TECHNOLOGY • PRODUCT • QUALITY

MIXING TECHNOLOGY OF QUALITY CONCRETE











CONCRETE - MIXING TECHNOLOGY

Mixing is a basic technological operation in the production of ceramic products. It is especially important in the production of concrete.

MD dynamic mixers, manufactured by **IdeaPro** in Nowa Sól, meet all the requirements related to the production of special concretes.

In particular, MD dynamic mixers are used to produce concrete for roof tiles and facing elements, railway sleepers, foam concretes, fibre-reinforced concretes, high-strength and ultra-high-strength concretes, and polymeric concretes which contain small amounts of additives with very-small granularity.

The optimum distribution of mineral fillers, dyes, and ultra-fine additives in particular, plus the ensuring of reactive contact over the largest-possible surface area, make the intensity of mixing essential for the most-exacting parameters and the reduction in the quantity of the required additives and water.

Owing to intensive mixing and excellent homogenisation, concretes contain several-percent less water, with the consequent effect on the properties of the product, while retaining their consistency.





The intensity of mixing, defined as the amount of mechanical energy used exclusively for the mixing work, is a very--important parameter in concrete production.

For traditional mixers, it is about 4 kW per 100 kg, whereas dynamic MD mixers generate from 2- to 10-plus kW per 100 kg.

The mixing intensity of dynamic mixers corresponds to the speed of the mixing tools (turbines).

While traditional mixers work at about 1.5 m/s, the speed of MD dynamic mixers can be adjusted during the mixing process in the range of from 1 to 15 m/s, thanks to the use of VFD drive.

This allows the mixing energy to be adapted to the different phases of the mixing process, thus optimising energy consumption and preparation time.

The possibility of adjusting the mixing intensity has particular importance for the production of special concretes containing ground quartz, ground limestone, pigments, fly ash, and micro-silica.

The particle size of pigments and micro-silica is 50 to 100 times smaller than that of cement.



MD dynamic mixers - with their inclined rotary drums and high-speed agitators - are dedicated to the concrete industry, and have the following features:

- · Water can be added at any dosing speed
- The mixing time does not depend on the size of the mixer
- The speed of the agitator (i.e. the mixing intensity) can be adjusted over a very-wide range
- The shape of the mixing tool is matched to the particular type of product
- · The mixture quality does not depend on the filling level of the mixer
- The mixture-moisture content can be accurately measured

MD mixers make use of the phenomenon of gravitational setting and the turbulence of particles, caused by the mixing drum's rotating at an angle and the high-speed agitator's forcing their proper direction.

IdeaPro MD dynamic mixers for the production of special concretes are available in various sizes - shown below.

MD dynamic mixers		
Туре	Capacity	
	litres	kg max
MD-11	350	500
MD-16	600	900
MD-19	1000	1500
MD-21	1800	2500



The advantages of the mixing process in MD dynamic mixers:

- · A controlled mixing process through the PLC system
- A wide range of mixing powers, from 2 to 10+ kw per 100 kg
- A wide speed range of the mixing tool (agitator), from 1 to 15 m/s
- Energy savings: 90% of the power is used only for mixing work
- The high homogenisation and reduction of additives
- The high quality of the product (concretes)
- A reduction in the amount of batch water
- · Reduced mixing time, e.g. From 240 to 60 seconds for SCC concretes
- Hybrid-mixing technology (the adjustment of mixing intensity to the given stage of concrete-mix preparation)
- · Water and cement savings



The use of MD dynamic mixers has a positive impact on the reduction in production costs resulting from, for example, the reduced side surface of the pan, and the lining of its bottom surface. Fewer overhauls result from the use of the central lubrication system, and efficiency is increased by the shortening of loading, mixing, and unloading times. Charge material is saved due to the improved dispersion and homogenisation of fine particles (cement). Quality and productivity are improved by reducing non-conformities, which is particularly important when using costly and high-quality materials.

The unique way of mixing, with the use of dynamic MD mixers, which combines macro-mixing (rotating pan) and micro-mixing (turbine), allows the speed of the agitator to be adjusted, and consequently the appropriate energy input employed for the various stages of concrete preparation, taking into consideration the properties of the materials The use of materials with ultra-fine granularity requires high mixing speeds for full deagglomeration.

Therefore, the use of this "hybrid" mixing method allows preparation time to be reduced by several times in comparison with simple mixers.



The machines, devices, and complete production lines manufactured by IdeaPro are designed specifically for use e.g. in the foundry, automotive, glass, iron and steel, mining, ceramics, insulating and refractory materials industries, and many other





We provide assistance and technical support services, putting our consultants and their extensive experience at your disposal

We provide comprehensive project implementation services, which include:

- the development of underlying concepts
- the formulation of technical and business objectives
- industry-specific projects, e.g. water supply and compressed air lines, gas and electric systems
- foundations and construction works
- · machinery and equipment
- · shop floors and steel structures
- dust removal systems
- power supply and electric control systems
- the organisation of project-related supplies and deliveries
- the installation and start-up of the resulting technological lines
- the implementation of manufacturing processes

Drawing on our many years of experience, we have developed our own know-how basedon technologies designed for building machines and technical equipment, including in particular:

- shot-blasting machines
- sand processing stations
- turbine mixers
- · vibro-fluidised bed and blade-mixer coolers
- fluidised bed and vibro-fluidised bed dryers
- pulse-press moulding machines
- automatic moulding lines
- the maintenance and online monitoring of manufactured and operating equipment and production lines

We also provide supply services in the following areas: designing, engineering, control and automation, repairs, mechanical treatment, welding steel structures, shot blasting, and painting, as well as other services, according to our own machinery park





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