VIC & NPX SERIES
INTERNAL MIXERS

The Internal mixer represents the most important piece of equipment of a mixing room: here is where quality really starts and results of mixing affect the whole process of rubber production down to its completion and use. POMINI Rubber & Plastics, based on their experience of more than 50 years, are combining fully upgraded tradition of Tangential mixers (NPX type) with pure innovation of Variable-Intermeshing-Clearance mixers (VIC type).

VIC intermeshing mixers have been engineered and manufactured by POMINI Rubber & Plastics since 1987. These mixers combine all advantages of both open roll mill (quality) and internal mixer (productivity) in a single unit, which makes VIC the most versatile machine available on the market today. The technologist can now adapt the physical geometry of the mixing chamber to best suit each phase of the mixing process. All this is possible through one operating variable that no other internal mixer has: the capability to change the clearance between the rotors. In fact, the name of this mixer stands for:

**V**ARIABLE **I**NTERMESHING **C**LEARANCE

This unique feature is covered by International Patent, valid worldwide.

NPX series, by simplifying mechanical design and improving the most critical areas of the mixer, represents the answer to Customers’ requirements for today’s needs: easier maintenance and longer life of the equipment.

For both types of mixers rotor geometry is studied by CFD-FEM and new rotor design is developed to maximise both quality (dispersion and distribution) together with productivity of mixing cycles. They are provided with forced cooling system and coated with hard material on their working surfaces to improve wear resistance.
VIC “X” SERIES
INTERMESHING MIXERS

VIC “X”

Based on their long experience so far acquired on VIC – Variable Intermeshing Clearance – mixer, POMINI Rubber & Plastics studied a geometry improvement in order to further improve the mixing performances in terms of quality and productivity. The basic idea is to enhance the compound flow behaviour between ROTOR TIP and CHAMBER WALL: in this way the compound can be mixed not only between the rotors, as typical for intermeshing rotors geometry, but, additionally, also between rotors and chamber. The proposed solution is the VIC with “eXtended” chamber (patented). The VIC “X” series has a chamber volume increased of 8% with respect to standard chamber. Enlarged chamber can be retrofitted to any existing machine WITHOUT ANY MODIFICATION but changing the set of sides.

VIC “X” DEVELOPMENT STEPS

After the comparison of different geometries of mixing chambers, based on the results of:
• Computational fluid dynamic analysis
• Laboratory experimental analysis
• Homogenisation experiments with silicon rubber
• Complete recipe tests
POMINI Rubber & Plastics realized the mixing chamber geometry that optimizes quality and productivity for all mixing stages.

INDUSTRIAL RESULT

With respect to standard VIC, the new VIC “X” mixer allows:
• Increased batch weight (+6÷10%): directly related to increased volume of mixing chamber
• Better homogeneity and fillers dispersion: due to larger “working” region (between rotor and rotor - between rotor and chamber) dispersive and distributive quality is enhanced
• Faster cycle time: due to larger volume, rubber intake is even faster

By comparing two identical industrial size machines (standard versus enlarged chamber), the combination of larger batch and shorter cycle time gave productivity increases between 8% and 15% and, in some cases, even more than 20%.

Industrial performances were tested on VIC165 “X” for technical good compounds and on VIC275 “X” for tire compounds: VIC “X” improves all advantages of variable clearance by enhancement of extended chamber.

European patent #0 783 945; USA patent# 5,806,974
PARALLEL-ROTOR MIXING MACHINE WITH A CLOSED MIXING CHAMBER HAVING WALLS SYMMETRICALLY TRANSLATED WITH RESPECT TO THE ROTOR AXES.
NPX SERIES
TANGENTIAL MIXERS

NEW DESIGN FOR EFFICIENCY
AND RELIABILITY
Based on their long experience so far acquired on tangential mixer – more than 500 mixers sold – POMINI Rubber & Plastics studied new design, new materials, a manufacture improvement in order to further enhance the mixers efficiency. The basic idea is to keep the same chamber and rotor geometry (the “heart” of the mixer) improving the parts that mostly affect the reliability:
• Sides with interchangeable “LIPS” on the drop-door contact area
• Easy and faster assembly and disassembly of sides
• Large HOPPER for faster raw material loading
• New high-performance materials for hopper and rotors
• New anti-wear materials and new methodology for hard material coating

NPX MIXER ROTORS GEOMETRIES
The technological “heart” of every internal mixer are the rotors. POMINI Rubber & Plastics can offer four different rotor’s shapes, starting from traditional 2WING and 4WING rotors to the new HDM (High Distributive Mixing) and NTT (New Technology Tangential). Main features of NTT rotors are:
• Geometry for best mixing performances (both quality and productivity) in all stages of mixing
• Improved “distributive mixing” action by an optimisation of a “variable” wing angle (patented)
• Improved “dispersive mixing” behaviour by the optimisation of the rotors “dispersive mixing section”
• Optimised reliability and mechanical property by FEM analysis and fatigue analysis of a new rotor material

In case of upgrading mixing technology, POMINI Rubber & Plastics suggests:
• To replace 2WING rotors by HDM (the customer can keep same mixing cycles – with minor adjustements - and same mixing room layout)
• To replace 4WING rotors by NTT (as above)
AUTOMATION

POMINI Rubber & Plastics automation packages, based on the most advanced information technology tools, are customized in order to satisfy the specific needs of each Customer. They manage from a single production unit (e.g. the Internal Mixer) up to a complete mixing room (including material handling, small bag preparation, ERP interface...). Main target is to guarantee repeatability, tracking, consistency, logging and analysis of the line operating condition data, in production of all different formulations processed by the line and set by technologists. Each local unit is supervised by a PC and is connected through LAN (Local Area Network) to a central server that manages all the data. Data are available to production control, technologist, laboratory, etc. as soon as collected.

POMINI Rubber & Plastics Supervision System provides, under windows user-friendly environment:

- Synoptics in real time
- Editing of recipes and production schedule
- Small chemical production management
- Raw/finished materials storages/certification
- Process evaluation
- Scheduled maintenance
- Efficiency analysis
- Additional sensors (vibration, ultrasounds, temperature) monitoring
- Reporting
- Historical data analysis
- Statistical analysis for all parameters

POMINI Rubber & Plastics automation system (both hardware and software) are fully in-house realized.
That’s why I choose Pomini