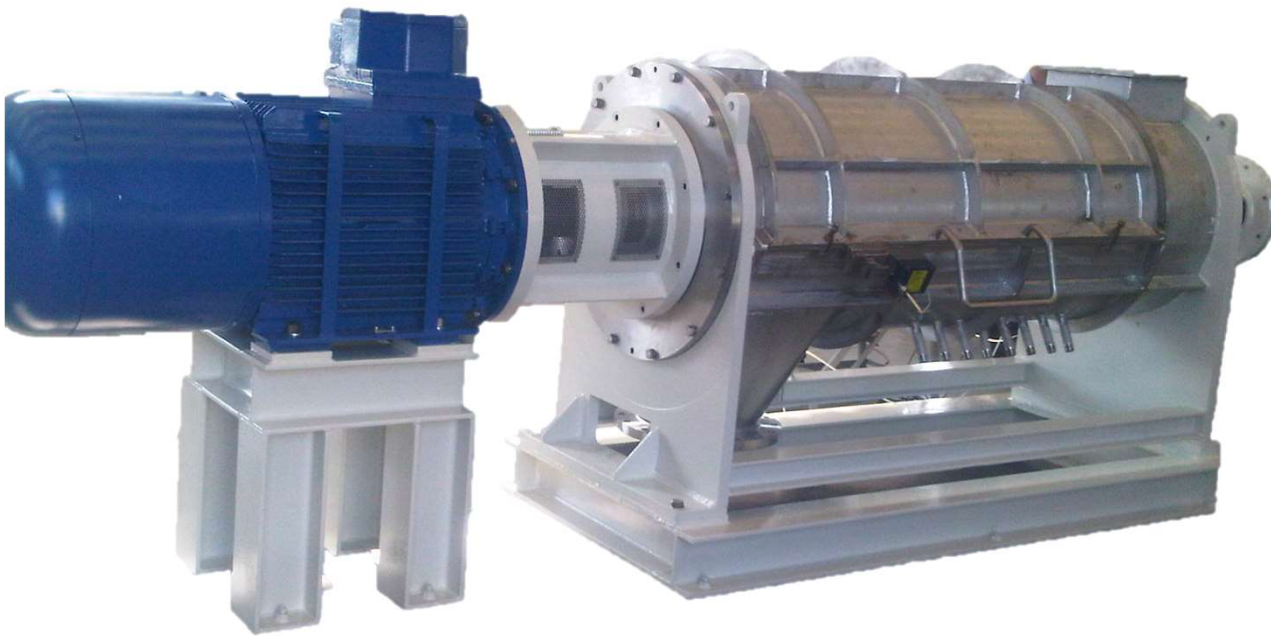


NTD - Non Tower Detergent powder production technology



ballestra
SINCE 1960

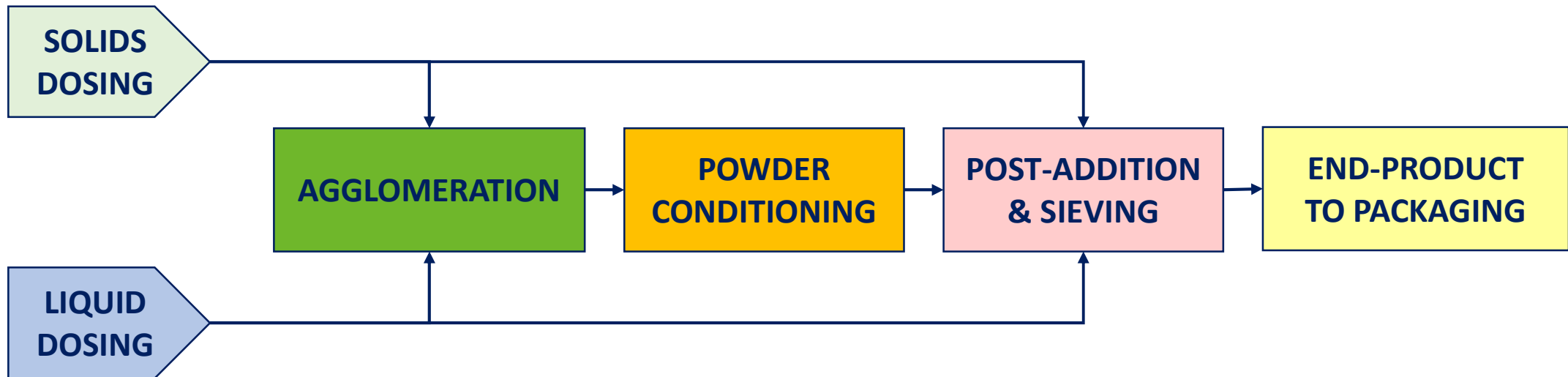


MAZZONI
SINCE 1940

Introduction

The innovative NTD - Non Tower Detergent production technology, based on the proprietary KETTEMIX reactor/granulator, has been developed by Ballestra to meet the worldwide market requirements for detergent powder production with reduced energy demand and manufacturing cost, without limitation to the physical, chemical and performance characteristics of the products.

Ballestra's know-how for the manufacture of high quality detergent powder and its unique expertise achieved with the supply of more than 550 spray-drying plants all over the world have merged into the design of this reliable, easy to operate NTD plant.



Benefits and advantages

Limited Investment costs

High production flexibility in terms of powder formulation and physical characteristics, namely:

- total active matter content: up to 25%
- powder bulk density: 600 to 1,000 gr/lt (by using particular components)

Low energy consumption

Ease of operation with limited manpower requirements

Low installation costs

- reduced transportation cost
- short erection time
- limited building requirements, the plant is designed for housing under shed over a concrete floor

Negligible environmental impact

- No gaseous nor liquid effluents



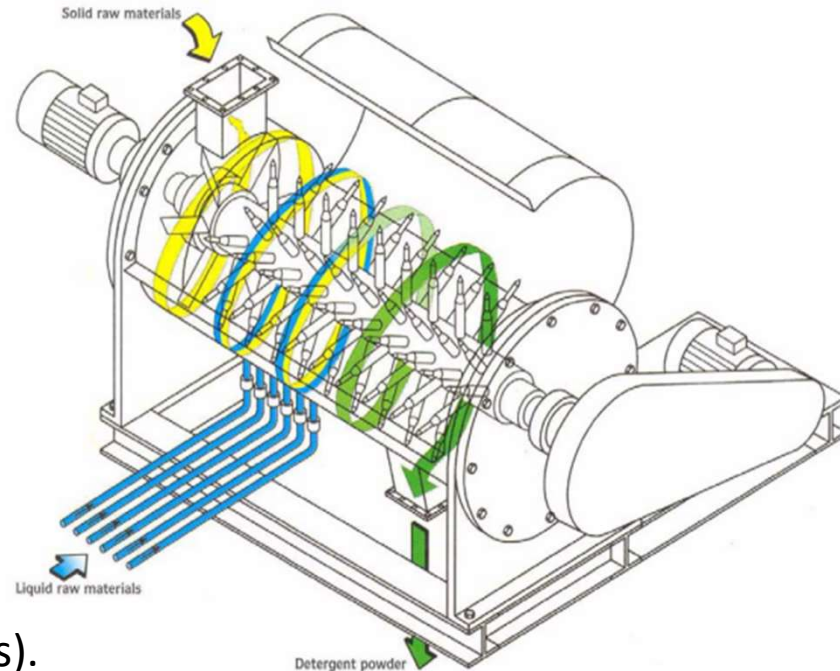
Ballestra Kettemix reactor

The Kettemix reactor is a special, self-cleaning agglomerator designed by Ballestra on the base of the deep experience achieved in the detergent powder production technology over the years.

The approach in developing the Kettemix reactor has been focused on factors like:

- mechanical simplicity
- easy and reduced maintenance
- operation flexibility

Therefore the Kettemix reactor has been designed as a continuous mixer-reactor for the production of agglomerated powders, either by combination of spray-drying plus agglomeration (Combex process), or according to a fully Non-Tower route (NTD process).



Solid becoming turbulent (dry pattern)

Solid/liquid mixing and reacting (wet pattern)

Granulating (dry pattern)

The production of formulated powder containing anionic surfactants is possible by feeding the Kettemix reactor with LAB Sulphonic Acid and a stream of solid mixture containing sodium carbonate which acts as neutralizing agent.

This “dry process” for the neutralization of sulphonic and carboxylic acids has a positive effect of reducing production cost and of simplifying the process.

The Kettemix reactor is capable of incorporating other “active ingredients” in liquid form.

The working principle of the Kettemix reactor is based on the granulation effect due to the rotation of inner adjustable elements which maintain a controlled gap between themselves and the wall of the mixer; the body is a horizontal cylinder, while the rotary stirring elements are connected to a horizontal shaft.

On this shaft, an high efficiency impeller is also fitted, and its rotation is made independent from the stirring spykes.

This way the residence time of the powder in the reactor can be easily regulated.

Kettemix characteristics

Solids and liquids are dosed downward and upwards respectively. The agglomeration process in the mixer can be ideally divided into 3 zones:

1st zone:

The dosed stream of premixed solid ingredients is pre-dispersed by a special impeller which at the same time provides for a controlled air flow and turbulence across the apparatus.

2nd zone:

The liquid components are individually dosed at the bottom of the Kettemix in such a way to avoid any preferential and uncontrolled distribution. Therefore the turbulent pattern of the dry ingredients is the driving force which provides for liquid transport and distribution through the mixer.

3rd zone:

The semi-wet blend of liquid and solid components is intimately contacted, granulated and transported through the ideal crown created between the peripheral stirring elements and the inner wall of the mixer. Along this path, the neutralization of sulphonic and fatty acids over Na_2CO_3 or other solid alkalis is completed, as well as the granulation of the resulting blend of surfactant/coadjuvant components.

Most outstanding differences between Spray-drying tower and NTD

TOPICS	PROCESS ROUTE	
	TOWER	NON-TOWER
Obtainable Bulk Density	low - medium	medium - high
Product shape	hollow beads	layered granules
Water evaporation by	Slurry spraying and contact with hot air	Fluid bed conditioning
Key-equipment demand	high	low
Water evaporation/ton product	high	low
Overall energy demand	high	low

Combex – coupling tower and agglomeration

The “Combex” plant is the combination of the traditional Spray-Drying technology with the innovative NTD technology.

It can be applied to new plants as well as to the retrofit of existing factories.

Main advantages of the combined route

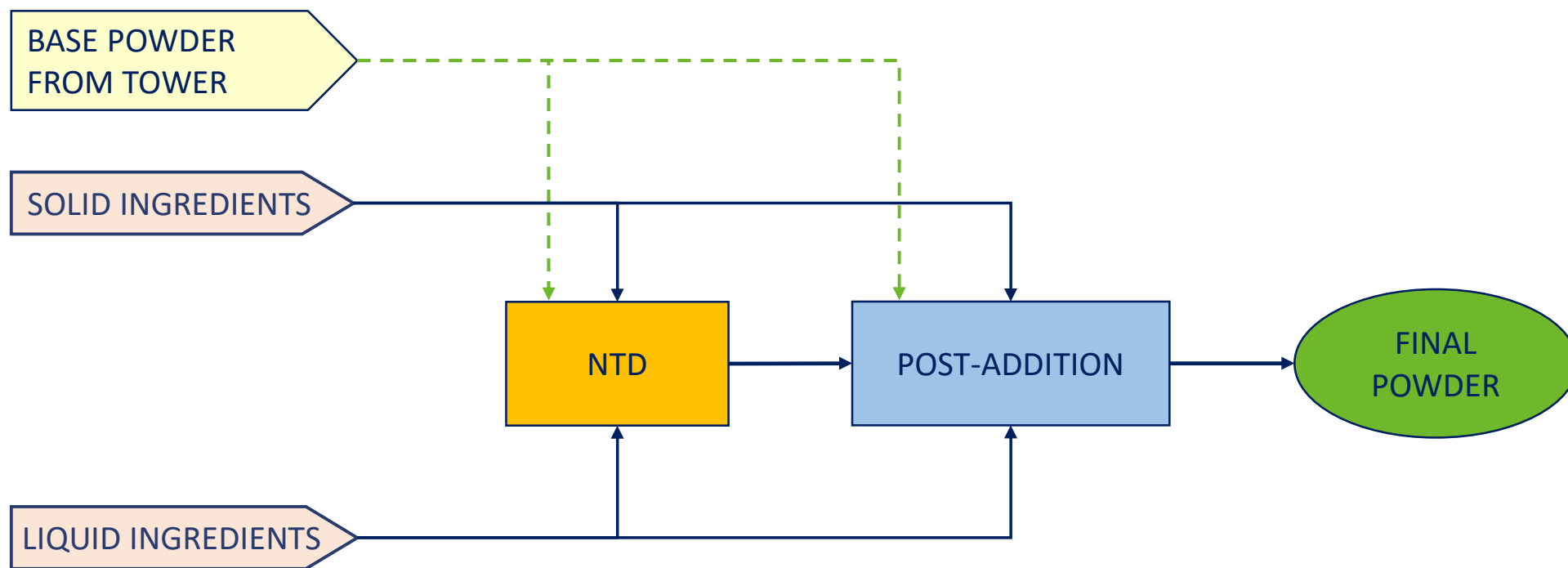
- Increase of overall production capacity
- Extension of the range of obtainable bulk density
- Increase of total active content in the final powder
- Reduction of overall energy consumption, with beneficial impact on production cost and the CO₂ emissions
- Reduction of the specific water consumption

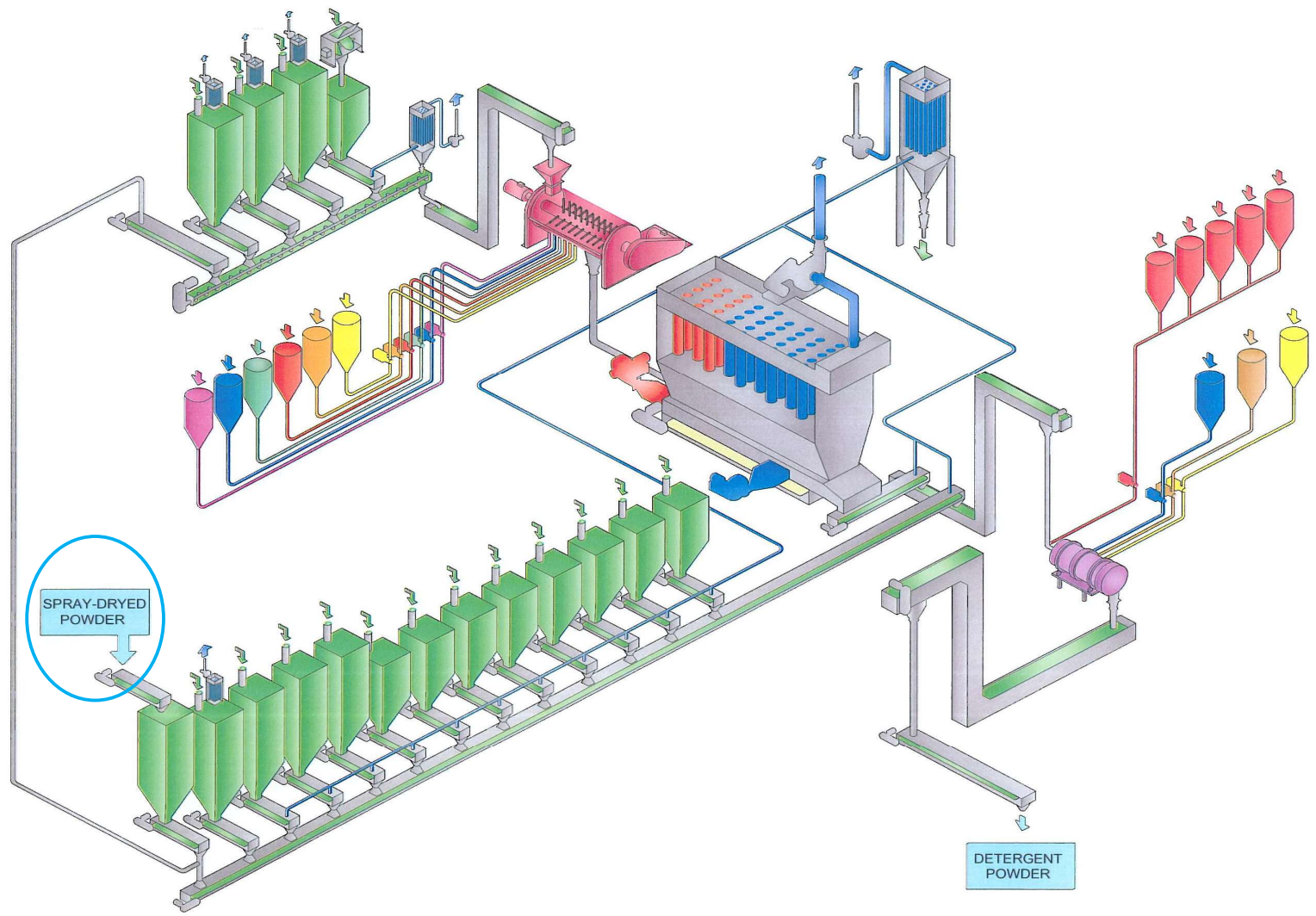


Combex – plant basic operation

The base powder coming from the Spray-Drying tower can be fed into the Kettemix reactor or in the Post-addition blender.

The first solution allows to obtain an higher bulk density, while the second solution a lower bulk density.

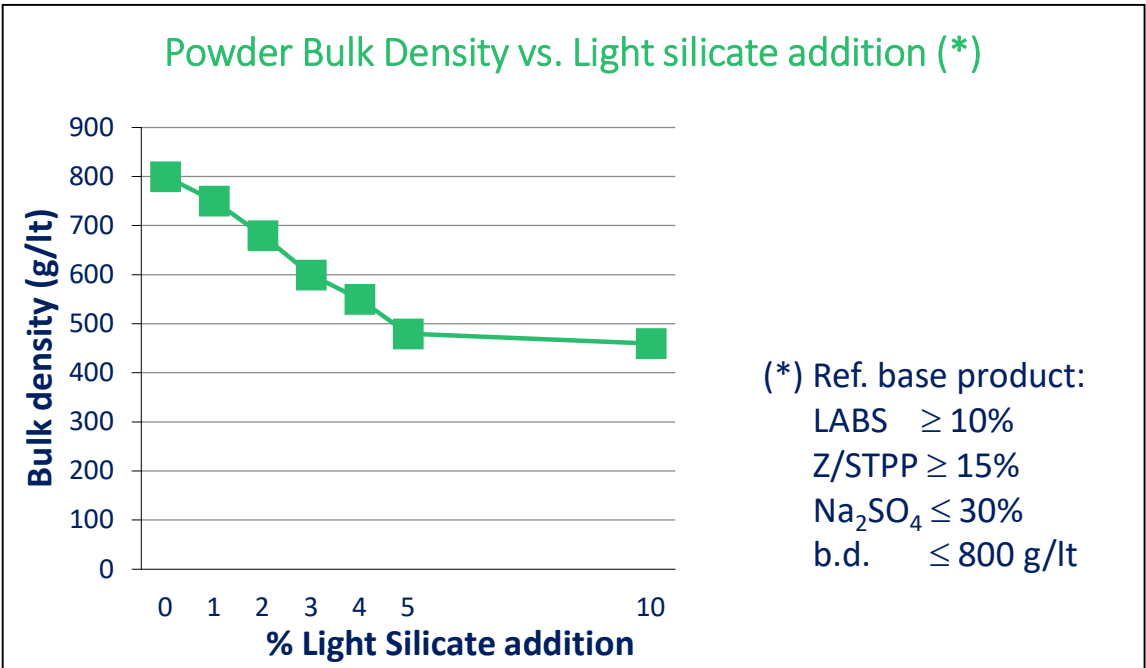




Reduction of powder bulk density

Density of detergent powder produced in the NTD plant can be easily reduced (i.e. in the range 450-550 g/l) by post addition of dry light Sodium Silicate.

Light silicate can be produced in the same plant by a drying unit that can be easily fitted into the NTD process area with a limited investment.





North America Agent

Neil A Burns LLC

Freehold, NJ 07728

+1 (732) 688-9585

www.neilaburns.com

neil@neilaburns.com



Via Piero Portaluppi,17
20138 Milano– ITALY
Tel +39 0250831
www.ballestra.com
mail@ballestra.com

Corso Sempione 212, Bis
21052 Busto Arsizio – ITALY
Tel +39 0331 356111
www.mazzonilb.it
info@mazzonilb.it

