

Liquid Handling and Filling – AIDIC / IPACK IMA Convention

Milano 10/02/2015



Hygienic Liquid Filling

Summary



- Ronchi Mario Spa and Ronchi Group : machines for liquid packaging lines
- Ronchi production portfolio
- RONCHI main markets
- About liquids
- Ronchi Exacta Flow meter
filling technology

And

- Relevant hygienic aspects



RONCHI Group milestones

- 1966 Ronchi Mario Spa was founded by Mr Mario Ronchi.
- '70s The Company focused on the market of liquid chemical, cosmetic and food products.
- 1990 The flow-metering system has been introduced.
- 1993 The first flow-metering filler was installed in a customer's plant.
- 1996 On the 30th anniversary the Company moved to the new facility in Gessate, covering an area of about 20,000 square meters.
- At present, RONCHI MARIO manufacture approx. 100 machines per year, sold all over the world.
- Over 1500 flow meter rotary filling machines EXACTA are installed worldwide.



The Ronchi Group



► Production



► Commercial and SAS



RONCHI Group products

Unscramblers Orientors

- Rotomatic
- Rotomatic-SP
- Rotomatic-PT
- Rotobot
- Rototech
- De-Pucker



Fillers

- Exacta R
- Exacta RM
- Exacta RC
- Exacta XP



Cappers

- Sirio M
- Sirio S
- Sirio PD
- Sirio PT



Unscramblers Orientors



Bi-Rotomatic



De-Pucker



Rotomatic PT



Rototech



Bottle unscramblers, orienters & depuckers

Rotomatic

Bottle Unscrambler

Bi - Rotomatic

Hi-speed Unscrambler

Rotomatic - PT

Positive insertion of bottles in PUCKS

Insertion of bottles in pucks by gravity

Rotomatic - SP

Rototech

Unscrambler + Orientator in monoblock

Rotobot

Bottle Orienter

De - Pucker

Bottle de - pucker



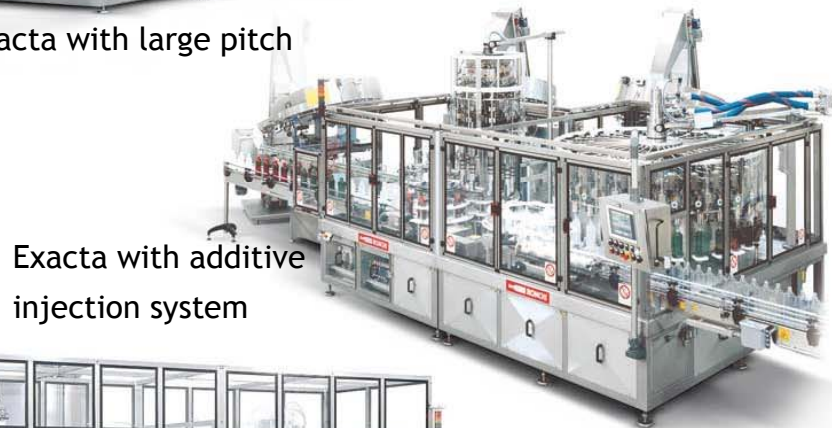
Fillers and filling capping monoblocks



Exacta with large pitch



Exacta with servo-driven capping turret



Exacta with additive injection system



Exacta with triple capping turret



Exacta with rinsing turret



Fillers and filling-capping monoblocks

Exacta/R

Volumetric flow meter technology

Exacta/RM

Mass flow meter technology

Exacta/RC

Corrosion proof execution

Exacta/RC - H version

Corrosion proof execution Hastelloy based for HCl

Exacta/XP

Explosion proof execution



Cappers and pump inserters

Sirio/M

Mechanical capper

Sirio/S

Servo driven capping heads

Sirio/PS

Spray pump inserter

Sirio/PD

Dispenser pump inserter

Sirio/PT

Trigger pump inserter

SIRIO S- e cam

Electronic cam and Servo motors now standard on
the SIRIO PS/PD/PT 8, 12, 16 Heads



Main Markets

Cosmetics

Detergents

Pharmaceutical

Food

Chemicals



About Liquids

Mostly Non-Newtonian: pseudoplastic and tixotropic liquids

Shear sensitive

Viscosity: $\mu = 10 \text{ mPa}\cdot\text{s} - 500.000 \text{ mPa}\cdot\text{s}$ (10 - 500.000 cP)

Homogeneous and non-homogeneous

Shampoo, Hair conditioners, Gels, Creams, Lotions

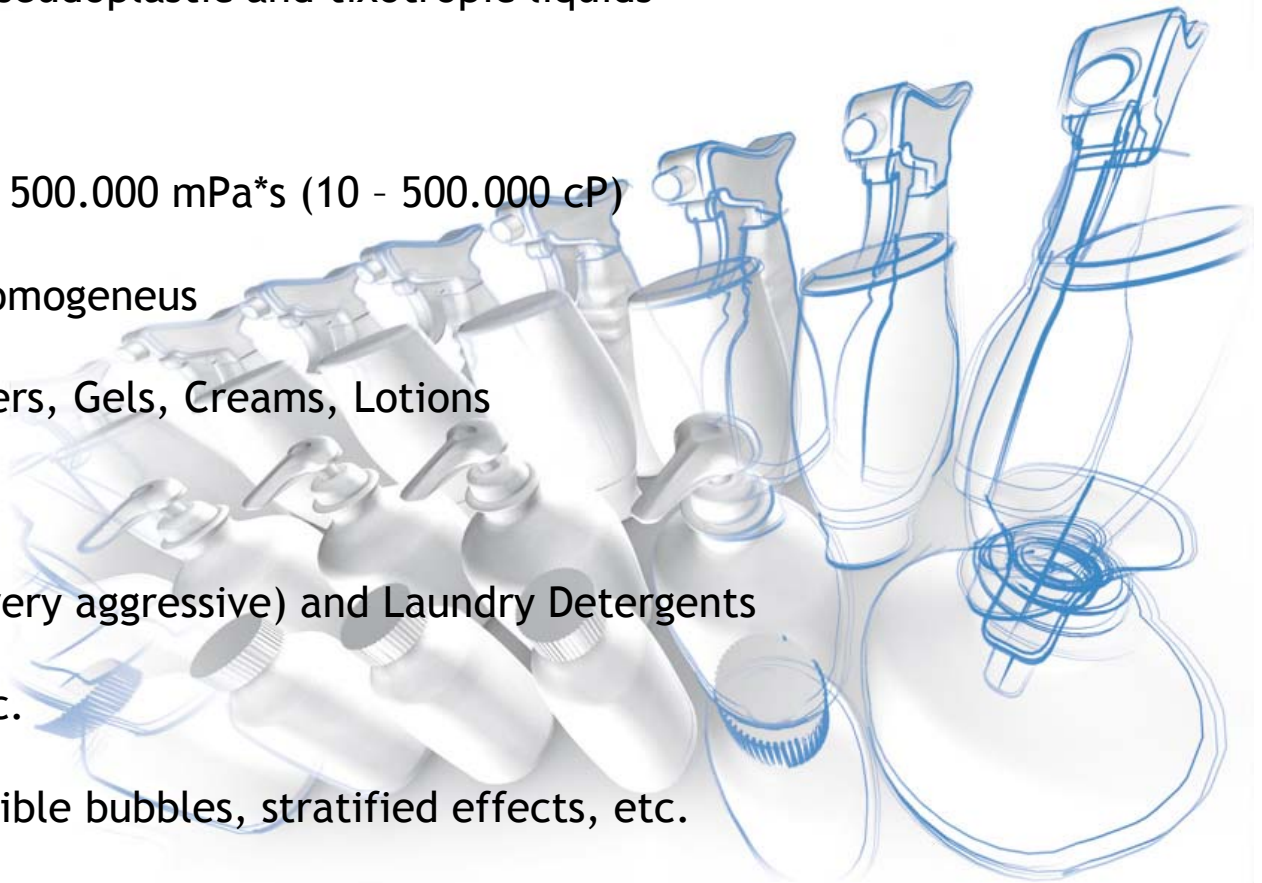
Mouthwash

Home cleaners (pH also very aggressive) and Laundry Detergents

Hot filled, cold filled, etc.

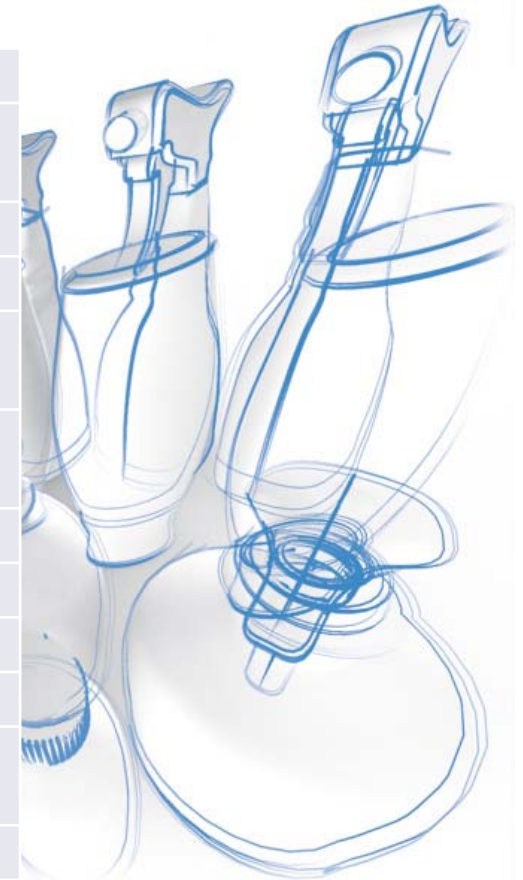
Special requirements: visible bubbles, stratified effects, etc.

Enzymes, proteins, other nutritionals, bids, anti-perspirants, etc.

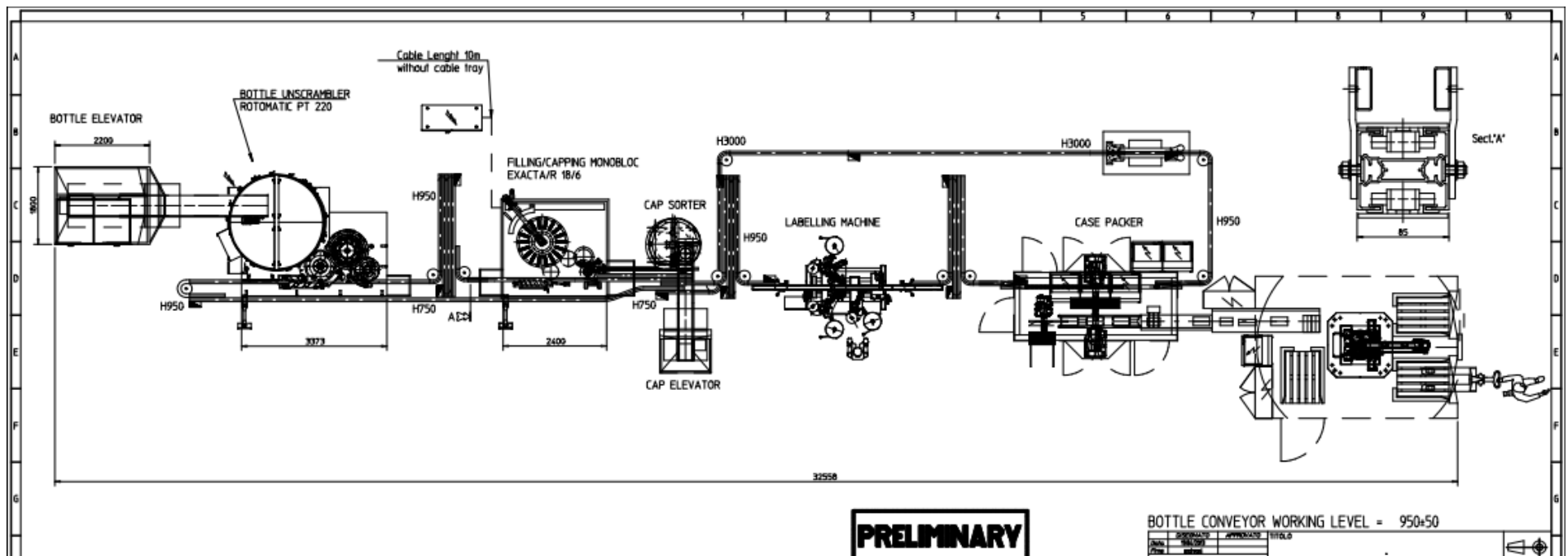


About Liquids

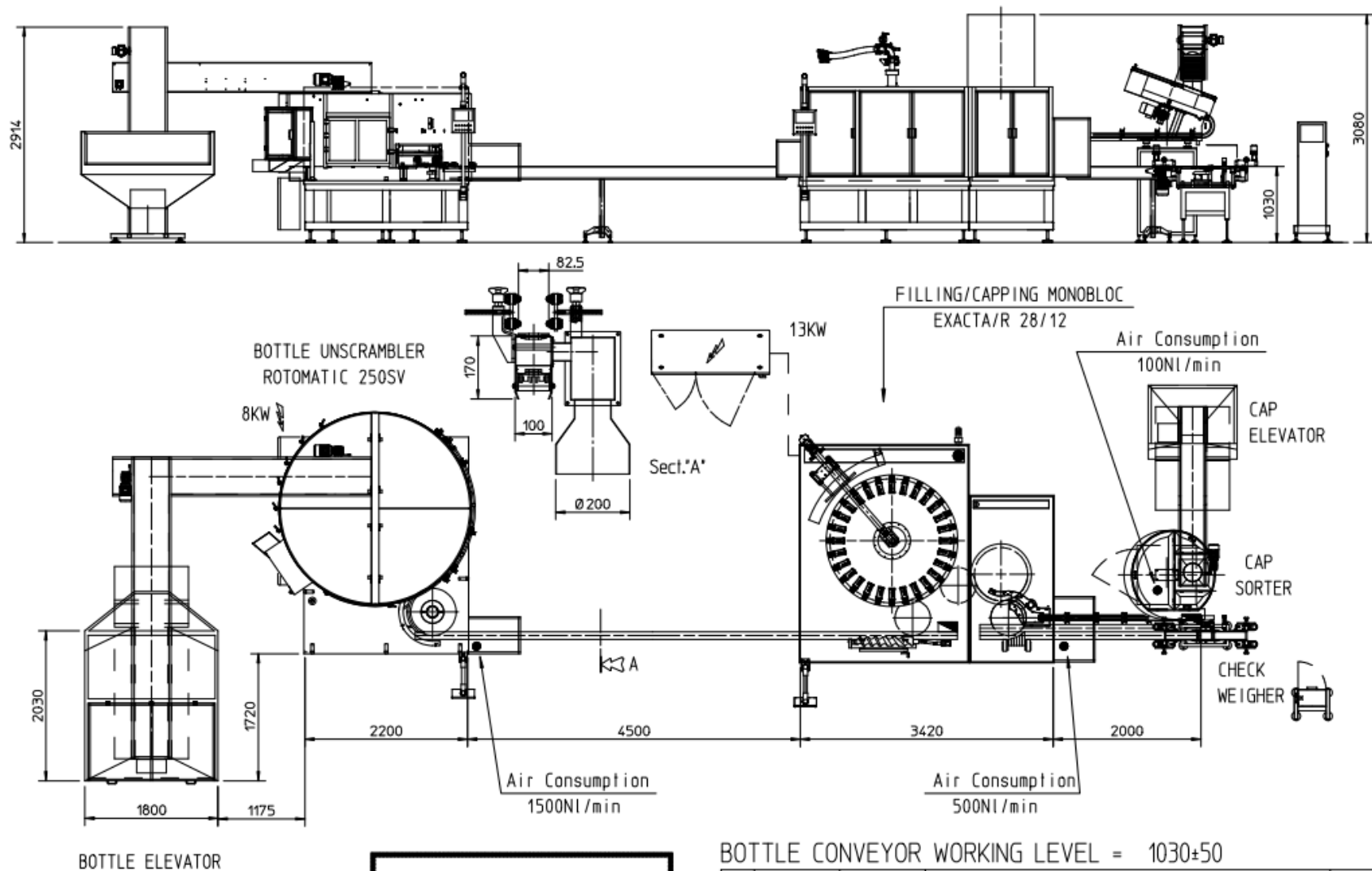
	Gravity	Viscosity
Day cream	0.98 - 1.03	55,000-100,000
	0.98 - 1.03	30,000-90,000
	0.99 - 1.05	18,000-48,000
Night cream	1.005 - 1.025	60,000-90,000
	0.986 - 1.014	40,000-65,000
Day cream	1.03-1.05	60,000-75,000
	0.98-1.03	15,000-35,000
	0.98-1.03	30,000-60,000
	0.99-1.05	20,000-50,000
Night cream	1-1.03	90,000-120,000
	1.03-1.05	60,000-90,000



PUCK FILLING LINE (BOTTLES AND TOTTLES IN PUCKS)



STANDARD FILLING LINE

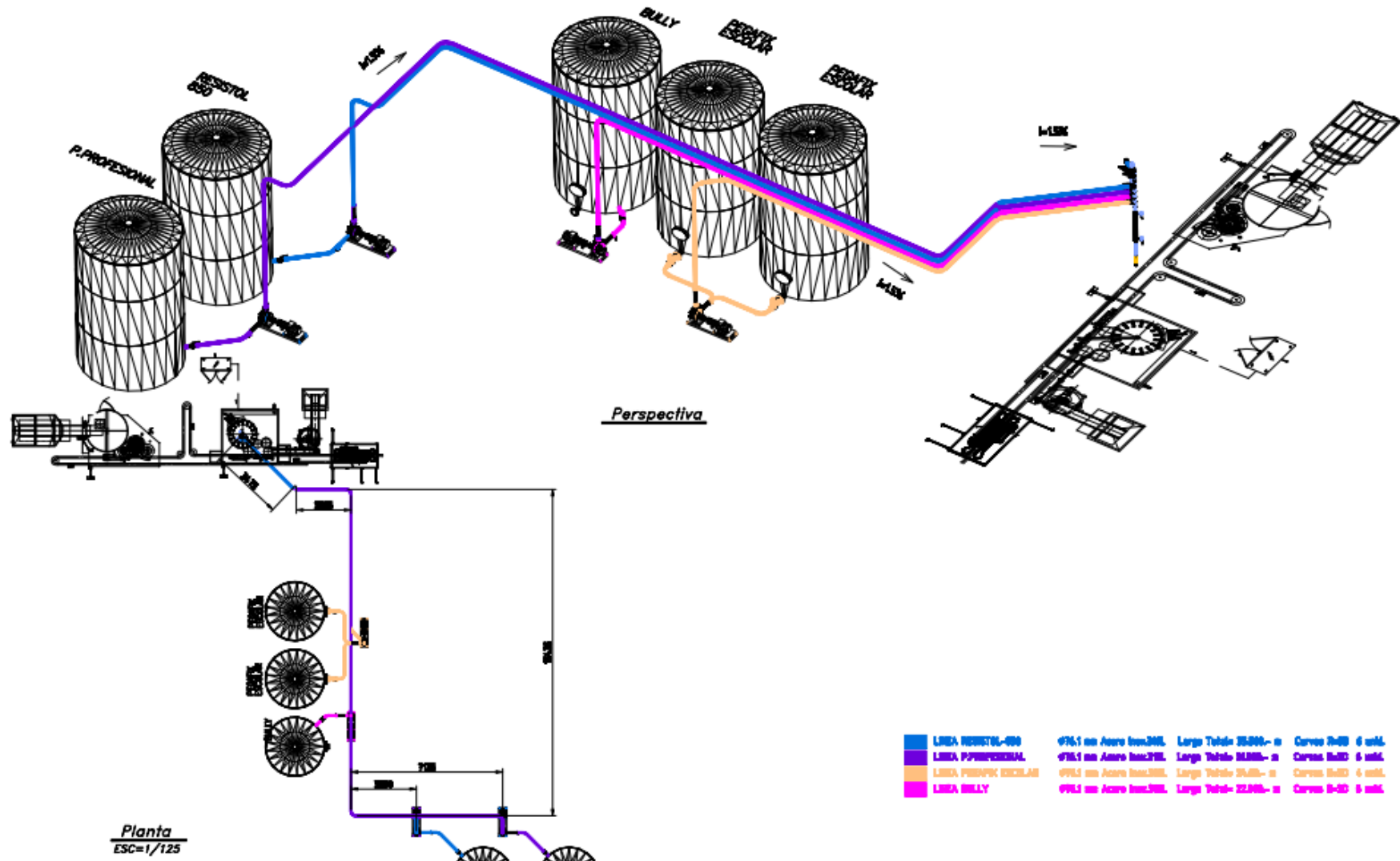


PRELIMINARY

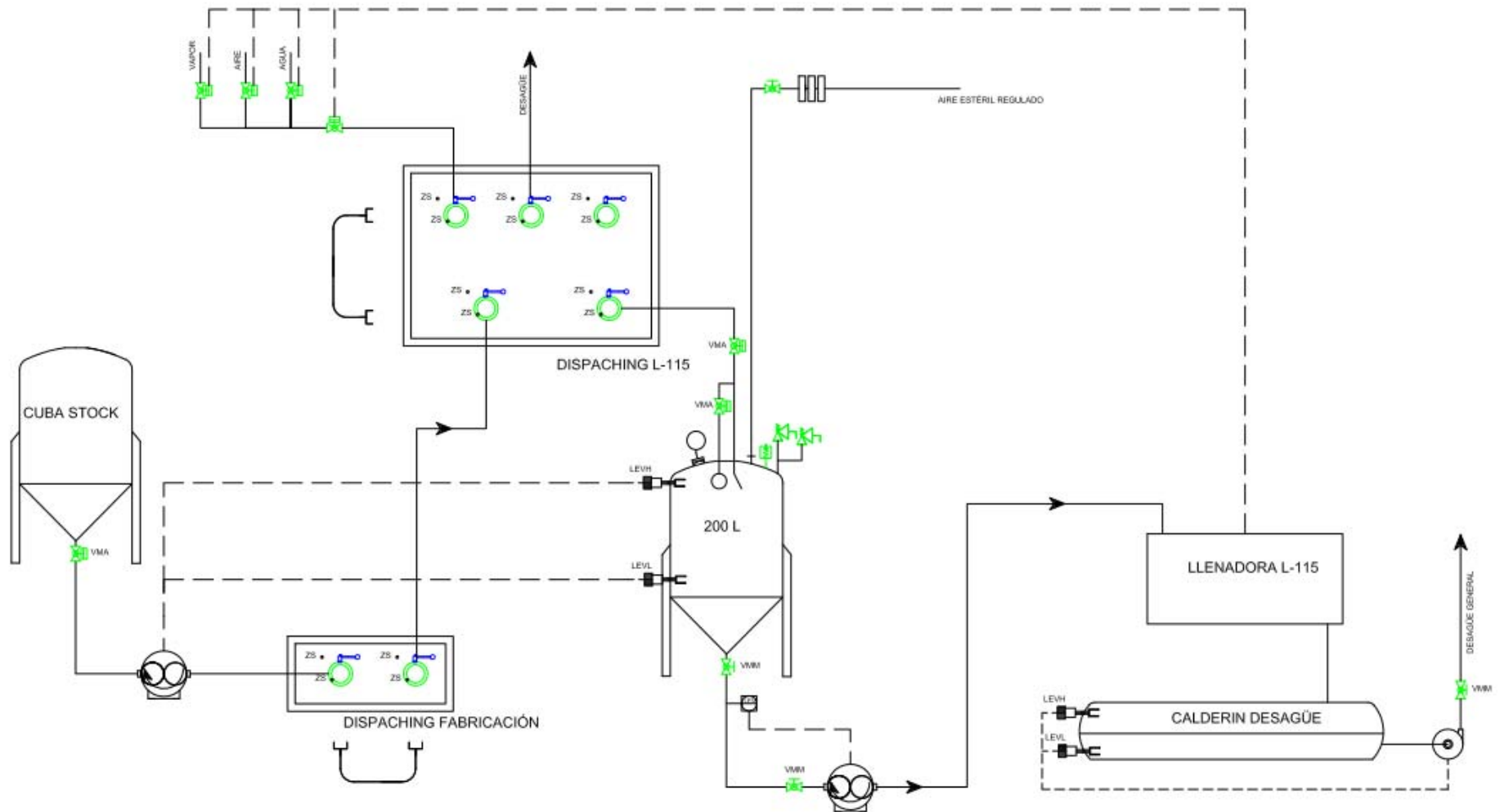
DISIGNATO	APPROVATO	TITOLO
Data	16/04/2010	
Firma	antonio	
CLIPNTE	NAZIONE	SCALA



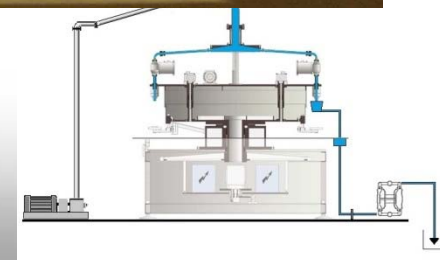
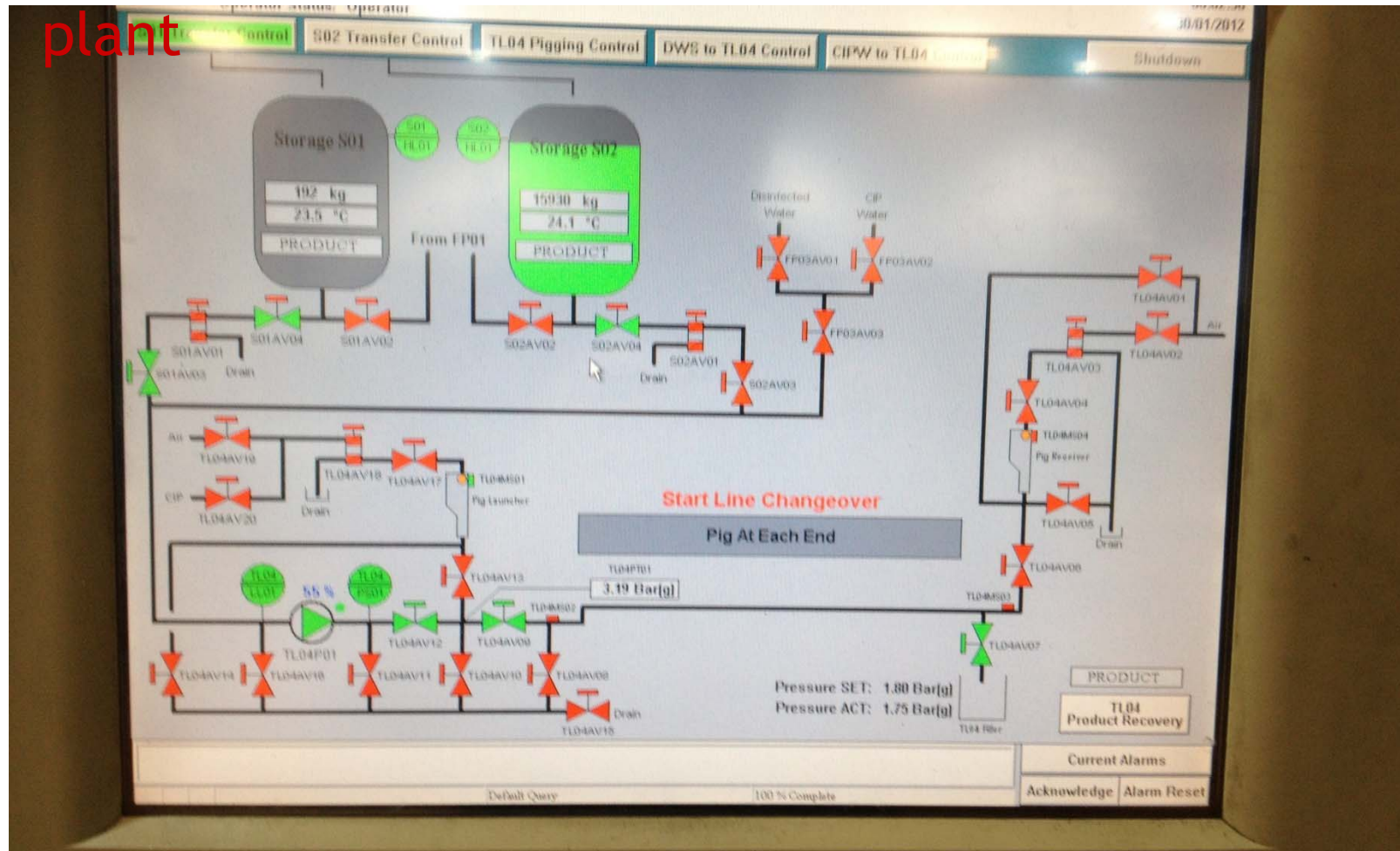
The RONCHI filler EXACTA in the P.I.D. of the plant



The RONCHI filler EXACTA in the P.I.D. of the plant



The RONCHI filler EXACTA in the P.I.D. of the plant



Higienic Liquid filling -some of the requirements

Stainless steel AISI 316L - $Ra < 0,8 \mu m$

Minimized Presence of gaskets and sealings

Self draining surfaces

Turbolent flow (high speed)

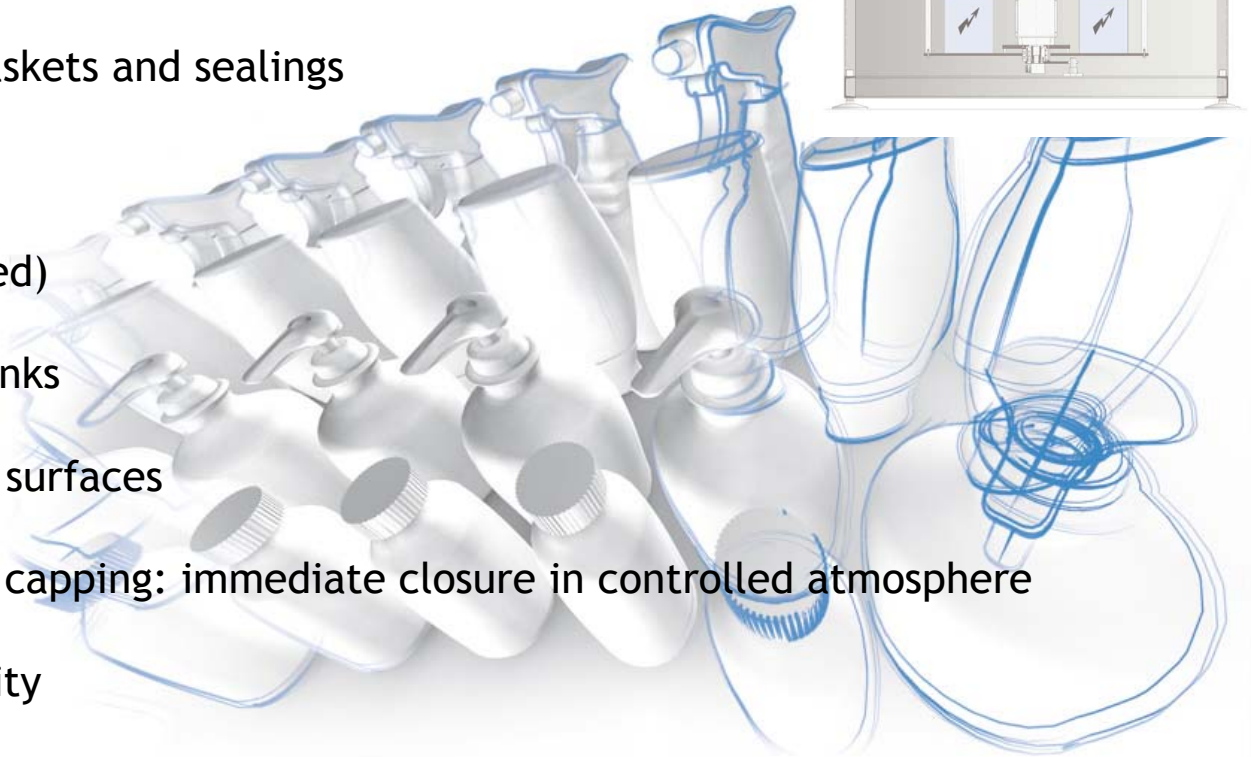
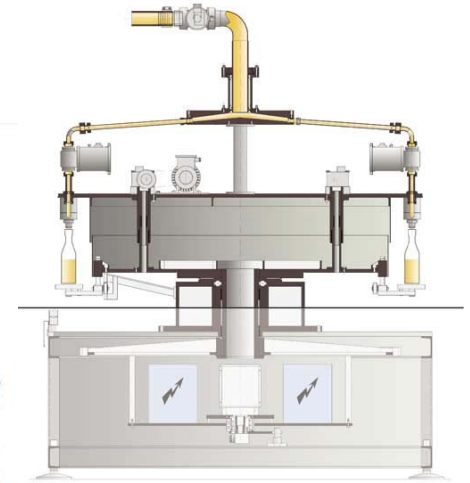
Minimized presence of tanks

Absence of air and liquid surfaces

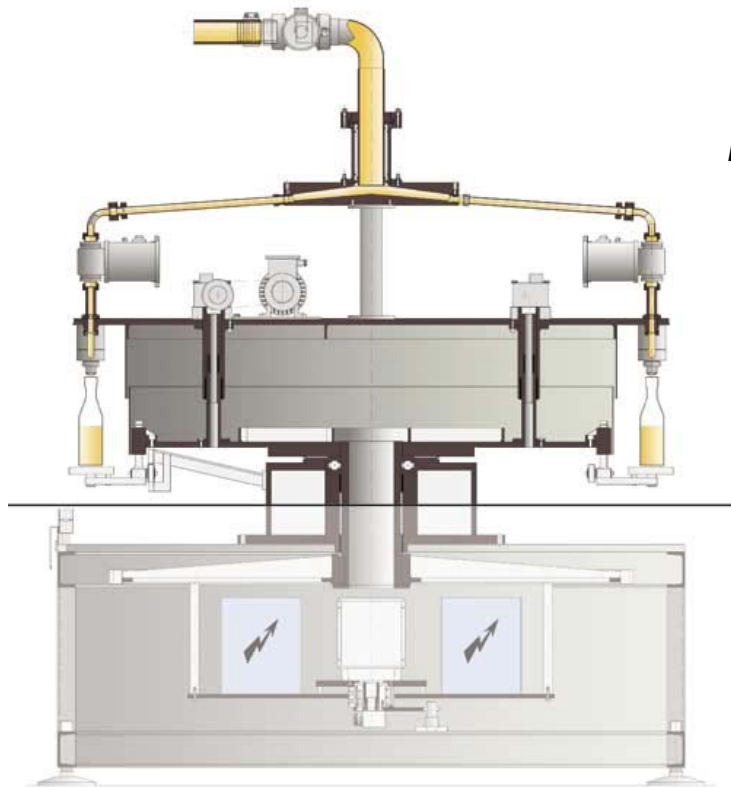
Monoblock for filling and capping: immediate closure in controlled atmosphere

Cleanability / Sanificability

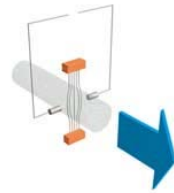
Easy inspection / controls



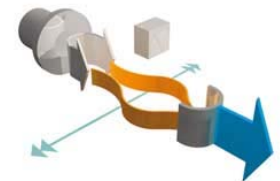
EXACTA technology



Sketch of the filling system



Magnetic flowmeter



Mass flow meter

Tri-clamp fittings

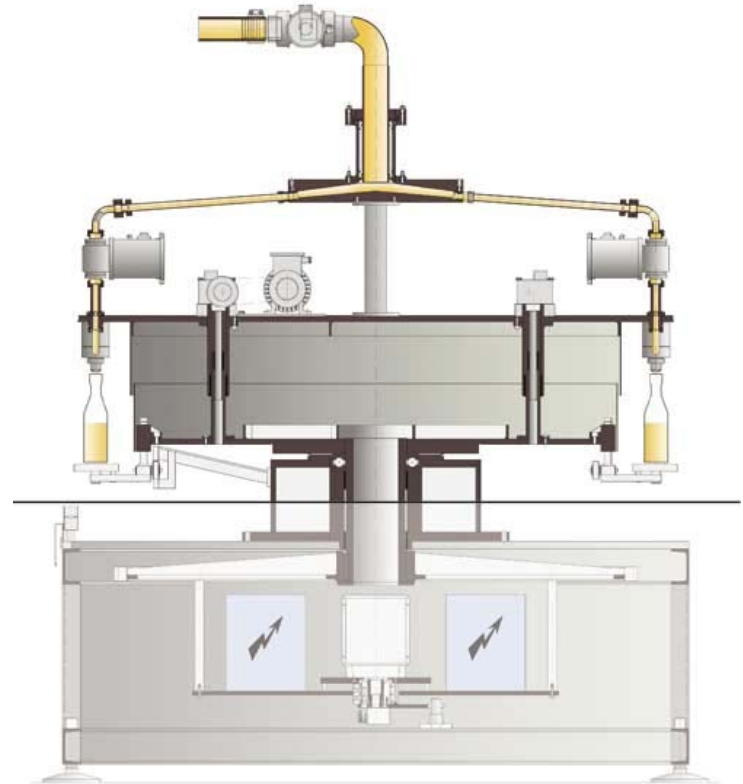


RONCHI EXACTA FILLERS

without tank since ever

Ronchi filler is a continuation of the product pipeline up to the neck of each bottle.....

or to the collecting tray
(with automatic insertion)
when filler is in the CIP
mode



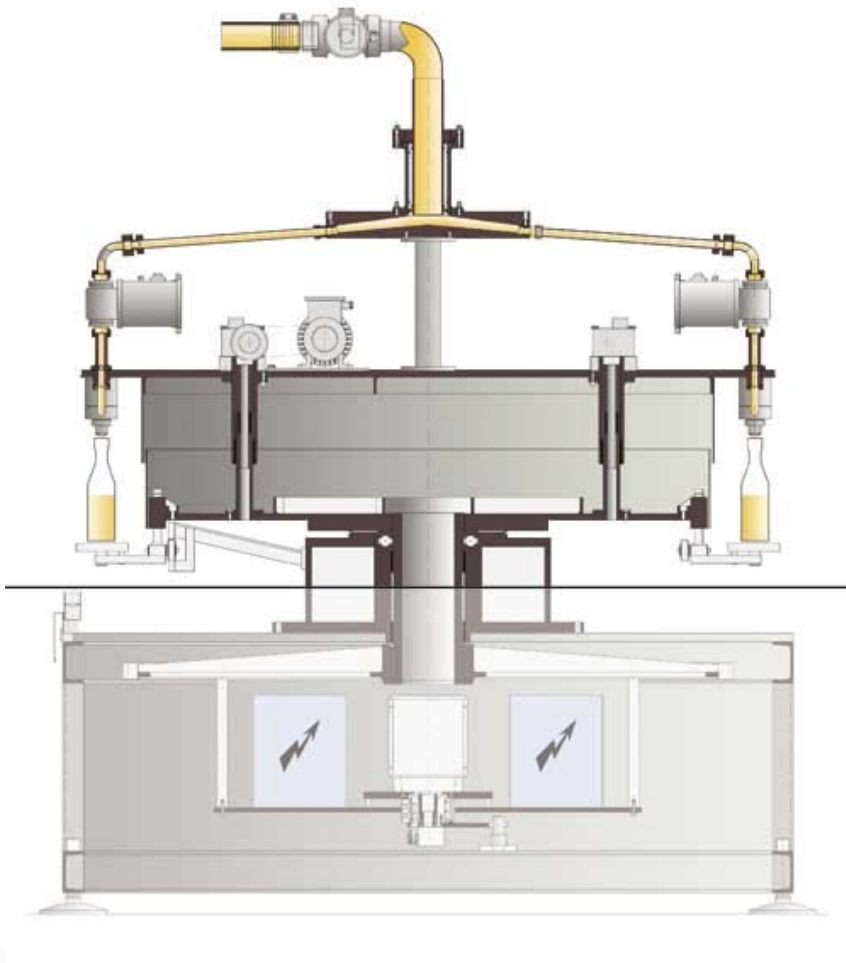
RONCHI EXACTA FILLERS ADVANTAGES

in detail

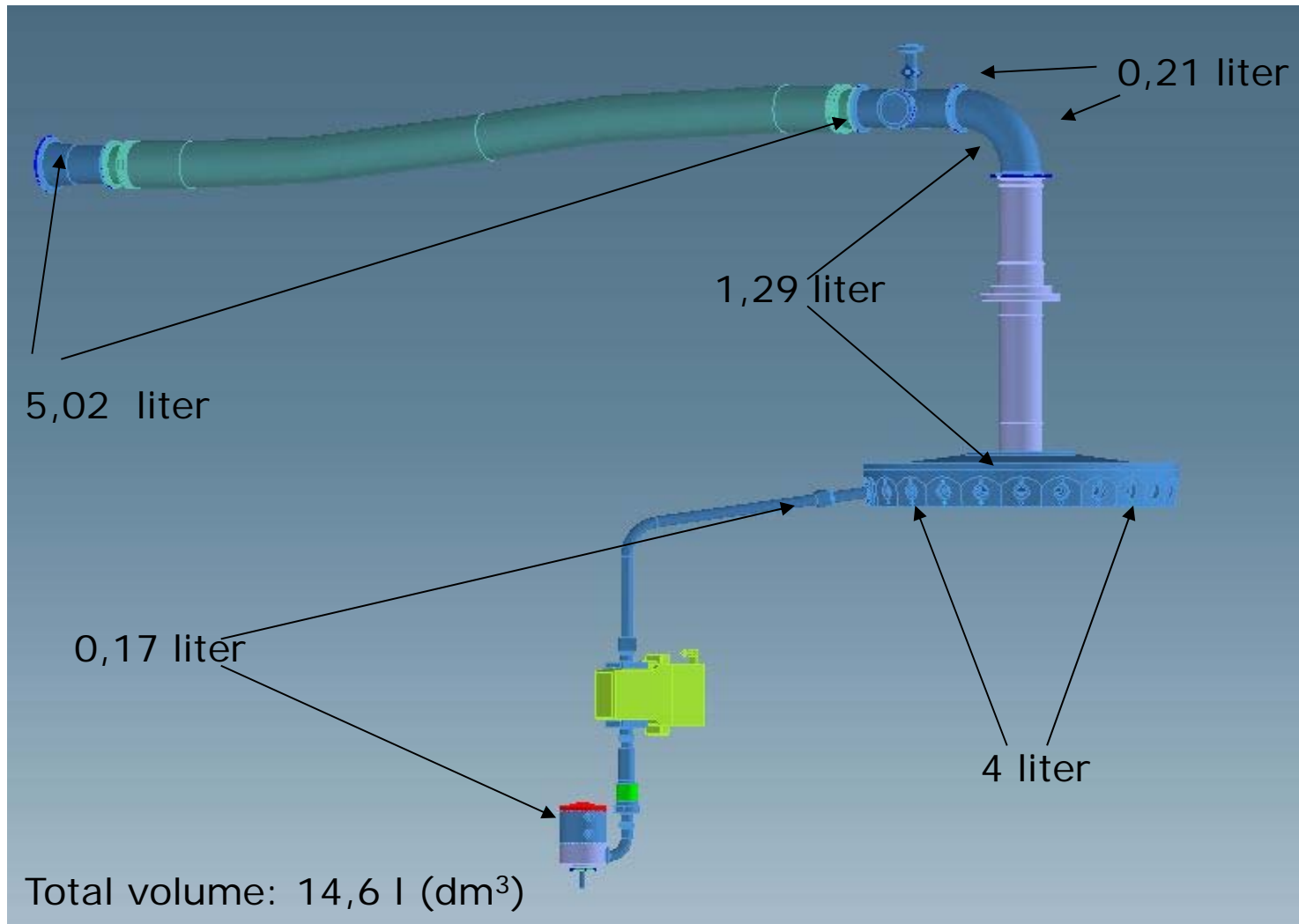
No contact surface
between air and product
along all the system (from
pump to nozzle)

Minimum volume of
product to despose before
product change over

Minimum volume of
product during CIP/SIP



AN IDEA OF LIQUID VOLUMES IN THE RONCHI EXACTA FILLER

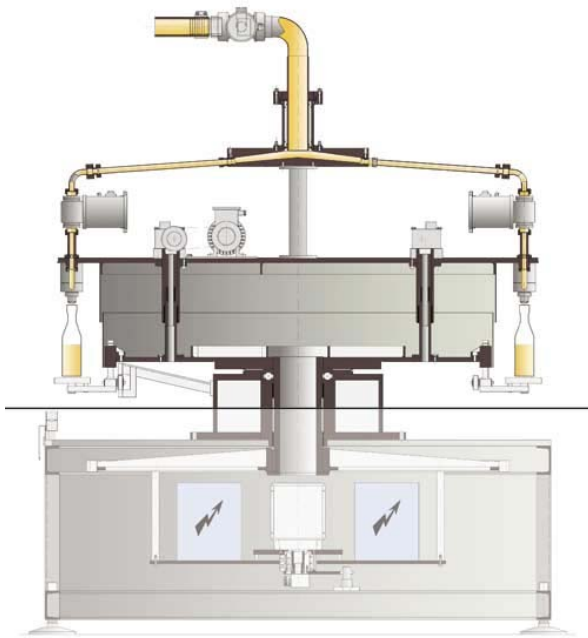


LIQUID VOLUMES IN THE FILLER – (note: volumes are referred to Exacta R 24 stations – they change with the filler dimensions)



RONCHI EXACTA FILLERS ADVANTAGES

in detail

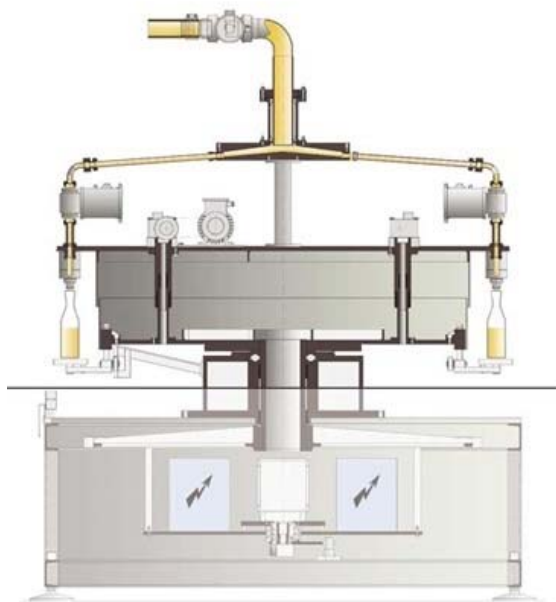


High efficiency CIP / SIP:
high flow rate (turbulent
flow)

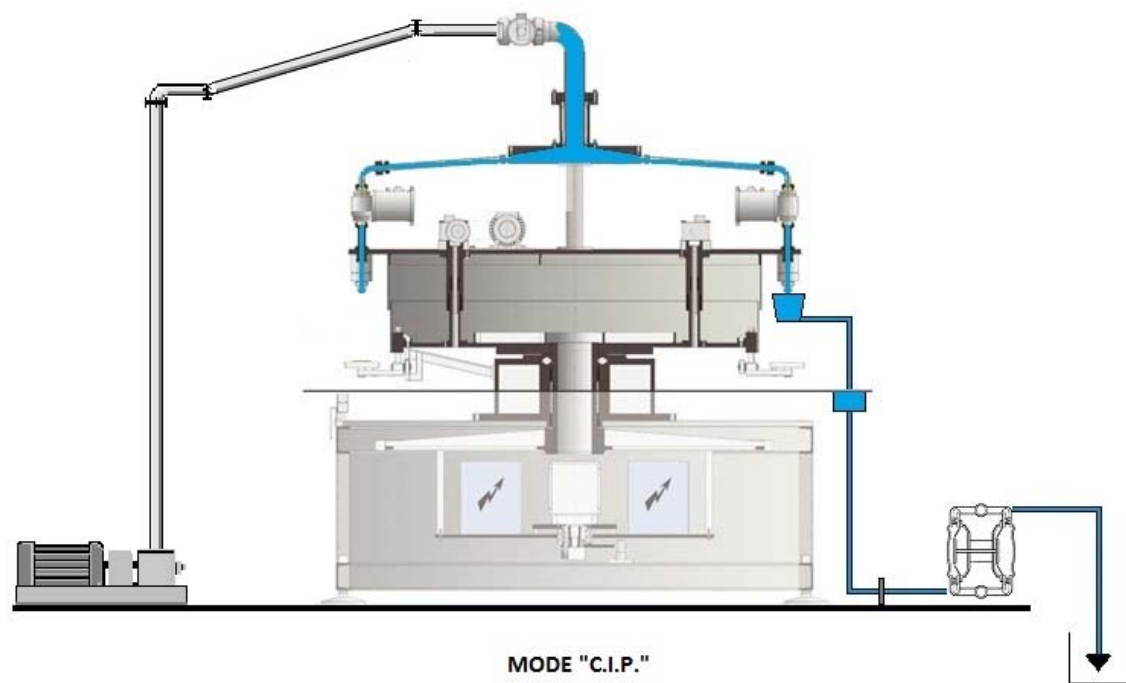
High sanificability: high
flow rate and high
temperature



RONCHI EXACTA FILLER – PRODUCTION MODE / CIP MODE



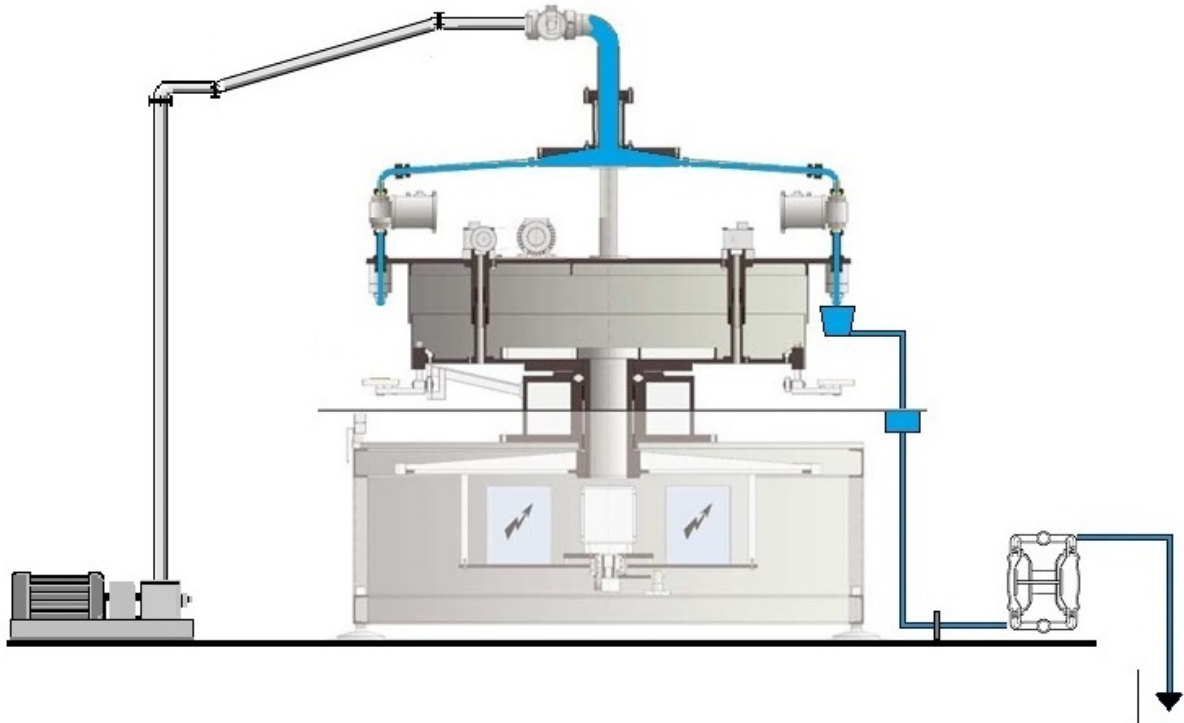
MODE "PRODUCTION"



MODE "C.I.P."



RONCHI EXACTA FILLER ADVANTAGES – CIP / SIP MODE



CIP: Ronchi Exacta has just to be flushed as a pipeline

Discharge can be into a tray (image) or closed circuit,

then into the main tray of the basement and to the discharge pump



SYNCHRO BLOCKING / SPACE EFFICIENCY

AIR RINSER-FILLER-CAPPER MONOBLOCK

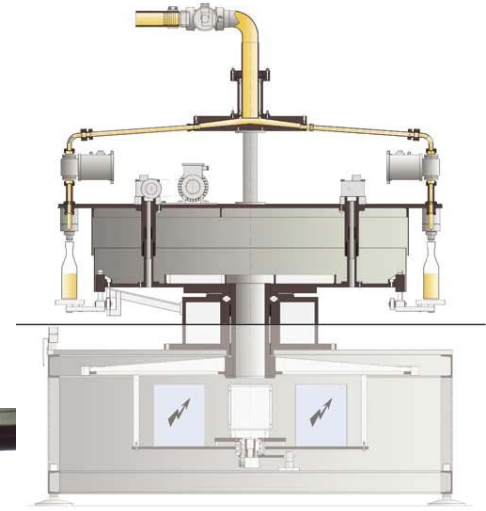


MONOBLOCK

FILLER-CAPPER MONOBLOCK



TANKLESS FILLERS / REDUCED WASHINGS



PRODUCT CHANGE OVER - C.I.P. / S.I.P.

Emptying the filler: 5 min

Emptying the pipeline

- With PIG (Pipeline Inspection Gauge)
- Without PIG

CIP / SIP operations

Sending the new product to the filler

Purging the air (2 min)

Calling the recipe of the new product and confirming it (1 min)

Filling the new product: in Max 2 min the filler is back to full production speed



SPECIAL FILLING (jars)

PLASTIC JAR FILLING

HOT FILLING

GLASS JAR FILLING

JAR FILLING AND CAPPING – NO PUCKS – IN PUCKS

SPEEDS: 300 jpm, 200 jpm, 150 jpm

CAPS, LIDS, PRODUCT SURFACE ASPECT



JAR FILLING



Jar filler EXACTA R



Jar capper SIRIO S



JAR FILLING

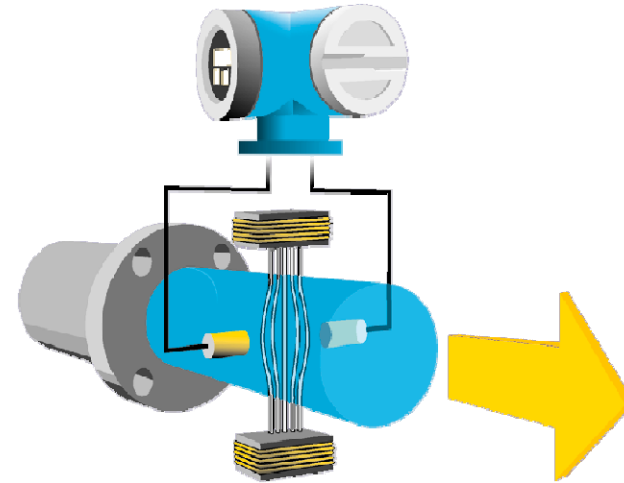
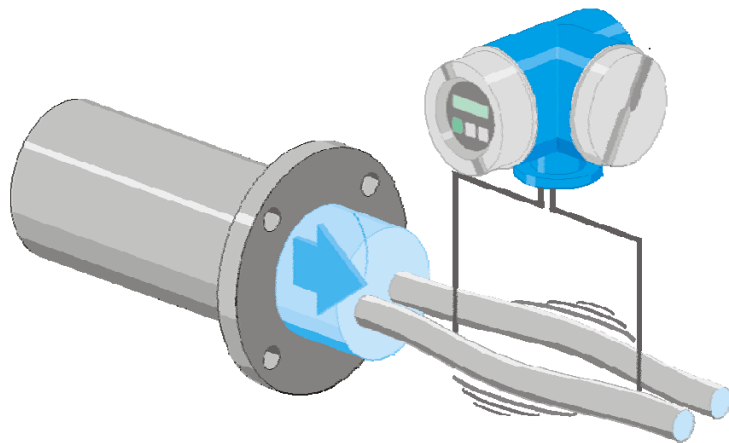


Jar Filler / Capper EXACTA MONOBLOCK – Heat tracing – thermal insulation



Volumetric flowmeter

Suitable for any electric conductive liquid.



MASS FLOWMETER

Suitable for ANY liquid - The system operates independently to fluid characteristics (i.e. conductivity, flow profile, suspended particles).

The RONCHI excellence In flowmeter filling technology

Highlights

- High filling accuracy (on $V \geq 500$ g: $\sigma = 0,1$ %).
- No need for parts gripping the bottle, minimized changeover times and maintenance.
- Maintenance free machine: no moving parts in the measuring system.
- Extremely quick size change over
- High speed bottle through the line up to 600 b.p.m.



The RONCHI excellence in flowmeter filling technology

Flexibility

- Filling capability volume from 3-5 ml up to 15.000 ml and over
- Filling capability of foaming products - low viscosity products
- Filling capability of very viscous products (500.000 cPs or more)



The RONCHI excellence in flowmeter filling technology

Sanitary Design

- Self-draining rigid pipe line (AISI 316L)
- Tri-clamp connections.
- Mirror polished surfaces in contact with the product
- Easy cleaning with the possibility of C.I.P. and S.I.P. at and up to 130 °C.



Higienic Liquid filling - summary of some requirements

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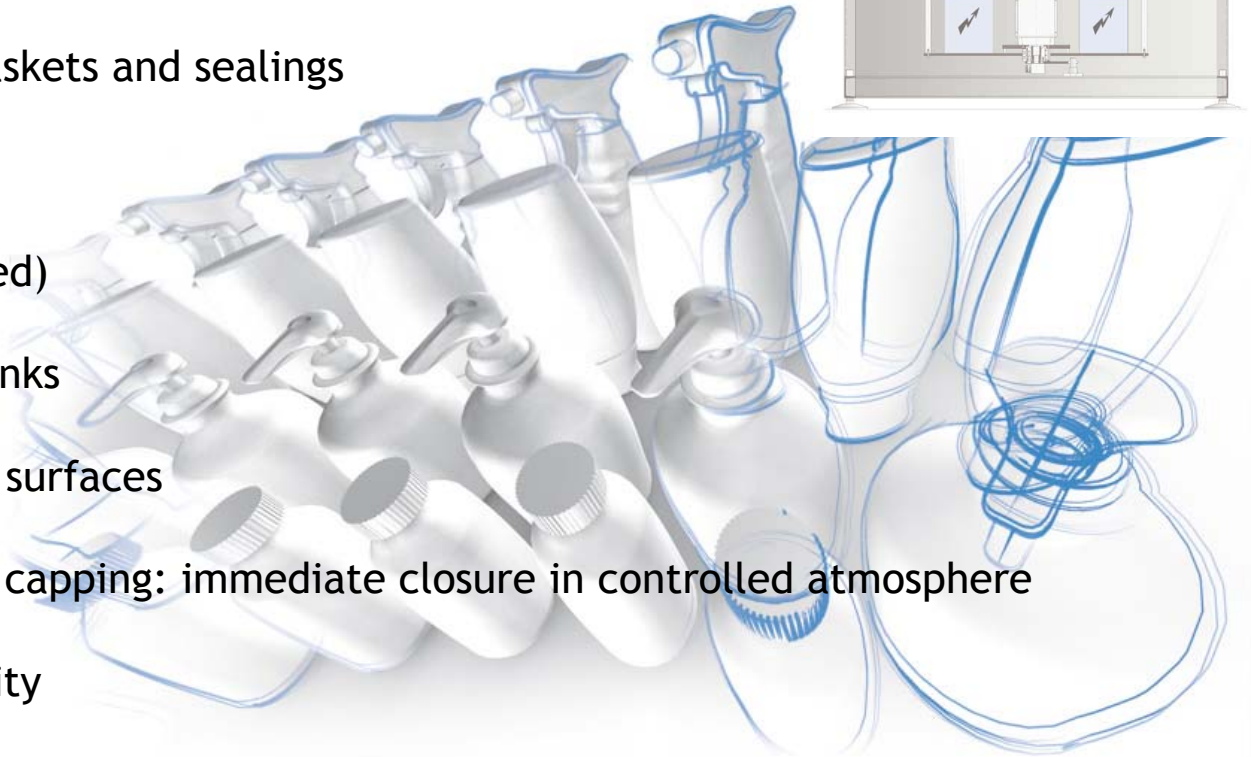
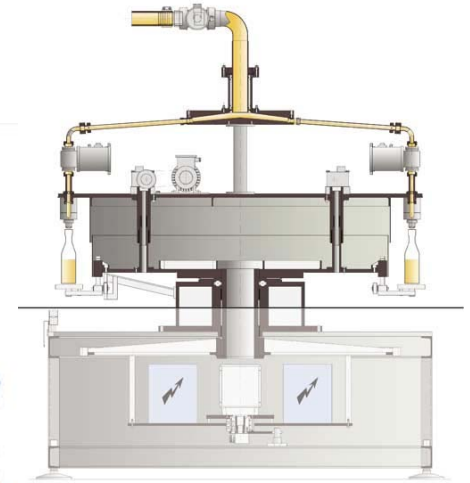
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Absence of air and liquid surfaces

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Easy inspection / controls



Thank you for your kind attention!



PROCESSING & PACKAGING

Please, visit us at:

**Fieramilano
19-23 maggio 2015**

www.ronchi.it

www.ronchipackaging.com