SPC: STATISTICAL PROCESS CONTROL

SPC is a tool used to manage quality.

- Collecting samples
- Analysis of the test data.
- Rule violations - conditions where we are out of control, out of our range.
- Quality goes on planning how often taking a test

The SPC module provides a number of features that can be used to implement the policies and procedures of a Quality Management System (QMS). The capabilities provided are the following:

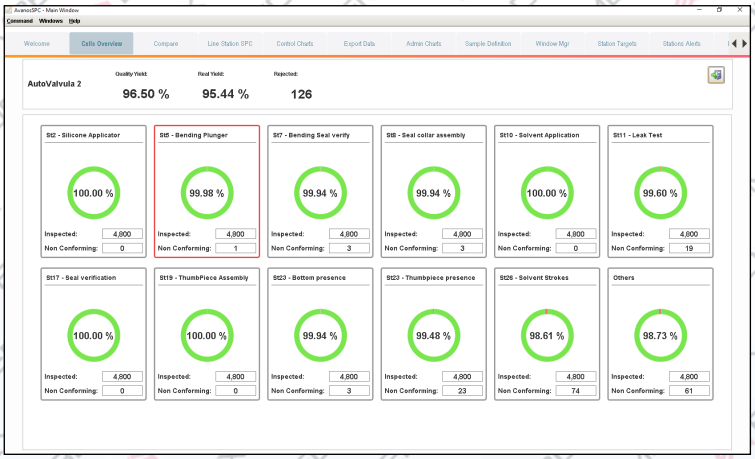
- Manual Sample Collections
- Automatic Sample Collections
- Scheduling of Samples based on real-time production conditions
- Alerting of Samples Coming Due, Due or Overdue
- Automatic Evaluation of Control Limits and Out of Control Signals without human intervention
- Alerting of Out of Control Conditions
- Control Charts
  - XBar–Range o XBar–S
  - Individual
  - Pareto
  - Histogram o P chart
  - NP chart o C chart
  - Uchart
  - BoxandWhiskerChart o ProcessCapability
  - ProcessPerformance

HALYARD – MANUFACTURING OF MEDICAL PRODUCTS (Magdalena, México)

SCOPE: Implementation of an automatic Real Time SPC platform for: Data collection, Real Time information display, Historics analysis, Automatic alerts & alarms for out-of-range parameters for 20 automatic production cells and lines.

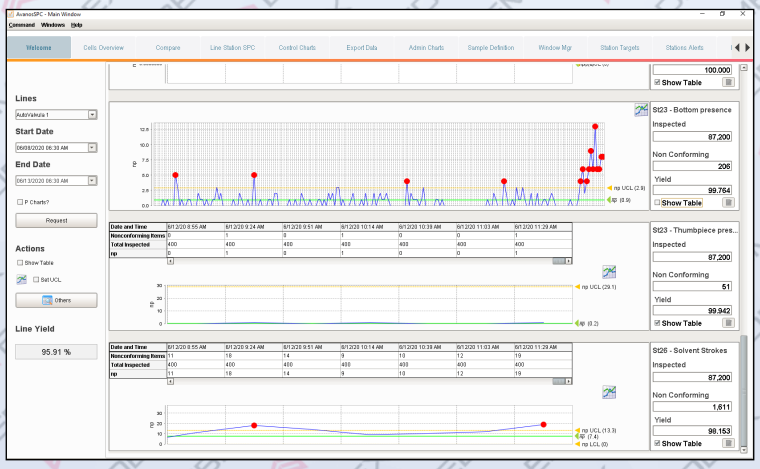
The information is automatically retrieved from each machine´s PLC in real time, and instantly evaluated by SPC rules. All data is stored in a Database for future analysis.

Automatic production counts, defective parts count per station (rejection cause).



Picture 1: REAL TIME SPC PLATFORM – REAL TIME YIELD AT MULTIPLE STATIONS AT ONE AUTOMATIC ASSEMBLY CELL

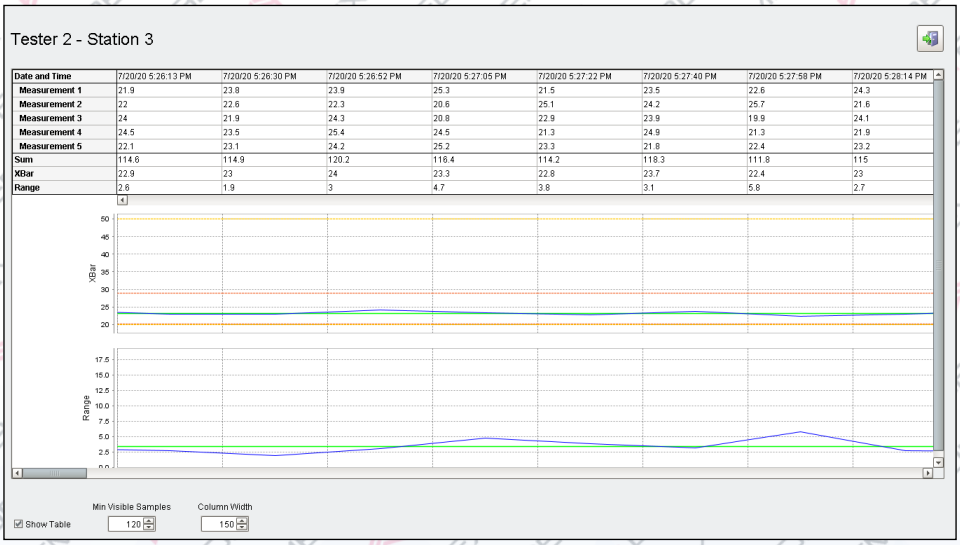
The information above shows the Quality information in Real time from the automatic Assembly Cell "Auto-valve 2", as well as the detailed data from each one of its automatic stations. This data is automatically collected from the machine´s PLC in real time.



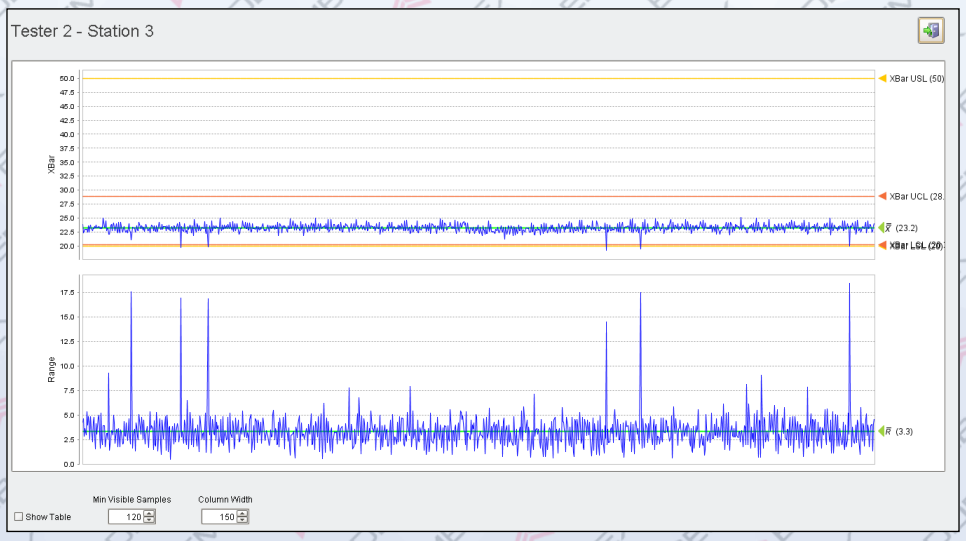
Picture 2: REAL TIME SPC PLATFORM – Stations NP Charts

The interface shown above displays historical data, such as NP Charts allowing the user to select a specific cell, as well as detailed information from each one of its stations.

The platform can also retrieve and evaluate variable data, such as Temperature, Pressure, Flow rates, and other data relevant to a specific process and calculate and generate SPC Control Charts accordingly.



Picture 3: REAL TIME SPC PLATFORM – XBar – Range Control Chart with data table



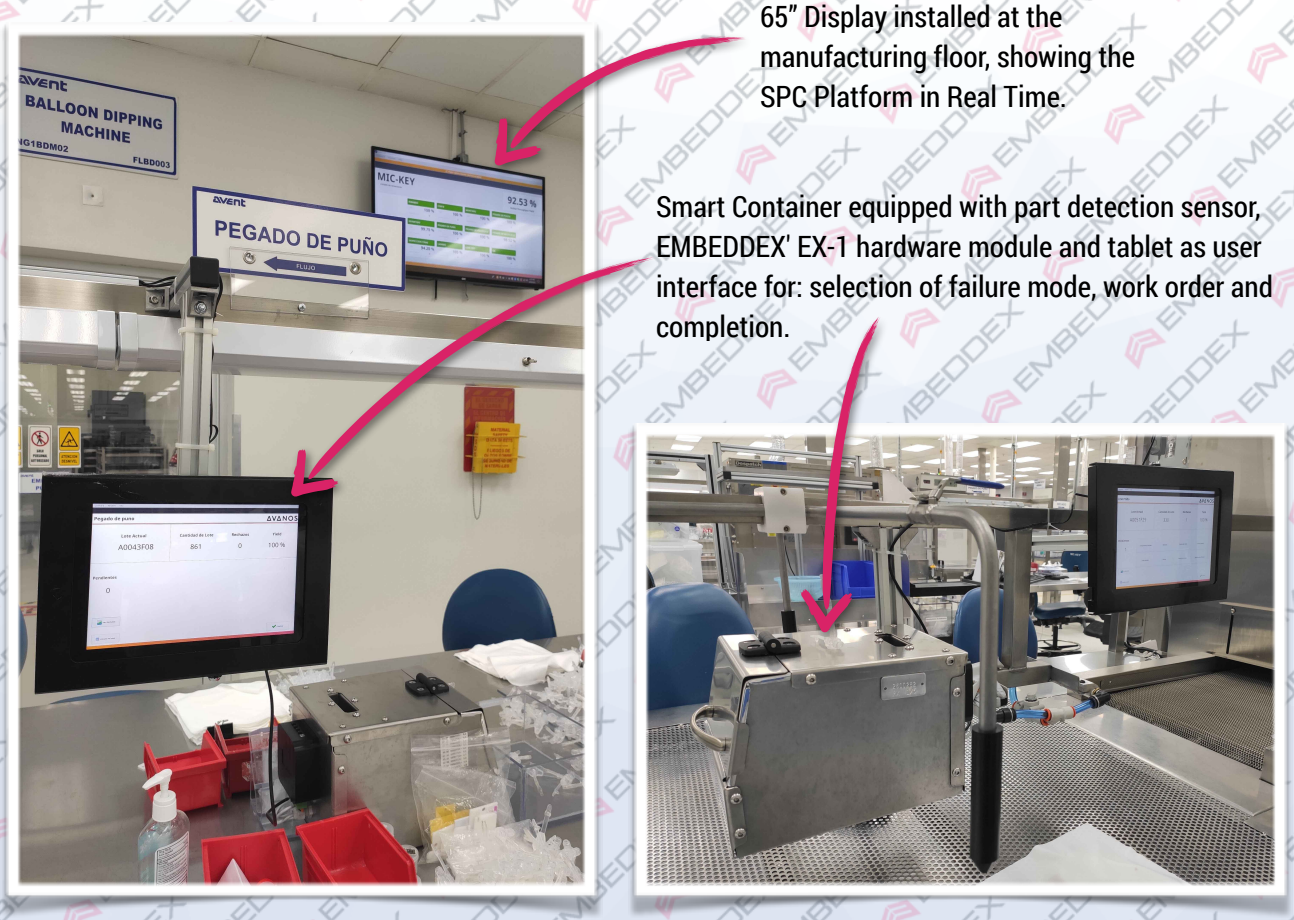
Picture 4: REAL TIME SPC PLATFORM – XBar – Range Control Chart

AVANOS – MANUFACTURING OF MEDICAL PRODUCTS (Nogales, México)

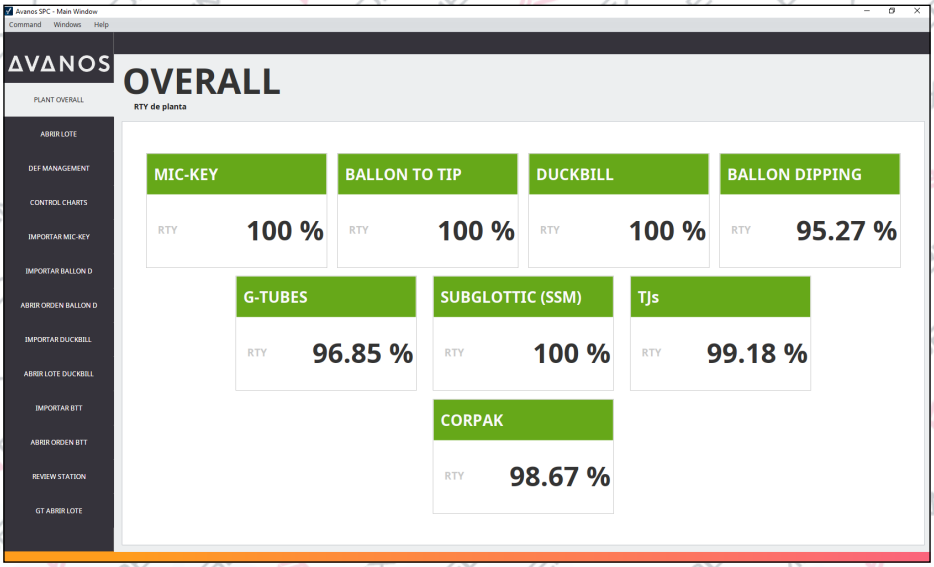
SCOPE: Implementation of an automatic Real Time SPC platform for: Data collection, Real Time information display, Historics analysis, Automatic alerts & alarms for out-of-range parameters for scrap segregation at the manufacturing areas.

Yield and Rolled Throughput Yield calculation in real time, through smart scrap segregation. Smart containers that detect and count the amount of defective parts in real time. Assisted with tablets installed at the process, the operator can select the rejection cause, in stations where multiple causes exist.

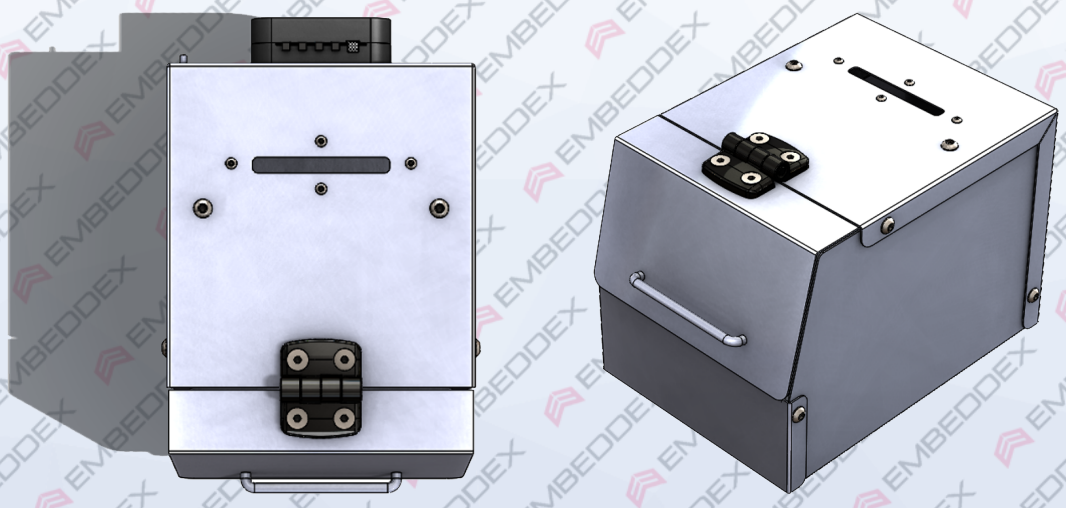
The way in which the system gathers information is by means of a network of hardware devices used to segregate and classify defective pieces (scrap) in each of the processes. This devices are stainless steel containers equipped with an EX-1 module (developed by Embeddex), which sends information about the process to a central server which hosts the web platform service, and, in the case where there are many possible scrapping reasons in a single station, a tablet mounted in close proximity to the device allows the operator to select the reason each piece is rejected.



Picture 5: REAL TIME SPC PLATFORM – XBar – Range Control Chart

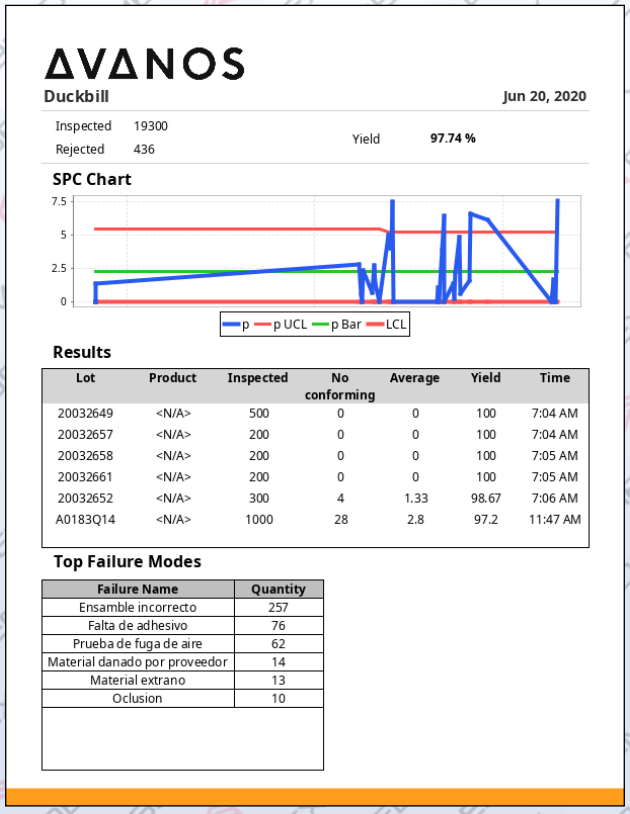


Picture 6: REAL TIME SPC PLATFORM – Overall Business Unit Dashboard



Picture 7: REAL TIME SPC PLATFORM – Scrap Container with EX-1 Communication Module

Picture 8: EMBEDDEX´proprietary EX-1 Communication Module



AVANOS

Duckbill — Jun 20, 2020

Inspected	19300	Yield	97.74 %
Rejected	436		

SPC Chart

Results

Lot	Product	Inspected	No conforming	Average	Yield	Time
20032649	<N/A>	500	0	0	100	7:04 AM
20032657	<N/A>	200	0	0	100	7:04 AM
20032658	<N/A>	200	0	0	100	7:05 AM
20032661	<N/A>	200	0	0	100	7:05 AM
20032652	<N/A>	300	4	1.33	98.67	7:06 AM
A0183Q14	<N/A>	1000	28	2.8	97.2	11:47 AM

Top Failure Modes

Failure Name	Quantity
Ensamble incorrecto	257
Falta de adhesivo	76
Prueba de fuga de aire	62
Material danado por proveedor	14
Material extrano	13
Oclusion	10

Picture 9: REAL TIME SPC PLATFORM – Automatically Generated pdf Report