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IMAS Vibration Damping in Roller Mills with Polymer Base Construction

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About Imas

New face, new breath, new way of thinking...

Financial Strength

The only milling machine producer having public offering since April 2022, with a increasing value of shares in İstanbul Stock Exchange every day.

Growing Team, Growing Targets

Launch of new İstanbul Office to bring industry professionals together and create a real 'synergy' ambient

Proven Global Expertise in Turnkey Projects

500+ complete projects over 100 countries One of the largest milling complexes in Nigeria with 2.400 TPD capacity to be delivered in 2023

R&D and Engineering

Over 30 years of know how and experience in flour milling One of 250 companies having the most R&D spending in Turkey



Innovation Award 2023

At Imas, we believe that the reliability of our machines is important as much as their technology. For this reason, we continuously develop our machines and systems through new engineering standards.

Imas R&D and Engineering team achieved to develop an alternative roller mill chassis construction material to the steel or cast iron, with the use of polymeric composites as being the first in milling industry. This is one of our latest innovations which has received the product showcase award by IAOM USA in 2023.



Multimilla Roller Mill with Polymer Base Construction®

Vibration Problem of Machinery

Roller mills

Short term

Distruptive effect on the sensitive operating adjustments of machines

Long term

Shortened machine life through continuous vibration effect and damage to the materials

(bearing, bearing housings, moving parts, etc.)

Mill building

Problems in the static structure Impacts on worker health and safety







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Chassis Structure of Roller Mills

The traditional way of roller mills' chassis production is using either sheet steel with welding, or cast iron.

Then break rolls are mounted on the cast bedplate and secured on the ground with the floor frame.









Polymer Base Construction



Instead, we used Polymer in the base construction of our roller mills, which has better vibration damping abilities than the welded steel and cast iron.

With this method, we achieved a significant improvement in the vibration damping ability of the chassis.







What is 'Polymer' ? -

Polymer composite (mineral casting) is a combination of polymers (i.e., thermosets or thermoplastics) with various continuous and noncontinuous reinforcements/fillers, principally added to polymers to improve the material performance.

Polymer composites are increasingly being used in various engineering fields including automotive and aerospace industries.





	Welded Steel	Cast Iron	Mineral Casting
Vibration Damping	Low	Medium	High
Thermal Features	High heat conduction coefficient	High heat conduction coefficient	Low heat conduction coefficient
Production Flexibility	High production time and costs	High production time and costs Need for heat treatment	Low production times
Corrosion Resistance	Low	Low	High
CO ₂ Emmissions	Medium	High	Low



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Polymer Composites







LABORATORY EXPERIMENTS

Laboratory experiments were performed for Polymer material with high vibration damping ability to compare it to steel and cast constructions.









LABORATORY EXPERIMENTS

EQUIPMENT LIST

Accelerometer

Dynamic Data Collection System

















Vibration damping ability of mineral casting is up to 10 times better than the cast iron.



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Cast chassis roller mill and polymer chassis roller mill were produced and evaluated under the same conditions, in order to make a comparative evaluation.



Polymer Chassis







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Bottom Measurement

Milleral[®]

Three dimensional measurement of acceleration

Viteral[®]

Cuteral[®]



Steral



0.02

0.015

0.01

0.005

-0.005

-0.01

-0.015

-0.02

0

Acceleration (a) Acceleration (a) **Cast Chassis Composite Chassis**

0.02 Maximum **Cast Chassis** 0.015 Acceleration (a) 0.01 0.005 **Composite Chassis** 0 **Top Measurement Bottom Measurement**

Three dimensional measurement of acceleration







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Milleral[®] **Viteral**[®]







It has been observed that the roller mill with composite (Polymer) chassis absorbs vibration about **10 times better** on average compared to roller mills with cast chassis.

Our roller mills are a great value and can help bring a better work and maintenance environment to your facility.





Multimilla Roller Mill _____ Other Important Features

Inox Surfaces

- All product contact surfaces are made of stainless steel.
- Suitable and optimized for food safety and sanitation.







Multimilla Roller Mill **Other Important Features**

Aluminium Profiles

- Clean, smooth, easy to use aluminium profiles ٠
- Provide noise and heat isolation ٠
- Easy to clean ۰
- Non-sticky surfaces ٠







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Multimilla Roller Mill _____ Other Important Features

Aluminium Injection Covers

Easy access via swing-open panels as well as a sliding feed module that is easy to clean and provides the highest sanitation standard.

The Roller Mill front covers are made through aluminum injection.

Many providers manufacture these covers from fiberglass or plastic materials.







Thanks for your time and attention.



