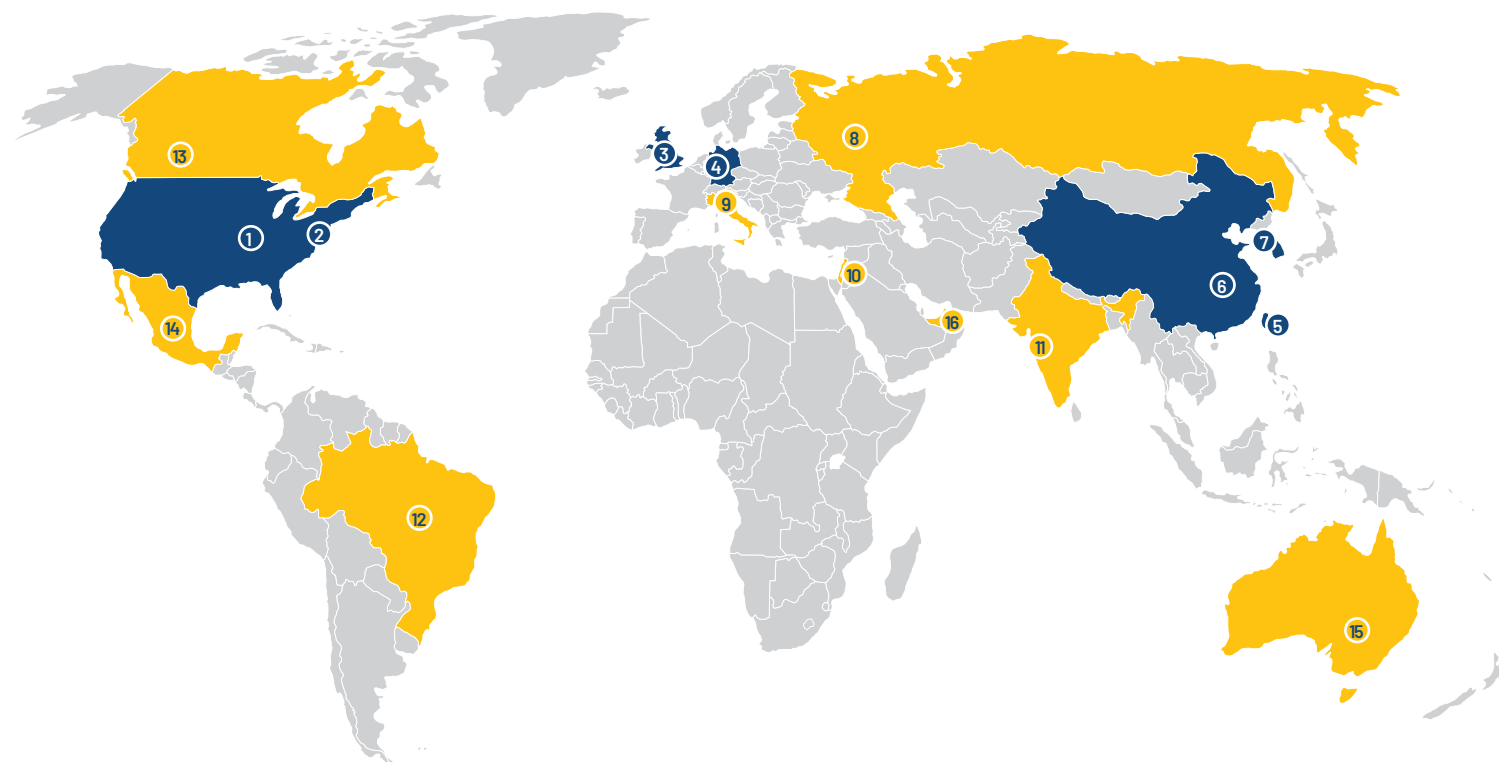


# ACTIVE ISOLATION SYSTEMS



## 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
- ⑦ **South Korea**  
Stabilus

### 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 active 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.**

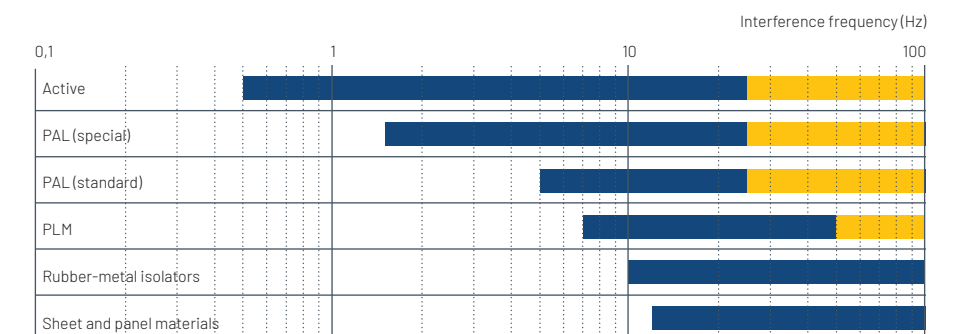
Fabreeka® systems take the industry standard to the next level in vibration isolation for precision instruments. Our goal is to lead the world market in designing and manufacturing innovative high-technology vibration isolation systems and solutions for vibration sensitive instruments, equipment, and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

We use a fully decoupled patented architecture for isolating vibrations from the floor, environment, 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.

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

- 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 micro-technology and nanotechnology.

#### Machines

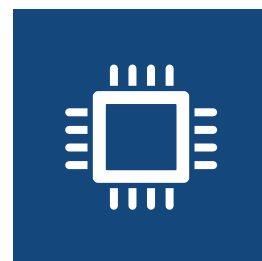
Semiconductor chip manufacturing is a very complicated process involving tens of different machines on the production floor. Most of these processes require dedicated precision equipment, chiefly high-resolution units subject to aggressive moving-stage motion.

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.



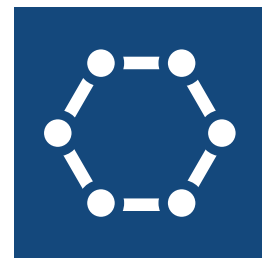
MICROSCOPES: AFM, SEM, TEM



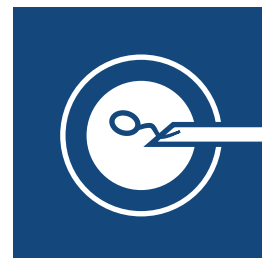
SEMICONDUCTORS



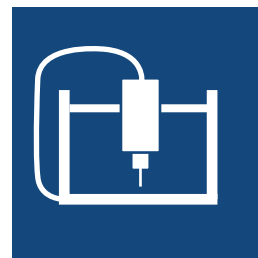
AUTOMOTIVE



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

ISO <b>TablA</b>	Tabletop - active vibration isolation system ..... 8
ISO <b>BlocA</b>	modular - medium capacity active isolation blocs ..... 12
ISO <b>ModA</b>	modular - high capacity active isolation blocs ..... 14

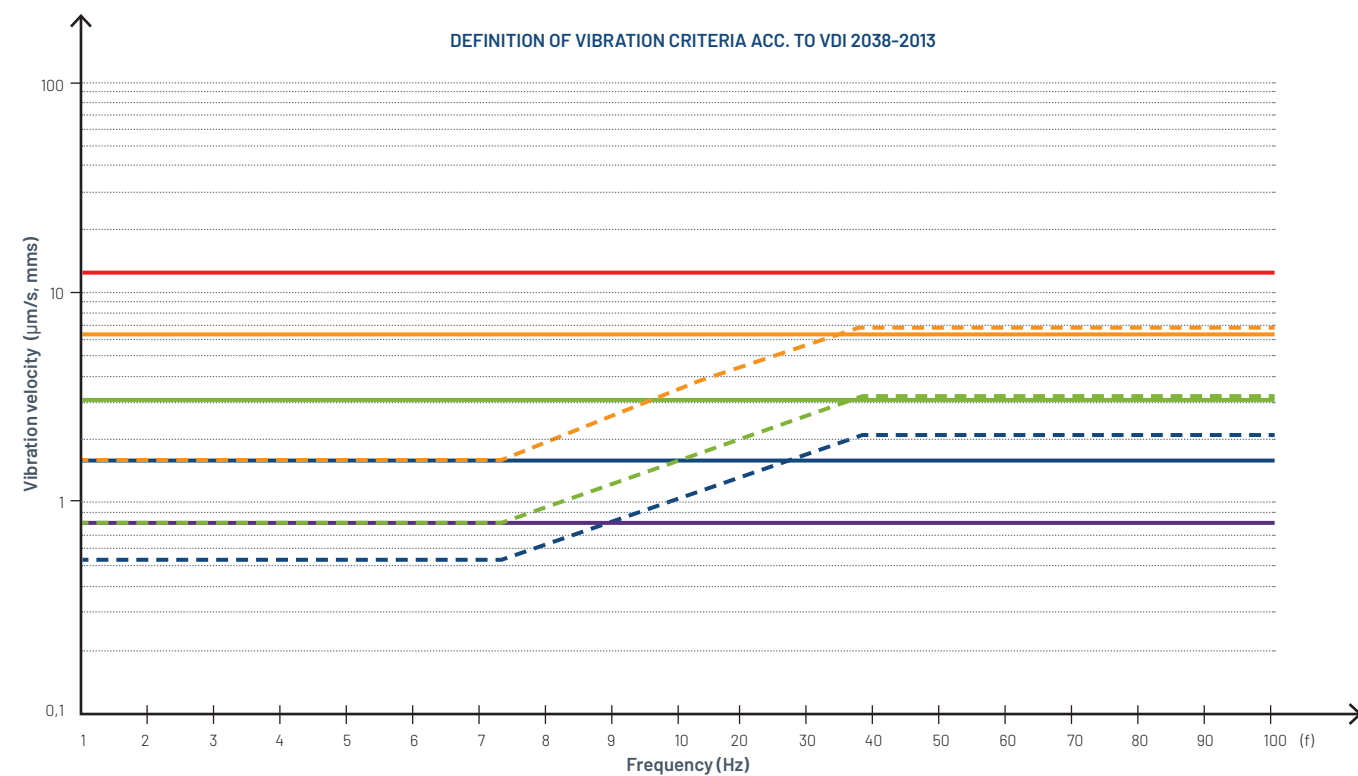


# ISO**Tabl**A

## 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**  
Appropriate standard for optical microscopes to 1000x  
Lithography and inspection equipment to 1000 nm detail size

**VC-nanoD**  
Very difficult to reach criterion for Nanotec REM, detail size 1 nm

**VC-D**  
Suitable in most instances for demanding equipment, including many electron microscopes, detail size 100-300 nm

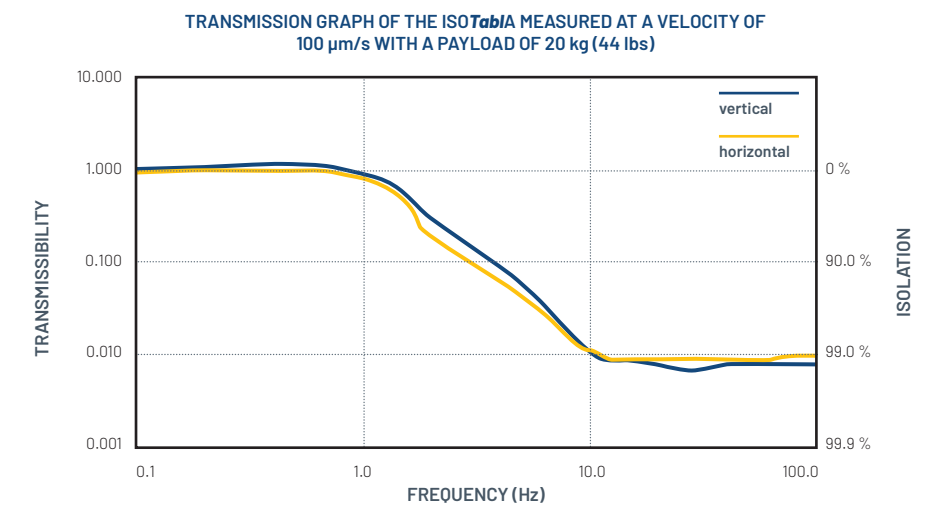
**VC-nanoE**  
Extremely difficult to reach criterion for Nanotec REM, detail size 0.2 – 0.5 nm

**VC-E**  
Challenging criterion to achieve for equipment of highest precision, detail size <100 nm

**VC-nanoEF**  
Most strict criterion for SEM and TEM of nanotechnology in the sub-Angstrom range.

**VC-F**  
Criterion for extremely quiet research rooms, more than difficult to reach

**VC-G**  
Criterion for extremely quiet research rooms, more than difficult to reach

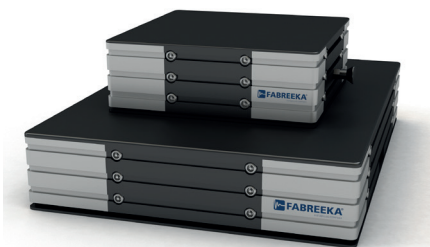
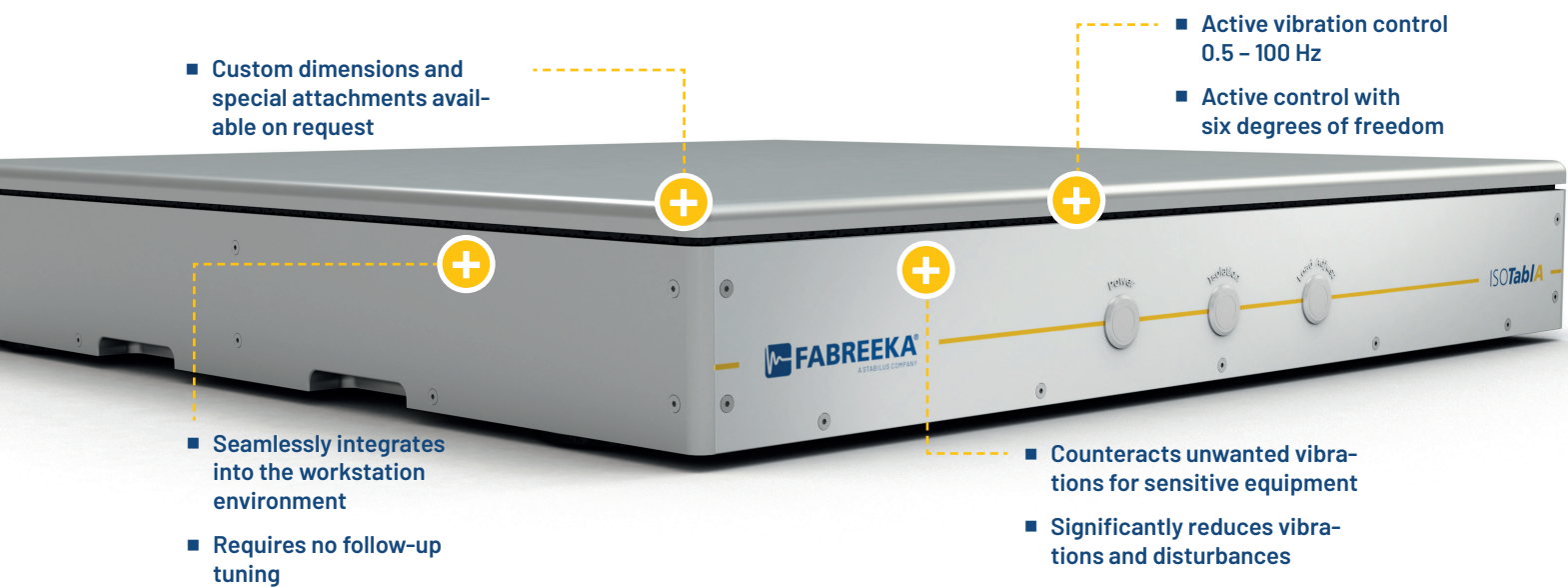


## KEY FEATURES

- Isolation in all six degrees of freedom.
- Active vibration isolation starts at 0.6 Hz (passive isolation above 200 Hz).
- Automatic load adjustment and transportation lock.
- Settling time only 0.3 s.
- AC power from an electrical outlet is sufficient; no compressed air supply is needed.
- No natural low frequency resonance and, as a result, excellent vibration characteristics also in frequency ranges below 5 Hz.
- Excellent position stability – inherent stiffness typically 20 – 30 times higher than that of a 1 Hz passive isolator.
- Exceptionally compact dimensions.
- Two-year warranty.
- Long term tests and quality control procedures.

ISO**Tabl**A

ACTIVE VIBRATION ISOLATION SOLUTIONS



Product line	Dimensions (mm)	Load capacity (kg)
ISO <b>Tabl</b> A-0-120-S	400 x 500 x 90	0 - 120
ISO <b>Tabl</b> A-0-105-M	600 x 600 x 90	0 - 105
ISO <b>Tabl</b> A-40-150-M	600 x 600 x 90	40 - 150
ISO <b>Tabl</b> A-0-105-L	550 x 700 x 92	0 - 105
ISO <b>Tabl</b> A-40-150-L	550 x 700 x 92	40 - 150

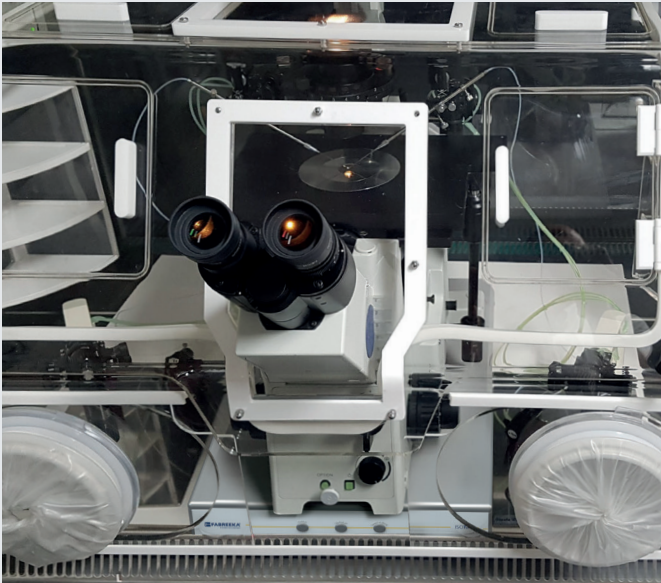
Product line	Dimensions (mm)	Load capacity (kg)
ISO <b>Tabl</b> A-0-8-N	204 x 204 x 69	0 - 8
ISO <b>Tabl</b> A-5-25-N	400 x 300 x 75	0 - 25
ISO <b>Tabl</b> A-10-30-N	400 x 300 x 75	10 - 30

Isolation technology	ISO <b>Tabl</b> A control technology based on piezoelectric type acceleration pickup, fast signal processing and electro-dynamic force transducers.
Force directions	Active compensation in all six degrees of freedom.
Isolation performance	> 5 Hz - 25 dB (94.4 %)    > 10 Hz = -40 dB (99.0 %)
Active bandwidth	0.6 - 200 Hz* (passive isolation beyond 200 Hz)
Settling time	300 ms**
Response time	0.5 ms***
Stroke of the actuator	1 mm
Max. correction forces	Vertical ± 8 N Horizontal ± 4 N

\* The low-pass characteristics of the spring-mass combination dominate the dynamic behavior of the isolation system above 200 Hz. The part of the active isolation decreases with increasing frequency.

\*\* The settling time and maximum compensation level depend on several conditions such as payload, frequency and load distribution. The mentioned settling time value is exemplary for a centric load of 80 kg. The settling time defines the time until an incoming vibration is compensated.

\*\*\* The response time determines when the system starts to actively isolate an incoming vibration after detection by the sensors.

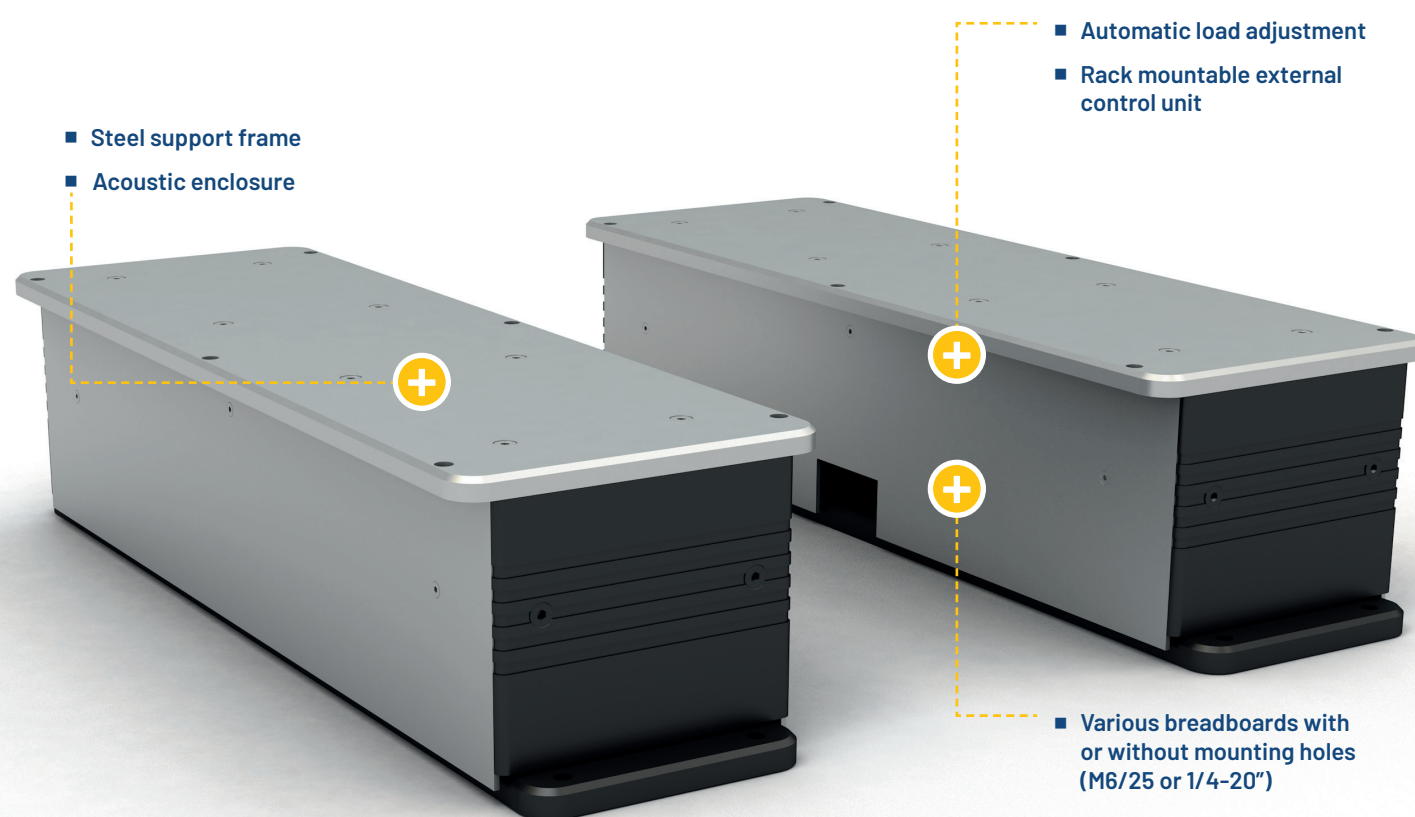




## ISOBlocA

### MODULAR - MEDIUM CAPACITY

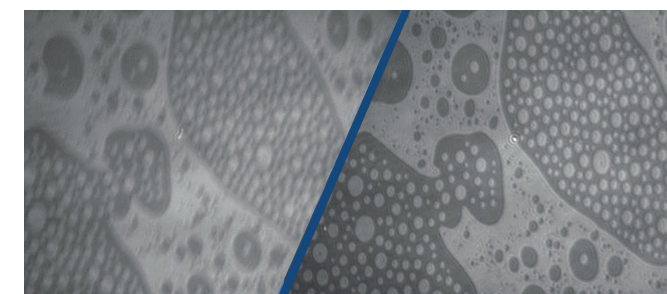
### ACTIVE ISOLATION BLOCS



Product line	Dimensions (mm)	Load capacity (kg)
ISOBlocA-0-300-S	2 x 396 x 120 x 110	0 - 300
ISOBlocA-0-600-S	4 x 396 x 120 x 110	0 - 600
ISOBlocA-0-300-M	2 x 636 x 130 x 110	0 - 300
ISOBlocA-0-600-M	4 x 636 x 130 x 110	0 - 600
ISOBlocA-0-300-L	2 x 932 x 130 x 110	0 - 300
ISOBlocA-0-600-L	4 x 932 x 130 x 110	0 - 600

ISOBlocA systems are element based modular vibration isolation systems, consisting of at least two isolation elements and an external control unit. The primary model, the ISOBlocA has been designed for the isolation of high static loads. While the two-element-configuration can carry loads of up to 300 kg, the maximum load capacity can be increased by adding more isolation elements. Thus a set-up of six isolation elements can cope with a load of 900 kg.

For applications with frequent load changes or without access to the isolation elements, we offer the option of an automatic load adjustment.



Floating monolayer of ethyl stearate without and with active vibration isolation taken with a Brewster angle microscope

The compact dimensions and its flexibility render this product series ideal for installations in customer-specific applications. A typical example is the combination with an optical breadboard. It serves as a mechanical link between the isolation elements and can be used for a variety of laboratory set-ups e.g. interferometer or other laser set-ups.

<b>Isolation technology</b>	ISOBlocA control technology based on piezoelectric type acceleration pickup, fast signal processing and electro-dynamic force transducers.
<b>Control electronics</b>	External control unit with sensor and actuator LEDs.
<b>Force directions</b>	Active compensation in all six degrees of freedom.
<b>Isolation performance</b>	> 5 Hz - 25 dB (94.4 %) > 10 Hz = -35 dB (98.2 %)
<b>Active bandwidth</b>	1 - 200 Hz* (passive isolation beyond 200 Hz)
<b>Settling time</b>	300 ms**
<b>Response time</b>	0.5 ms***
<b>Stroke of the actuator</b>	1 mm
<b>Max. correction forces - 2 element configuration</b>	Vertical ± 8 N Horizontal ± 4 N
<b>Max. correction forces - 4 element configuration</b>	Vertical ± 16 N Horizontal ± 8 N

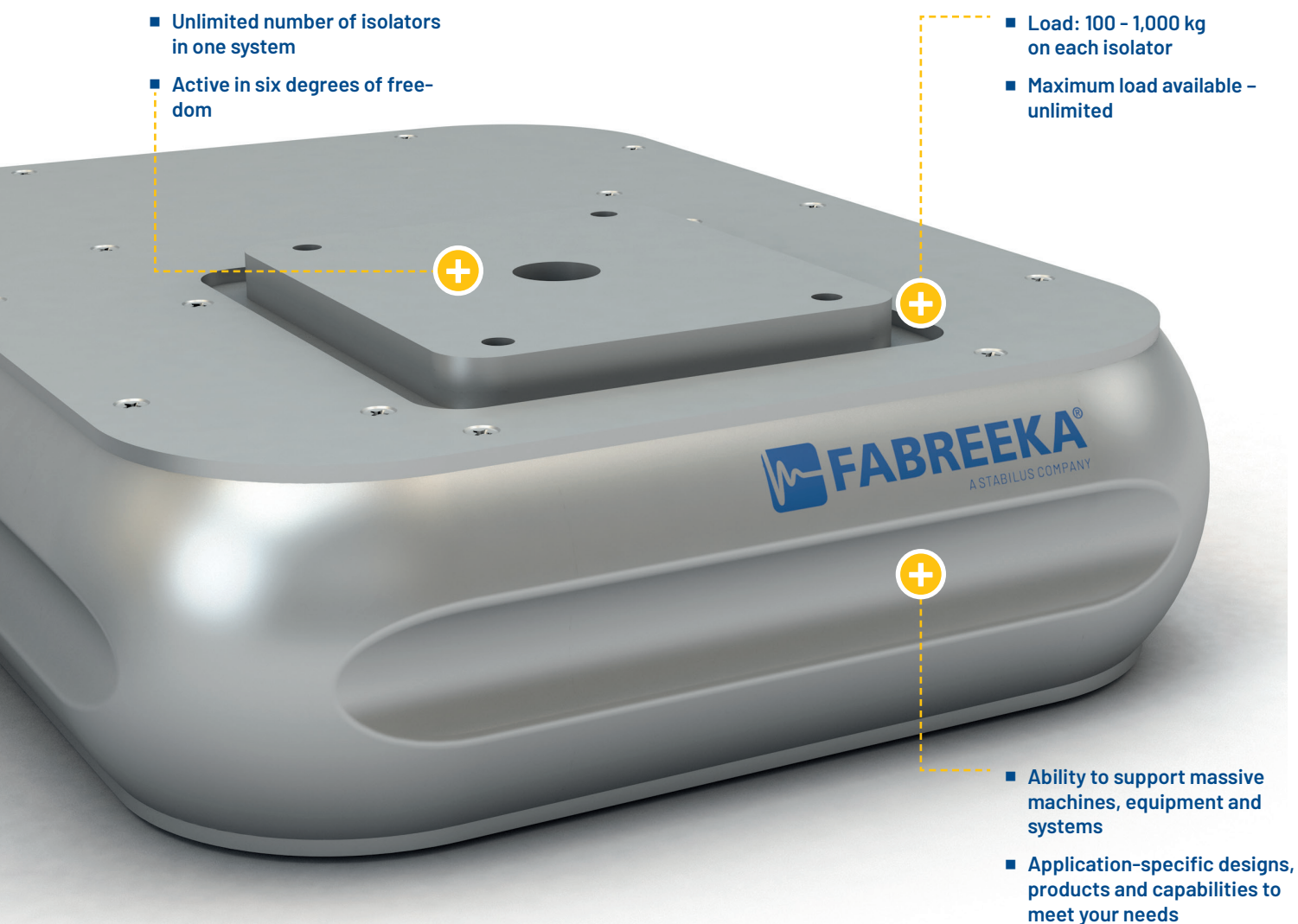
\* The low-pass characteristics of the spring-mass combination dominate the dynamic behavior of the isolation system above 200 Hz. The part of the active isolation decreases with increasing frequency.

\*\* The settling time and maximum compensation level depend on several conditions such as payload, frequency and load distribution. The mentioned settling time value is exemplary for a centric load of 80 kg. The settling time defines the time until an incoming vibration is compensated.

\*\*\* The response time determines when the system starts to actively isolate an incoming vibration after detection by the sensors.



# ISO**ModA** MODULAR - HIGH CAPACITY ACTIVE ISOLATION MODULES

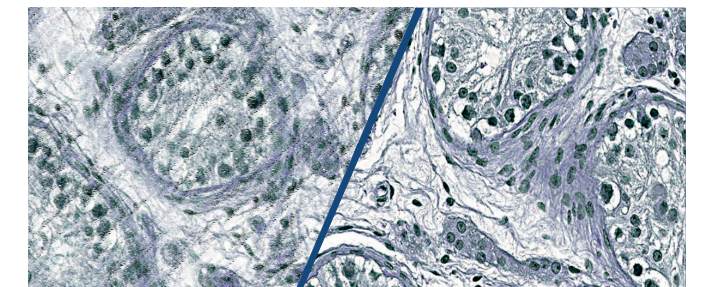


Product line	Dimensions (mm)	Load capacity (kg)
ISO <b>ModA</b> -100-300	270 x 230 x 75	100 - 300
ISO <b>ModA</b> -200-500	270 x 230 x 75	200 - 500
ISO <b>ModA</b> -500-1000	370 x 230 x 75	500 - 1,000

Our lightweight and compact modular active vibration isolation systems counteract the vibrations that affect sensitive equipment. The streamlined design allows easy installation. Developed by engineers, physicists and leading industry consultants with expertise in precision instruments, ISO**ModA** 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**ModA** has the capacity to support load capacities of massive machines and heavy tool systems.

## MICROSCOPE IMAGE COMPARISON USING ISO**ModA** ANTI-VIBRATION SYSTEM

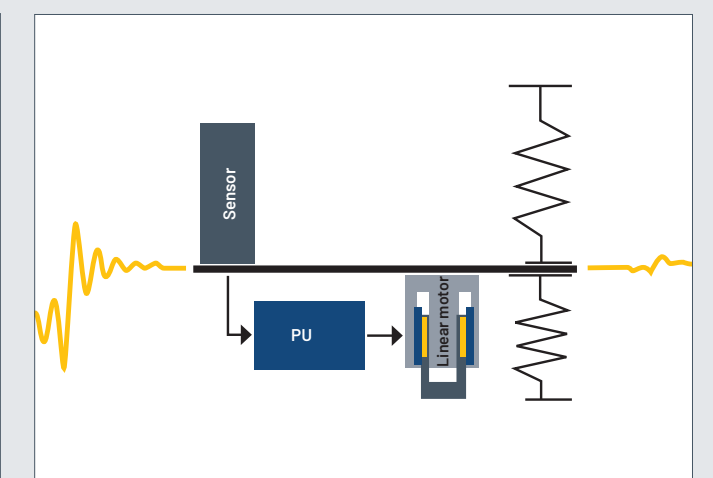


Without active vibration isolation

With active vibration isolation



Real-time vibration measurement by oscilloscope



Platform architecture diagram

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

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

### North America

Boston, Massachusetts, USA  
Fabreeka International, Inc.  
1023 Turnpike Street  
Stoughton, MA 02072

Tel: +1 800-322-7352  
Tel: +1 781-341-3655  
Fax: +1 781-341-3983

info@fabreeka.com  
**www.fabreeka.com**

Countries/Territories:  
United States, Canada, Mexico,  
Latin America, South America,  
South Africa, Middle East,  
Australia, New Zealand

### The United Kingdom

ACE Fabreeka UK  
Unit 404 Easter Park  
Haydock Lane  
Haydock WA11 9TH  
ENGLAND

Tel: +44 (0) 1942 727440  
Fax: +44 (0) 1942 717273

info@ace-fabreeka.co.uk  
**www.fabreeka.co.uk**

Countries/Territories:  
England, Ireland, Scotland, Wales

### Germany

Fabreeka GmbH Deutschland  
Hessenring 13  
D-64572 Büttelborn  
GERMANY

Tel: +49 (0) 6152-9597-0  
Fax: +49 (0) 6152-9597-40

info@fabreeka.de  
**www.fabreeka.de**

Countries/Territories:  
Germany, All European  
countries (except UK),  
Israel, Russia, India

### Taiwan

Fabreeka International, Inc.  
Taiwan Branch  
7F-1, No. 10, Lane 377, Sec. 3,  
Jhonghua East Road,  
Tainan 70167 TAIWAN

Tel: +886 935-273-732  
or: +886 970-273-732

info@fabreeka.tw  
**www.fabreeka.com.cn**

Countries/Territories:  
Taiwan, Southeast Asia,  
Japan

### China Mainland

Stabilus (Jiangsu) Ltd. /  
斯泰必鲁斯 (江苏) 有限公司

No.8 Longxiang Rd., Wujin National  
Hi-tech Industrial Zone,

Changzhou, Jiangsu Province,  
China 213164

江苏省常州市武进国家高新技术产业  
开发区龙翔路8号 邮编:213164

Tel: +86 (0)519-8622-3520  
Fax: +86 (0)519-8622-3550

shocks@acecontrols.cn.com  
**www.fabreeka.com**

### South Korea

Stabilus Co. Ltd. Sales Office  
A-#702, Suwon venture valley 2,  
142-10, Saneop-ro 156beon-gil,  
Gwonseon-gu,

Suwon-si, Gyeonggi-do, Korea,  
ZIP : 16648

Tel +82 31 5182 8526  
Mobile/Cell +82 10 9810 5204

julim@stabilus.com  
**www.stabilus.com**