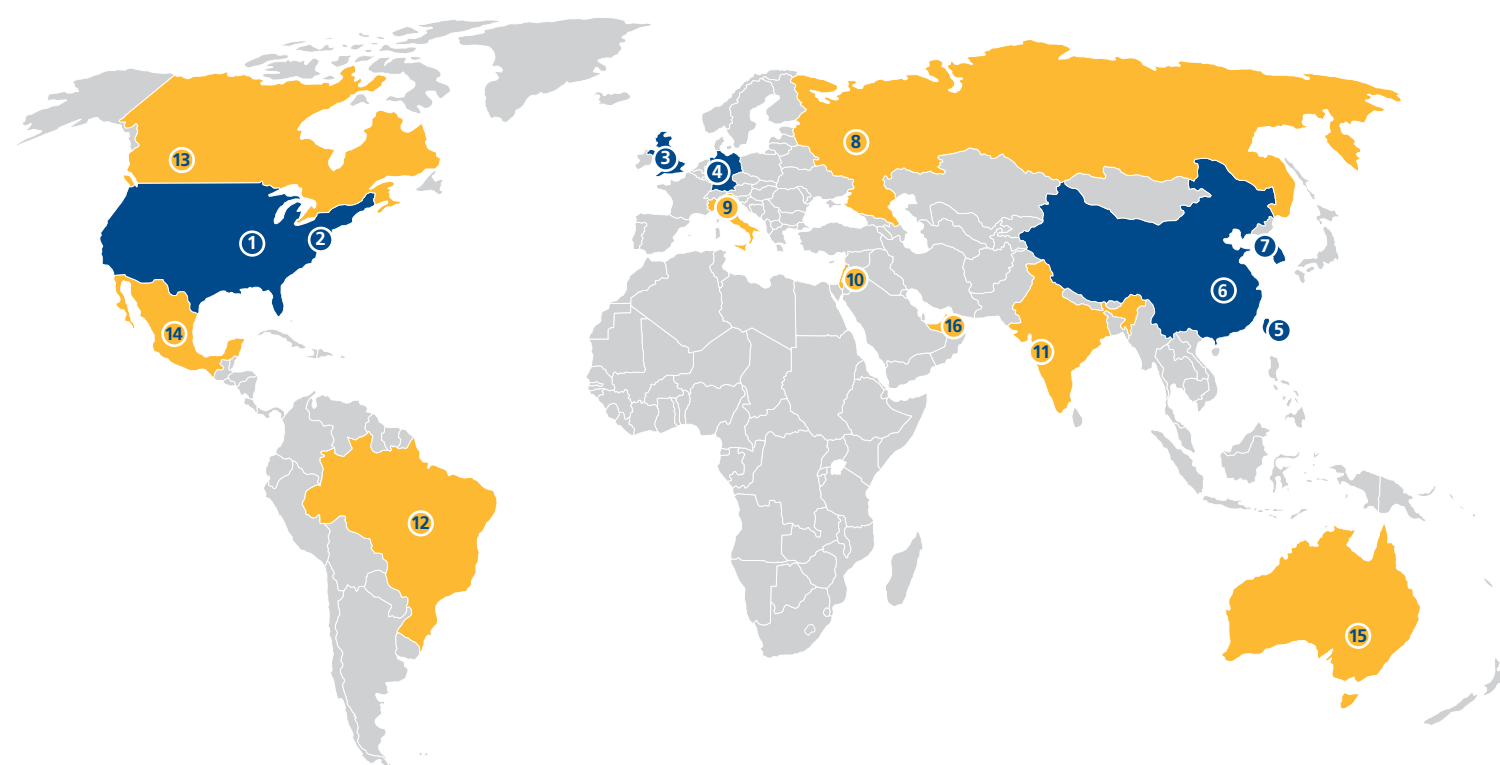


ACTIVE ISOLATION SYSTEMS



GLOBAL THINKING



FABREEKA Locations

- 1 **United States**
Tech Products Corporation
- 2 **United States**
Fabreeka International Inc.
- 3 **United Kingdom**
ACE Fabreeka UK
- 4 **Germany**
Fabreeka GmbH
- 5 **Taiwan**
Fabreeka International Inc.
- 6 **China**
Stabilus SBV
- 7 **South Korea**
Stabilus SBV

FABREEKA Representations/Distributors

- 8 **Russia**
- 9 **Italy**
- 10 **Israel**
- 11 **India**
- 12 **Brazil**
- 13 **Western Canada**
- 14 **Mexico**
- 15 **Australia**
- 16 **United Arab Emirates (UAE)**

FABREEKA® THE COMPANY

Fabreeka® has been leading the international market in shock and vibration isolation since 1936. Our facilities at Büttelborn near Darmstadt include our European administration as well as installation, service, quality assurance and warehousing.

Our products can be found in specialties such as measurement and laboratory technology, building services and mechanical engineering. Our in-house and field staff provide vibration measurements in the field as well as installation services, consulting and training.

This brochure describes our vibration isolation product range. Don't hesitate to contact us if you have any questions or need advice on an ideal solution for your vibration issues. Our team of qualified engineers at Fabreeka® would be pleased to discuss the matter with you on the phone or meet you at your premises.

Please refer to the last page for our contact details and locations.

Many companies offer products for vibration isolation and shock control. Fabreeka demonstrably delivers sophisticated technical solutions. Understanding customer-specific requirements and matching proven products to the solution required has been one of our strengths for a hundred years.

OUR VISION

Our vision is to ensure the best results with the highest accuracy and throughput while maintaining the lowest failure rate for every item of precision equipment on the market used in research, manufacturing and measurement.

OUR MISSION

Our mission is to improve, innovate, and supply advanced technology across the world, and to bring inspiration and confidence to scientists, developers, manufacturers and consumers by ensuring a vibration-free environment for optimal results.

THE TEAM

Experience

Our team of mechanical and civil engineers, physicists, and experts from industry share a vast wealth of experience in automation, electronics and real-time processing.

Customizable solutions

Tailored to customer and industry needs

Patented top-performing systems

Innovative, user-friendly

Design-focused R&D

In-house manufacturing

FABREEKA® ACTIVE ISOLATION SYSTEMS SIMPLE AND SMART – THE PERFECT SOLUTION FOR QUALITY OPTIMIZATION



High-precision equipment only provides optimal results with every possible condition met. Our systems provide maximum vibration reduction – the result of a century of experience in vibration and shock isolation.

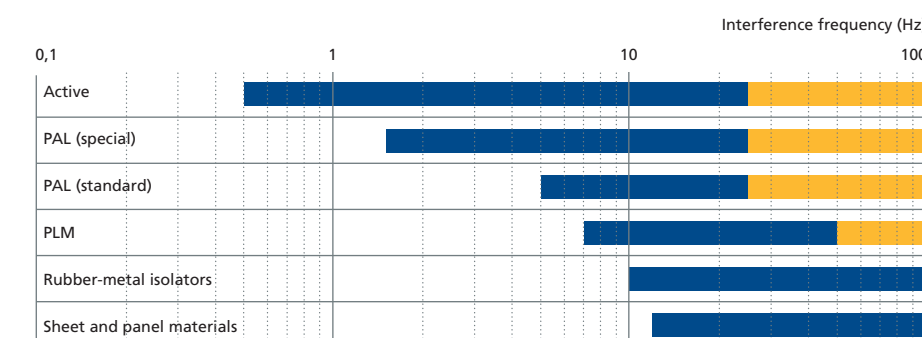
Fabreeka® systems take the industry standard to the next level in vibration isolation for precision instruments. Our goal is to lead the world market in designing and manufacturing innovative high-technology vibration isolation systems and solutions for vibration sensitive instruments, equipment, and processes.

We use a fully decoupled patented architecture for isolating vibrations from the floor, environment, or machines or equipment such as moving stages, fans, and internal motors.

Settling times for high-acceleration stages in semiconductor machines typically lie between 200 and 300 ms. Our integrated technology inside the machine can potentially reduce these settling times down to 30–50 ms – a factor of around ten.

Chip manufacturers designing new fabs to meet vibration specs can achieve significant savings by using Fabreeka® devices for sensitive equipment.

APPLICATION AREAS FOR ISOLATORS



Fabreeka® active systems vs. other vibration isolation approaches

vs. air-based systems

- Hundredfold isolation at 2 Hz
- Tenfold isolation from 3 to 50 Hz
- No air supply needed
- No frame required
- Compact dimensions
- Easy to use with lightweight equipment

vs. soft passive systems

- No special skills required for set up
- Isolates most of the surrounding environment
- Insensitive to COG shift and significant weight change

vs. competing active systems

- Does not use piezoelectric technology in sensors or actuators
- Wider active frequency bandwidth
- Much longer actuator stroke
- Lighter weight
- Significantly lower height
- LESS EXPENSIVE

INDUSTRIES USING ACTIVE VIBRATION ISOLATION DEVICES

A wide field of industries alongside medical engineering and ultra-precision measuring applications have come to use microtechnology and nanotechnology.

Machines

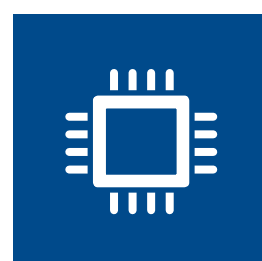
Semiconductor chip manufacturing is a very complicated process involving tens of different machines on the production floor. Most of these processes require dedicated precision equipment, chiefly high-resolution units subject to aggressive moving-stage motion.

Semiconductor-manufacturing machines are affected by vibrations from the floor or environment, or their own moving parts.

Vibrations from various sources reduce throughput and cause excessive wear.



MICROSCOPES: AFM, SEM, TEM



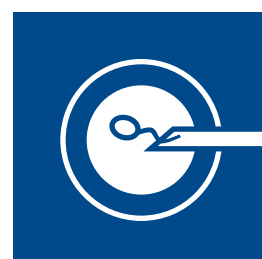
SEMICONDUCTORS



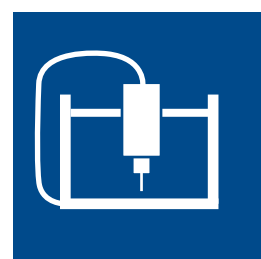
AUTOMOTIVE



NANOINSTRUMENTS



IVF AND LIFE SCIENCE



PRECISION MACHINES



PRECISION MEDICAL DEVICES



PRECISION MEASURING
EQUIPMENT



PRECISION BALANCES

Fabs

Fabs are designed so as to keep vibration levels within the specs of sensitive equipment. Most floors in fabs do not meet the design spec; and even if they do, equipment on the fab floor increases vibration levels over time (Colin Gordon Associates, 2004).

Vibration levels are usually measured before the fab is equipped, but degrade

by around 10 – 15 dB over the first two years with increasing amounts of production and maintenance equipment.

Production technology developing from 10 to 7 to 5 nm node pose their own challenges by increasing demands on measuring and inspection equipment.

Fabs that are already struggling to meet

floor vibration criteria for the current technology node will have even more difficulty in the next node.

Vibration isolation platforms are needed for the equipment to function up to spec.

PRODUCT LINES STANDARD – OEM – CUSTOMIZED



STANDALONE OFF-THE-SHELF
PRODUCTS

Our standard systems are designed for easy installation with minimal technical support required.



INTEGRATED OEM
SOLUTIONS

Our technology integrates into equipment from other manufacturers.



CUSTOMIZED
SOLUTIONS

If our off-the-shelf products are not compatible with your needs, we are happy to tailor our technology for a custom solution.

Fabreeka® offers a wide range of active vibration isolation systems. We adapt of-the-shelf systems to specific OEM specifications on technical performance or dimensional constraints towards completely bespoke solutions that meet the most exacting customer requirements.

PRODUCT OVERVIEW

ISOTabl**A** Tabletop – active vibration isolation system 8

ISOMod**A** Modular – active vibration isolation system..... 12

ISOTabl**P** Tabletop – passive vibration absorption system..... 14

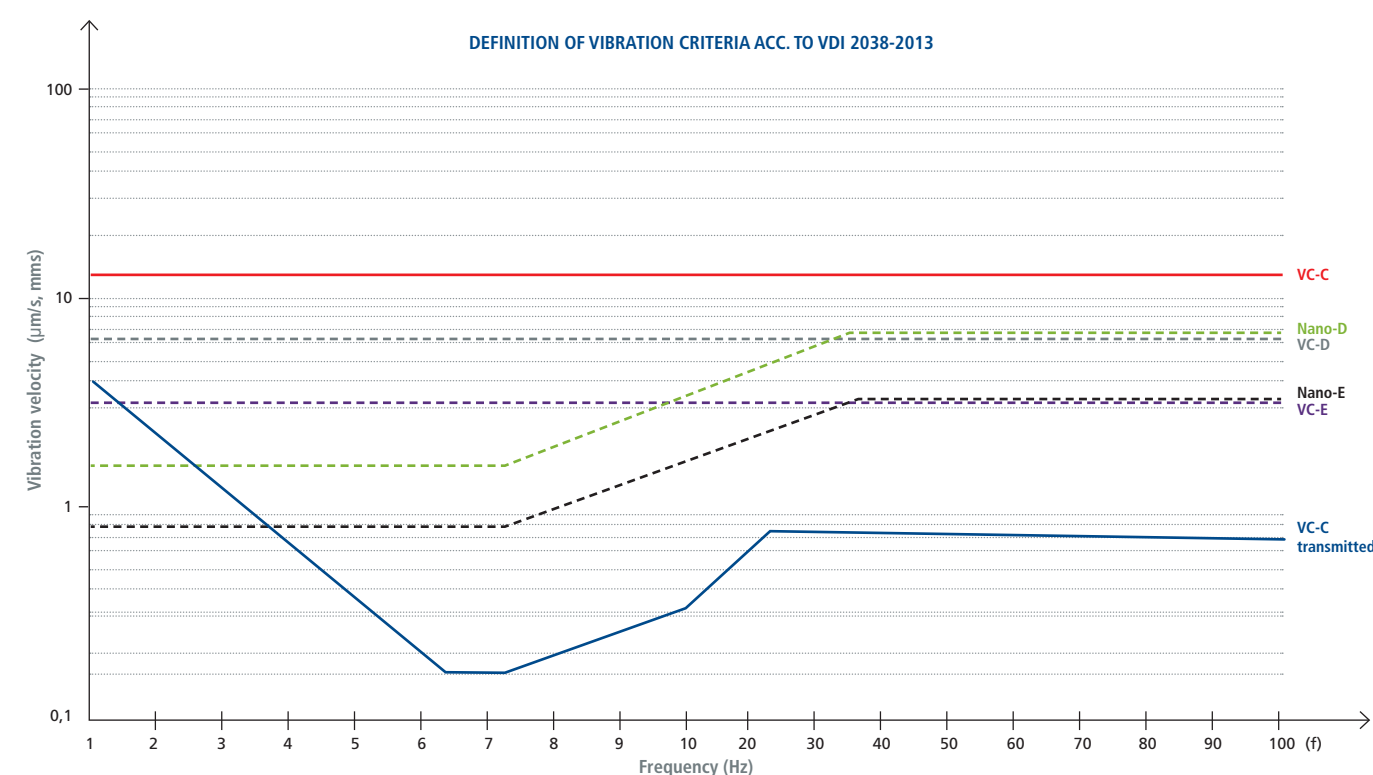
ISOMod**P** Modular – passive vibration absorption system 14

ISO**Tabl**A

ACTIVE VIBRATION ISOLATION SOLUTIONS

The decoupled architecture (patent pending) in every Fabreeka® active isolation system provides significant advantages compared to other systems available on the market. We supply standard systems as well as highly customized OEM solutions depending on the intended application.

Fabreeka® active systems use linear motor technology as an active drive, thus lengthening the active actuator stroke compared to commonly used piezoelectric technology. As a result, ISO-Tabl-A platforms have active bandwidths starting at 0.5 Hz to reduce environmental vibration by 10 dB at frequencies as low as 1 Hz. Nano-E specifications can be reached at very low frequencies



VC-C
Applicable standard for optical microscopes up to 1,000x

Lithography and inspection equipment down to 1 mm detail size

VC-C transmitted
Response after isolation system using VC-C as input

VC-D
Suitable in most instances for sensitive equipment, including many electron microscopes; detail size 100 – 300 nm

VC-E
Challenge for top-precision equipment, detail size <100 nm

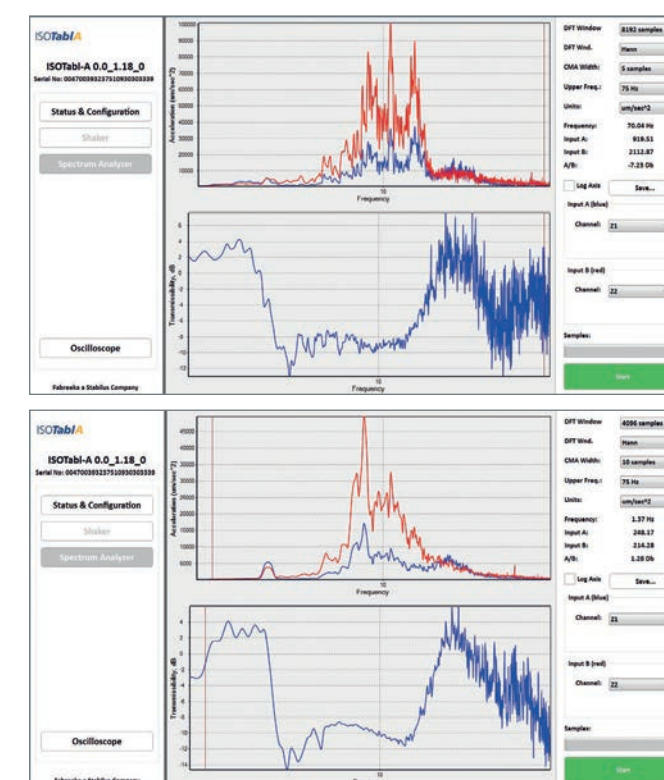
Nano-D
Very challenging for Nanotec REM, detail size 1 nm

Nano-E
Extremely challenging for Nanotec REM, detail size 0.2 – 0.5 nm

ISO-TABL-A SHAKER MODE

Understand how your system or device performs under vibration conditions

- Test how your system or device performs under different vibration conditions
- Adjust the test for different frequencies and amplitudes
- Simulate real-world environmental conditions
- Verify your internal components' responses to vibrations
- Use our, or your own, standard external sensors to assess the effect of vibration and shock
- Determine the effect of induced internal component resonances on your system's performance
- Find the limitations of your system
- Collect and analyze data in the form of transmissibility



KEY BENEFITS

Performance

- Six degrees of freedom
- Active gain starting from 0.5 Hz
- Decoupled architecture (patent pending)
- Variable damping

Easy installation for heavy tools

- No need for lifting tools or heavy support structure

Low cost

Capabilities

- Longer actuator stroke
- Active bandwidth adjustable using software
- Remote control

Integrated real-time diagnostic tools

- Spectrum analyzer
- Oscilloscope

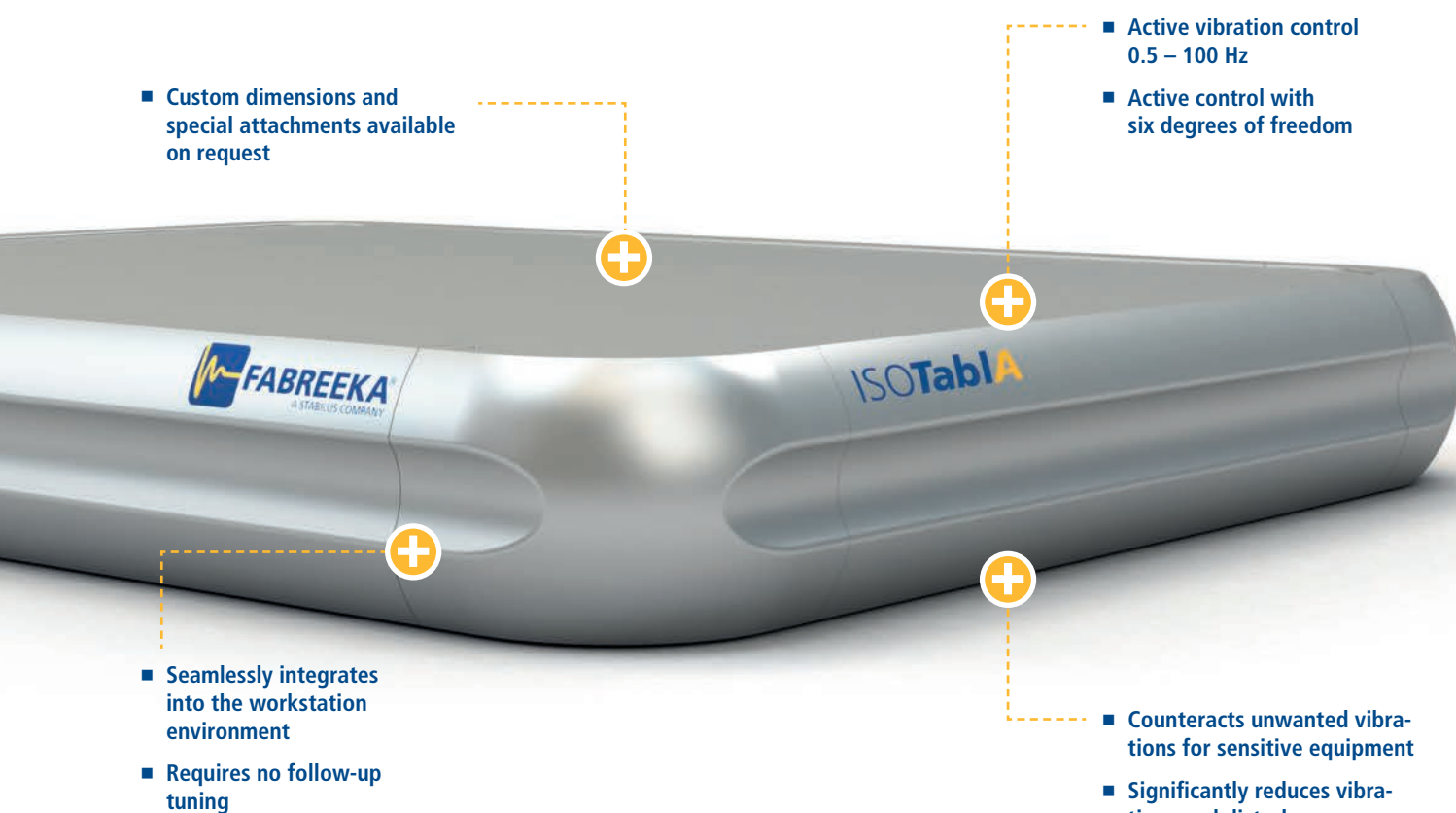
Highly tunable vibration isolation control

- Systems can be configured to challenging environmental conditions

Customizable due to flexible internal architecture

ISO**TablA**

ACTIVE VIBRATION ISOLATION SOLUTIONS



- Seamlessly integrates into the workstation environment
- Requires no follow-up tuning

- Counteracts unwanted vibrations for sensitive equipment
- Significantly reduces vibrations and disturbances

Product line	Device capabilities	Dimensions (mm)	Load capacity (kg)
ISO-Tabl-A-15-75	Vibration isolation system	300 x 450 x 65	15 – 75
ISO-Tabl-A-15-75-I	Vibration isolation system	400 x 500 x 80	15 – 75
ISO-Tabl-A-15-75X	Vibration isolation system	400 x 500 x 80	15 – 75
ISO-Tabl-A-40-100	Vibration isolation system	400 x 500 x 80	40 – 100
ISO-Tabl-A-70-150	Vibration isolation system	400 x 500 x 80	70 – 150
ISO-Tabl-A-80-180	Vibration isolation system	500 x 600 x 80	80 – 180
ISO-Tabl-A-90-200	Vibration isolation system	600 x 800 x 80	90 – 200
ISO-Tabl-A-XX-XXX	Vibration isolation system	500 x 600 x 80	Custom
ISO-Tabl-A-XX-XXX	Vibration isolation system	600 x 800 x 80	Custom

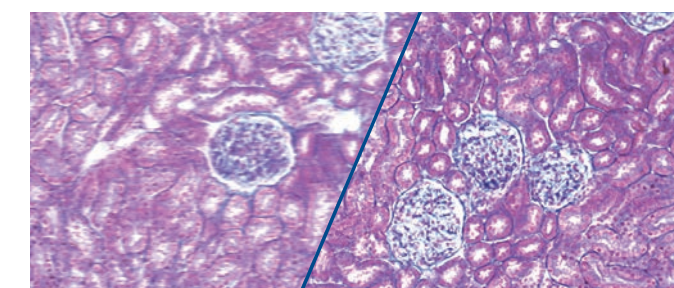
PLATFORM ARCHITECTURE

- Patented architecture (patent pending in some countries)
- Patented variable damping mechanism (patent pending in some countries)
- Active vibration isolation in all six degrees of freedom
- No piezoelectric components – improved performance at low frequencies, longer lifetime
- Fully decoupled architecture isolates vibrations from the floor, or from machines or equipment such as moving stages, fans, or internal motors

TECHNOLOGICAL PRINCIPLE

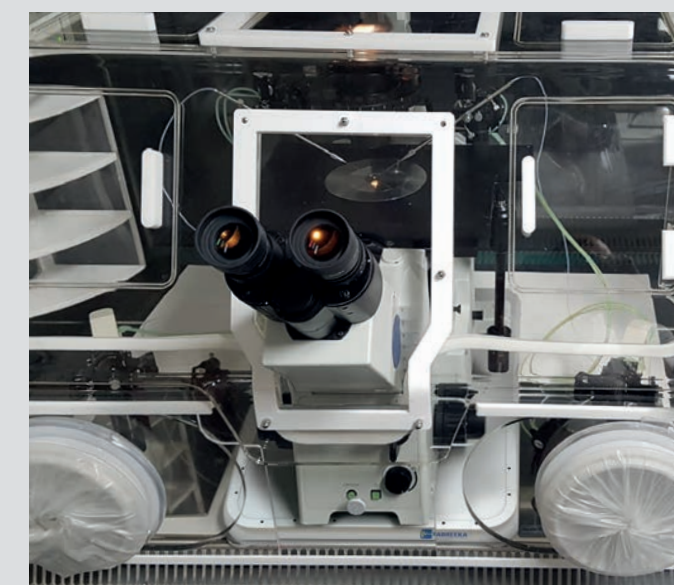
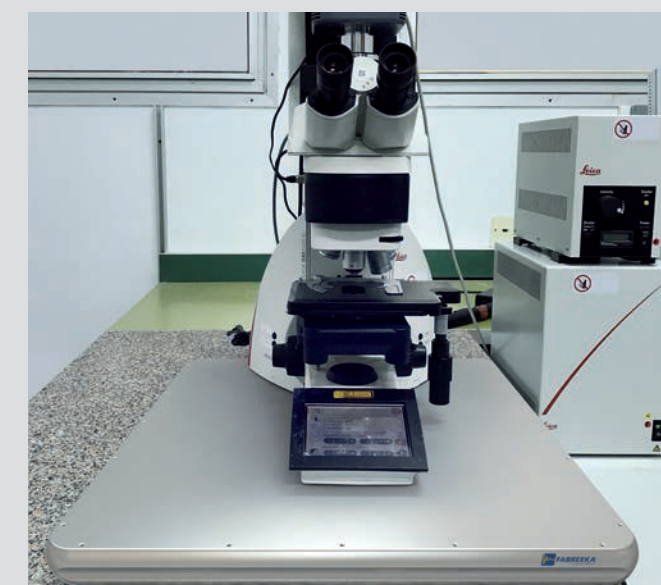
Fabreeka® active vibration isolation systems are based on advanced technology combining up to three independent layers of active and two layers of passive vibration cancellation. The high level of flexibility in this system architecture gives Fabreeka systems maximum performance in installations, especially where a typical system would be impossible to use.

MICROSCOPE IMAGE COMPARISON USING ISO-TABL-A ANTI-VIBRATION SYSTEM



Without active vibration isolation

With active vibration isolation

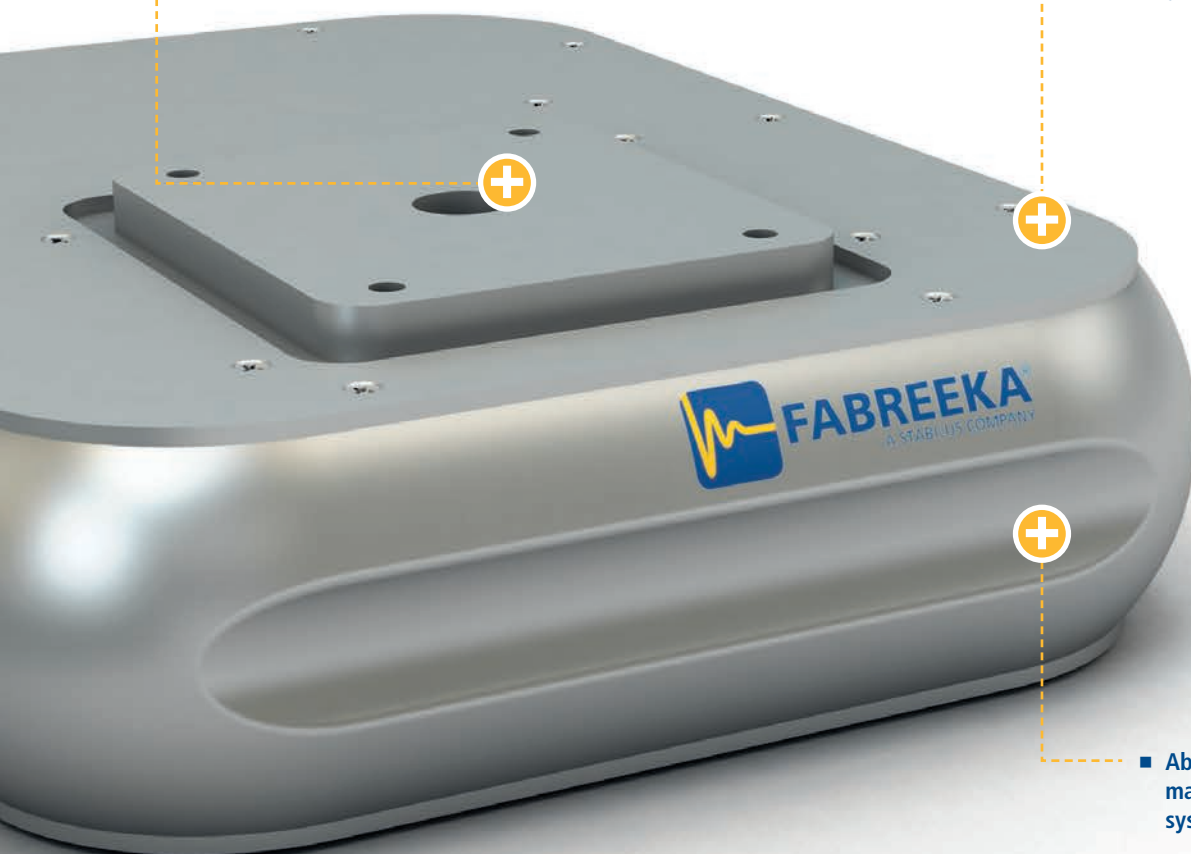


ISO**ModA**

MODULAR ACTIVE VIBRATION ISOLATION SYSTEM

- Unlimited number of isolators in one system
- Active in six degrees of freedom

- Load: 100 - 1,000 kg on each isolator
- Maximum load available – unlimited



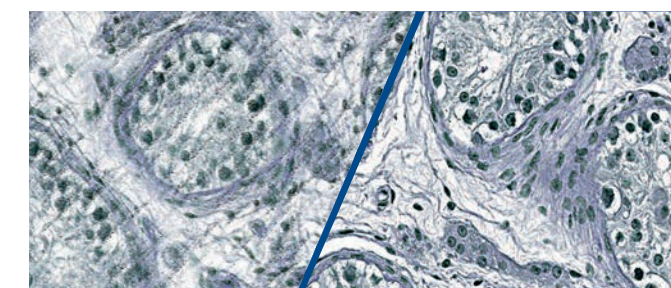
- Ability to support massive machines, equipment and systems
- Application-specific designs, products and capabilities to meet your needs

Product line	Device capabilities	Dimensions (mm)	Load capacity (kg)
ISO-Mod-A-100-300	Active vibration isolation system	270 x 230 x 75	100 – 300
ISO-Mod-A-200-500	Active vibration isolation system	270 x 230 x 75	200 – 500
ISO-Mod-A-500-1000	Active vibration isolation system	370 x 230 x 75	500 – 1,000

Our lightweight and compact modular active vibration isolation systems counteract the vibrations that affect sensitive equipment. The streamlined design allows easy installation requiring no follow-up tuning. Developed by engineers, physicists and leading industry consultants with expertise in precision instruments, ISO-Mod-A is a revolutionary device that plays an essential role in reducing vibrations and disturbances.

Equipment can be placed on an unlimited number of isolators installed independently of one another. ISO-Mod-A has the capacity to support load capacities of massive machines and heavy tool systems.

MICROSCOPE IMAGE COMPARISON USING ISO-MOD-A ANTI-VIBRATION SYSTEM

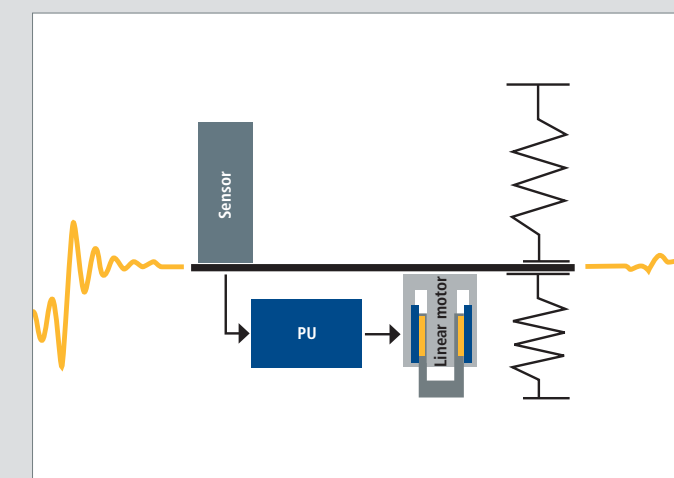


Without active vibration isolation

With active vibration isolation



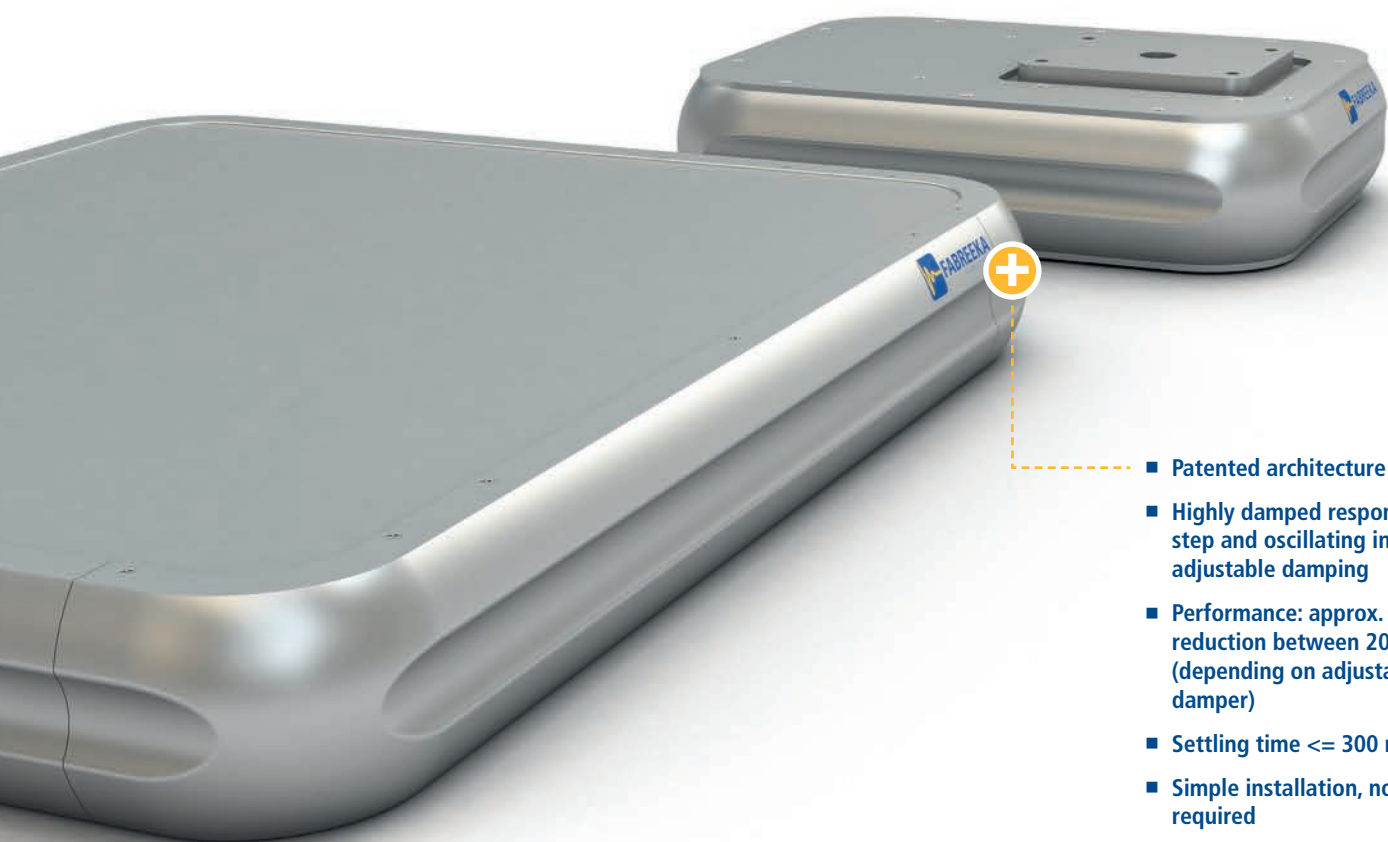
Real-time vibration measurement by oscilloscope



Platform architecture diagram

ISO**TablP** & ISO**ModP**

MOST ADVANCED PASSIVE VIBRATION ABSORPTION SYSTEMS



- **Patented architecture**
- **Highly damped response to step and oscillating inputs with adjustable damping**
- **Performance: approx. 40 dB reduction between 20 – 40 Hz (depending on adjustable damper)**
- **Settling time ≤ 300 ms**
- **Simple installation, no tuning required**
- **Application specific designs, products and capabilities to meet your needs**

Product line	Device capabilities	Dimensions (mm)	Load capacity (kg)
ISO-Tabl-P-15-75	Vibration absorption system	300 x 450 x 65	15 – 75
ISO-Tabl-P-15-75X	Vibration absorption system	400 x 500 x 80	15 – 75
ISO-Tabl-P-40-100	Vibration absorption system	400 x 500 x 80	40 – 100
ISO-Tabl-P-70-150	Vibration absorption system	400 x 500 x 80	70 – 150
ISO-Tabl-P-80-180	Vibration absorption system	500 x 600 x 80	80 – 180
ISO-Tabl-P-90-200	Vibration absorption system	600 x 800 x 80	90 – 200
ISO-Tabl-P-XX-XXX	Vibration absorption system	500 x 600 x 80	Custom
ISO-Tabl-P-XX-XXX	Vibration absorption system	600 x 800 x 80	Custom
ISO-Mod-P	Vibration absorption system	120 x 110 x 75	Up to 1,000

ISO-Tabl-P and ISO-Mod-P lightweight space-saving vibration absorption systems counteract unwanted vibration loads on precision workstations.

- ISO-Tabl-P – tabletop vibration absorption system
- ISO-Mod-P – modular vibration absorption system

Our systems use state-of-the-art technology to reduce the levels of vibration generated by pumps, compressors and similar.

- Vacuum pumps
- Compressors in air-conditioning units
- Refrigerating units and compressors
- Biotech workstations
- Drones
- Automotive applications

Our compact and lightweight modular vibration absorption systems significantly reduce unwanted vibrations that could otherwise pose major challenges at high-precision workstations.

The ISO-Tabl-P and ISO-Mod-P models were developed by engineers, physicists and leading technical consultants with expertise in vibration technology and its effects on precision instruments to ensure that these models are indeed able to reach significant reductions in vibration levels.

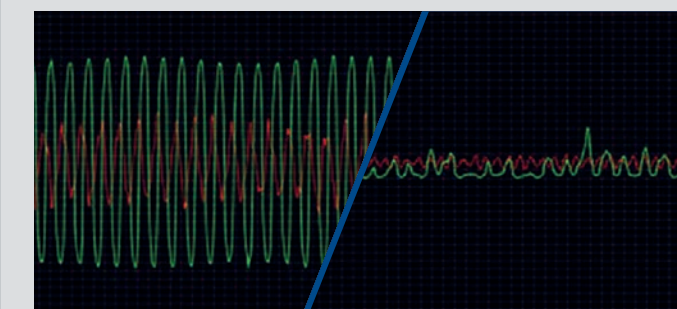
Installing heavy machines, tool systems, and production and metering equipment for low vibration is a simple task with several ISO-Mod-P modules installed in parallel.

SPECIFICATIONS	
Load per isolator	
ISO-Mod-P-100-300	100-300 kg each
ISO-Mod-P-200-500	200-500 kg each
ISO-Mod-P-500-1000	500-1000 kg each
Available options	
Four ISO-Mod-100-300 systems	Max load 1,200 kg
Four ISO-Mod-200-500 systems	Max load 2,000 kg
Four ISO-Mod-500-1000 systems	Max load 4,000 kg
Eight ISO-Mod-500-1000 systems	Max load 8,000 kg
Patented architecture	High degree of vibration absorption
Simple installation	No local tuning required
ISO-Mod-P dimensions	120 x 110 x 75 mm
Application-specific designs, products and loads	Bespoke solutions
Supports the installation of heavy machines, tool systems, and metering and production equipment	



Transmissibility curve

VIBRATION MEASUREMENT COMPARISON WITH AND WITHOUT AN ISO-TABL-P VIBRATION ABSORPTION SYSTEM INSTALLED



Pump installed on the floor

Pump installed on an ISO-Tabl-P

Want to learn more
about us, or have a
specific isolation issue?

Ask us about it – we'll get
together to find a solution.

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