IMAS Vibration Dampening in Roller Mills Using Polymer Base Construction

IAOM Meeting – September 28th, 2023

imas NORTH AMERICA

'The technology that understands the language of nature'

About İmas

New face, new breath, new way of thinking…

Financial Strength

- *We were established in 1989 and publicly owned since April 2022, with an increasing share value in the İstanbul Stock Exchange.*

Growing Team

- *We launched our new İstanbul office to bring industry professionals together and create synergy*

Proven Global Expertise in Turn-key Projects

- *500+ complete projects in over 100 countries including one of the largest milling complexes in Nigeria with 2400 TPD capacity to be delivered in 2023*

R&D and Engineering

- *We have over 30 years of know-how and experience in flour milling and are among the top 250 companies having the most R&D spending in Turkey*

Vibration Problems

Roller Mills

Short-term

Distruptive effects on the operating adjustments

Long-term

Shortened machine life (bearing, bearing housings, moving parts, etc.)

Mill Building

Problems in the static structure

Mill Personnel

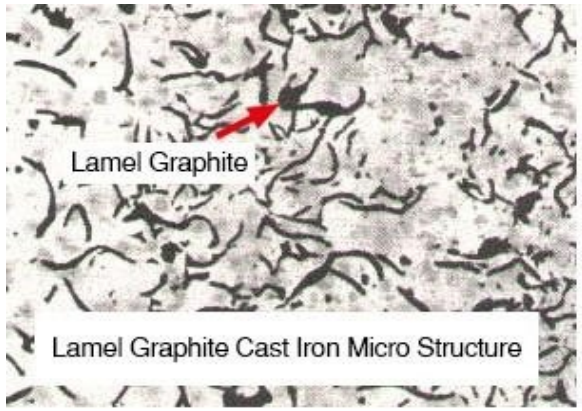
Impacts on worker health and safety

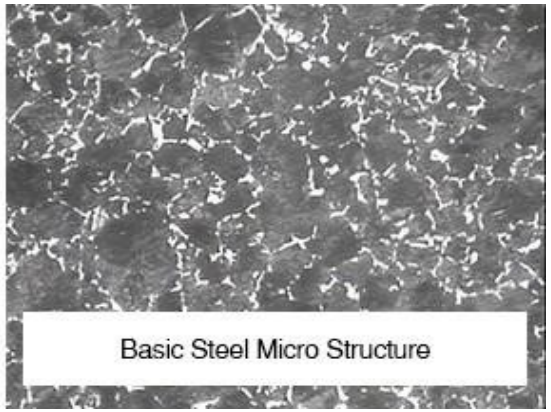
Multimilla
Roller Mill

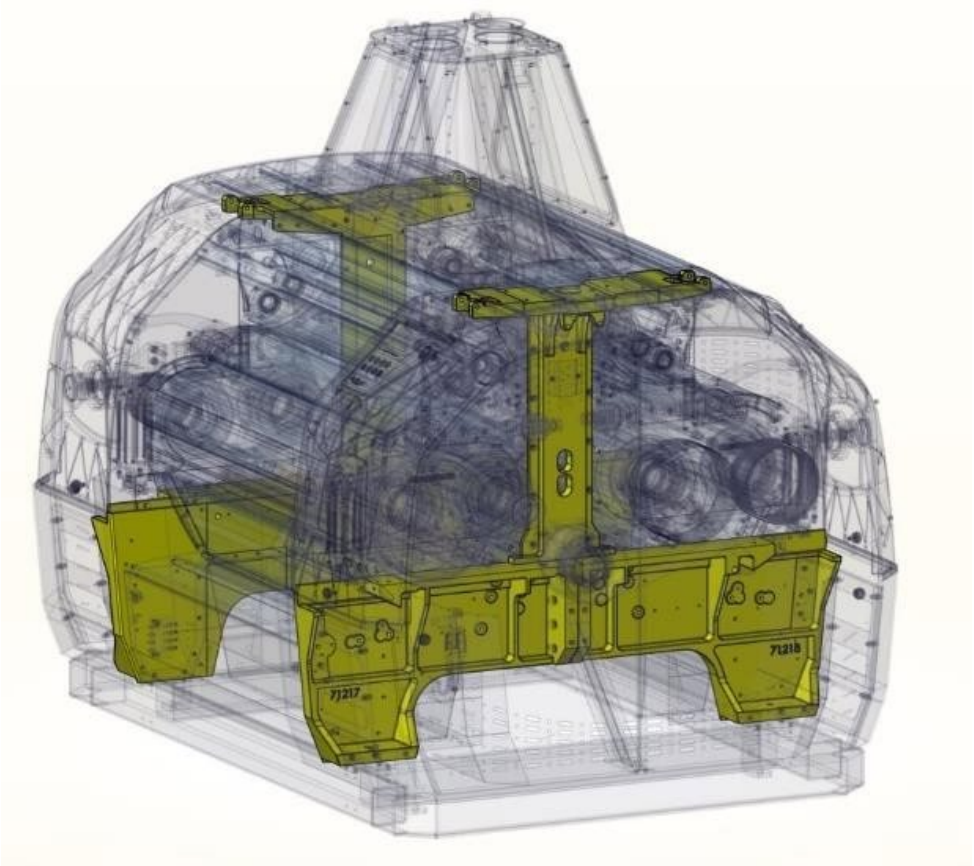
Chassis Structure of Roller Mills

The traditional way of roller mill chassis production uses either sheet steel with welding or cast iron.

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



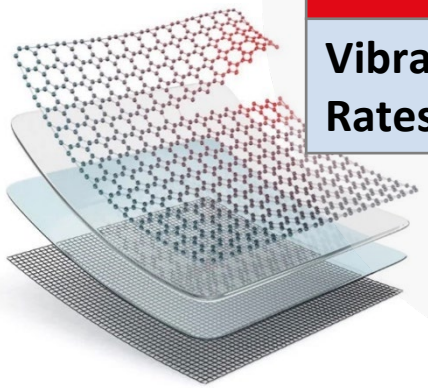


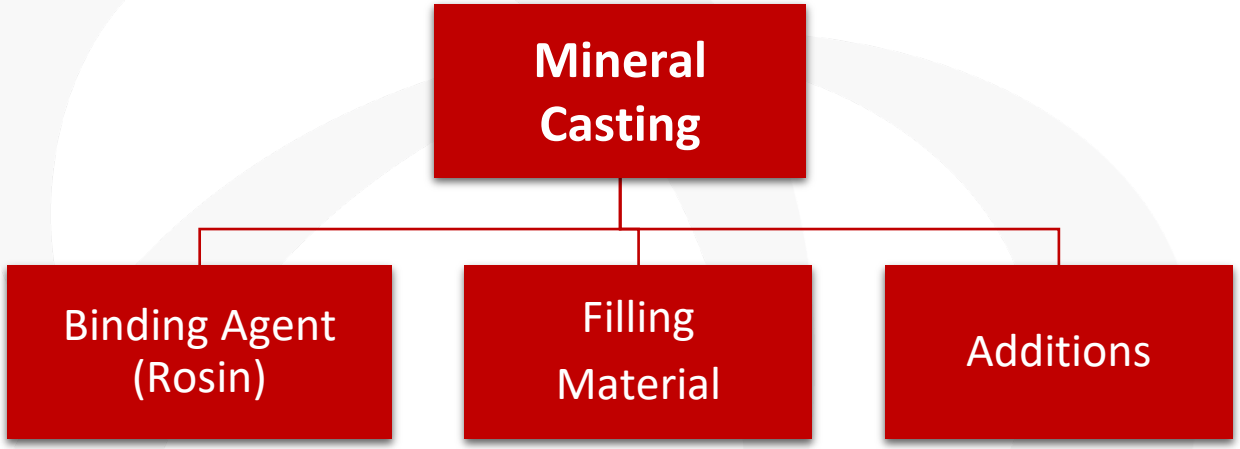


What is ‘Polymer’ ?

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.



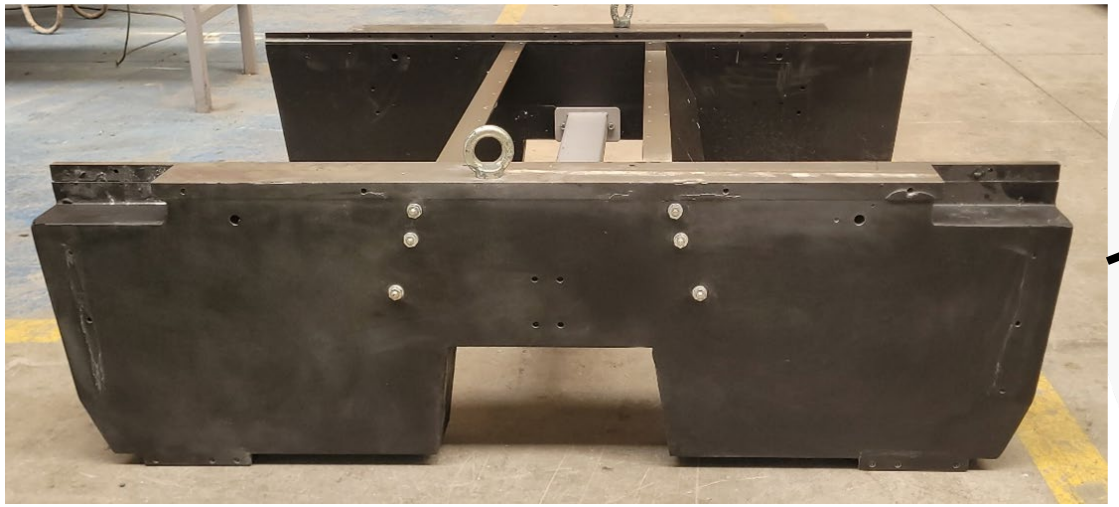


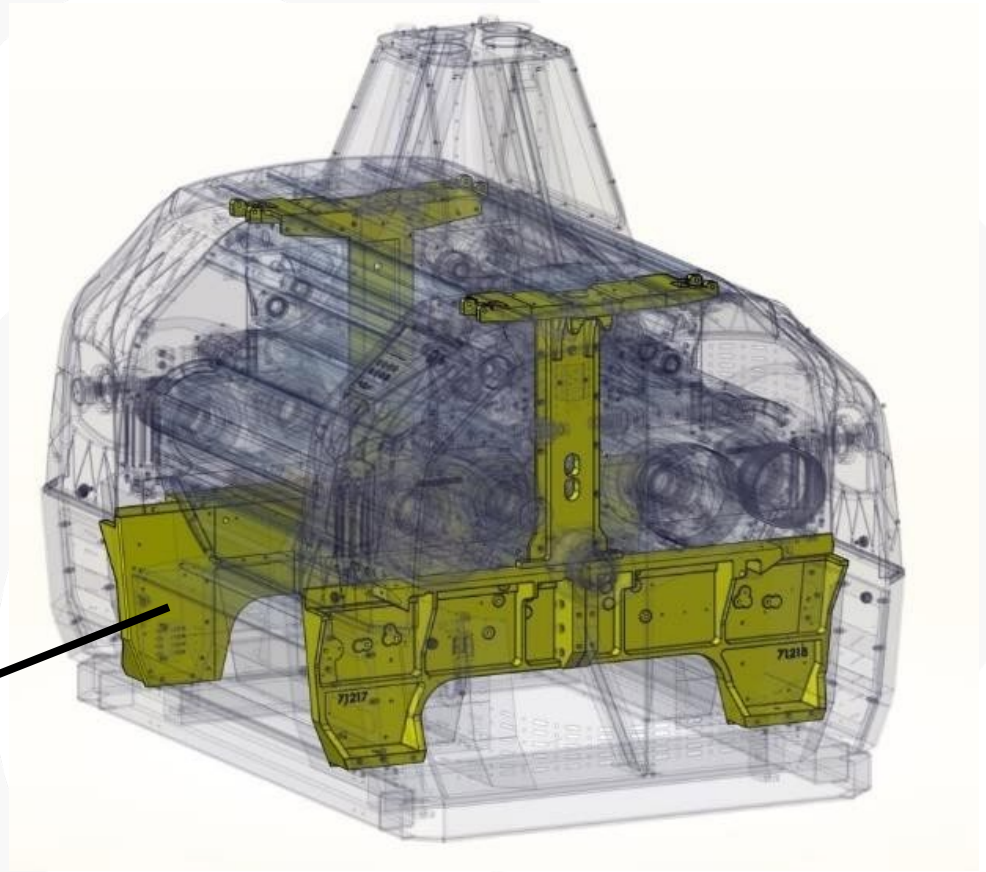
Comparison Chart	Welded Steel	Cast Iron	Mineral Casting
Vibration Damping Rates	0.0005	0.001	0.01

Polymer Base Construction

Instead, we used Polymer in the base construction of our roller mills. This has better vibration dampening abilities than traditional welded steel or cast iron.

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



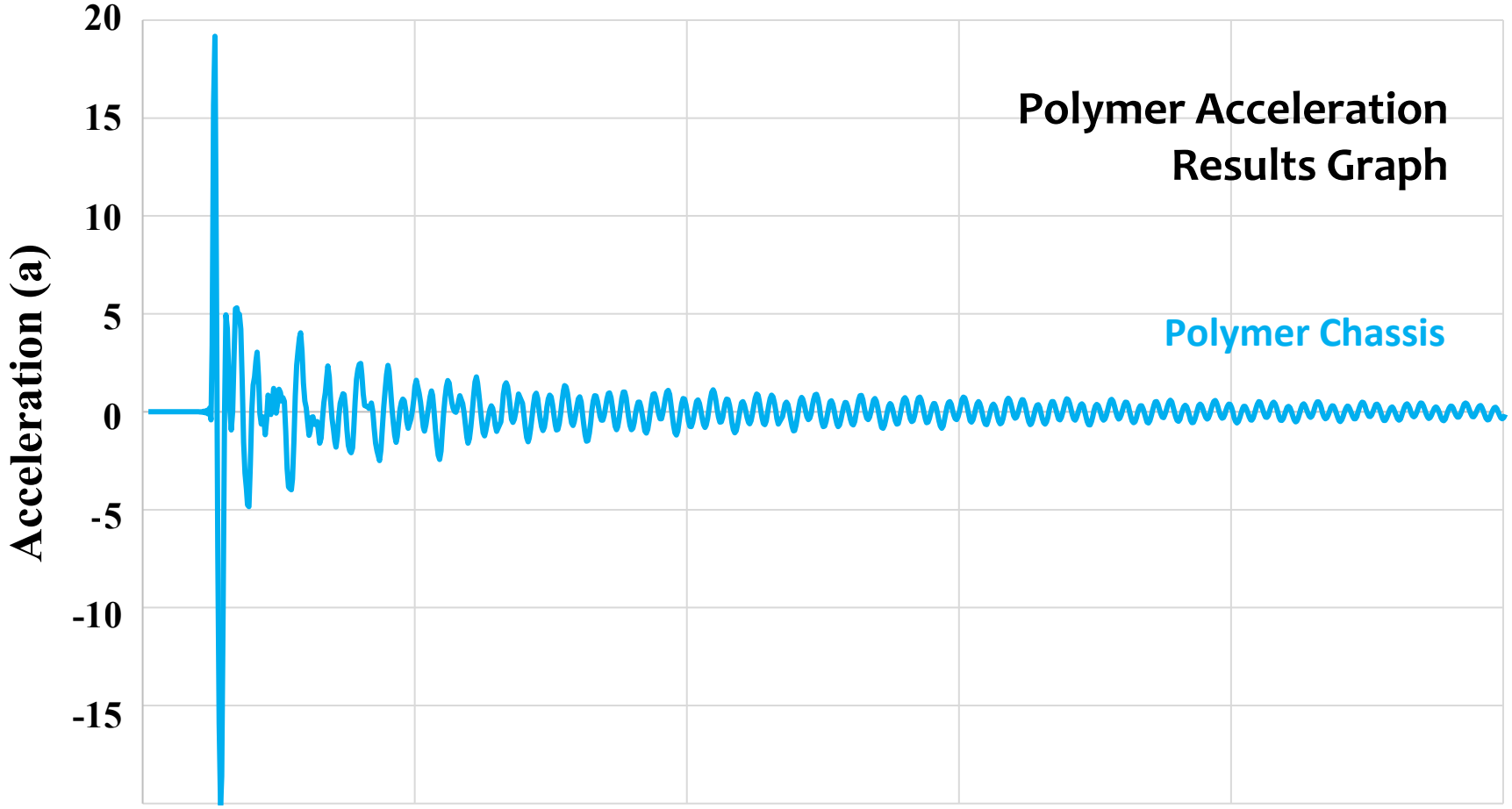


EQUIPMENT LIST

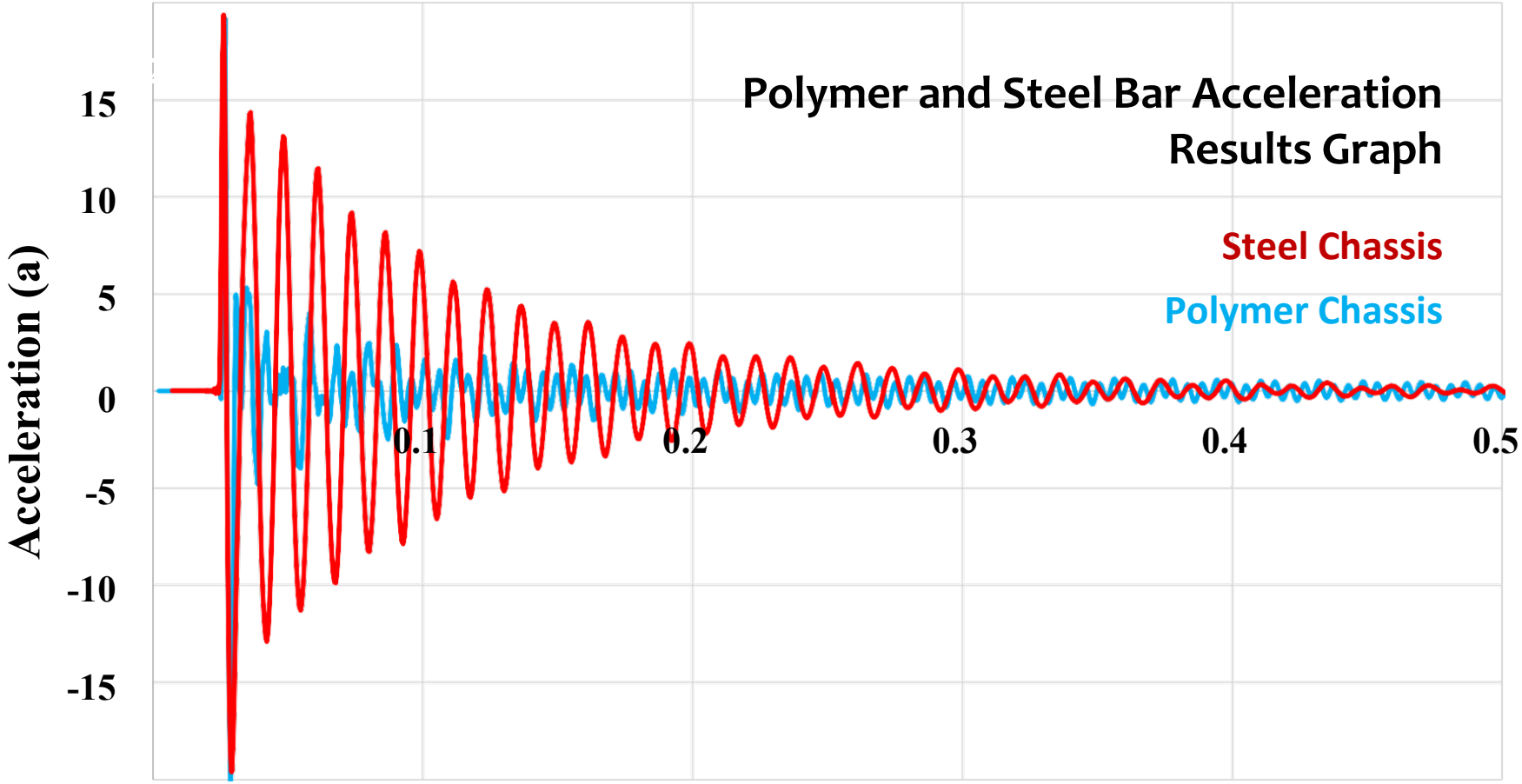
Accelerometer

Dynamic Data Collection System

LABORATORY EXPERIMENTS

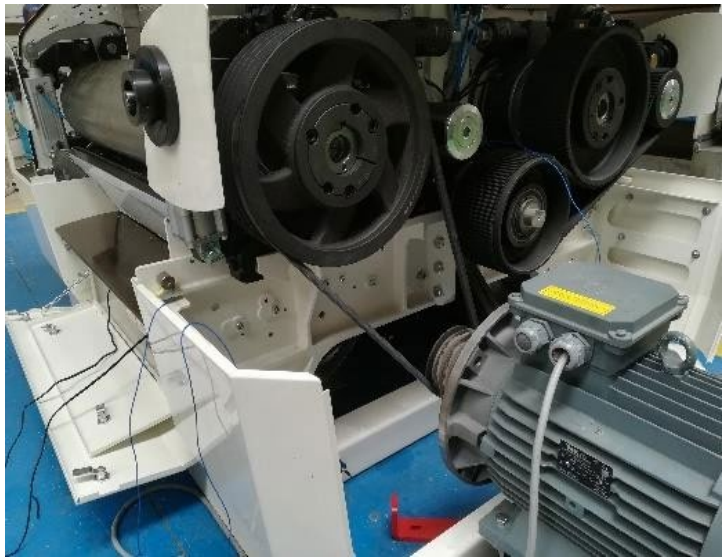


LABORATORY EXPERIMENTS



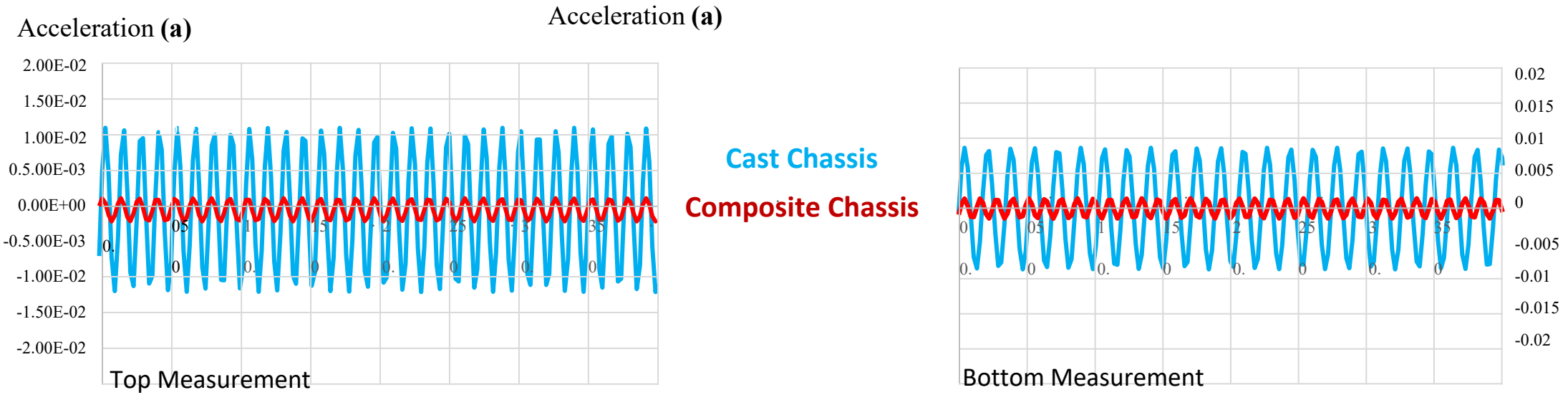
PROTOTYPE PRODUCTION AND TEST RESULTS

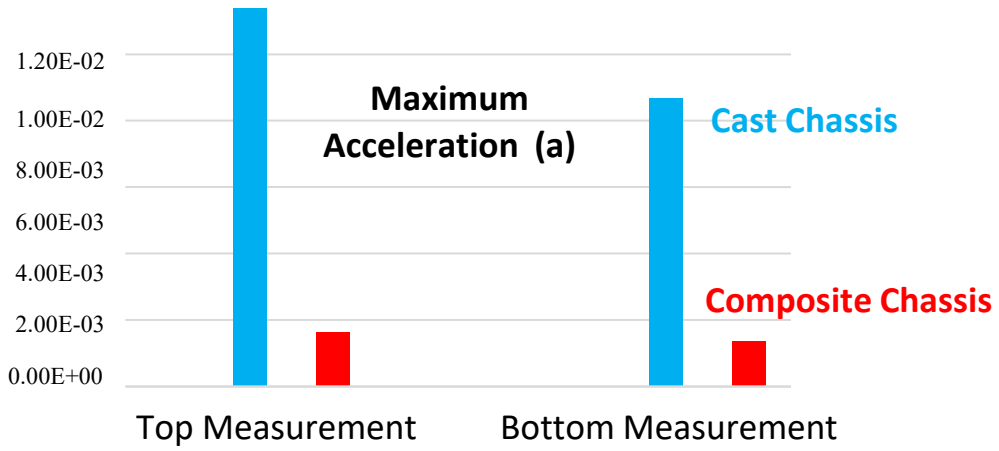
A cast chassis roller mill and polymer chassis roller mill were produced and evaluated under the same conditions, in order to make a comparative evaluation.



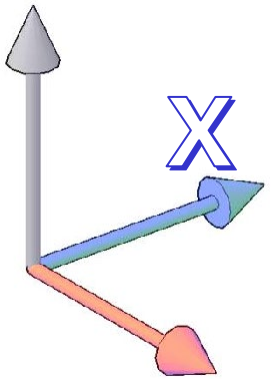
Polymer Chassis

PROTOTYPE PRODUCTION AND TEST RESULTS

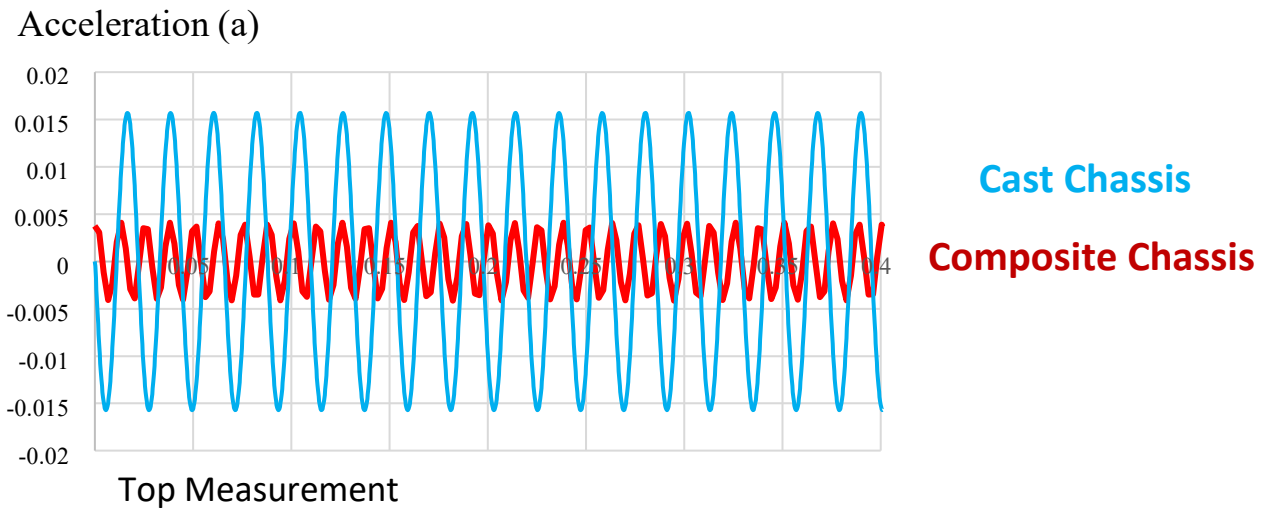




Three dimensional measurement of acceleration

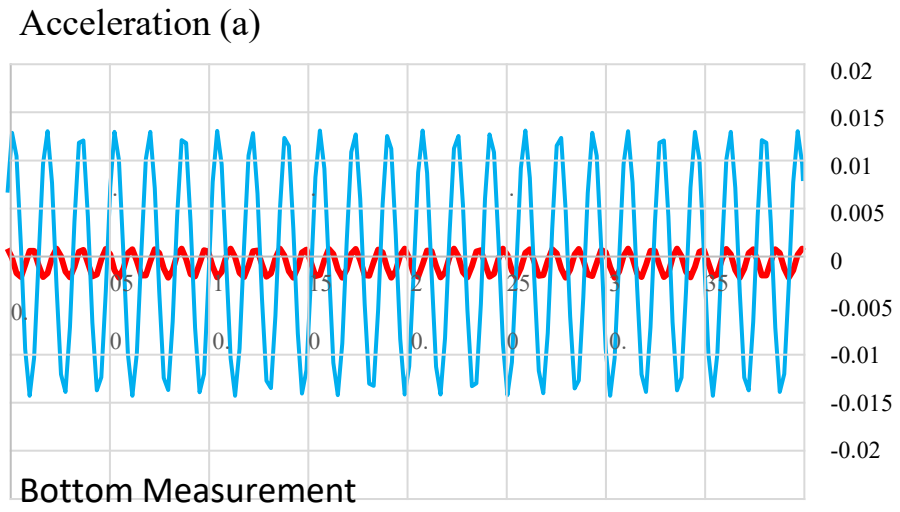


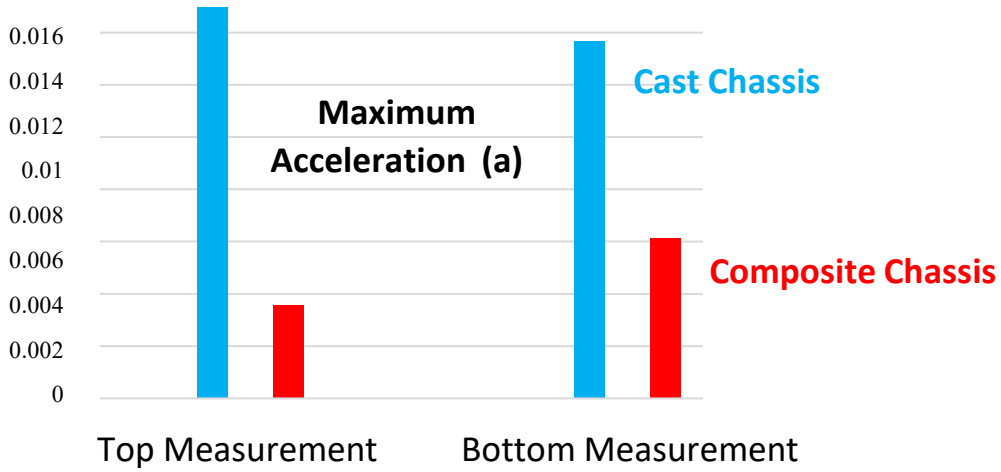
PROTOTYPE PRODUCTION AND TEST RESULTS



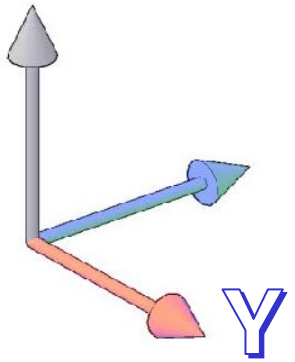
Cast Chassis

Composite Chassis

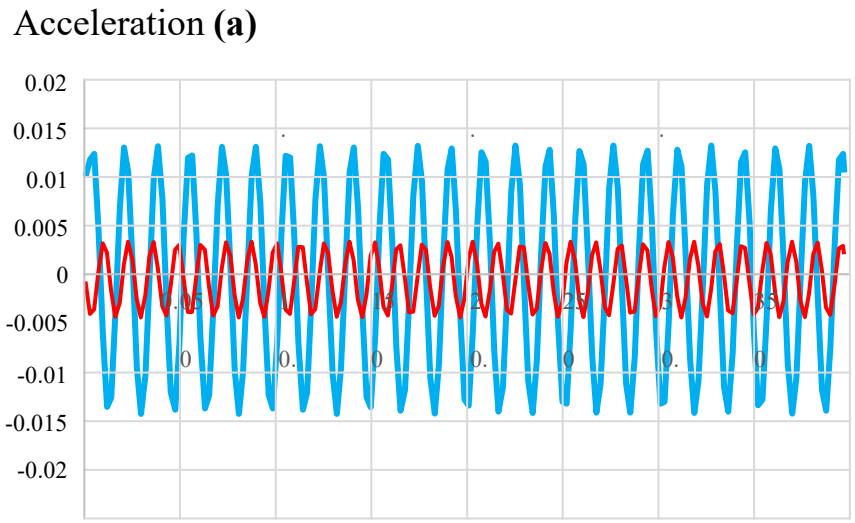




Three dimensional measurement of acceleration

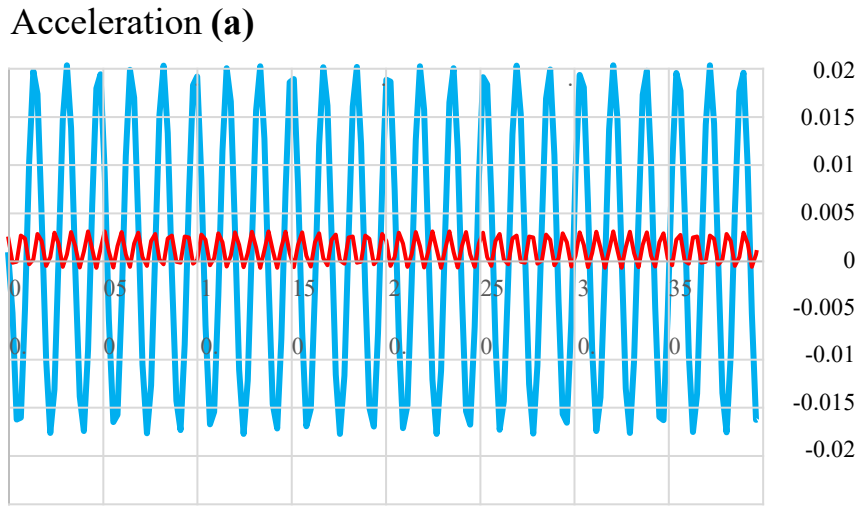


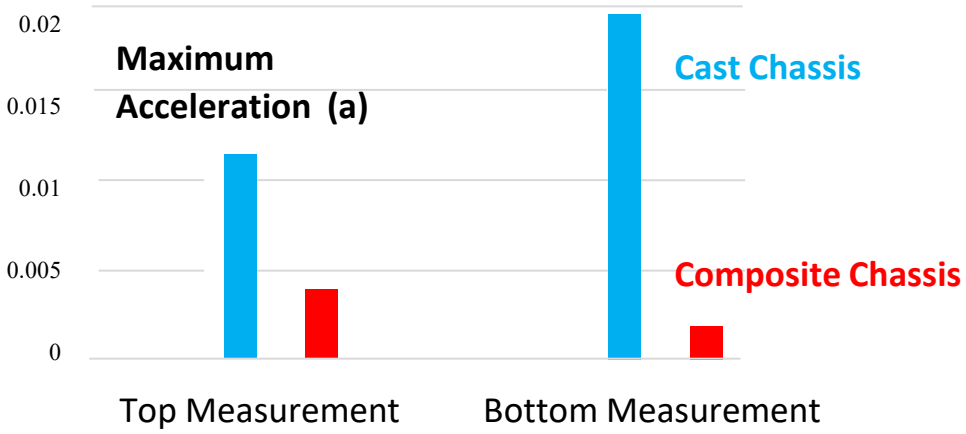
PROTOTYPE PRODUCTION AND TEST RESULTS



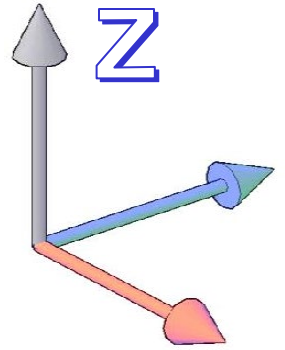
Cast Chassis

Composite Chassis





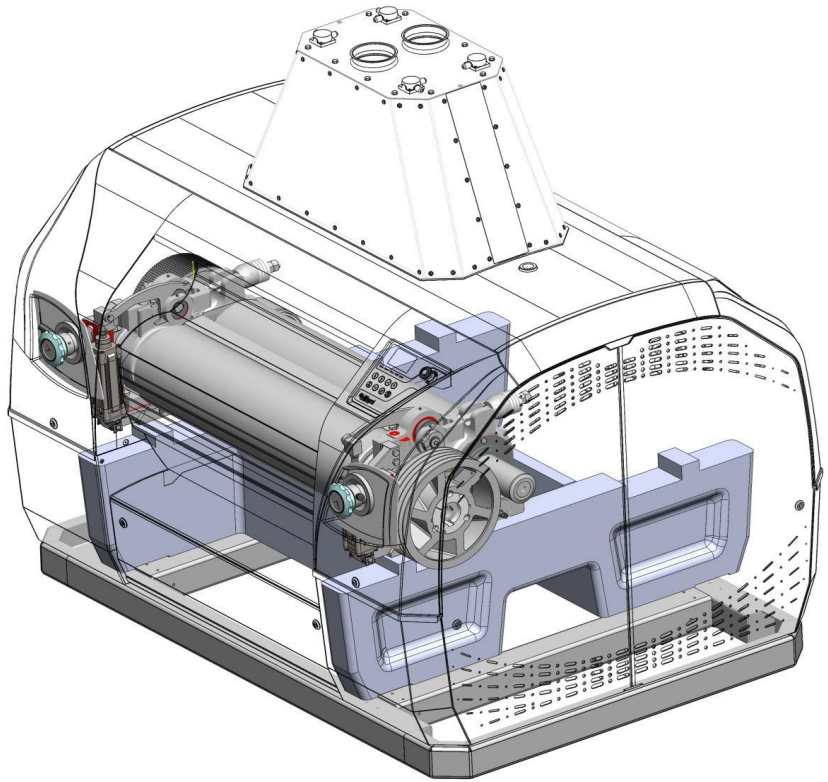
Three dimensional measurement of acceleration



PROTOTYPE PRODUCTION AND TEST RESULTS

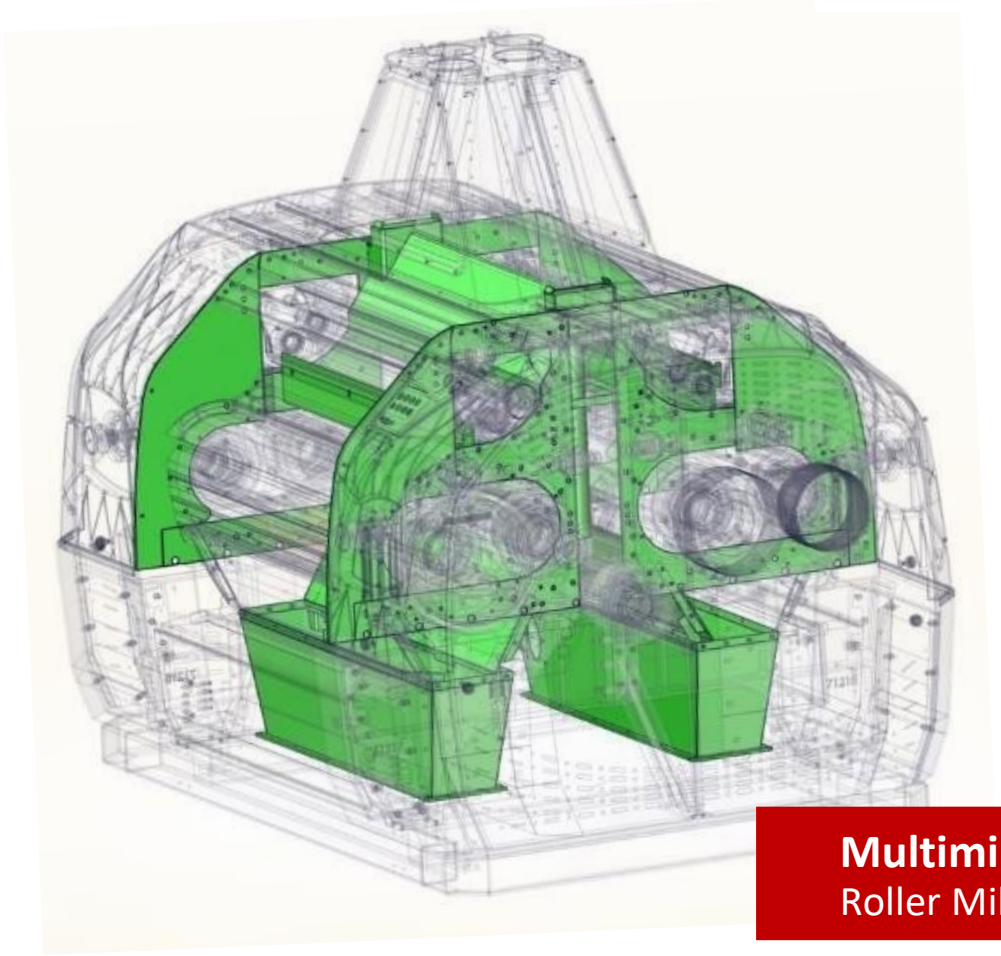
It has been observed that the roller mill with composite (Polymer) chassis absorbs vibration **significantly better (we guarantee 2X)** on average compared to roller mills with cast chassis.

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



Other Important Features

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



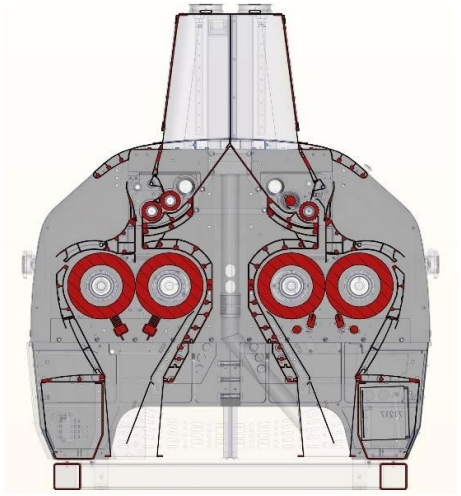
Multimilla
Roller Mill

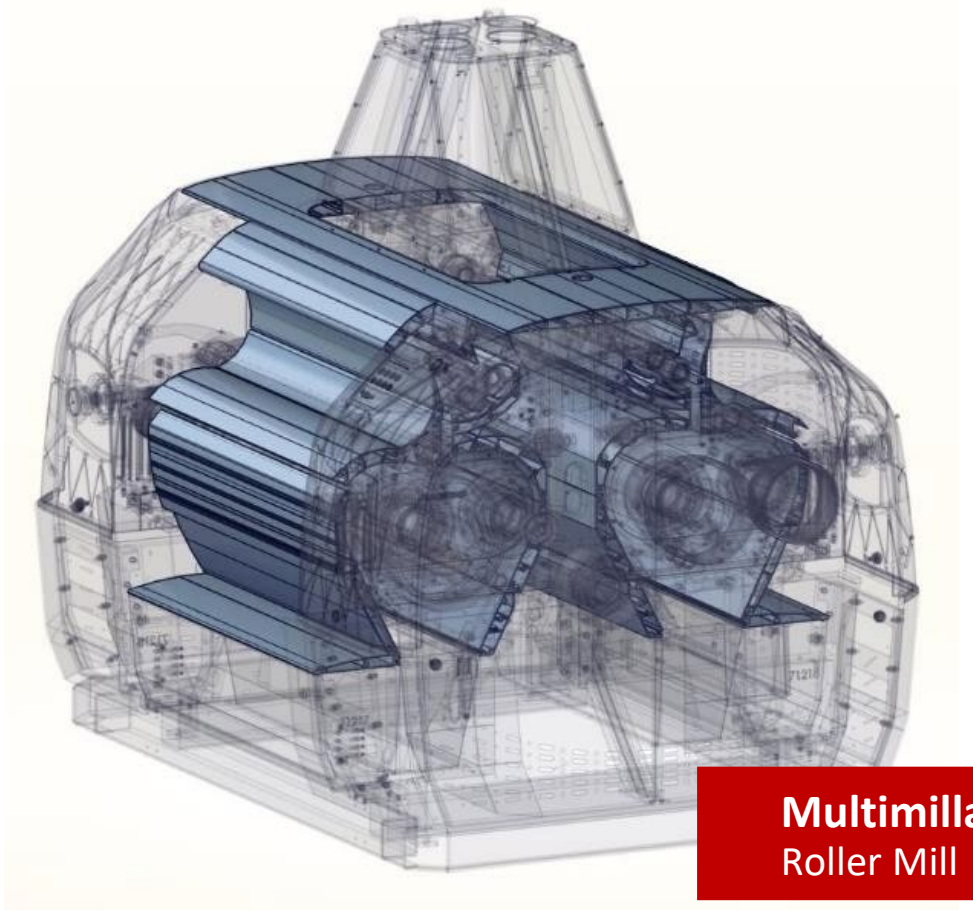
Multimilla Roller Mill

Other Important Features

Aluminum Profiles

- Clean, smooth, easy to use aluminum profiles
- Provide noise and heat isolation
- Easy to clean
- Non- stick surfaces





Multimilla
Roller Mill

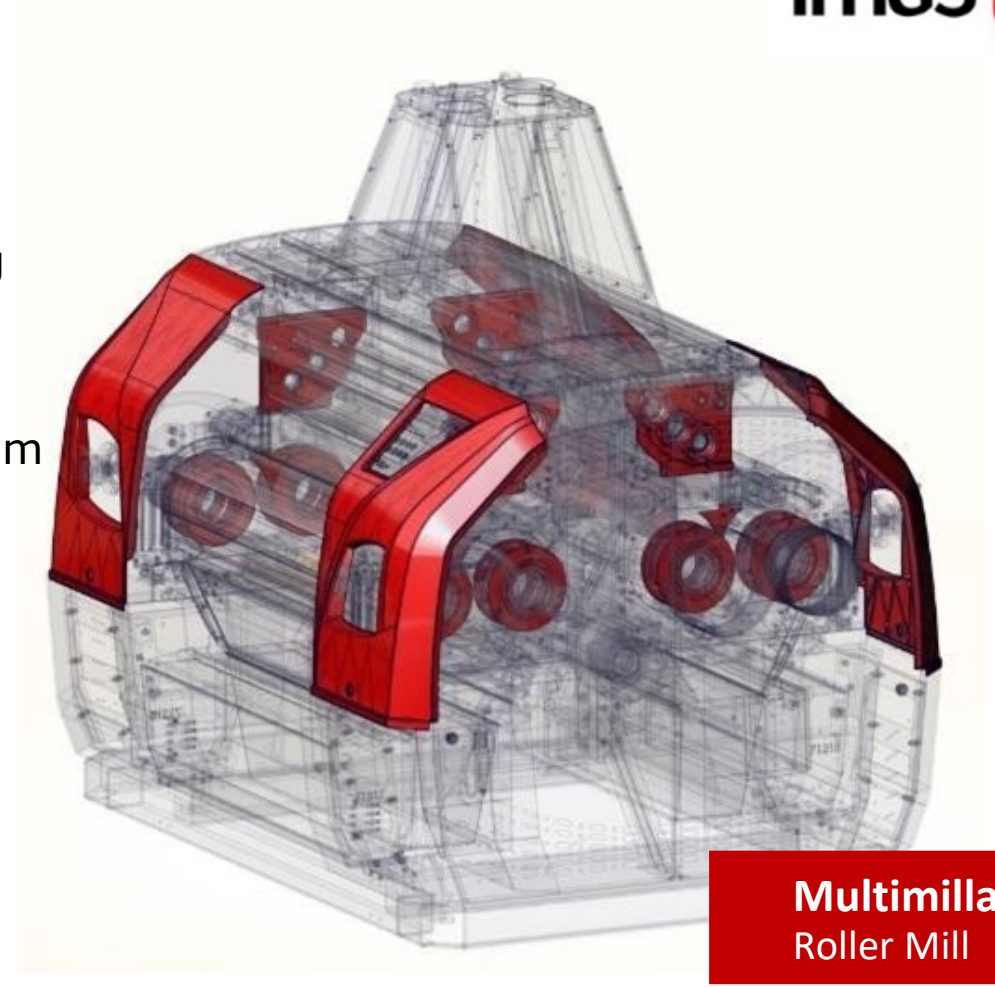
Other Important Features

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.



Multimilla
Roller Mill

Other Important Features

Infrared Level Sensor

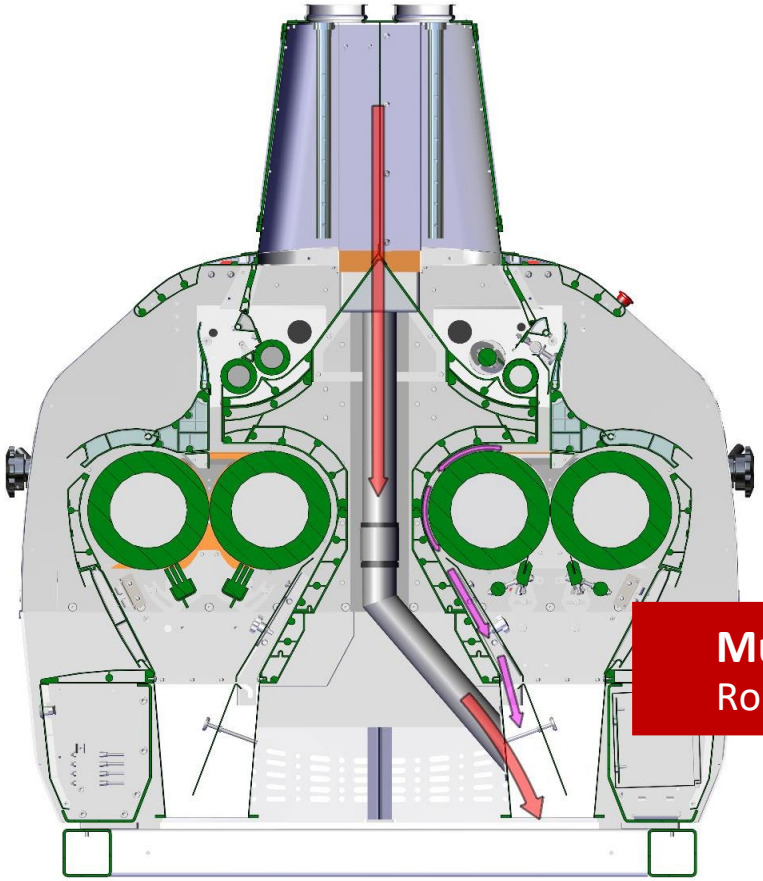
- The ten-level infrared sensor enables sensitive stock flow level control by monitoring the feed roll cycles.
- The Feed Hopper Sight Glass is easy to access for cleaning and maintenance.

Multimilla
Roller Mill

Other Important Features

Negative Pressure Aspiration System

- Evacuates trapped dusty air from the inlet hopper to the outlet hopper by using the pneumatic system.
- The adjustable turbo system creates negative pressure to suck dust around the break rolls.
- Dust around the rolls is sucked in to prevent dust from escaping.

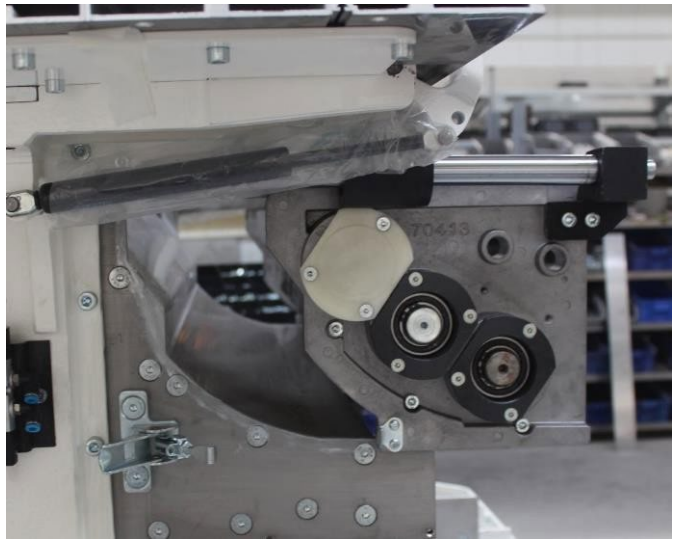


Multimilla
Roller Mill

Other Important Features

Linear Slide out Feeding Group

- Easy to clean and provides the highest sanitation standard.
- The feeding rolls' housing is made of light weight injected single piece aluminum for easy handling.



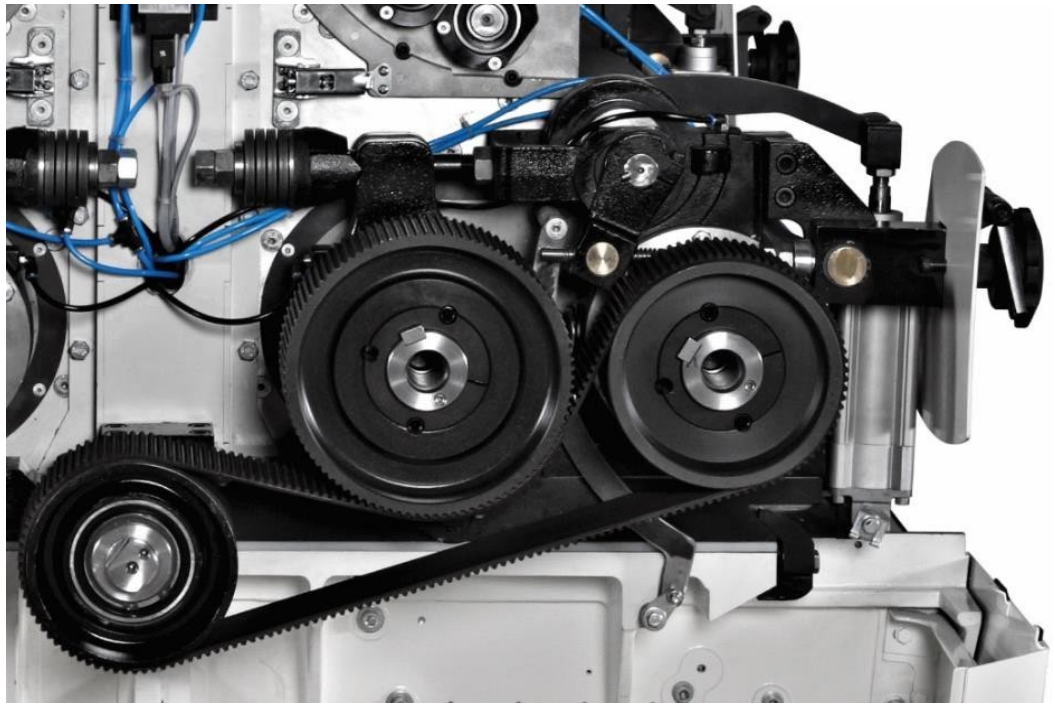
Three Rolls Feeding Group

Provides effective product distribution and uniform feed of stocks (only for smooth & 1250 mm rolls).

Other Important Features

Timing Belt Drive

- The Timing belt does not allow belt sliding. Thus, the differential ratio between the rolls is kept constant.
- The same type and size timing belts are used for both grinding and smooth rolls which offers easy spare parts stocking.



Equipment, installation, and design…

Whatever your need is…

imas NORTH AMERICA

Please consider IMAS North America!

imas NORTH AMERICA

Complete Project Scope

Individual pieces of equipment or a complete mill…

imas NORTH AMERICA

Thank you for your time and attention.

imas NORTH AMERICA