

# DELIP: Liquid Detergents Process Plants



# UNIVERSAL PROCESS PLANT

DELIP: an innovative, flexible and versatile process plant to produce PERSONAL CARE and HOME CARE liquid detergents.

Flexible design allowing fast formulas changeovers.

Versatile process: modular solution that allows producing PERSONAL/HOME-CARE products with minimal plant modification.



# HOME CARE

A wide range of HOME CARE products with DELIP!

- *Dish washing*
- *Detergent for glass surface*
- *Detergent for mirror surface*
- *Disinfectant for kitchen and restroom*
- *Decalcifier*                      *chemically aggressive*



# PERSONAL CARE

A wide range of PERSONAL CARE products with DELIP!

- *Shampoo*
- *Conditioner*
- *Liquid Soap*
- *Skin Protective*
- *Emollient*



# Plants Capacities

## Batch Process



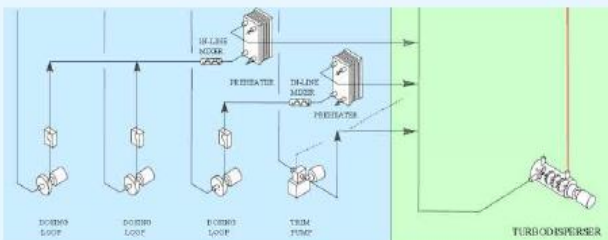
Customized capacities

Multipurpose production

Wide range of capacities:  
from 5 to 100 ton/day

	Single Batch Capacity tons	Daily Production reachable TpD
Single - 4	4	up to 32
Single - 10	10	up to 80

## Continuous Process



Optimized for high volume with single recipe

Continuous Process  
Plant are available for  
production greater  
than 100 ton/day

Daily Production reachable TpD
starting from 100
Continuous Process

Detergents viscosity range from 3.000 cP up to 10.000 cP.

## ...in terms of bottles

Typical production data based on a 4 tph plant with different bottle sizes.

We can provide our services for:

- Utilities generators
- Raw material storage/handling
- Filling machines

Batch Capacity	Tons	4
Batch Duration	Hours / Batch	3,5
Working Hours	Hours / day	8
Number of Batches / day	Batch / day	2
Plant capacity l/ day	l	8.000

Packaging volumes	<b>litre</b>	<b>1</b>
Number of bottles	bottles / day	8.000
	bottles / minute	16,67

Packaging volumes	<b>litre</b>	<b>0,75</b>
Number of bottles	bottles / day	10.667
	bottles / minute	22,22

Packaging volumes	<b>litre</b>	<b>0,5</b>
Number of bottles	bottles / day	16.000
	bottles / minute	33,33

Packaging volumes	<b>litre</b>	<b>0,33</b>
Number of bottles	bottles / day	24.242
	bottles / minute	50,51

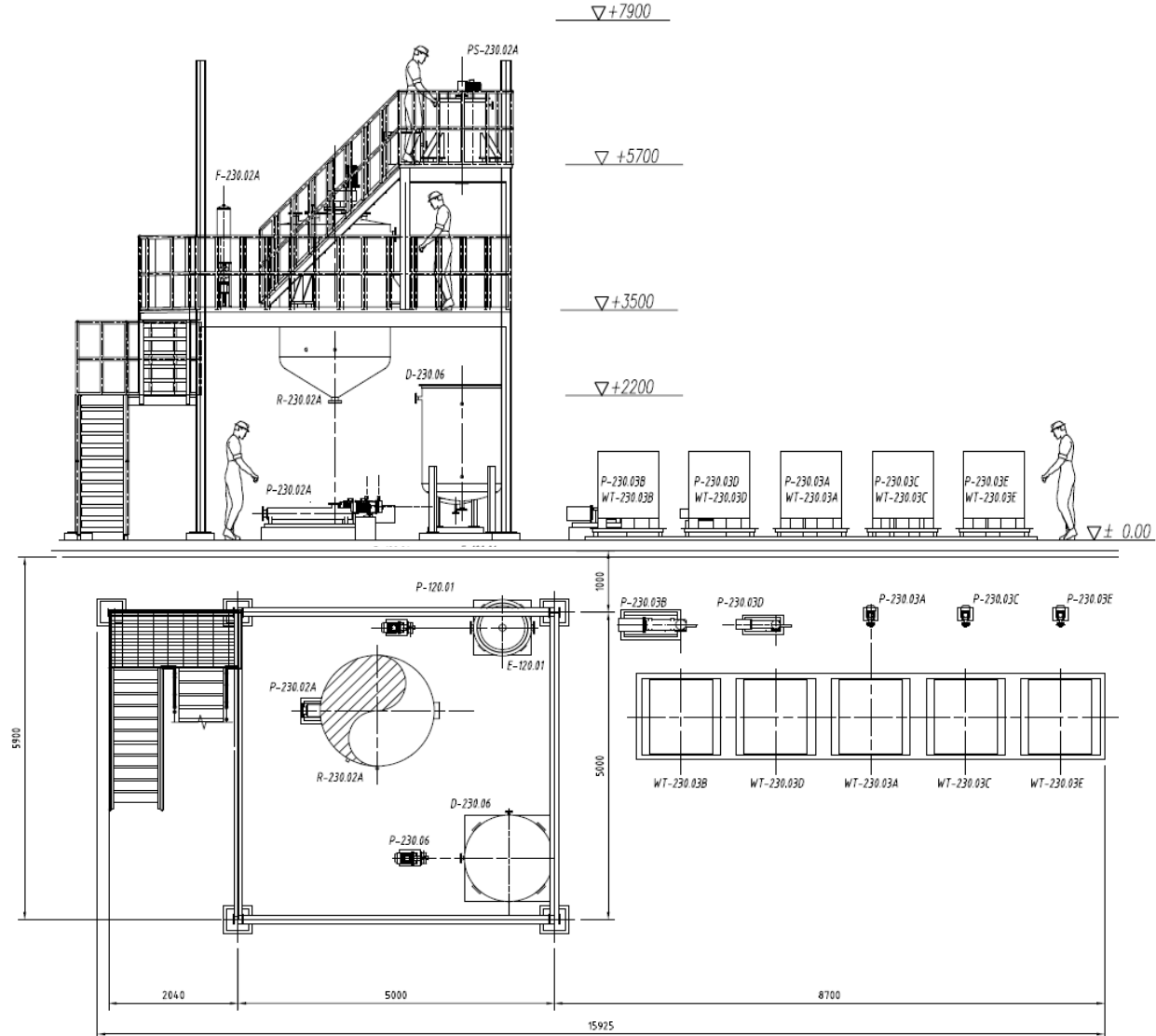


# TYPICAL LAYOUT

Compact process design requiring only 150/200 sq/mt with maximum height approx. 10m.

Modular plant design allowing to fit additional components to cope with **Client specific formula requirement**

Easy capacity expansions with the installation of additional reactor.



# Raw Materials Handling and Storage

## LIQUID RAW MATERIALS COMPOSED BY:

### A. MAIN RAW MATERIALS:

Main raw materials, usually stored in tanks, are fed to the Reactor by pumps and metered by load cell system.

### B. SECONDARY RAW MATERIALS:

Secondary raw materials, typically stored in IBC tanks, are dosed to the Reactor by pumps and Mass Weight Loss measured with platform load cell system.

### C. MINOR RAW MATERIALS

Minor raw materials are manually dosed through the manhole on the top of the Reactor.

A dedicated dosing system can be foreseen by means of a tank positioned on top of the Reactor. A premix of minor raw materials is fed by gravity under weight loss control system.

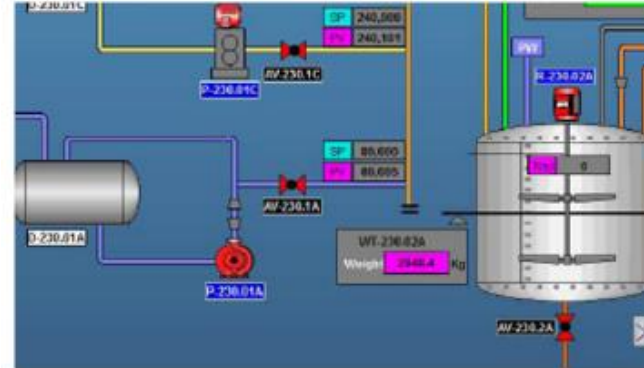




# PC/PLC Control System

Fully automated system with PC/PLC control system that allows easy management and real time visualization of the various sections of the system:

- Formula selection
- Start/stop function
- Working parameters setting
- Automatic manual operation



This is the command window for a motor:



To manually start the motor, press "Start"

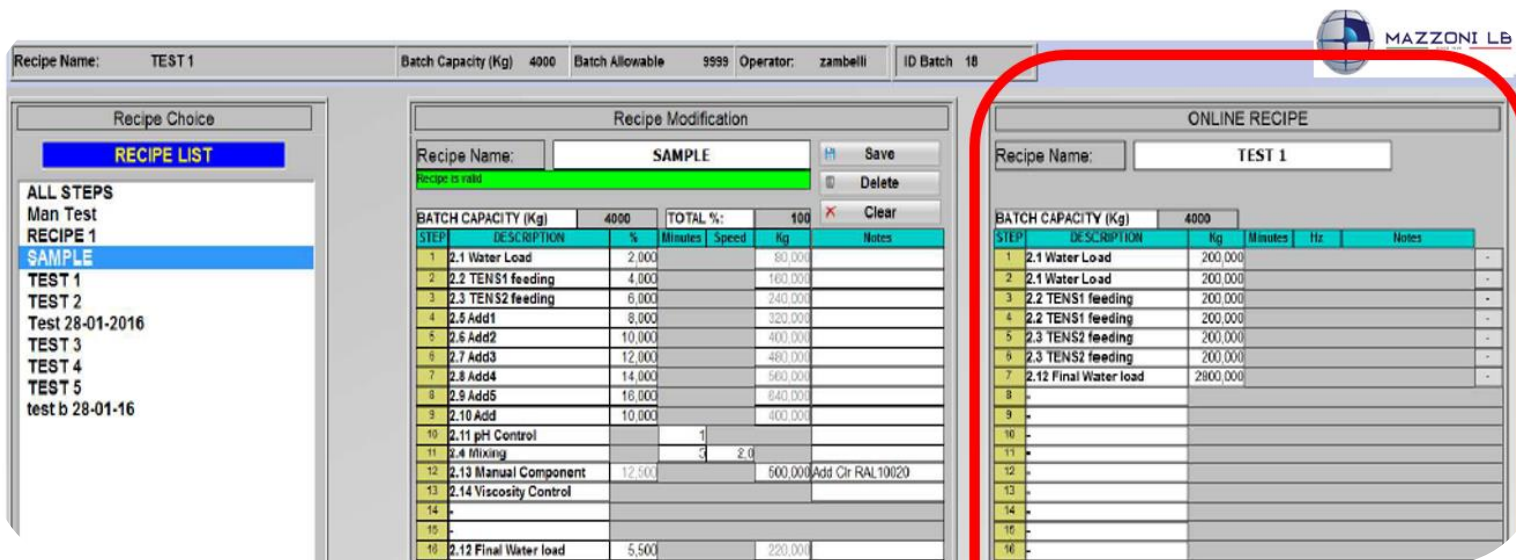
To manually stop the motor, Press "Stop"



# Product Recipe – Industry 4.0

DELIP plant is provided with a «Recipe Management System» divided in three sections:

- RECIPE CHOICE
- RECIPE MODIFICATION
- ONLINE RECIPE



The screenshot displays the Recipe Management System interface with the following sections:

- Recipe Choice:** A sidebar menu with a "RECIPE LIST" button and a list of recipe options including "SAMPLE", "TEST 1", "TEST 2", "Test 28-01-2016", "TEST 3", "TEST 4", "TEST 5", and "test b 28-01-16".
- Recipe Modification:** A central panel for editing a recipe. It shows "Recipe Name: SAMPLE" and "Recipe is valid". Below is a table with columns: STEP, DESCRIPTION, %, Minutes, Speed, Kg, and Notes. The table contains 15 rows of recipe steps.
- ONLINE RECIPE:** A panel on the right, highlighted with a red rounded rectangle, showing "Recipe Name: TEST 1". It displays a table with columns: STEP, DESCRIPTION, Kg, Minutes, Hz, and Notes. The table contains 16 rows of recipe steps.

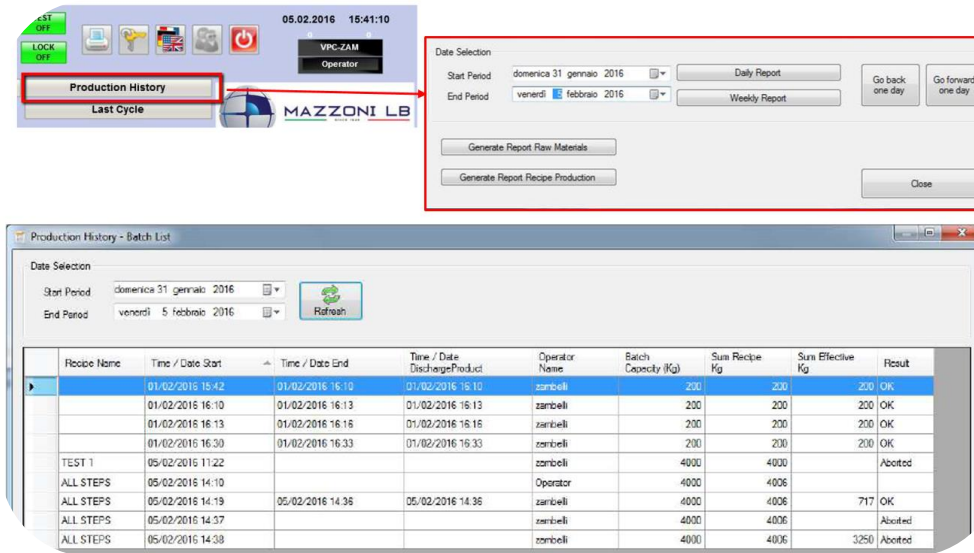
STEP	DESCRIPTION	%	Minutes	Speed	Kg	Notes
1	2.1 Water Load	2,000			80,000	
2	2.2 TENS1 feeding	4,000			160,000	
3	2.3 TENS2 feeding	6,000			240,000	
4	2.5 Add1	8,000			320,000	
5	2.6 Add2	10,000			400,000	
6	2.7 Add3	12,000			480,000	
7	2.8 Add4	14,000			560,000	
8	2.9 Add5	18,000			840,000	
9	2.10 Add	10,000			400,000	
10	2.11 pH Control		1			
11	2.4 Mixing		3	2.0		
12	2.13 Manual Component	12,500			500,000	Add Chr RAL10020
13	2.14 Viscosity Control					
14						
15						
16	2.12 Final Water load	5,500			220,000	

STEP	DESCRIPTION	Kg	Minutes	Hz	Notes
1	2.1 Water Load	200,000			-
2	2.1 Water Load	200,000			-
3	2.2 TENS1 feeding	200,000			-
4	2.2 TENS1 feeding	200,000			-
5	2.3 TENS2 feeding	200,000			-
6	2.3 TENS2 feeding	200,000			-
7	2.12 Final Water load	2800,000			-
8					
9					
10					
11					
12					
13					
14					
15					
16					

# Production Report - Industry 4.0

The PC/PLC allows to control:

- List of active alarms
- Historical files
- Trends of the present variables
- Totalizers of raw materials



Recipe Name	Time / Date Start	Time / Date End	Time / Date Discharge/Production	Operator Name	Batch Capacity (Kg)	Sum Recipe Kg	Sum Effective Kg	Result
	01/02/2016 16:42	01/02/2016 16:10	01/02/2016 16:10	zambelli	200	200	200	OK
	01/02/2016 16:10	01/02/2016 16:13	01/02/2016 16:13	zambelli	200	200	200	OK
	01/02/2016 16:13	01/02/2016 16:16	01/02/2016 16:16	zambelli	200	200	200	OK
	01/02/2016 16:30	01/02/2016 16:33	01/02/2016 16:33	zambelli	200	200	200	OK
TEST 1	05/02/2016 11:22			zambelli	4000	4000		Aborted
ALL STEPS	05/02/2016 14:10			Operator	4000	4000		
ALL STEPS	05/02/2016 14:19	05/02/2016 14:36	05/02/2016 14:36	zambelli	4000	4000	717	OK
ALL STEPS	05/02/2016 14:37			zambelli	4000	4000		Aborted
ALL STEPS	05/02/2016 14:38			zambelli	4000	4000	3250	Aborted

## Recipe Production Report

From: 28/01/2016 00:00:00

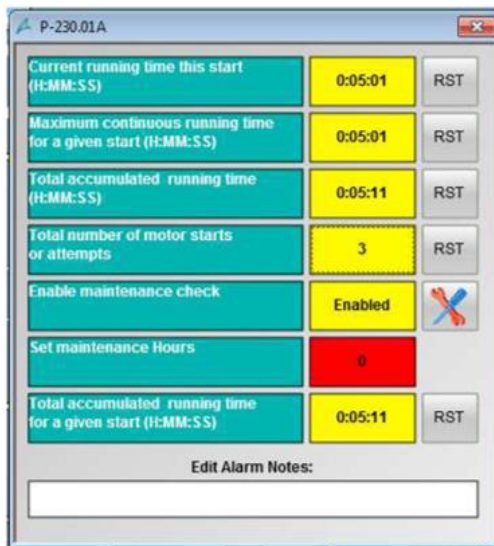
To: 28/01/2016 23:59:59


Recipe Name	Count	Recipe Quantity (Kg)	Effective Quantity (Kg)
Test 28-01-2016	2	6.508,777	6.511,954
test MINIMO	7	3.241,000	2.857,990
<b>GRAND TOTAL</b>	<b>9</b>	<b>9.749,777</b>	<b>9.369,944</b>

# CLEANING & MAINTENANCE

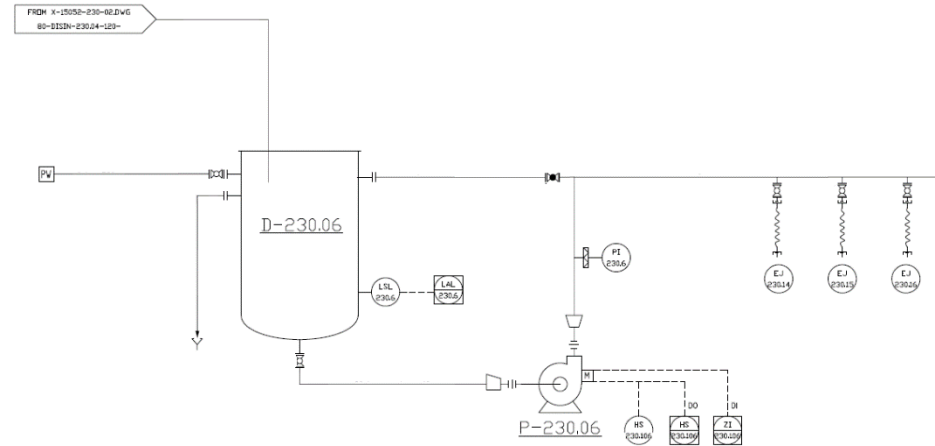
## CIP - CLEAN IN PLACE

CIP system for automatic plant cleaning allowing no contaminations and fast operations



P-230.01A		
Current running time this start (H:MM:SS)	0:05:01	RST
Maximum continuous running time for a given start (H:MM:SS)	0:05:01	RST
Total accumulated running time (H:MM:SS)	0:05:11	RST
Total number of motor starts or attempts	3	RST
Enable maintenance check	Enabled	
Set maintenance Hours	0	
Total accumulated running time for a given start (H:MM:SS)	0:05:11	RST

Edit Alarm Notes:



## SCHEDULED MAINTENANCE

The control system is provided with a scheduled maintenance program



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