

**MIXING EQUIPMENTS AND SERVICES FOR PVC
DRY-BLEND, POWDER COATINGS, MASTER BATCH AND WPC**

WHO WE ARE

YOUR PARTNER IN MIXING since 1967



PVC mixing



Powder coatings



Master batch and pigments



Other applications

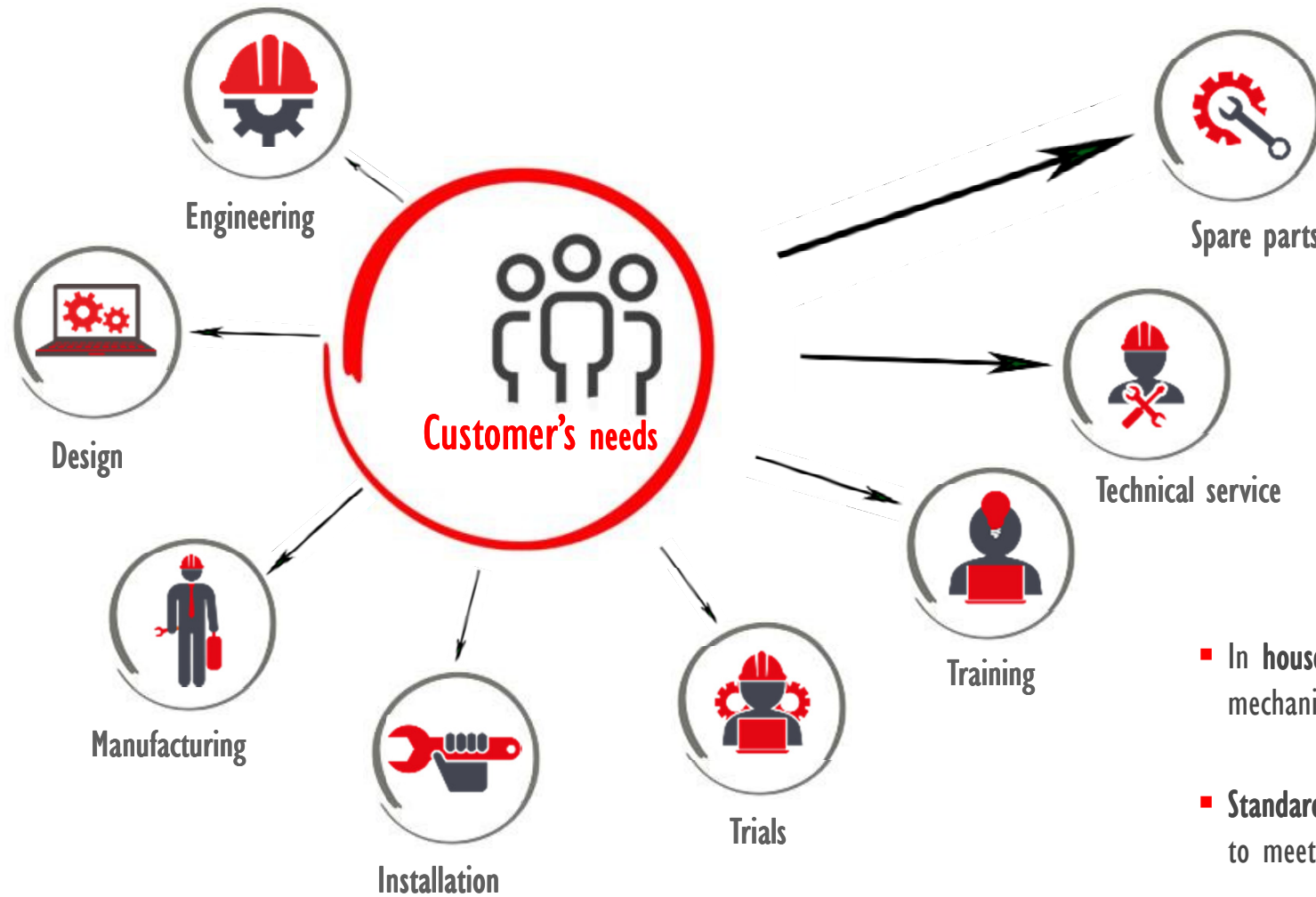


Laboratory mixers



Wood plastic composites

WHO WE ARE



- In house production of every single mechanical and electronic item
- Standard and custom engineering and design to meet the varied processing requirements

WHO WE ARE

 **5.600** | Machines working worldwide




2.159 | TRM



1.104 | HEC



420 | TRR
sold
since
1995

 **49** years of experience

 **90%** export worldwide

 **80** people employees

 **14 mio €** turnover 2014

 **3** mio € value spare parts warehouse



- Development of new methods of processing different kinds of materials
- Research to ensure a competitive edge in plastics processing
- Whole range of mixing machinery to **test customers' products**



- Listening



- Analysis and study
- Engineering and design

→ Team of 15 people | 3D software



- 100% satisfaction

IN HOUSE MANUFACTURING IS A MATTER OF FACT

IN HOUSE MANUFACTURING MEANS

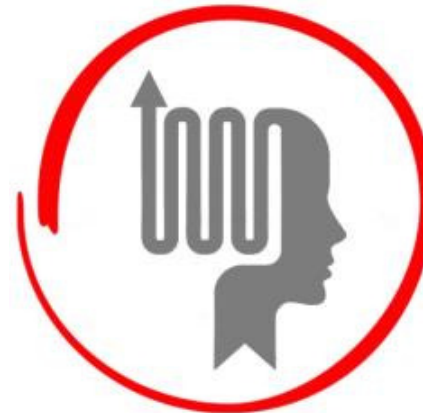
Highest quality



Maximum control



Top flexibility

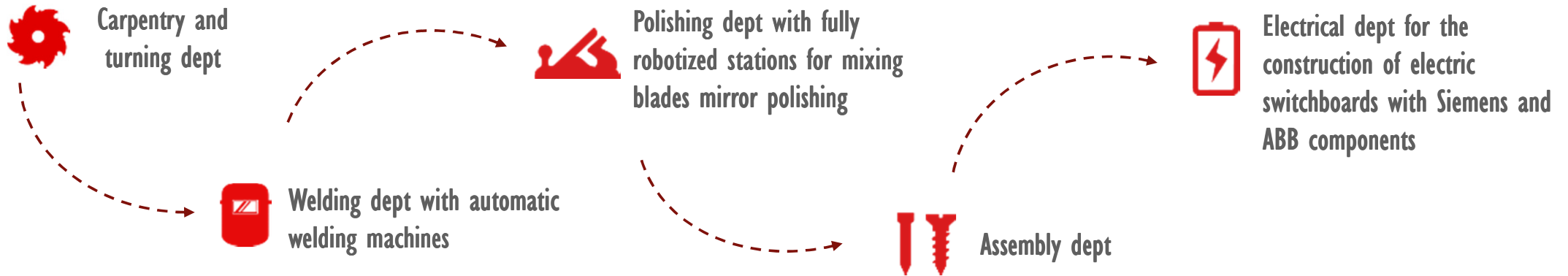


Experienced team



MANUFACTURING

A SKILLED TEAM OF 46 PEOPLE TAKES OF ALL MANUFACTURING PROCESS



Carpentry



Welding dept



Polishing dept



Assembly dept



Electrical dept



WE VALUE OUR RELATIONSHIP

A dedicated team of 14 people is at your disposal for



Technical
training



Maintenance
programs



On site and tele
service



Revamping



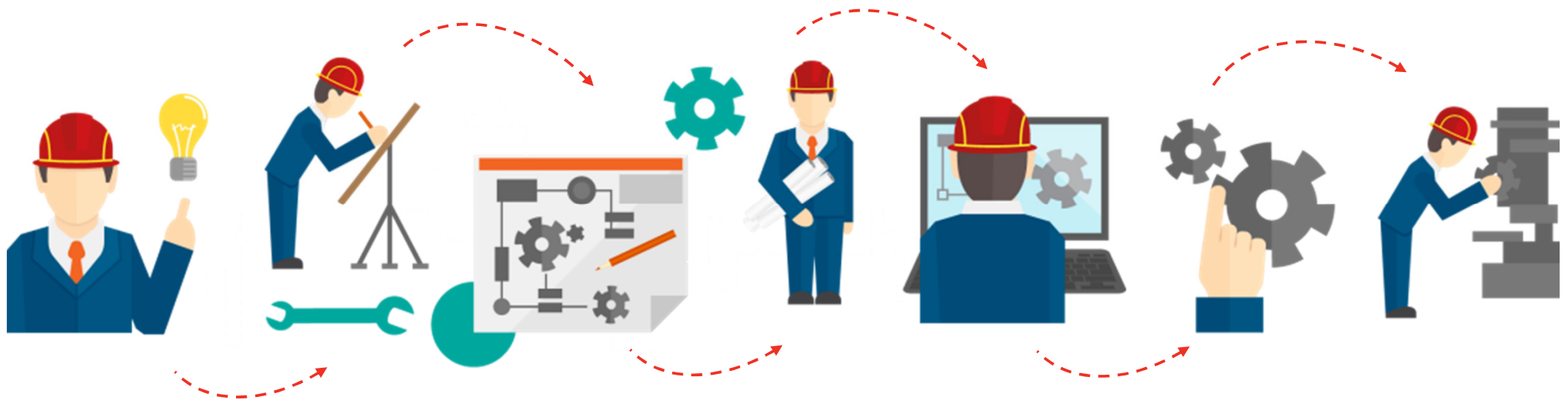
Spare
parts

'Spare Parts Special' to be promptly updated about the order status — daily email notifications from approval to delivery | a dedicated warehouse to be timely

PRODUCTION RANGE

MIXING PLANTS WITH NO LIMITS TO YOUR IMAGINATION

CUSTOMIZED MACHINES AND **TARGETED ADVICE** FOR THE MOST VARIED INDUSTRIES AND APPLICATIONS





NEED



SOLUTION



MAIN PRODUCTION LINES



PVC mixing systems



Powder coatings



Master batch and pigments



Other applications



Laboratory mixers



Wood plastic composites

MAIN PRODUCTION LINES - PVC MIXING SYSTEMS



PVC MIXING SYSTEMS



HC

HC COMBIMIX TRM + HEC



RV

RV COMBIMIX TRM + RFV



RO

RO COMBIMIX TRM + RFO

TRM HEATING MIXERS



TRM HEATING MIXERS are used for

RIGID and SOFT PVC MIXING powder coatings, master batch, WPC and special applications

- TRM heating mixers are the ideal solution in the **transformation industry** when **good quality thermoplastic material** must be combined with **high hourly throughput**
 - The vessel lid can be supplied in different configurations; the internal surfaces are in stainless steel; the closure plug, is operated by a pneumatic cylinder and is adapted to fit the internal shape of the vessel
 - **Accessories and optional** are available
-



MAIN PRODUCTION LINES - PVC MIXING SYSTEMS

HC - HIGH EFFICIENCY COOLING COMBINATION



HC COMBIMIX TRM +
HEC

HORIZONTAL COOLER COMBINATION – HC COMBIMIX is the combination of the heating mixer TRM and the high performance horizontal cooler HEC

RV COMBIMIX TRM
+ RFV

PVC mixer COMBIMIX-RV is the combination of the heating mixer TRM and the vertical cooler RFV.

The RFV range of coolers used for this combination is the ideal solution to combine the requirements of restricted spaces and easy cleaning

COMBIMIX-RV



COMBIMIX-RO



RO COMBIMIX
TRM + RFO

COMBIMIX-RO is the combination of the heating mixer TRM and the horizontal cooler RFO. It is used for those applications where the mixing process has a higher dry-blend final temperature.

MAIN PRODUCTION LINES - POWDER COATINGS



POWDER COATINGS



Pre Mixing

CONTAINER MIXERS TRR



Metallic Bonding

TRR/B CONTAINER MIXER

COMBIBOND HC/B



Metallic Blending

CONTAINER MIXERS TRR

MAIN PRODUCTION LINES - POWDER COATINGS

PRE MIXING

CONTAINER MIXERS

TRR

Cold mixing of polymers in powder or granular form with pigments fillers and additives

Concentrated master batches

Powder coatings

Pre-mixing of all kind of powders



- The **TRR serie** of mixers is the ideal **alternative to traditional turbomixers** when production conditions require high levels of flexibility and involve a wide range of different products to be mixed with the same machine
- Mixing head and container hopper are divided in two distinct and separate parts, so cleaning times are reduced to a minimum
- Different configuration with same or independent speed of the blades or high power version
- Storage and transport of the mixtures is also facilitated by direct use of the same container
- Accessories and optional are available

MAIN PRODUCTION LINES - POWDER COATINGS

METALLIC BONDING



TRR/B CONTAINER
MIXER

TRR/B model is the most robust, reliable and simple system for the Powder Coating Pre-mixing process



COMBIBOND HC/B

This mixing plant is the combination of the TURBOMIXER TRM and a cooling mixer to achieve the bonding process

This technology offers an excellent metallic bonding effect by a simple and safe process, taking account of the risk of any blast of aluminum pigment by inerting bonding chamber using a controlled nitrogen atmosphere

METALLIC BLENDING



CONTAINER MIXERS
TRR

The TRR serie of mixers is the ideal alternative to traditional turbomixers when production conditions require high levels of flexibility and involve a wide range of different products to be mixed with the same machine

MAIN PRODUCTION LINES — MASTER BATCH AND PIGMENTS MIXING



MASTER BATCH AND PIGMENTS



TRR-Container Mixers



TRM-High speed Mixer



TRA-Vertical Mixer

MAIN PRODUCTION LINES — MASTER BATCH AND PIGMENTS MIXING



CONTAINER MIXERS

TRR

Cold mixing of polymers in powder or granular form with pigments fillers and additives

Concentrated master batches

Powder coatings

Pre-mixing of all kind of powders

TRM HEATING MIXERS

RIGID AND SOFT PVC MIXING

MIXING RIGID OR PLASTICIZED PVC dry-blend obtained from polymers in suspension, emulsions or mass



TRA VERTICAL MIXER

Cool batch preparation of master batch materials with excellent pigment and additive dispersion characteristics.

Preparation of suspension or emulsion batch mixes, usually PVC based.

Pigmentation and intensive mixing of other thermoplastics, e.g. PE, PP, ABS, etc.



MAIN PRODUCTION LINES - WOOD PLASTIC COMPOSITES (WPC)



WOOD PLASTIC COMPOSITES (WPC)



COMBIWOOD HC



COMBIWOOD RV

HEATING MIXER TRM + COOLING MIXER RFV

Possibility of utilizing natural fiber with moisture content up to 15%

Agglomerate with a residual moisture less than 0,2%

Product Dust Free

Easily processable in extruder

MAIN PRODUCTION LINES - OTHER APPLICATIONS



THERMOPLASTIC

TURBOMIXER TRG



RIBBON BLENDER

HORIZONTAL
BLENDER HEB



UNIVERSAL MIXER

HORIZONTAL UNIVERSAL
MIXER HUM

HORIZONTAL MIXER MO

VERTICAL UNIVERSAL
MIXER TRA



PLASTISOL

MIXER TRP

MAIN PRODUCTION LINES - LABORATORY MIXERS



TRL



TRL/R



RV

Each industrial mixer of the range can be manufactured in small size for laboratory tests.

PLAS MEC laboratory mixers are supplied on its own or combined with the cooler.

The laboratory mixer TRL is suitable for PVC dry blend, powder coatings, master batch and pigments, thermoplastic rubbers, wood plastic composites and offers high reproducibility of the process environment on the production plants in order to provide essential data to improve productivity and quality.

TRL lab mixer is available from a minimum capacity of 5 lt. to a maximum capacity of 100 lt.

Adding the cooler mixer to the TRL, you obtain the laboratory heating cooling combination RV

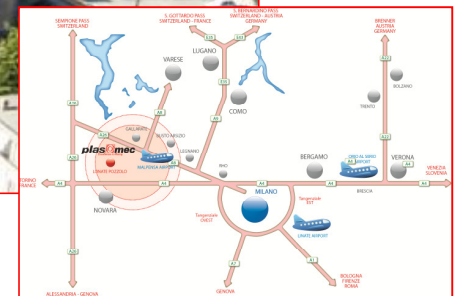
WHERE WE ACT



With a wide range of agents and international commercial team we cover the worldwide market

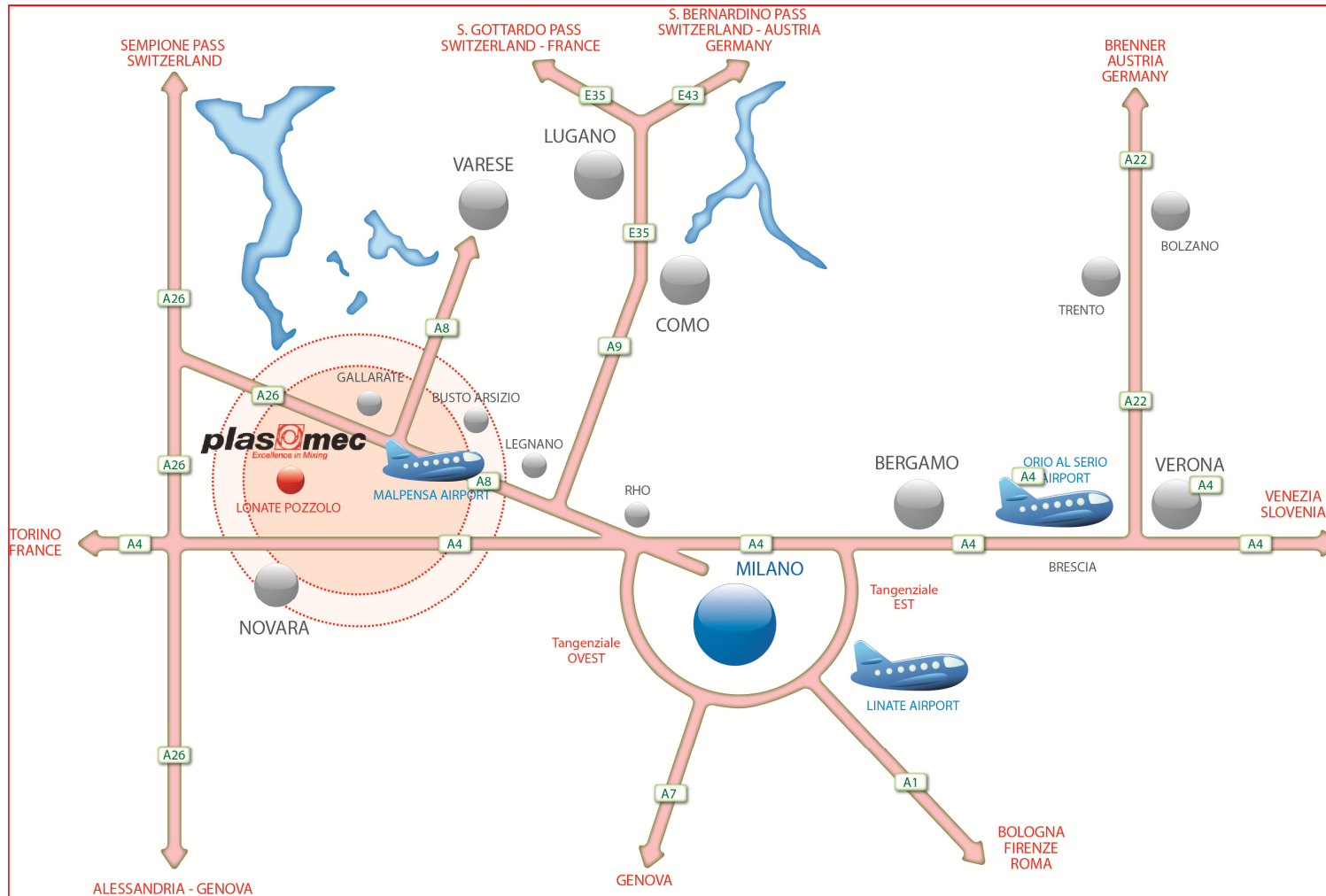
COME AND VISIT US

plas[®]mec
Excellence in Mixing



Lonate Pozzolo headquarter covers 20.000 m² floor space

COME AND VISIT US



PLAS MEC S.R.L.
Via Europa 79, 21015
Lonate Pozzolo (VA) - Italy

THANK YOU FOR YOUR ATTENTION!



PLAS MEC S.R.L.

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Phone +39 0331 301648 — **Fax** +39 0331 301749

www.plasmec.it

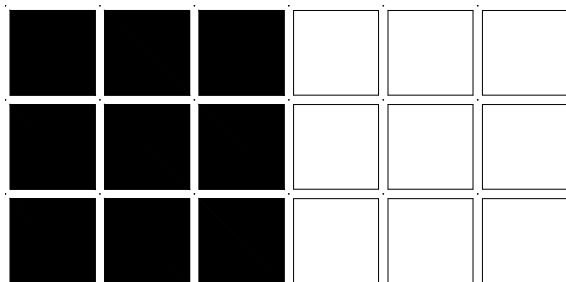


Latest developments in PVC dry blend preparation

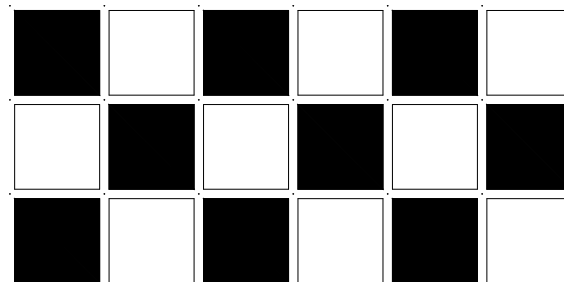
- Mixing tool technologies
- Cooling technology
- Humidity removal on PVC dry blend

MIXING :

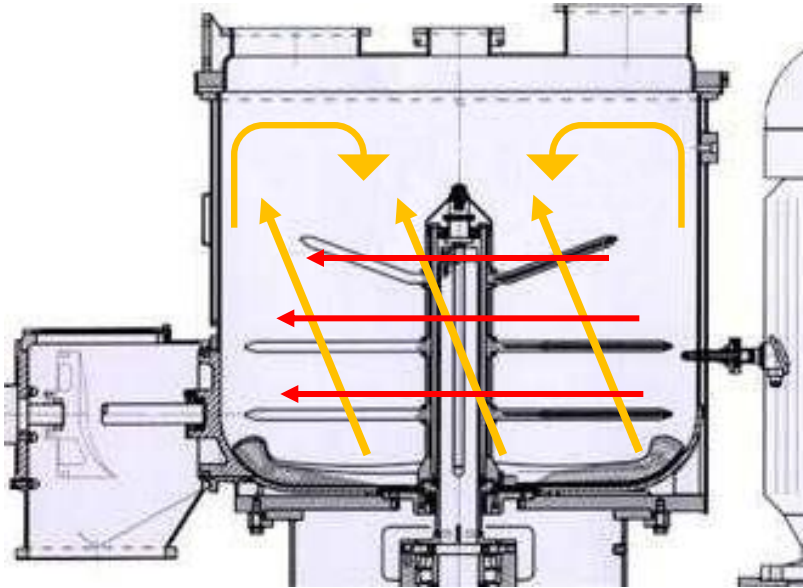
From non-homogeneous mixture to a ordered and distributed blend



INITIAL STATE



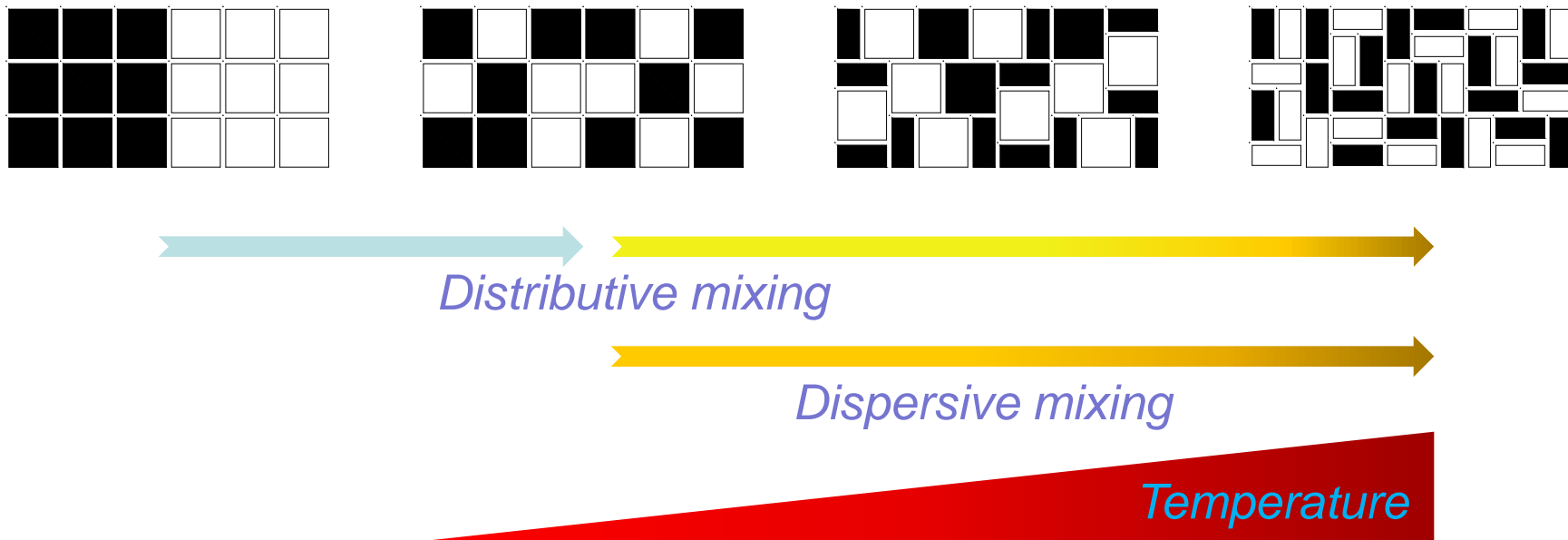
THEORETICAL IDEAL STATE



-VORTEX = Distributive Mixing

-VORTEX Cut = Dispersive Mixing

MIXING = Distributive mixing + Dispersive mixing





**First design
Double spoon**

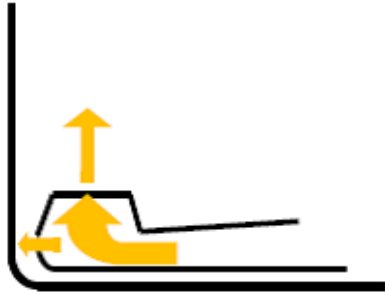


**Improved design
Spoon & Ring**



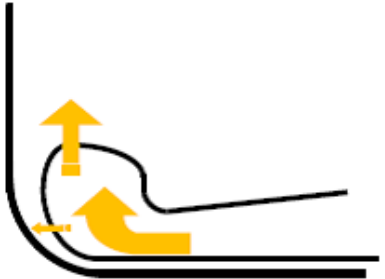
**Current design
Spoon & Blades**

Small radius vessel VS large radius vessel



Energy dispersed due to the abrupt change of direction

- *Premature wearing of the vessel*
- *Generation of crusts and hot spots*



Energy transfer optimized due to the larger vessel radius.

- *Longer life of vessel*
- *Less generation of crusts and hot spots*
- *Electrical consumption savings from 5 to 10% average*

Double Spoon



ADVANTAGES

- *Short cleaning time*
- *Lower cost of repairs or as spare part*

DISADVANTAGES

- *Longer heating time*
- *Possible contamination between products due to deflector*
- *High mixing speed required with consequent possibility of formation of hot spots*
- *Lower dispersion efficiency of fine components*
- *Small radius vessel design*

Ring



ADVANTAGES

- *Shorter heating time*
- *Mixing speed reduced*
- *Very gentle heating of transparent and high plasticized products*
- *Improved dispersion efficiency of fine components*

DISADVANTAGES

- *Longer cleaning time due to tool design complexity and presence of deflector*
- *Small radius vessel design*
- *Higher cost of repairs or as spare part*
- *Tendency of light materials to float on the ring*

Spoon & Blades


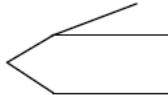

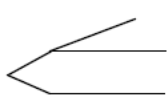


ADVANTAGES

- *Fast heating time*
- *Energy transfer optimization due to vessel bottom radius increasing*
- *Modular design permits to adjust tool configuration*
- *Very good dispersion efficiency of fine components*
- *Very gentle heating of transparent products and high plasticized ones*
- *Short cleaning time due to modular design and deflector removal*
- *Low price of repairs or as spare part because the tool has a modular design*

DISADVANTAGES = N O N E

Mixing tools profiles and materials

Round edge	Sharped edge	Sharped edge and sabre profile	Sharped edge with reduced thickness
			
Heating XXXX	Heating XXX	Heating XX	Heating X
Dispersion XX	Dispersion XXX	Dispersion XXX	Dispersion XXXX
PVC preparations Additives	Compound Masterbatch Additives	Compound Masterbatch Additives	Pigments Food Pharma

X Poor
XX Good
XXX Very good
XXXX Excellent

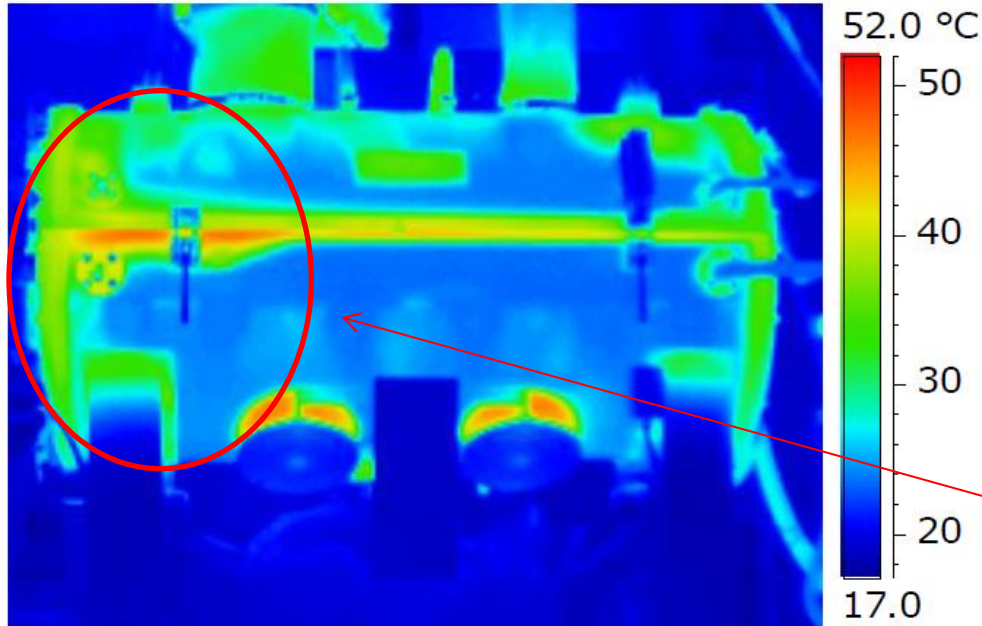
Material	PVC Rigid	PVC Soft	PVC Medical	Compound	Additives	Masterbatch Pigments	Pharma	Food
AISI 304 Mirror polished		X	X		X	X		
AISI 304 + Tungsten carbides	XX	XX		XX				
AISI 2205 Duplex Mirror polished			XX	X	XX	XX	X	
AISI 316 Mirror polished					X	X	XX	XX

X usable
XX recommended

Cooling mixers

		
Vertical cooler	U shaped horizontal cooler	High Efficiency Cooler

Cooling efficiency = Higher productivity
HEC cooler is the higher performance cooler



HEC 1st model

Performance

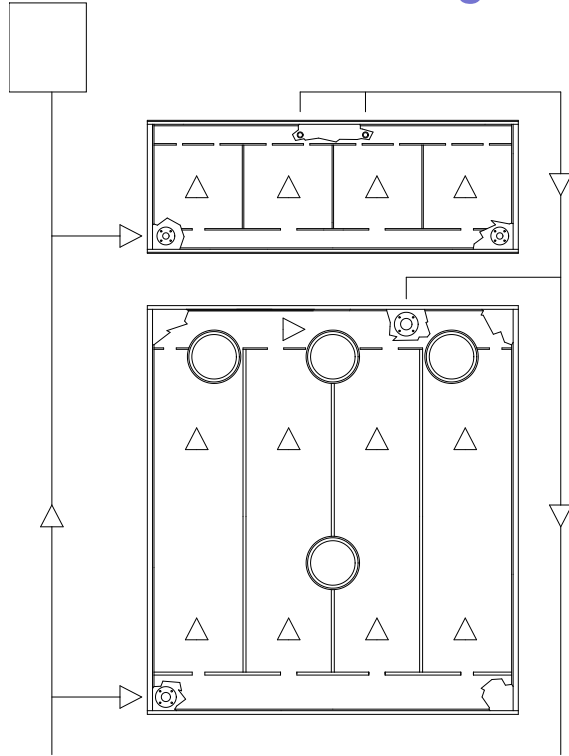
- More efficient thermal exchange compared to RFO and RFV
- Productivity 120-40°C = 7 batch/h

Limits

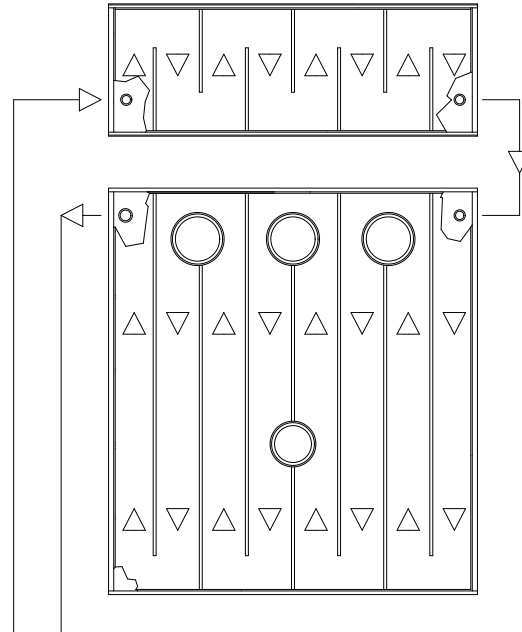
- Feeding water @ 0,5 Bar
- Thermal exchange unbalanced
- Market demand = 8 batch/h

Consequence

Revision of the jacket design



Previous jacket



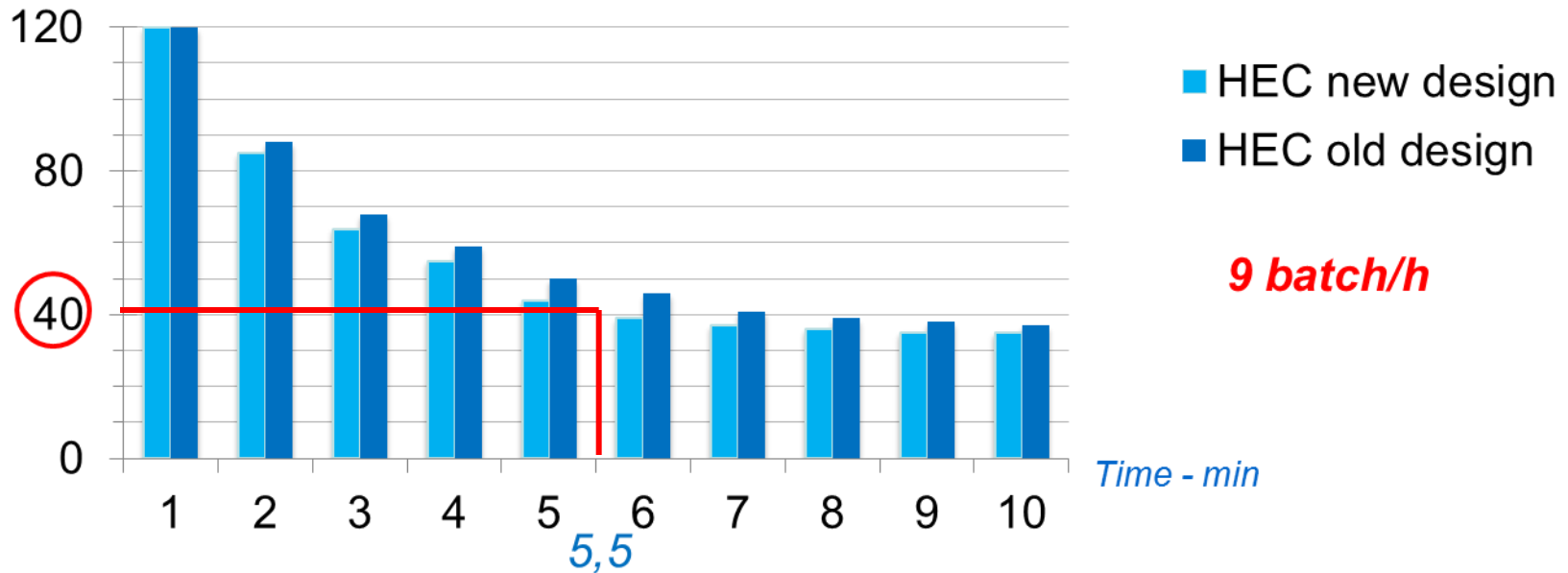
New "turbulence" jacket

New "turbulence" jacket

- *Very efficient thermal exchange*
- *Feeding water @ 2,5 Bar*
- *Productivity 120-40°C = 9 batch/h*
- *Lower installation costs*
- *Fewer deposits due to higher speed of water*
- *External insulation for lower cooling dispersions*

Previous jacket vs High «turbulence» jacket

Temperature - °C



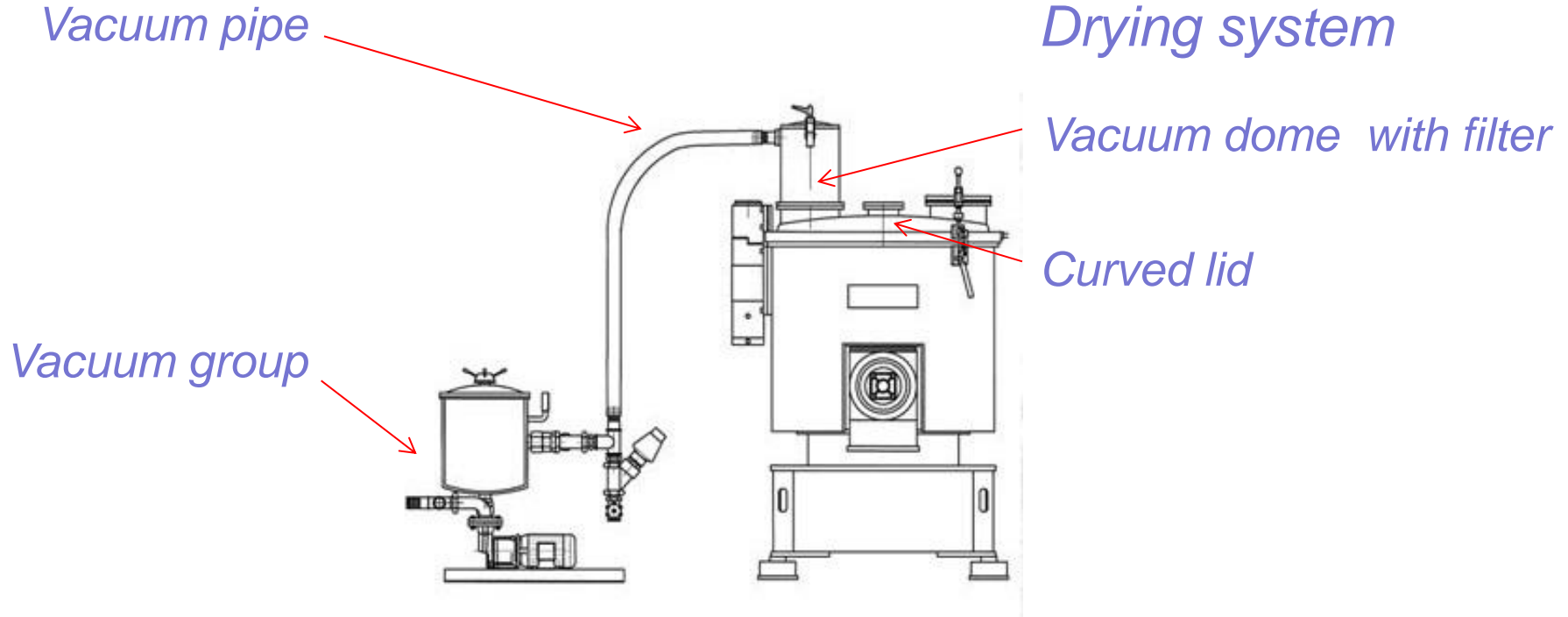


Fish eyes

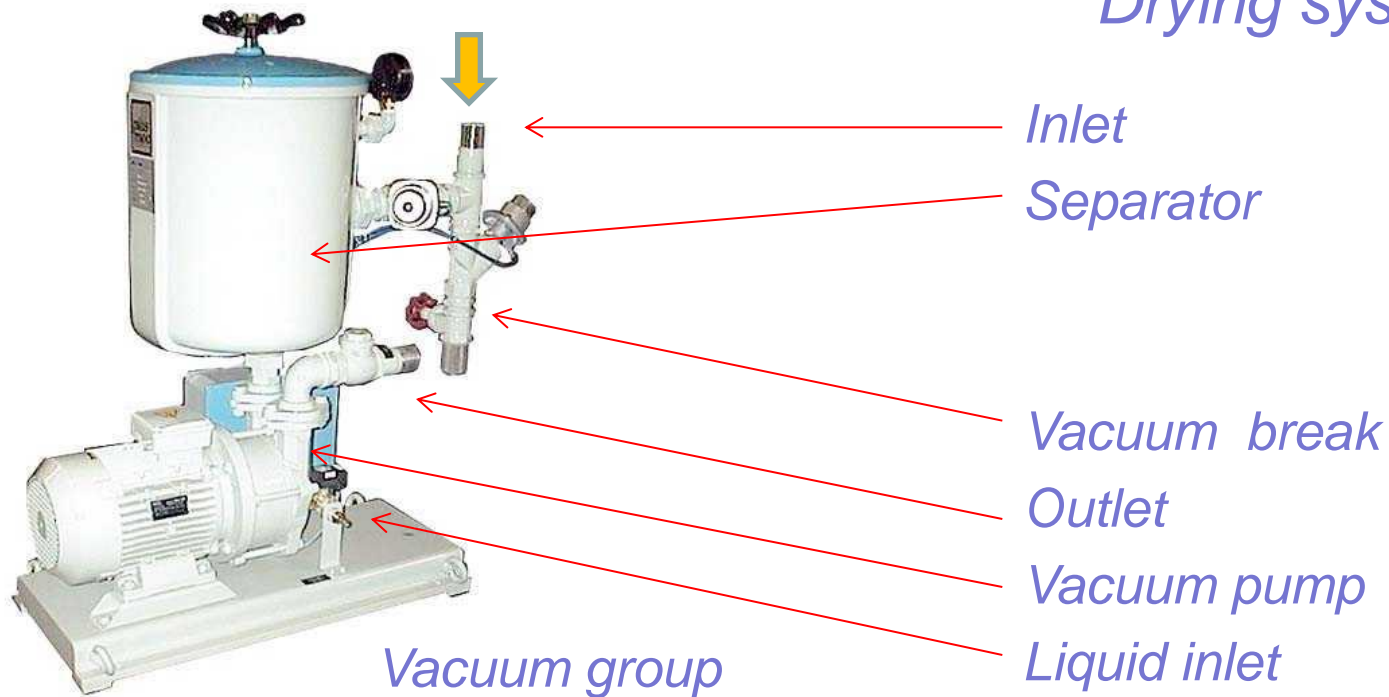
Moisture in PVC dry blend

Structural problems caused by bubbling



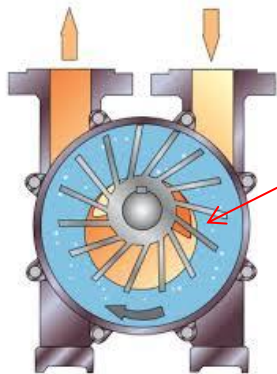


Drying system



Water

Humidity from turbomixer



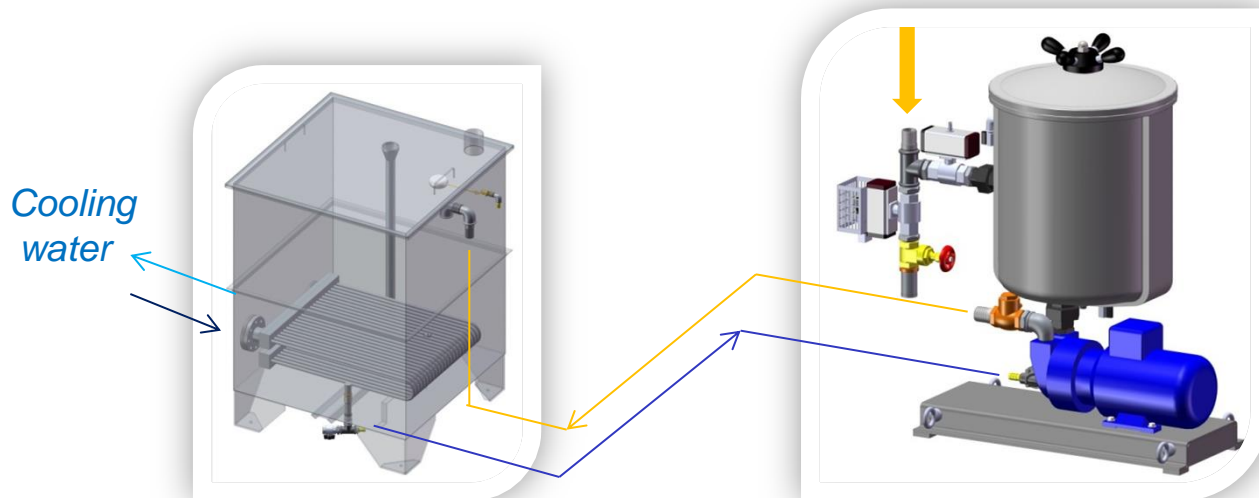
Water inlet for the ring

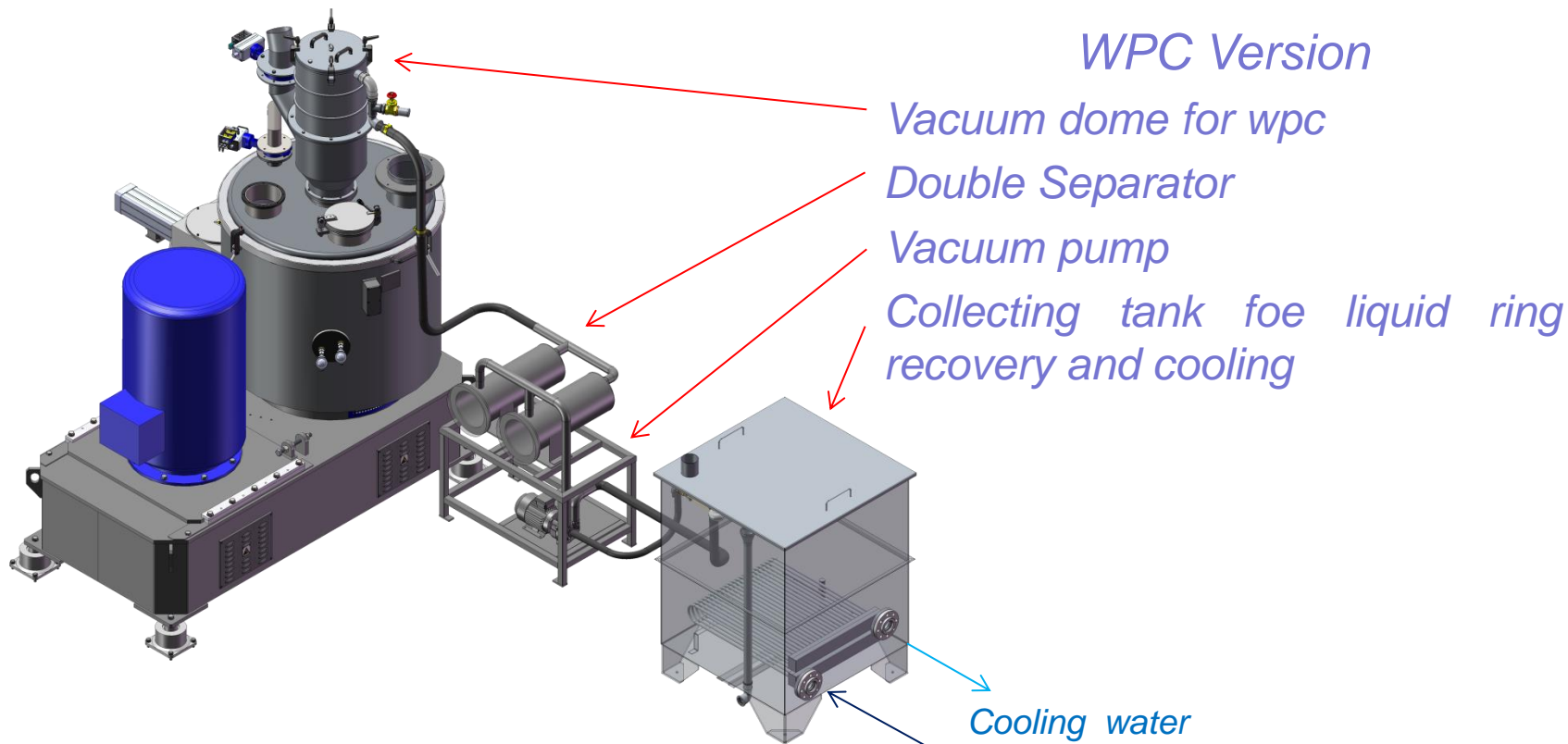


WATER was not collected and not recovered = extra costs for water consumption

Water is now re-circulated inside a tank with cooler exchanger

= COST SAVING







THANK YOU FOR YOUR ATTENTION

