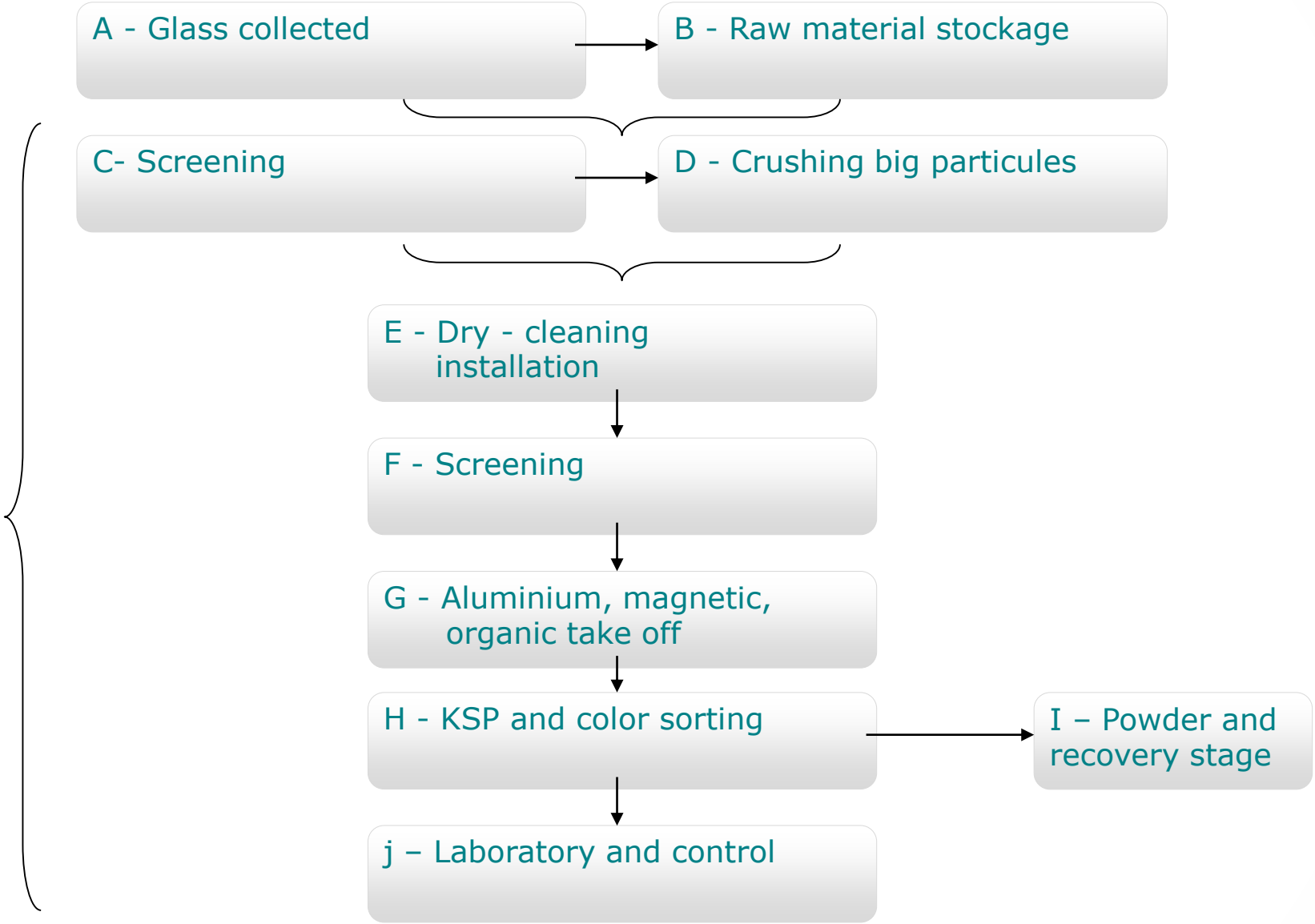
:: Dicrease
glass in wa
waste

:: Optimise
different s
in powder,

:: Optimise
between in

:: Optim
sorting

KEY FOR EACH INSTALLATION



A- GLASS COLLECTED, SOURCING

:: sorting tips : control of collection

:: Adapted storage : bottle bank or door to door with adapted trash

:: Adapted transport, cleanliness of dumpsters and intermediate storage without pollution (cross contamination)

A- GLASS COLLECTED, RAW MATERIAL CONTROL AND STORAGE

1. Control reception (PTM)

:: Control every truck :
Density control, visual control, …

:: Control in stock area

A- GLASS COLLECTED, RAW MATERIAL CONTROL AND STORAGE

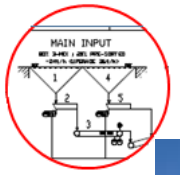
2. Storage and transfert

:: Raw material 10 years before

:: Raw material at this time : identify and with only one level, no contact with final product

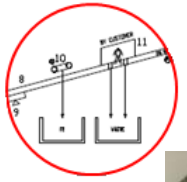
:: Different wheel Loader for raw material and final product to cancel cross contamination (no mixed raw product and final product)

C – INPUT AND SCREENING



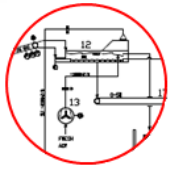
1. Infeed hopper

:: Standard feed hoppers or underground hoppers



2. Metal separation

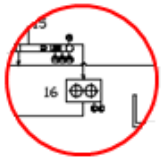
:: Overbelt magnet for ferrous metals



3. Prescreening

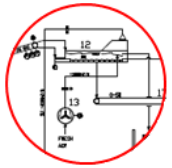
:: Coarse fractionation in combination with wind sifting

D – CRUSHING BIG PARTICULES



1. Crushing

:: Roller crushing for voluminous glass particles



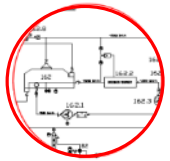
2. Big part sorting

:: Sorting big parts after crusher by screening (plastic bottle, cork, …)

:: Cork screen

E – DRY-CLEANING INSTALLATION

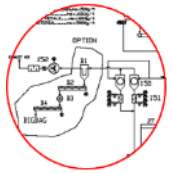
1. Drying



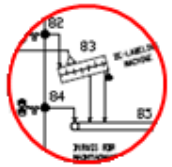
:: Efficient drying of glass cullet, extraction of fine waste particles With Fluidized bed dryer

:: Rotary dryer

2. De-dusting



:: Extraction of dust and fibers

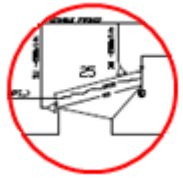


3. De-labeling

:: De-labeling for gentle and dry removal of labels like „attrition“ (dry cleaning)

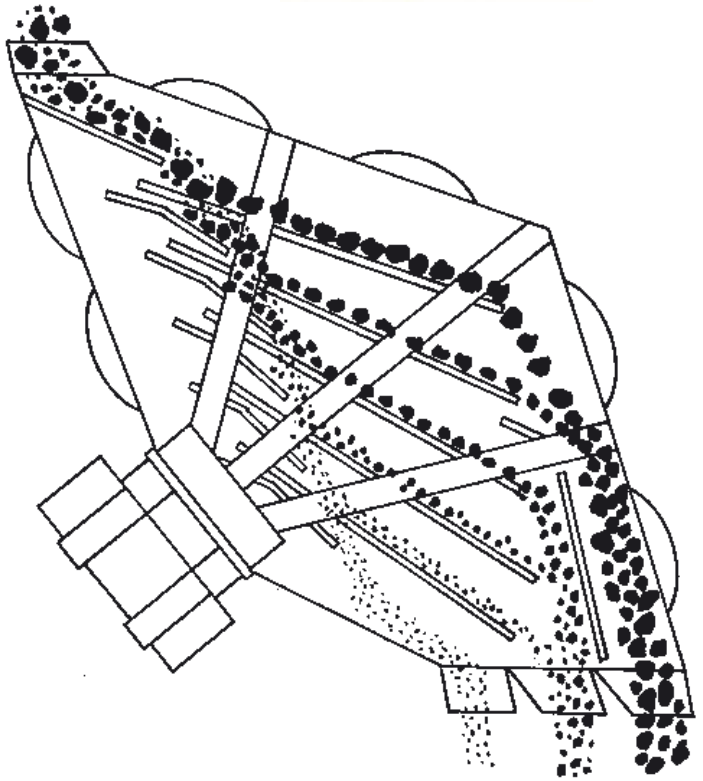
Product after dry-cleaning

F – MAIN SCREENING SYSTEM



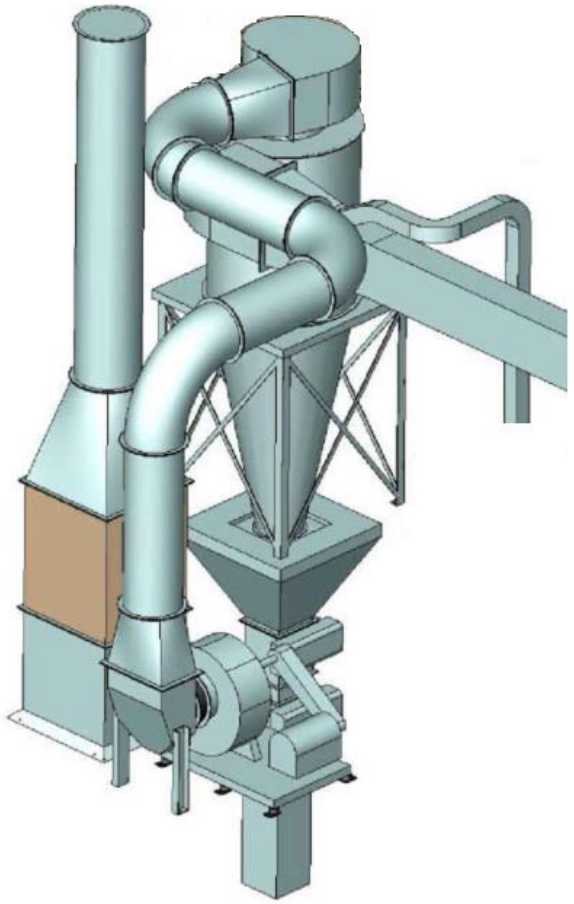
1. Screening unit

:: Specific screening and preparation for the sensor based sorting



F – ALUMINIUM, MAGNETIC AND LIGHT FRACTION TAKE OFF

2. Paper and plastic



:: Removing paper and plastic (light fraction) with suction

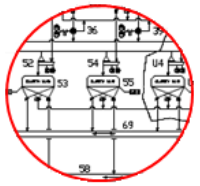
3. Magnetic

:: Removing magnetic pieces

4. Eddy current

:: Removing aluminium (and copper, …) pieces (more than 4 mm)

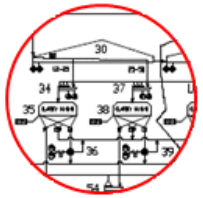
H – KSP AND COLOUR SORTING

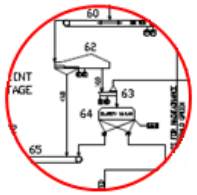


1. Sorting technologie

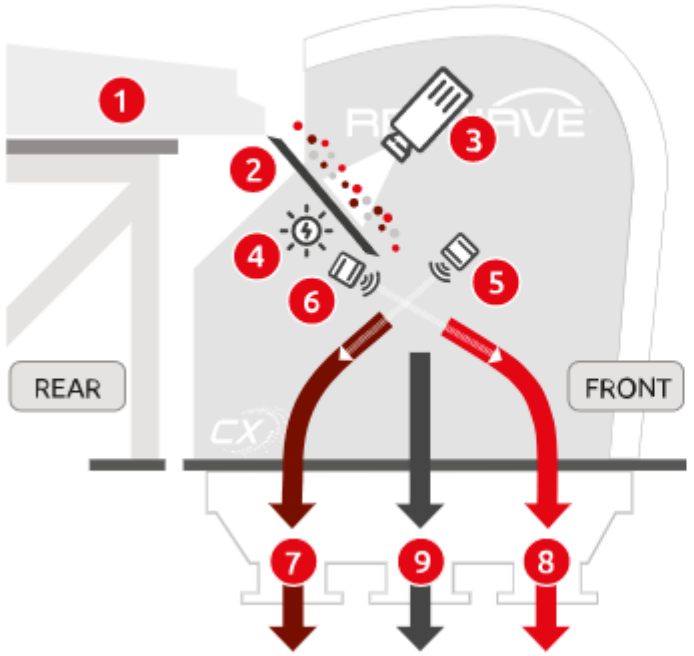
- **Based on pictures analysis : camera, soft, …**
- **Sorting pieces more than 1 mm**
- **Color detection**
- **Size distribution and choice size ejection**
- **Better detection of part pieces : plastics, paper on glass, …**
- **Option for detection of non ferrous, aluminium, vitroceramic, lead glass, wired glass, …**

MAIN SUPPLIERS : BINDER & CO (AUTRICHE), MOGENSEN (ALLEMAGNE), REDWAVE(AUTRICHE), KRS (ALLEMAGNE)

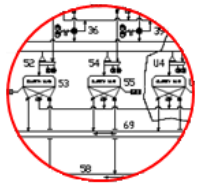




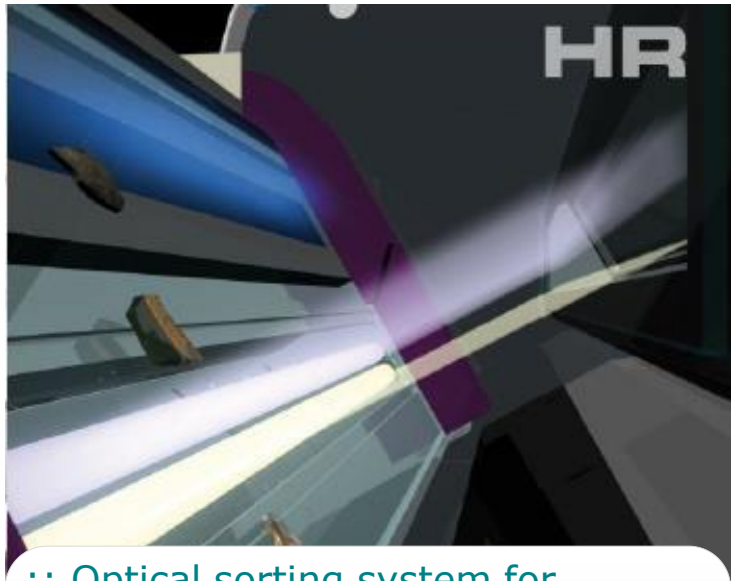
2. KSP or colour sorting



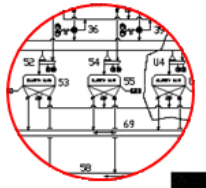
1. Vibratory feeder
2. Material slide
3. Camera
4. Light source
5. Valves and nozzles at the frontside
6. Valves and nozzles at the rearside
7. Chute for eject from front to rear
8. Chute for eject from rear to front
9. Chute for passing material



3. Vitroceramic sorting



:: Optical sorting system for separating heat resistant glass (glass ceramics) by CUT-OFF technology - Without X-Ray

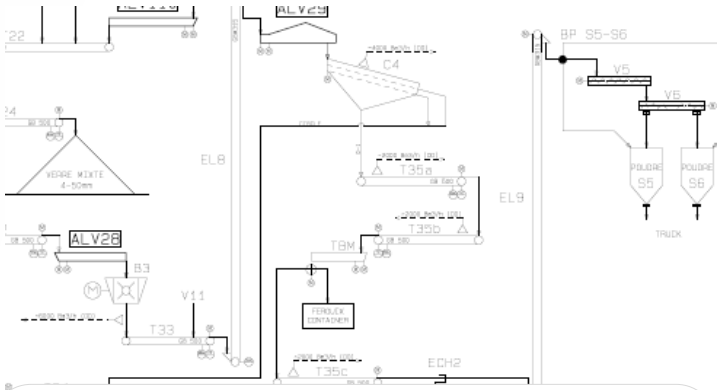


3. Lead sorting

:: Optical sorting system for separating lead glass (containing lead with up to 0,5% PbO concentration) by fluorescence technology - without X-Ray

I – POWDER AND RECOVERY STAGE

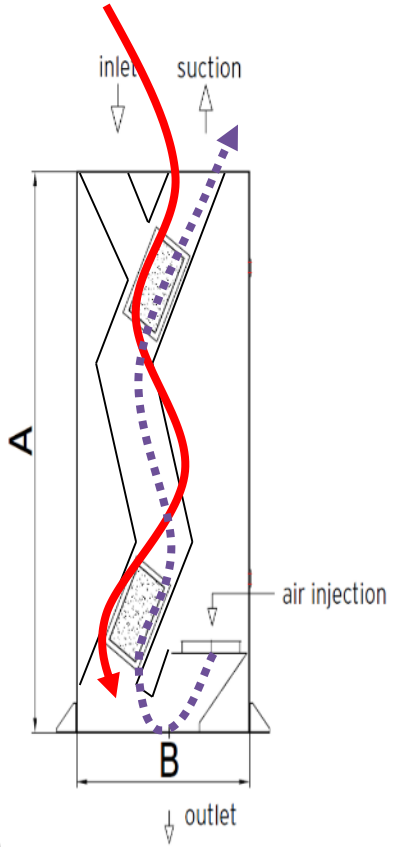
1. Powder

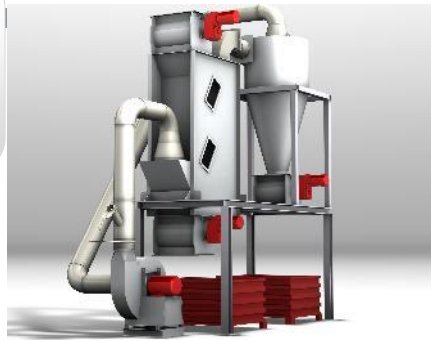


:: Crushing for KSP and fines fraction of glass (input of the plant generaly)

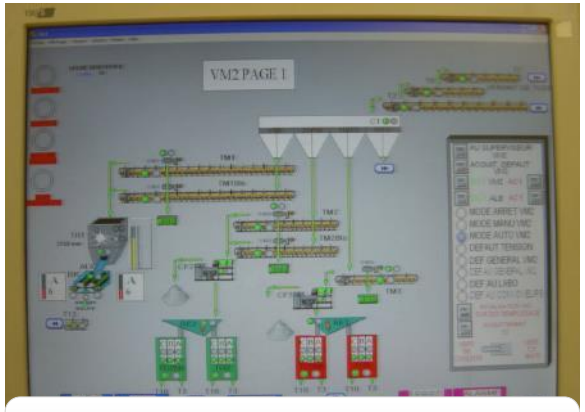
2. Recovery

:: Sifting for minimising glass lost and optimising yield

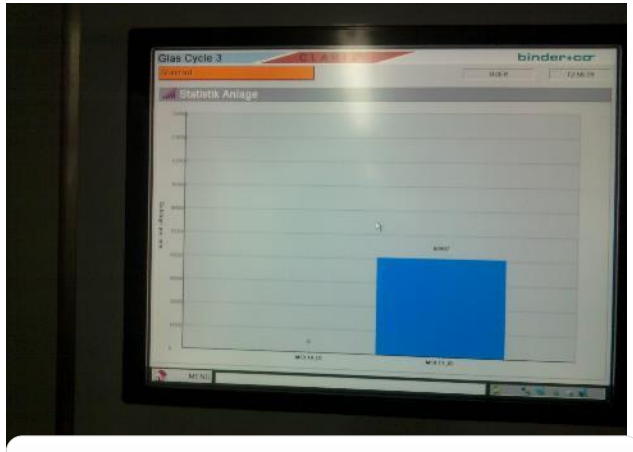




K - PROCESS CONTROL - SUPERVISION



:: Supervision control



:: Statistic analysis

:: Connection between statistic analysis and supervision control