



Process

System for the production of liquid, semi-pasty and pasty products

ErmaFlex #1

The Process at a glance

- **Highlights & Key Activities**
 - ✓ Production of shower gel
 - ✓ Production
 - ✓ Quick cleaning
 - ✓ Quality control of PH, viscosity, etc.
- **Specific components**
 - ✓ 40L triple wall stainless steel tank
 - ✓ Regulated heaters
 - ✓ PT100 temperature sensors and 1 analogue pressure sensor
 - ✓ Control cabinet equipped with a regulation system, a PLC and an operator console
- **Features**
 - ✓ L/ W/ H: 2500 x 1500 x 2100 mm
 - ✓ Electrical energy: 400V three-phase + neutral
 - ✓ Pneumatic energy: 7 bar
 - ✓ Weight: 500kg
 - ✓ Consumables: Machine supplied with phases for making shower gel
 - ✓ Water: Water supply and sewage disposal
 - This system is accompanied by a technical and educational file

References

- ✓ **FA30-FA32:** Process with control cabinet equipped with Schneider M340 PLC and colour graphic touch panel
- ✓ **UC13:** Industrial Supervision Option for a Machine
- ✓ **UC90:** Option: Fault box for electrical cabinet, remotely configurable on a tablet (Not supplied)
- ✓ **IO00:** IO-Link package for electrical and pneumatic measurements
- ✓ **SK20:** Sick TDCS Smart IoT Gateway Kit & Ermaflex Process Smart Sensors
- ✓ **UC51:** Option: Visual Instructions & Monitoring of Production Indicators on the Tulip open application environment and touch pad, for one machine
- ✓ **UC52:** Option Visual instructions on Tulip open application environment and touch pad, for one machine
- ✓ **MN15:** Programmable Digital Mock-up Process
- ✓ **QF10:** Manufacturing Process Control Toolkit

Functional description

- ✓ The Process, the manufacturing unit of the Ermaflex line, is designed to produce different types of products: liquid (e.g. liquid soap), semi-pasty (e.g. shower gel) or pasty.
- ✓ It is used for mixing the basic products used in recipes, emulsifying, heating and cooling mixtures.
- ✓ The Process consists of 7 functional sub-assemblies, a control cabinet and the operator console

Sub-assembly Mixing of ingredients

- ✓ It ensures that a homogeneous mixture is formed from the various ingredients in the tank
- ✓ It is mainly made up of:
 - ✓ A slow anchor mixer with articulated Teflon scrapers
 - ✓ A three-phase asynchronous electric motor driving the mixer

Product emulsion sub-assembly

- ✓ It ensures the emulsion of the mixture made in the tank
- ✓ It is mainly made up of:
 - A high speed turbine
 - A three-phase asynchronous electric motor driving the chain

CAP CIP - Bac Pro PLP - MSPC
BTS MS - IUT
Universities - Engineering schools

Double-shooting



IoT Sick Pack



Tank heating sub-assembly

- ✓ It ensures a temperature increase of the mixture up to 60 degrees
- ✓ It is mainly made up of:
 - A heating resistor located between the two shells of the tank
 - A PT100 temperature sensor (measurement in the heating/cooling circuit)
 - A PT100 type temperature sensor (measurement in the heart of the mixture)

Tank cooling sub-assembly

- ✓ It ensures that the mixture returns to room temperature after heating operations
- ✓ It is mainly made up of:
 - A cold water circuit located between the two walls of the tank
 - A solenoid valve to supply cold water to this circuit from the external network
 - A solenoid valve for water discharge to the sewer
 - A PT100 temperature sensor (measurement in the heating/cooling circuit)

Sub-assembly Tank cleaning

- ✓ It ensures the rinsing of the mother tank after each production cycle
- ✓ It is mainly made up of:
 - A 360-degree cleaning ball that spreads water over the walls of the tank
 - A solenoid valve for the supply of hot water from the external network

Lid lift sub-assembly

- ✓ It ensures the opening of the tank to introduce ingredients or to clean it
- ✓ It is mainly made up of:
 - A vertical hydraulic lid translation system
 - A guidance system for the mobile unit
 - A mechanical locking system operated by a crank
 - A sensor to check whether the cover is in the closed position



System architecture (continued)

Product discharge sub-assembly

- ✓ It ensures the evacuation of the product to the packaging unit
- ✓ It is mainly made up of:
 - An inclined seat solenoid valve for the discharge of the mixture
 - A pneumatic nozzle connected to the air network to send a semi-pasty mixture
 - A solenoid valve to supply compressed air

Operator console

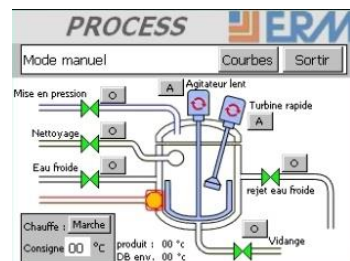
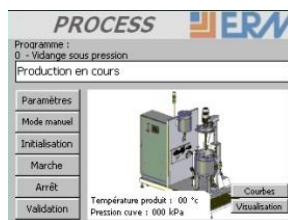
The colour graphic touch panel allows:

- Running the manufacturing unit
- Setting the controller parameters

Control cabinet

It is mainly made up of:

- Circuit breakers and fuse holders
- A Preventa safety relay to manage the emergency stop
- One 230V AC socket and two low voltage power supplies
- Contactors and relays for the control of electrical actuators
- A programmable logic controller type M340
- Terminal blocks



Examples of operator console screens

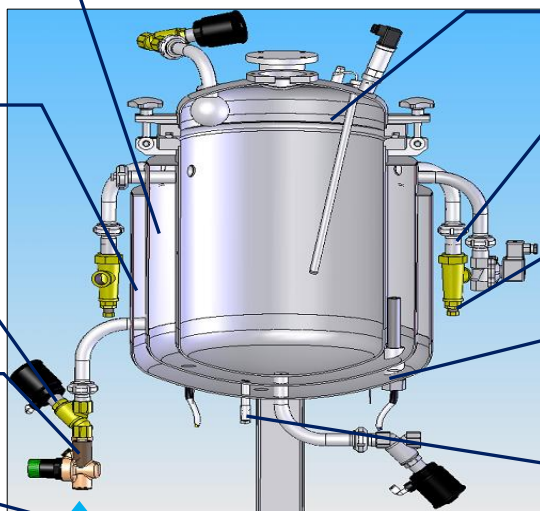
Enclosure containing the heating and cooling circuit

Wrapping containing insulation

2V4 valve

Pressure reducing valve

Cold water inlet



Temperature sensor B2

Solenoid valve 2V5

Cold water discharge

Heating resistor

Drain plug for heating circuit

Pedagogical approach

Educational activities

- ✓ Production of shower gel
- ✓ Functional analysis
- ✓ Study of technologies: electrical, pneumatic and mechanical
- ✓ Programming
- ✓ Regulation
- ✓ Optional quality control
- ✓ Settings
- ✓ Production
- ✓ Steering
- ✓ Supervision

Examples of Practical Work offered by ERM

TP1: Corrective maintenance on the tank drain valve

- ✓ Find out about the demand for labour
- ✓ Implementing safety instructions
- ✓ Preparing for the intervention
- ✓ Intervene
- ✓ Test and recommission
- ✓ Assessing the cost of the intervention

WP2: Identify the operation of the installation

- ✓ Find out about the pilot's job
- ✓ automated production systems
- ✓ Learn about the overall function of the manufacturing unit
- ✓ Study of the cover lift sub-assembly
- ✓ Study of the mixing and emulsion sub-assembly
- ✓ Study of the double envelope filling and cooling sub-assembly
- ✓ Study of the tank heating sub-assembly
 - ✓ Study of the tank draining sub-assembly
 - ✓ Study of the tank cleaning sub-assembly
 - ✓ Study of the evacuation sub-assembly



Related and complementary products

Ermaflex Process Control Case (QF10)

Control case Manufacturing process with:

- Viscometer
- density meter
- pH tester
- Thermometer
- portable balance
- test tubes
- several standard solutions for Ph



Industrial IoT for Process Ermaflex (SK20)

✓ The Sick TDCE Smart IoT Gateway & Smart Sensors for Ermaflex Process (Ref: SK20) contains:

- Sick Smart IoT Gateway TDC-E200EU
- SIG100 module for implementing logic gates and timers
- Double envelope temperature sensor (Exterior)
- Vibration sensor on high-speed agitator motor
- Temperature sensor on high-speed agitator motor
- Air pressure sensor for envelope pressurisation
- Cabinet temperature sensor



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Sick TDCE Smart IoT Gateway Kits & Smart Sensors



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Smart IoT Sick TDCE & Smart Sensors Case (SK00)

The Smart IoT Sick TDCE & Smart Sensor Gateway Toolkit contains several industrial smart sensor application cases.



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IO-Link electrical and pneumatic measurement package (IO00)

Study and implementation of an energy measurement system, communicating and IOT compatible



www.erm.li/io00



Ethernet IO-Link Master Kit, Supervision & IO-Link Sensors (IO01)

Design and implementation of IO-Link master and IOT compatible sensors



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