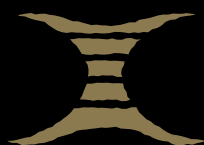


THE REVOLUTION IS HERE

# AP 1 330 PRO

SAPPHIRE  
LASER



APANI®

As Pure As Nature Intended®

Swiss Corporation +

The Apani Saphier Technologie

licenses by



RESEARCH DEVELOPMENT + DESIGN COMMUNICATION





A Lifetime Achiever

“Nothing holds more truth than your own experience”

# A VISIONARY LEADER

**Prof. Dr. Bodo W. Lambertz**

Founder of X-Bionic®, X-Socks®, Apani®,  
and X-Technology Swiss Research and Development.

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Developing . Engineering . Inspiring . Leading .

**PROF. DR.  
BODO W. LAMBERTZ**

### 1. International Award for Professor Dr. Bodo Lambertz

On July 10, 2019, Professor Dr. Bodo Lambertz received the international „Plus X Lifetime Achievement Award.“ The scientist and founder of the Swiss technology companies X-Tech- nology Swiss Research & Developing AG and Swiss Intellectual Property’s Research, De- velopment & Licensing AG is the visionary inventor behind the high-tech functional clothing brands X-BIONIC®, X-SOCKS®, and APANI®. This award honors his outstanding commit- ment to innovation in technology and the functional clothing industry. With his visionary thinking and entrepreneurial spirit, Dr. Lambertz has set significant benchmarks.

### 2. PLUS X AWARD: Recognition for Innovation and Inspiration

The official award ceremony and TV recording took place in the former German Bundestag in Cologne/Bonn. The PLUS X AWARD, recognized as the world’s largest innovation award for innovation, technology, sports, lifestyle, products, services, and brands, honors individu- als who have set milestones in business and industry. These pioneers create groundbreaking products and brands with their intellect and innovative power, serving as inspiration and guidance for others.

### 3. Exclusive Honor for a Visionary Innovator

With the „Lifetime Achievement Award,“ Professor Dr. Bodo Lambertz becomes only the seventh person to receive this prestigious honor. This exclusive award recognizes individuals who have left a lasting impact on the industry through their innovative inventions and their practical applications. Previous recipients include renowned personalities such as Sir James Dyson (2007), Professor Amar G. Bose (2008), Noel Lee (2012), Peter Skak Olufsen (2013), Prof. Hartmut Esslinger (2015), and Dieter Burmester (2016), all of whom are known for their groundbreaking contributions to the technology sector.

### 4. Over 40 Years of Industry Leadership

Dr. Lambertz is honored as a visionary scientist and inventor who has significantly shaped the industrial landscape for over 40 years with unique ideas, courage, diligence, and dedica- tion. Throughout his more than 40-year career, Dr. Lambertz has profoundly influenced the industrial landscape with revolutionary ideas and unwavering commitment. He has mastered the ability to perceive challenges as opportunities and to develop innovative solutions that not only resolve existing problems but also open new market segments.

### 5. Pioneering Work in Functional Clothing

Dr. Lambertz has devoted himself intensively to the research and development of functional clothing that significantly enhances athletes’ performance. Through his influential work, he laid the foundation for groundbreaking solutions in performance apparel, including the integration of patented technologies and thermoregulation into seamless knitting technology, transferring bionic insights to skin interfaces. By applying bionic principles, he has developed technologies that optimize the interaction between the environment and the human body. These innovations not only enable better thermoregulation but also improve the ergonomics and functionality of clothing.



### 6. Global Success of Premium Brands

The premium brands founded by Dr. Lambertz—X-BIONIC®, X-SOCKS®, and Apani as pure as nature intended—have achieved worldwide recognition and are now considered the most awarded and innovative products of their kind. With over 800 globally filed patent applicati- ons, these complex products demonstrably enhance performance, benefiting sports enthusiasts worldwide.

### 7. Awards and Achievements of the Products

Over a span of 20 years, X-BIONIC®, X-SOCKS®, and Apani as pure as nature intended have won more than 700 awards and distinctions, underscoring the innovation and quality of the products. Additionally, the brand has been named „Most Innovative Brand of the Year“ 12 consecutive times. These achievements have enabled professional athletes to win over 1,210 medals at national and international competitions, including the Olympic Games, further highlighting the effectiveness of Dr. Lambertz’s products.

### 8. Commitment to Innovation and International Partnerships

Dr. Lambertz has not only built his own brand but also serves as an advisor to various inter- national companies. His expertise and technologies have been directly integrated into the development processes of premium brands such as Lamborghini, PUMA, and Harley David- son. These partnerships demonstrate his commitment to innovation and his ability to bridge different industries to create groundbreaking and high-performance products.



Awarded to only 7 People in History

PROF. DR.  
BODO W. LAMBERTZ

# LIFETIME ACHIEVEMENT AWARD

**An award honoured to a person that has changed and influenced an entire industry.**

The PLUS X AWARD is considered the world's largest award for innovation in technology, sports, lifestyle, products, services, and brands. A highly selective jury composed of internationally renowned judges occasionally bestows an exclusive award to individuals who have set milestones in the worlds of business and industry. These pioneers have created trend-setting products and brands with their innovative spirit and serve as a beacon of inspiration for others.

In 2019, for only the seventh time in its history, the PLUS X AWARD honored a high-level entrepreneur for lifetime achievement. The recipient was Professor Dr. Bodo W. Lambertz, a successful innovator and creator who revolutionized sportswear with bionic-inspired technology. Previous winners include Sir James Dyson (2007), Professor Amar G. Bose (2008), Noel Lee (2012), Peter Skak Olufsen (2013), Professor Hartmut Esslinger (2015), and Dieter Burmester (2016). The "Lifetime Achievement" award was presented to Professor Lambertz at the German Parliament in Berlin, marking an important milestone in his 40-year career filled with global successes. Upon receiving the prestigious recognition, Professor Lambertz remarked: „Without an idea, there is no progress, and without progress, there can be no success“

1. **Sir James Dyson** (founder of Dyson)
2. **Pro. Amar G. Bose** (founder of BOSE)
3. **Noel Lee** (founder of MONSTER INC.)
4. **Peter Skak Olufsen** (CEO of Bang & Olufsen)
5. **Prof. Hartmut Esslinger** (founder of Frog Design)
6. **Dieter Burmeister** (high-end audio pioneer)
7. **Dr.Prof. Bodo W. Lambertz** (founder of X-Technology Swiss, X-Bionic, X-Socks & Apani)



**2007**

**SIR JAMES DYSON**

The visionary inventor and founder of Dyson.



**2019**

**DR. PROF. BODO W. LAMBERTZ**

Revolutionised sportswear with his bionic-inspired technology.



**2016**

**DIETER BURMESTER**

High-end audio pioneer.



**2008**

**PROF. AMAR G. BOSE**

The founder of the Bose Corporation.



**2012**

**NOEL LEE**

the founder of Monster Inc. and one of the architects of the success of Beats Audio.



**2013**

**PETER SKAK OLUFSEN**

CEO and descendant of the founder of Bang & Olufsen.



**2015**

**PROF. HARTMUT ESSLINGER**

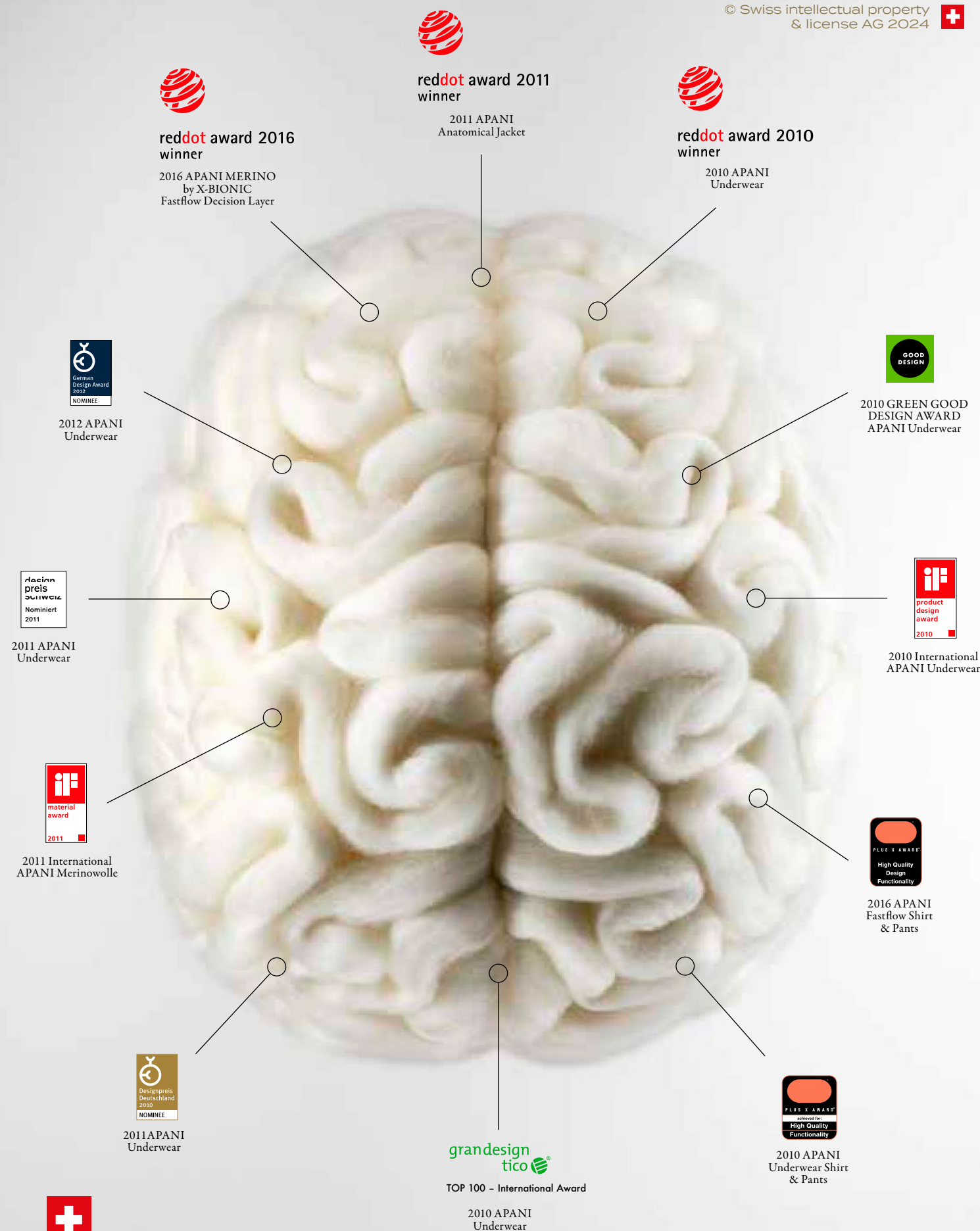
The founder of frog Design and one of the most influential industrial designers of all times.





# LEAVE THE THINKING TO US

At X-Technology Swiss we think that everybody should do what they do best. When it comes to our customers, this is taking care of business. And whilst they do that, we dedicate ourselves to the subject of innovation. This is where we excel. X-Technology Swiss offers clear navigation in a competitive landscape, access to a valuable knowledge base and the ability to develop the kind of groundbreaking ideas that drive modern businesses.



We made wool smart.  
Wool was stupid. It could not tell whether it felt too hot, too cold or too humid on the human skin. This went on for hundreds of years. Until X-Technology Swiss taught wool how to handle sweat intelligently. Today, wool is smart. It reacts. It comforts. It has value, added by X-Technology Swiss.



# CLAIM NEW GROUND WITH INNOVATIONS THAT GIVE YOU THE ADVANTAGE

Your biggest success has yet to happen and we intend to help you realizing it. X-Technology® Swiss is at the forefront of design and technology. The success of our own brands speak for themselves and our clients are setting new standards in their respective fields. X-Technology® Swiss offers the best in research and development services supported by an experienced team of experts, under the leadership of Prof. Dr. Bodo W. Lambertz. We deliver effective solutions to complex design problems. We are open-minded, goal-driven, technically advanced and strive for simplicity. This is the secret to our success. This could be your success.



swiss intellectual  
property  
inventions have  
demonstrated their  
value in the toughest  
of conditions in the  
fields of aerospace,  
aviation, racing and  
extreme sports.





Achieving Leading Innovator in Switzerland

PROF. DR.  
BODO W. LAMBERTZ

# INSPIRING THE INDUSTRY

For more than 20 years.



12  
TIMES IN A ROW  
MOST INNOVATIVE  
BRAND OF THE YEAR



Prof. Dr. Lamberz has led his team to developing  
the most unique textile technologies.

PROF. DR.  
BODO W. LAMBERTZ

# BREAKING RECORDS

In the Audi wind tunnel and on  
the international stage.

„Energy Accumulator 4.0 Patriot Edition is **the fastest ever measured**  
functional ski underwear in history, tested in **the Audi wind tunnel.**“

September 2019

**SWISSski**  
OFFICIAL POOL SUPPLIER

**X**  
X-BIONIC®  
SWISS ENGINEERED





Prof. Dr. Lamberz has led his team to developing  
the most unique textile technologies.

PROF. DR.  
BODO W. LAMBERTZ

# SO ADVANCED ITS USED IN SPACE

**Astronauts chose X-Bionic as the ideal apparel to control  
the body temperature in their space missions**



**FELIX BAUMGARTNER**  
Made the Jump from the  
Stratosphere wearing X-BIONIC



**ALEKSANDER MISSURKIN**  
Commander of the International Space  
Station, NASA Laboratories and the  
Mars Simulator wearing X-BIONIC





HONORS AND AWARDS

808

**PATENT  
REGISTRATIONS**

WORLD  
WIDE

HONORS AND AWARDS

621

AWARDS  
WON



# 54

## iF DESIGN AWARDS

Since 1954, the iF DESIGN AWARD has been a globally recognized symbol of design excellence. It is one of the most prestigious design awards in the world. Each year, thousands of designers, architects, and companies from around the world submit their projects for evaluation by independent design experts. To date, 54 iF DESIGN AWARDS have been granted to products created by Professor Lambertz.



# 37

## RED DOT DESIGN AWARDS

„In search of good design“: The Red Dot Design Award is one of the largest design competitions in the world. The Red Dot Label has become an internationally recognized seal of quality for outstanding design. The Red Dot Design Award is divided into three categories to professionally evaluate the diversity of submissions. Competitions for each discipline are held annually. To date, 41 Red Dot Design Awards have been presented to products created by Professor Lambertz. Many other accolades have been awarded to the Swiss genius and visionary whose ideas transformed an ordinary sock into a high-tech tool, outperforming any other garment as the perfect interface between human beings and sports activities.



reddot award 2016  
winner



reddot award 2011  
winner



reddot award 2010  
winner

## HONORS AND AWARDS

# 78

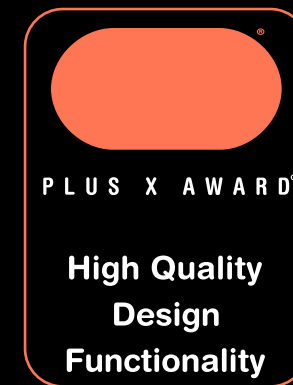
## PLUS X AWARD

With an independent international jury of 80 industries, 23 strategic partners, and over 700 participating international brands, the Plus X Award is the world's largest accolade for innovation in the fields of technology, sports, and lifestyle.

The „Plus X Award“ quality seals are granted to products that exhibit at least one „Plus X“ factor. Awards are given for new and innovative technologies, outstanding design, and user-friendly, intelligent operating concepts. Criteria such as exceptional ergonomic and ecological properties, as well as the use of high-quality materials that contribute to sustainable products with long-lasting value, are also recognized.

The award aims to strengthen brands and retail while helping consumers make well-informed purchasing decisions. To date, more than 100 Plus X Awards have been granted to products by Professor Lambertz across 17 categories, including:

- Highest level of innovation
- Outstanding functionality and aesthetics
- Superior design quality
- Best craftsmanship
- Best functional materials
- Exceptional functionality
- Best ergonomics
- Environmental friendliness
- Formal quality
- Best climate regulation features
- Most advanced technology

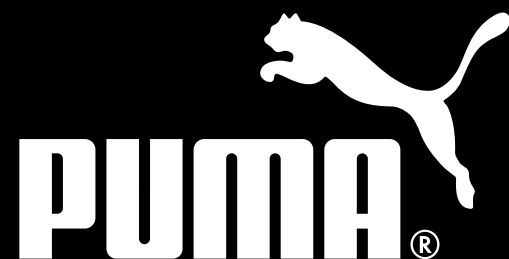




# THE PARTNERSHIP WITH PUMA

## Uniting innovation.

The partnership of X-BIONIC(R) with the sports giant PUMA combines the most valuable potential of two icons of top performance. Together, they will create a tsunami in the sports industry. The combination of all strengths in the areas of design, innovation, function and performance opens up previously unattainable potential for success. Puma SE employs more than 13,000 people worldwide and distributes its products in more than 120 countries. Through the joint activity, the two globally present partners will set important impulses for growing success and increased brand values.



— FOR —



# THE PARTNERSHIP WITH AUTOMOBIL LAMBORGHINI

## Driving innovation.

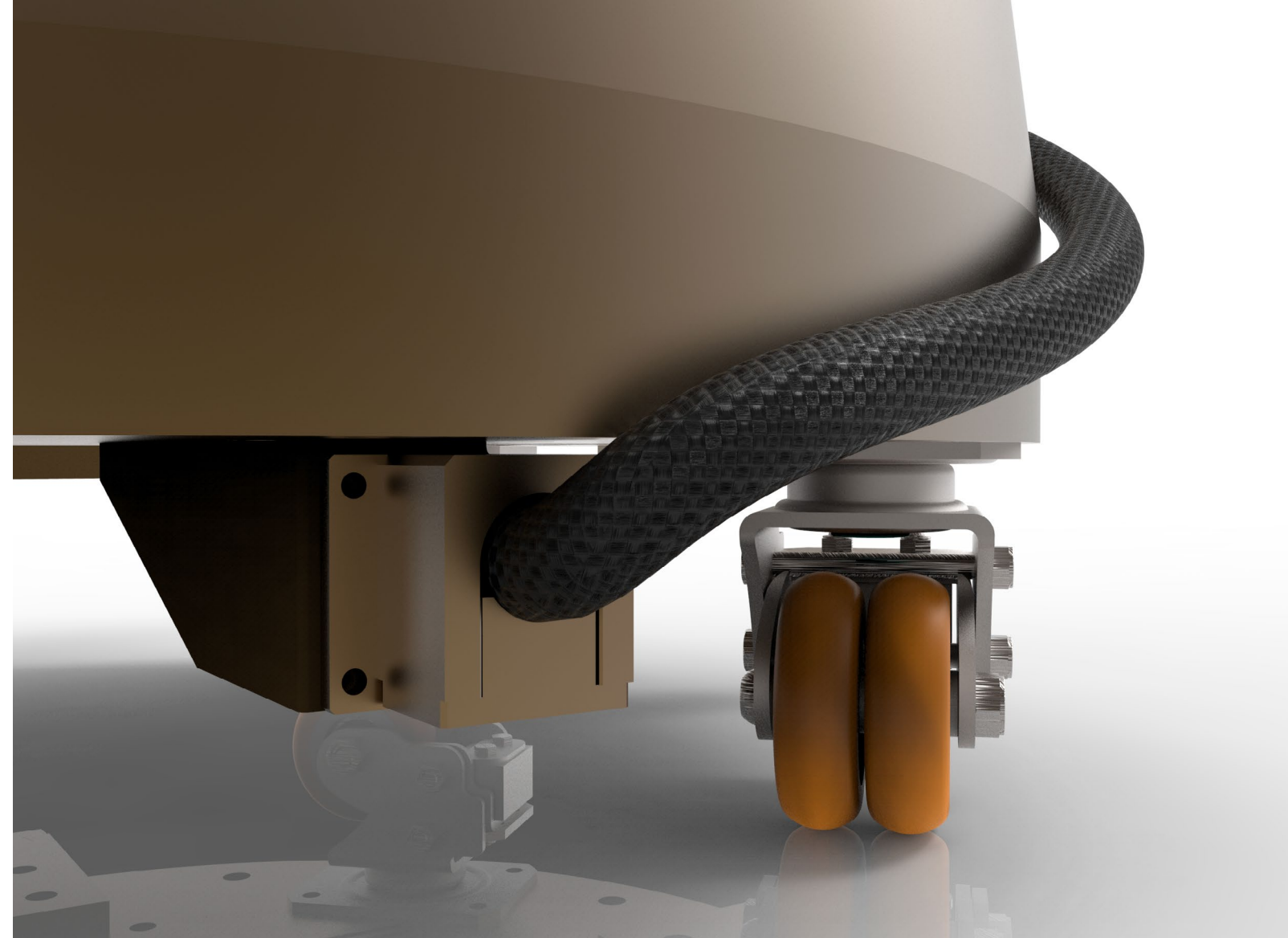
There are brands that share an exceptional reputation: technological leaders delivering premium quality and a unique brand profile. These brands are highly acclaimed and highly popular, much to the disdain of their competitors. Many of these brands are, or have been satisfied clients of X-Technology Swiss. With a growing trend towards product exchangeability, the key to success lies in outstanding performance and patentable inventions. Give your Brands the crucial competitive advantage it needs - achieve higher profit margins - become a brand that inspires. It's time to stand out



As pure as nature intended.

# APANI® SAPHIRE PULS- LASER

The revolution in  
surface cleaning



With a patented pyramid design and advanced laser technology, Apani® offers precise cleaning that is both environmentally friendly and highly efficient. Designed for industries where surface integrity is crucial, Apani® sets new standards in precision, non-destructive cleaning, and sustainability.

The Apani® Saphire Laser Surface Cleaning Machine brings a cleaner future by combining precision, environmental awareness, efficiency, and ease of use in one innovative solution. Developed in Switzerland, Apani®, as pure as nature intended, is redefining the standards for cleaning technology.





API Parameter Setting



API Language selection



# THE SCIENCE

## Laser technology in surface cleaning

### How Laser Technology Works

Apani's® laser technology focuses high-intensity light pulses on surface contaminants. This process breaks down unwanted particles without applying thermal or mechanical stress to the underlying material.

- **Non-destructive Cleaning**  
Apani's® laser system enables precise surface cleaning by removing contaminants without generating harmful heat. This technology is especially suitable for applications where surface protection is crucial, such as in heritage restoration or high-tech manufacturing.
- **Controlled Surface Interaction**  
The laser energy is precisely calibrated to remove contaminants while preserving the underlying material. This provides unmatched control and accuracy in cleaning applications.

### Material Compatibility and Versatility

Apani's® laser technology can clean a wide range of materials, including metals, ceramics, glass, and polymers. This versatility makes Apani® adaptable for numerous industries, from aerospace and automotive to heritage conservation and electronics manufacturing.

# PATENTED PYRAMID & CONE DESIGN

## Structural and functional advantages

### Enhanced Structural Stability

The pyramid and cone design of the Apani® machine offers several advantages over traditional rectangular designs:

- **Improved Stability**  
The pyramid shape distributes the weight evenly, reduces vibrations during operation, and ensures consistent laser performance for precise cleaning applications.
- **Vibration Damping**  
The unique design minimizes vibrations, ensuring that the laser maintains high accuracy even during extended operation.

### Optimized Thermal Management and Airflow

The pyramid and cone design naturally promotes airflow around the machine, improving heat dissipation and preventing overheating:

- **Extended Operating Times**  
Apani's® innovative design enables continuous operation without excessive heat buildup—ideal for industries that rely on high runtime.
- **Reduced Component Wear**  
Effective cooling reduces thermal stress on components, decreases maintenance efforts, and extends the machine's lifespan.

### Space Saving and Ergonomics

The pyramid shape also maximizes efficiency in the workplace:

- **Compact Footprint**  
The vertical design takes up less space and integrates seamlessly into existing workflows.
- **Improved Accessibility**  
The ergonomic design allows easy access to controls and components, enhancing usability and efficiency.







# ENVIRONMENT

## The economic advantages

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### Chemical-free Operation

Apani’s® laser technology does not require solvents or chemicals, making it safer and more environmentally friendly than traditional cleaning methods.

- **Reduced Hazardous Waste**  
Without chemicals, Apani® significantly reduces the production of hazardous waste.
- **Employee Safety**  
The chemical-free operation minimizes health risks for workers, reduces the need for protective equipment, and contributes to a safer workplace.

### Energy Efficiency

The combination of the laser system and pyramid shape ensures efficient energy use:

- **Lower Operating Costs**  
Apani’s® optimized energy efficiency helps reduce overall costs for the owner.
- **Sustainable Operation**  
Lower energy consumption aligns with the industry’s sustainability goals, making Apani® ideal for companies looking to reduce their CO<sub>2</sub> footprint.

# APPLICATION AREAS

## The Apani® Sapphire Laser Cleaner with Apani® is ideal for various industries and applications.

---

### Automotive and body repair shops, metal construction, stone and wood surfaces, industrial enterprises.

- Removes rust, paints, and contaminants from vehicle parts without damaging the base material.

### Aerospace maintenance

- Cleaning sensitive components such as turbines and aircraft parts without thermal or mechanical stress.

### Heritage restoration

- Non-invasive cleaning of historical artifacts and sculptures, preserving the original surface.

### High-tech manufacturing

- Precise cleaning for electronics, semiconductors, and medical devices, where a contamination-free surface is crucial.

### Industrial cleaning

- Efficient removal of rust, grease, and coatings from machines and industrial components.

## Conclusion

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The Apani® laser surface cleaning machine combines innovative laser technology with a patented pyramid design, setting new standards for precision, sustainability, and operational efficiency. In various industries, Apani enables non-destructive cleaning without the use of harmful chemicals, meeting modern requirements for environmental and workplace safety.

# APANI® SAPHIR LASER-MODULE

## APANI® Scanner System

The APANI® Scanner System consists of a drive plate and a high-speed oscillation motor, along with a highly precise and fast servo control system. The oscillation motor is a special motor that operates through rapid back-and-forth movements (oscillations). This technology enables extremely precise movement control, ensuring uniform and reliable results.

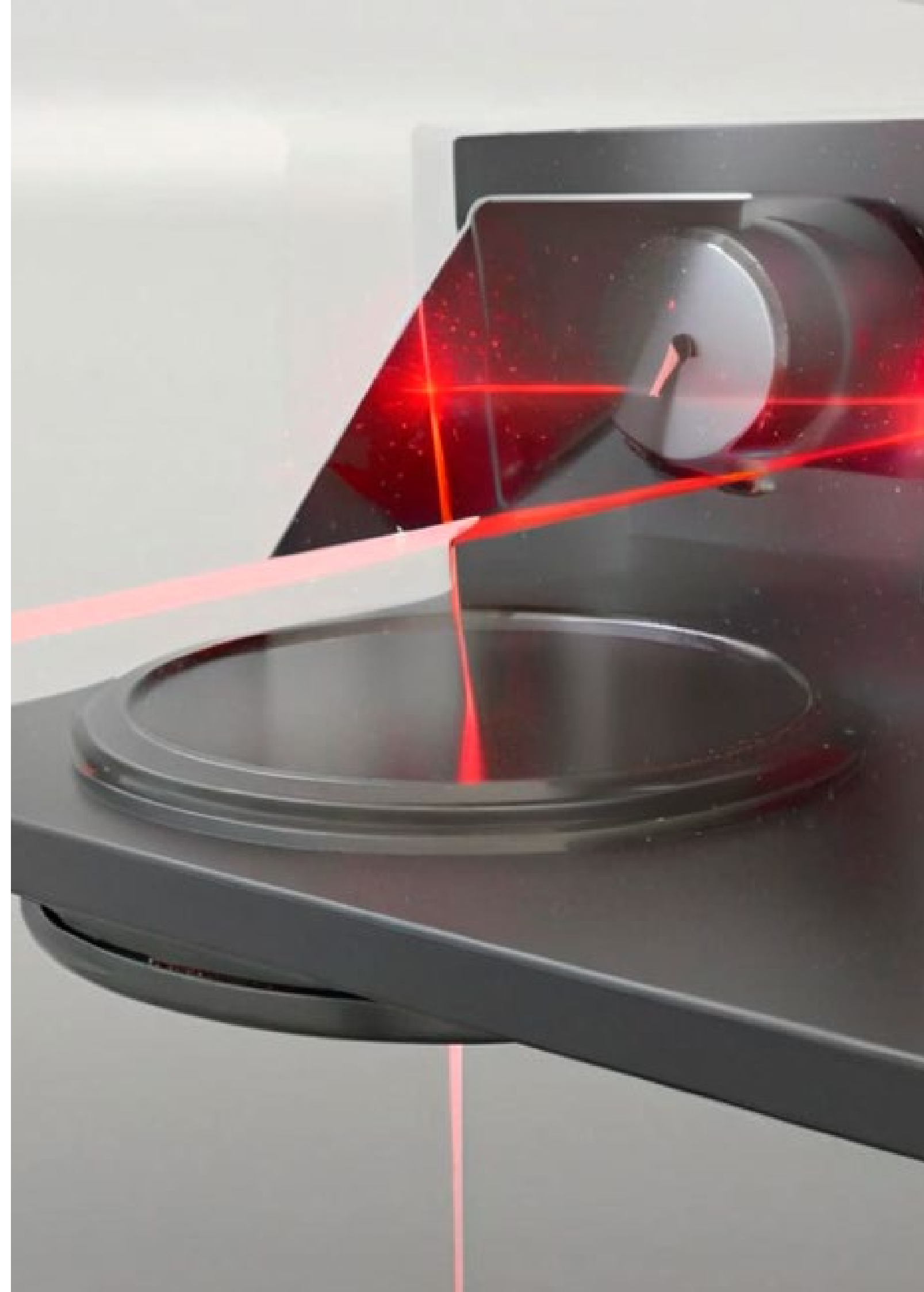
The APANI® oscillation motor not only ensures that the laser beam is guided accurately along the predefined path by precisely controlling the movement of the lens, but it also significantly increases cleaning efficiency. Thanks to the fast and controlled oscillations, both cleaning accuracy and speed are optimized.

## APANI® High-Speed Oscillation Motors

The APANI® oscillation motors impress with their compact design, high thermal efficiency, and long bearing lifespan. These features enable high-speed and highly reliable scanning operations, even in tight spaces.

The specially developed high-speed motors from APANI® deliver exceptional performance with linear speeds of up to 55,000 mm/s – more than 50% faster than other motor brands on the market. This not only makes cleaning more efficient but also significantly reduces long-term operating costs.

The APANI® motors are particularly suited for applications that require fast and effective cleaning, setting new standards in precision and efficiency.

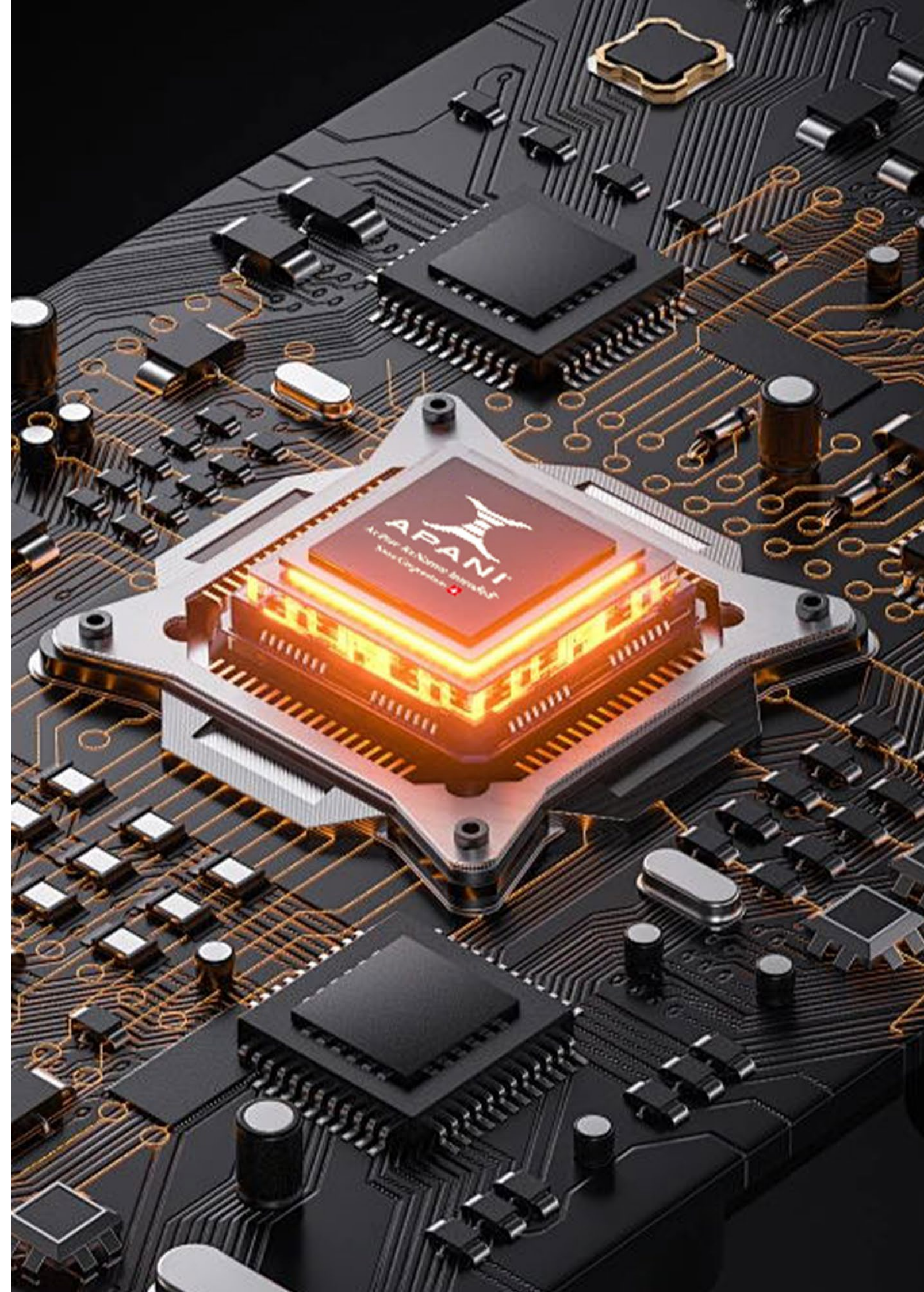




# APANI® HIGH EFFICIENT INVERTER POWER SUPPLY

## Die High Efficiency Apani HEIS

- 1 High energy efficiency**  
Voltage conversion efficiency of up to 94%, minimizing power loss, making it more energy-efficient and environmentally friendly.
- 2 Altitude adjustment**  
Works efficiently at altitudes of up to 5,000 meters.
- 3 Certified safety**  
Meets North American UL certification and international IEC standards.
- 4 Voltage protection**  
Automatic shutdown when input voltages are below 110 V or above 264 V, with automatic recovery once the voltage is stabilized. If the input voltage is below 110 V or above 264 V, the automatic protection is triggered to maximize the safety of the laser. Once the voltage stabilizes, the function is automatically restored.
- 5 Apani® Twin Cool Voltage Protection**  
Automatic shutdown when input voltages are below 110 V or above 264 V, with automatic recovery once the voltage is stabilized.
- 6 Apani® Twin Cool Dual Fans:**  
Equipped with inverter technology; the fans automatically adjust their speed based on temperatures ranging from -30°C to +70°C.





# APANI® OPTICAL FIBERS

## Innovation and engineering combined

The **Apani® Optical Fibers** are a masterpiece of modern technology and engineering. Each individual layer of their precise structure serves a specific purpose and contributes to their outstanding performance.

### Features:

- **Innovative Technology:** Advanced materials and manufacturing processes ensure the highest efficiency and precision.
- **Layer by Layer Optimization:** Each layer of the fiber has been designed to fulfill a specific function – from light transmission to thermal stability.
- **Reliable Performance:** The fibers guarantee consistent and lossless transmission of energy and data.
- **Versatile Applications:** Ideal for industrial laser systems, precise optical instruments, and other high-tech applications.

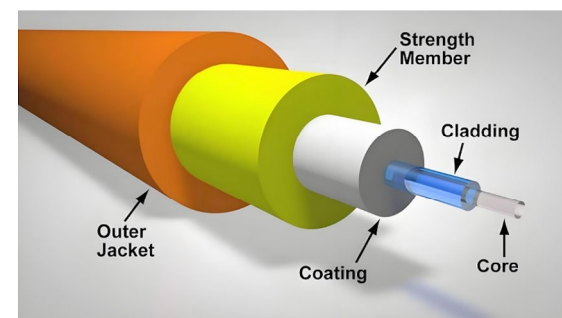
Experience the perfect balance of Swiss innovation and technical excellence with

**Apani® Optical Fibers** – developed for the highest standards.

**Apani® Optical Fibers** – The perfect balance of performance and durability.

The **Apani® Optical Fibers** combine innovative technologies with precise engineering to ensure stable and efficient performance for communication systems. Every component of their structure has been specifically designed to meet the highest demands.

- **Core:** Made from high-purity material, it ensures efficient transmission of optical signals with minimal losses.
- **Cladding:** Optimized with total internal reflection technology, it provides maximum transmission efficiency and stability.
- **Coating:** A multi-layer protective structure offers effective protection against external influences and extends the product's lifespan.
- **Outer Jacket and Reinforcement Element:** Provides increased tensile strength to ensure reliable operation even in complex and demanding environments.



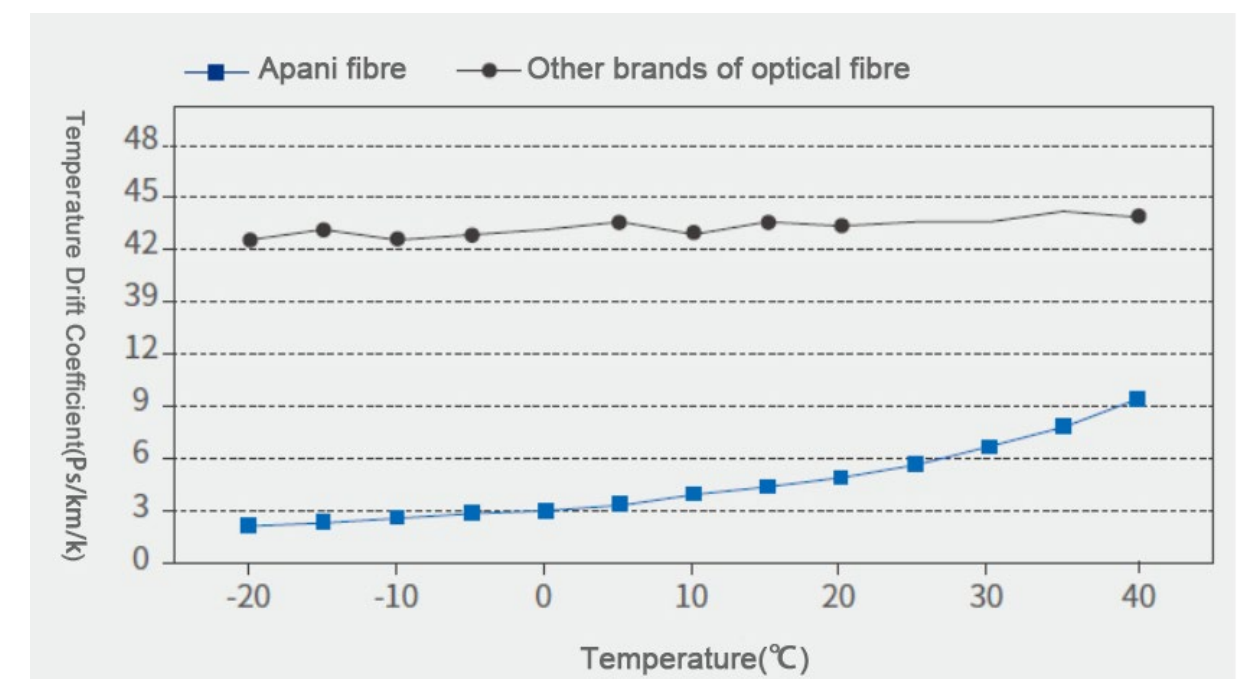
The **Apani® Optical Fibers** combine outstanding performance with long-lasting quality. Their precise structure ensures stable and efficient technical support in modern communication systems – the ideal solution for demanding applications.

# APANI® OPTICAL FIBERS VS. NORMAL FIBER

## Temperature Drift Coefficient Comparison

The above figure shows the temperature drift coefficient of **Apani® Optical Fibre** compared to other optical fibers. The specially designed Apani® fiber impresses with excellent temperature stability, showing only minimal changes in the drift coefficient as the temperature increases.

This stability allows the **Apani® Optical Fibre** to transmit laser light evenly and reliably even under varying environmental conditions. As a result, the consistency and precision of the laser cleaning process are significantly improved – making it the clear choice for maximum efficiency and accuracy.



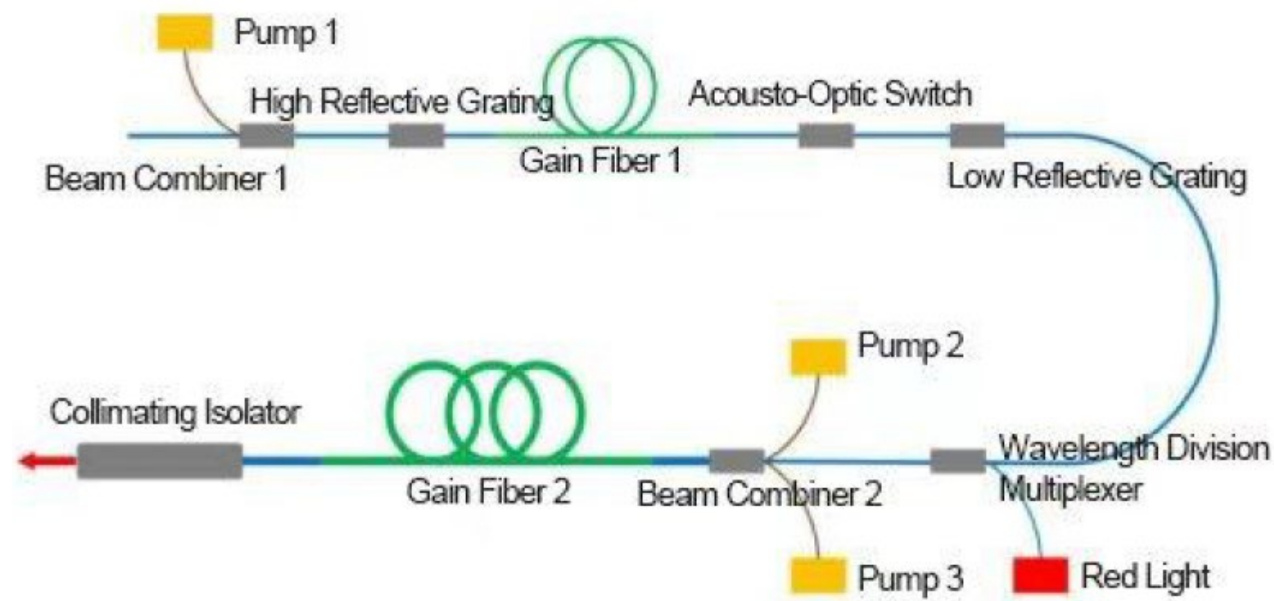


# APANI® LASER OPTICAL PATH-ISOLATIONDESIGN

Apani® Laser stands for the highest precision and longevity. Thanks to our innovative optical path isolation design, our systems benefit from improved stability and an extended lifespan.

Our Apani® lasers are equipped with independent isolators at every stage of the optical design. This thoughtful construction effectively prevents the feedback of laser radiation and protects the internal components from damage caused by laser reflections.

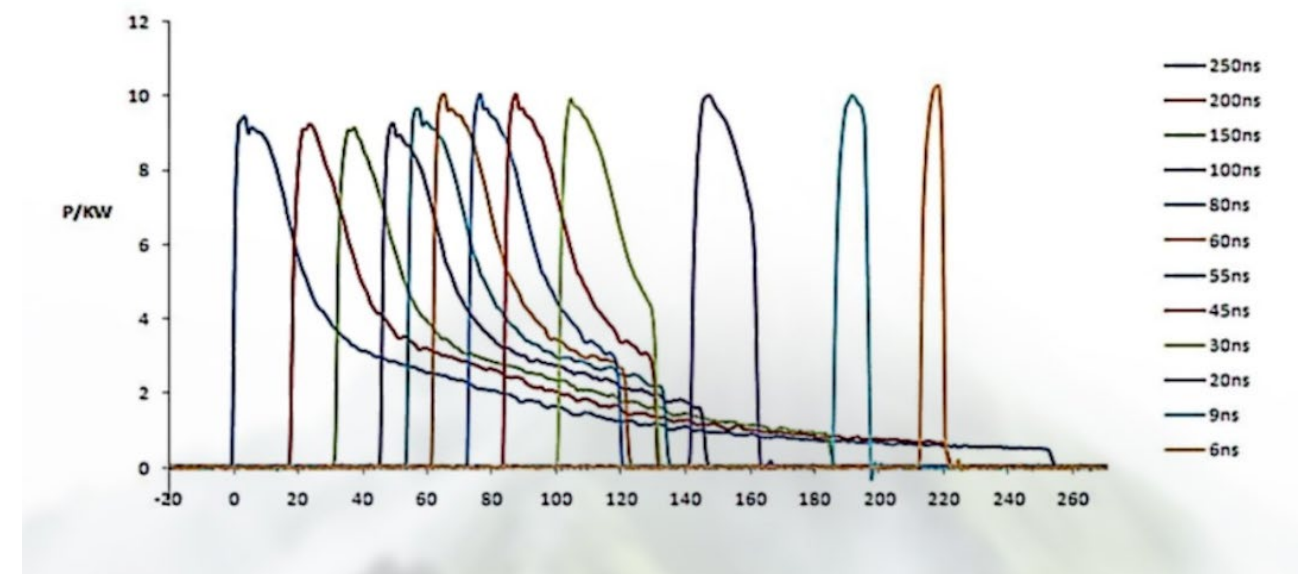
This unique design from Apani® significantly minimizes the risk of damage to internal components. The result is a robust and reliable laser that delivers top performance even under the most demanding conditions.



# APANI® LASER SOURCE

## Stable performance at high-frequency outputs

The Apani® laser consistently maintains stable peak performance at high-frequency output. This stability allows the Apani® laser to deliver outstanding performance in industrial applications that require high frequency and precision, while simultaneously avoiding power instabilities due to fluctuations in power.



# APANI® - SLUF

## Apani® Sapphire Laser Head

### Apani® Remote Control at the Laser Head

- Control and adjustment of cleaning parameters remotely for precise and comfortable operation.

### Focal Length Measurement and Display at the Laser Head

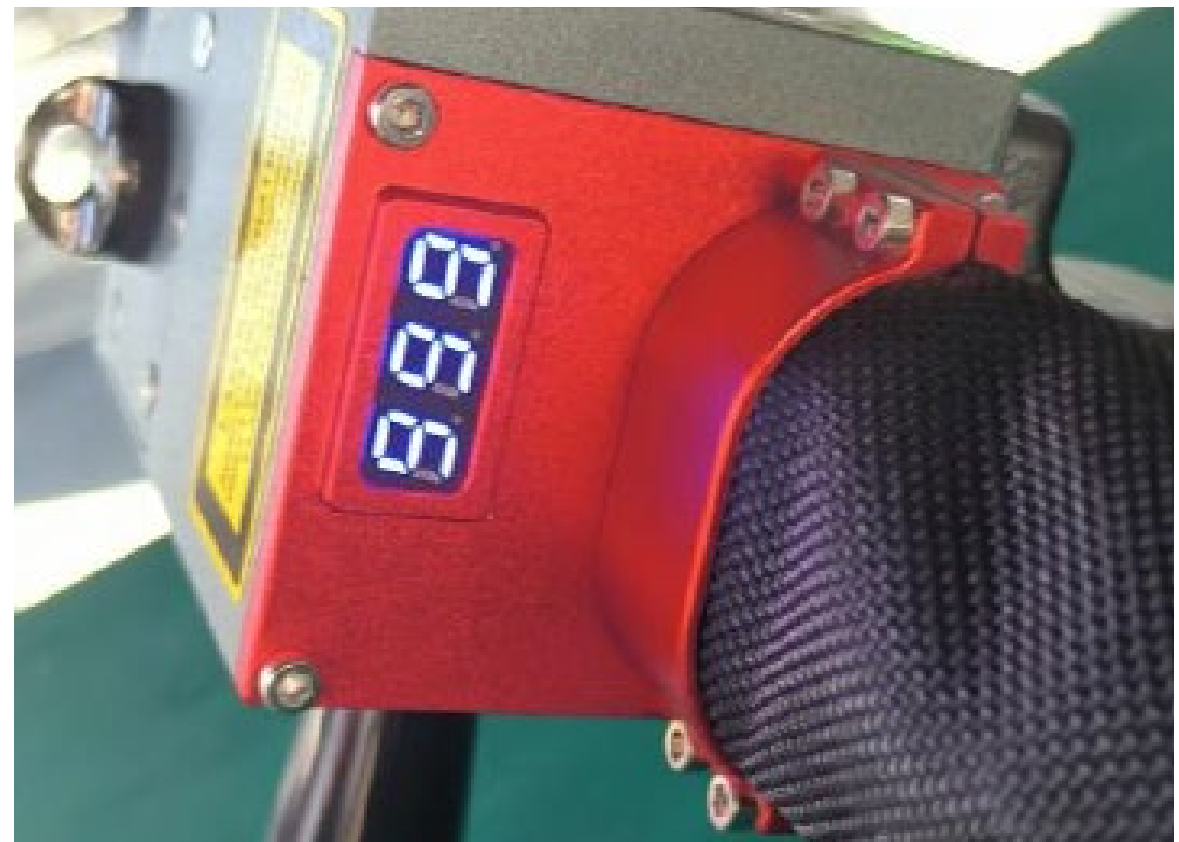
- The digital display on the cleaning head measures the distance between the laser and the material, allowing for easy adjustment of the focal length.

### Apani® - SFSS Technology, Ultra-Fast Scanning Speed

- Scanning speeds of 35,000–40,000 mm/s, significantly faster than the industry standard of 20,000–25,000 mm/s.
- Reduced laser dwell time minimizes surface damage and enhances cleaning efficiency.



Remote Screen



Focal length measurement function

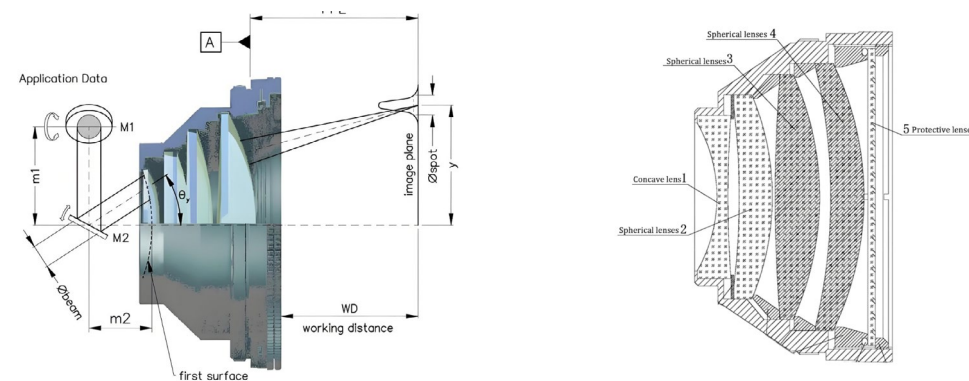


The perfect blend of science and innovation.

# APANI® HTL OPTICAL LENSES

Highest precision and efficiency for laser guidance.

The Apani® HTL optical lenses are a key component of the Apani® laser system, providing maximum light transmission and precise laser guidance. By using high-quality, highly transmissive, and low-loss quartz glass, along with a specially developed Apani® HTL coating, they guarantee optimal performance in every application.



## Technology of Apani® HTL Optical Lenses

### 1. Hochwertiges Quarzglas

- Gefertigt aus hochtransmissivem, verlustarmem Quarzglas für maximale Lichtdurchlässigkeit und minimale Streuverluste.

### 2. Apani® HTL-Beschichtung

- Die optical Linsen sind sowohl auf der Einfalls- als auch auf der Ausfallseite mit der einzigartigen Apani® HTL-Beschichtung versehen.
- Diese Beschichtung besteht aus einer speziellen Mischung aus SiO<sub>2</sub> und weiteren hochentwickelten Materialien, die für perfekte Lichtbrechung und -übertragung sorgen.

### 3. Verlustarme Optik

- Dank der besonderen Beschichtung und Materialwahl wird der Energieverlust erheblich reduziert, was die Effizienz und Präzision des gesamten Lasersystems steigert.

## Advantages of the Apani® HTL Optical Lenses

### 1. Maximum Light Transmission

- The HTL coating ensures that the laser beam is transmitted almost completely without losing intensity.

### 2. Apani® HTL Coating

- Optimized light refraction keeps the laser beam precisely focused on the target point, regardless of its length or angle.

### 3. High Stability

- The Apani® optical HTL lenses are resistant to environmental factors such as temperature fluctuations and wear, ensuring consistently high performance.

### 4. Efficiency Improvement

- Reduced energy losses result in a more efficient use of the laser, leading to lower operating costs.

### 5. Application Flexibility

- Ideal for high-precision cleaning processes in the automotive, aerospace, high-tech, and restoration industries.

## Apani® HTL Lenses – Innovation Meets Precision

The combination of high-transmissive quartz glass and the unique HTL coating makes the Apani® HTL optical lenses an indispensable component for any laser process where precision, efficiency, and reliability are key.

## Conclusion

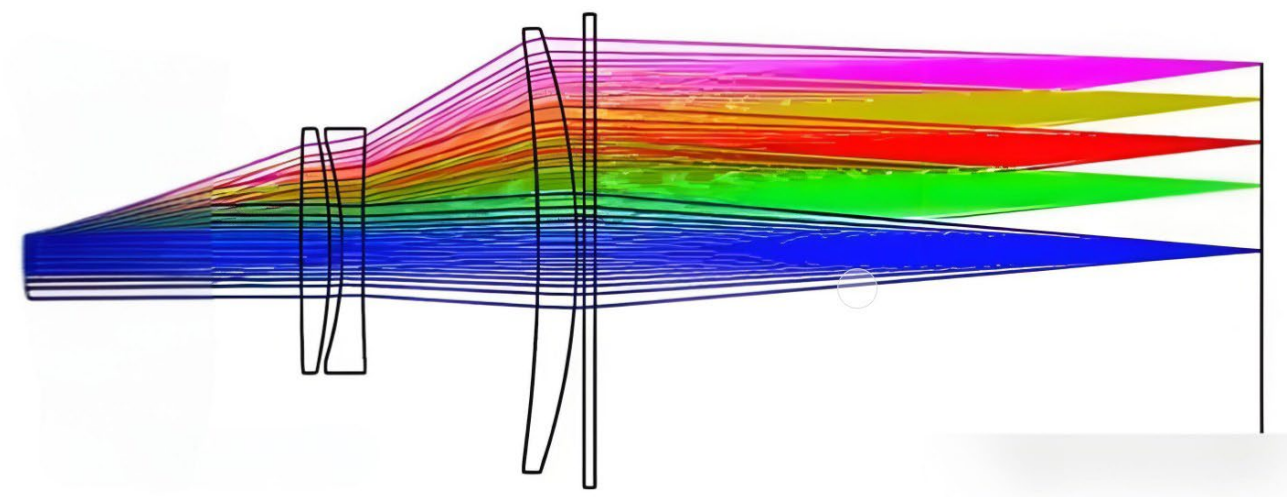
The Apani® HTL optical lenses offer an unparalleled combination of cutting-edge technology, efficiency, and precision. They ensure consistent results and are the key to an optimized laser process.

Where innovation and precision meet.

# APANI® AFMD

## Unique Field-Mirror Design

The Apani® Field-Mirror Design (AFMD) represents a groundbreaking innovation in laser technology. It ensures the highest precision, uniform energy distribution, and consistent surface cleaning. Through its unique optical design, Apani ensures that the laser beam is precisely focused on the desired area during every cleaning process.



## Technology und Design

The Apani® AFMD is based on an optical structure of 4-5 lens sets specifically designed to precisely guide the laser radiation.

- **Spherical Lenses:** The Apani® lens sets direct the light in such a way that the laser beam is always focused on the same plane, regardless of its length.
- **Convergent Focusing:** As shown in the illustration above, the pink laser has the longest path, while the blue laser has the shortest path. Regardless of the path length, all laser beams converge exactly at the same focal plane.

This design ensures uniform energy distribution, improves the stability of the laser beam, and provides consistent cleaning performance.

## The benefits of the Apani Field-Mirror Design.

### 1. Uniform Energy Distribution

- The AFMD ensures that the laser beam hits the surface evenly throughout the cleaning process, resulting in consistent cleaning without hotspots or energy loss.

### 2. Highest Precision

- Regardless of distance or angle, the laser focus remains stable, enabling effective and safe cleaning of delicate surfaces.

### 3. Improved Process Consistency

- The uniform energy distribution guarantees repeatable and high-quality cleaning results with every application.

### 4. Laser Beam Stability

- The design minimizes deflections or fluctuations of the laser beam, enhancing efficiency and precision.

### 5. Energy Efficiency

- Through precise focusing, no energy is wasted, reducing energy consumption and lowering operating costs.

## Conclusion: The Strength of the Apani AFMD

The Apani® Field-Mirror-Design is the perfect combination of advanced technology and practical benefits. It offers:

- Precise energy distribution: For consistent, high-quality cleaning results.
- Consistency and stability: For repeatable processes and consistently high quality.
- Efficiency and cost savings: Lower energy consumption, maximum results.



Ultimate Protection and Efficiency

# APANI® PROTECTION LENSES

## Maximum Purity and Performance for Apani® HTL Optical Lenses

The **Apani® Protective Lenses** are specifically designed to protect the **Apani HTL optical lenses** while maximizing the efficiency and stability of the laser system. Made from **Corning 7980 Silica Glass**, a quartz glass of the highest purity, the Apani lenses offer outstanding advantages over conventional synthetic quartz materials.

### Advantages of the Apani® Protective Lenses

#### 1. Maximum Light Transmission

- **99% Silicon Dioxide Content**
- Corning 7980 contains a 99% silicon dioxide content, significantly higher than the typical 90-95% found in synthetic quartz materials.
- This ultra-pure material ensures exceptional laser transmission and reduces energy loss during laser transfer.

#### 2. Higher Output Efficiency

- **10–15 % higher performance**
- Due to improved laser transmission, the final output power of Apani® laser cleaners is significantly increased.
- This enhanced efficiency leads to faster and more thorough cleaning with consistent energy input.

#### 3. High Quality Guarantee

- **Manufactured by Corning Incorporated:**
- Corning 7980 is produced by a globally leading manufacturer of specialty glass with over 170 years of experience.
- The quality and stability of this material guarantee long-term reliability and superior performance.

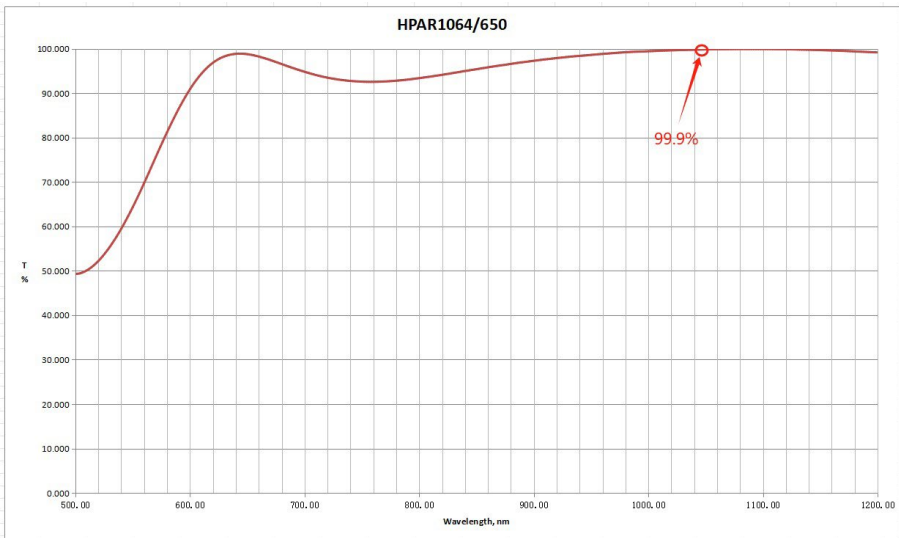
### How Apani® Protective Lenses Protect Your System

The Apani® Protective Lenses act as the first layer of protection for the sensitive HTL lenses.

- **Block Contaminants:** Protect the HTL lenses from dust, dirt, and other environmental influences.
- **Reduce Wear:** Extend the lifespan of the HTL lenses by protecting them from physical and thermal stress.
- **Maintain Optical Efficiency:** Thanks to their high purity, they ensure that the performance of laser transmission remains consistently at the highest level.

### Technical Advantages of Apani® Corning 7980 Silica Glass

- **Extremely high purity:** 99% silicon dioxide content for maximum laser transparency.
- **Excellent heat resistance:** Stable even at high laser temperatures.
- **Long-term durability:** Resistant to thermal and mechanical wear.



### Why Apani® Protective Lenses?

- **High-transmissive Apani Corning 7980 Silica Glass:** For maximum purity and efficiency.
- **Higher cleaning efficiency:** 10–15% increased performance through improved laser transmission.
- **Quality assurance:** Produced by a world-leading glass manufacturer.
- **Durability and protection:** Extends the lifespan of the HTL lenses and preserves system performance.

### Conclusion: Protection and Efficiency in One Product.

The **Apani® Protective Lenses** offer a perfect combination of protection, efficiency, and durability. They are an essential component of any Apani® laser system, ensuring long-term, reliable performance in every application.

# APANI® PROTECTIVE GLASS COATING

## Double-layer coating process

The **Apani® protective lenses** not only provide top-tier protection for the high-quality focusing lenses of your laser system but also enhanced durability through our innovative **double-layer coating process**.

## Double-layer coating – Technology and Benefits

Our protective lenses are made from **Corning 7980 glass for Apani®** and are coated with a double-layer coating that covers both the top and bottom sides of the lenses.

### Coating Materials

#### 1. S102 (Silizium Dioxid)

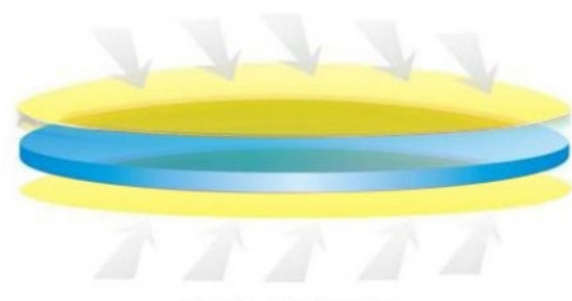
- Sorgt für eine hohe Lichtdurchlässigkeit und reduziert Energieverluste.

#### 2. AL203 (Aluminiumoxid)

- Increases mechanical durability and protects against scratches and wear.

### Advantages of the Double-layer Coating

- **Increased Wear Resistance:** The double coating effectively protects the lenses from damage caused by abrasive particles and contaminants.
- **Extended Lifespan:** Protective lenses last longer and require less frequent replacement.
- **Stable Optical Performance:** The high-quality coating ensures consistent light transmission, maintaining the efficiency of the laser system.
- **Comprehensive Protection:** The double-sided coating fully protects the lens, increasing reliability even in demanding applications.



- Apani® Protective coating AL 203
- Corning 7980 Glas für Apani
- Apani Protective coating Layer S102

## How APANI® Protective Lenses Coating Reduces Your Costs

### 1. Reduced Maintenance Costs

- Protective lenses are more cost-effective than focusing lenses and can be regularly replaced, avoiding expensive repairs.

### 2. Extended Lens Lifespan

- The focusing lenses remain in optimal condition thanks to the protection, which extends the lifespan of the entire system.

### 3. Consistent Laser Performance

- By protecting against contaminants, the optical efficiency remains consistently high.

## Ideal for demanding applications

- **Cultural heritage restoration:** Protects lenses during the cleaning of delicate surfaces.
- **Automotive industry:** Resists dust and residues in workshop environments.
- **High-tech manufacturing:** Ensures consistent optical quality during the cleaning of electronic and medical components.
- **Industrial applications:** Protects against abrasive materials during rust or coating removal.

## Conclusion: Protection and performance united.

With the **Apani® double-layer coating**, your protective lenses are optimally protected against wear and contamination. This extends the lifespan of your lenses, reduces maintenance costs, and guarantees consistent laser performance.



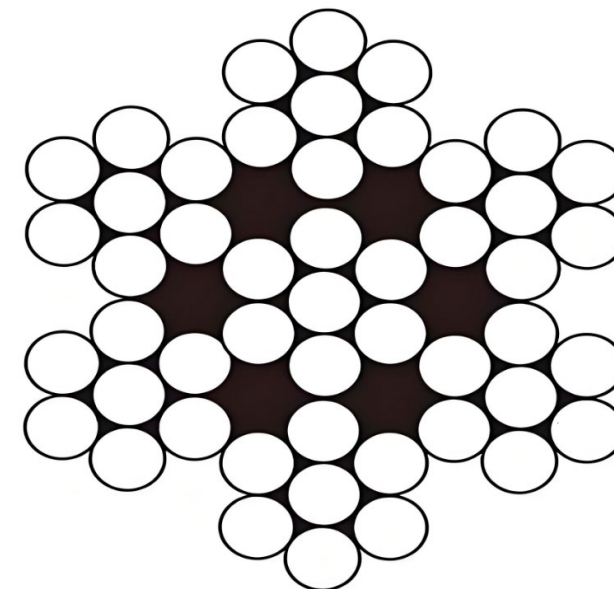
Because safety makes the difference.

# UNIQUE APANI® BREAK-AWAY PROTECTION

**304 Stainless Steel (Patent Pending) Apani BAWP**

Maximum protection for sensitive fiber optic cables – Safety and efficiency at the highest level.

The **Apani® Break-Away Protection** is an advanced safety solution specifically designed to protect sensitive fiber optic cables and optical fibers in laser cleaning machines. This innovative technology combines durable materials with thoughtful design to prevent damage and maximize the lifespan of your equipment.



## Benefits of APANI® Break-Away Protection

### 1. Effective Protection for Fiber Optic Cables

- The Break-Away Protection reliably prevents fiber optic cables from breaking or being damaged under tension.

### 2. Increased Lifespan and Reliability

- The wire rope absorbs the tensile force, allowing sensitive cables to remain functional for a longer period.

### 3. Reduced Maintenance Costs

- Fewer cable failures and lower repair costs increase cost-efficiency in operations.

### 4. Ergonomic and User-Friendly Design

- Easy to use and designed to ensure safety without compromising cleaning precision.

### 5. Durability Under Intense Use

- The high-quality stainless steel wire rope withstands demanding working conditions and protects the laser cleaning machine from failures.

### 6. Patented Safety Technology

- The patented design ensures the latest safety standards and technical excellence.

## Why Apani® Break-Away Protection

### 1. Protection Against Real Risks

During the operation of laser cleaning machines, the cleaning head can accidentally be pulled or torn. Without protection, this often leads to:

- Cracks in the fiber optic cable.
- Interruption of electrical connections.
- Expensive repairs or system failures.

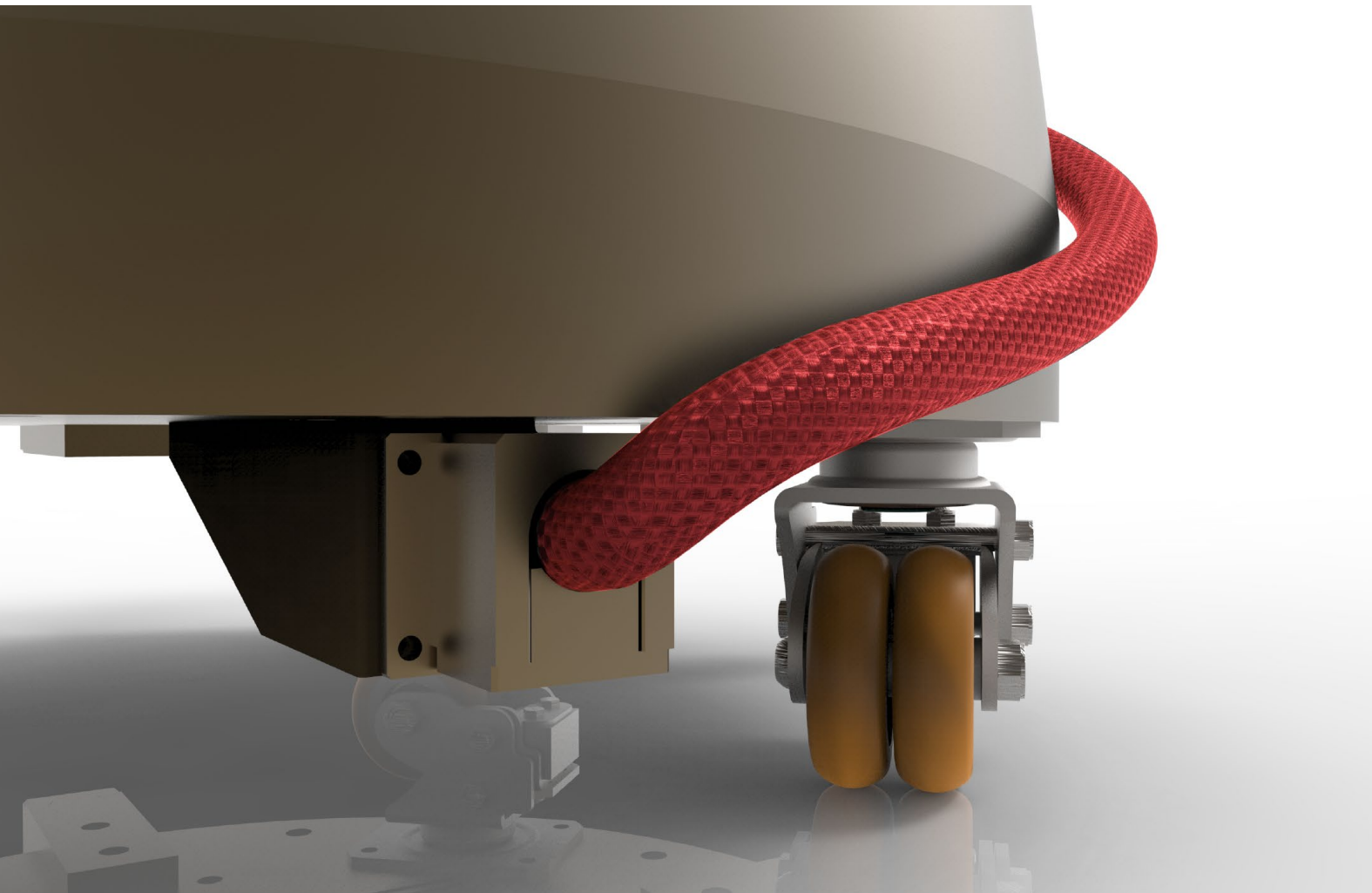
With **Apani® Break-Away Protection**, the robust steel cable takes on the tension load, protecting the sensitive cables and effectively preventing failures and damage.

### 2. Precision Meets Safety

- The Break-Away Protection enables safe cleaning without compromising the mobility of the cleaning head.
- Even in demanding applications, performance remains stable and reliable.

### 3. Perfectly Matched Design

- The steel cable and fiber optic cable are perfectly coordinated, ensuring that the protection function does not interfere with the performance of the laser system.



## Technical Specifications

**Material of the Wire Rope:** 303 Stainless Steel

**Wire Structure:** 7x7 Layout, 40 individual wires

**Wire Rope Diameter:** 2 mm

**Maximum Tension Force:** Up to 40 kg

**Length Ratio:** Wire rope is 5 cm shorter than the fiber optic cable

**Purpose:** Protection of the fiber optic cable from tensile load

## Applications

The Apani® Break-Away Protection is ideal for a variety of industries:

### 1. Industrial Cleaning:

- Prevents damage to cables in harsh, dirty environments.

### 2. Automotive Industry:

- Optimal for workshops where the cleaning head is frequently moved and pulled.

### 3. Cultural Heritage Restoration:

- Protects the sensitive fiber optic guide during the precise cleaning of delicate artifacts.

### 4. High-Tech Manufacturing:

- Ensures reliable performance when cleaning electronic and medical components.

## Apani® Break-Away Protection for Maximum Safety

The **Apani® Break-Away Protection** is more than just a safety mechanism – it is an essential innovation for every laser cleaning machine. By combining robust design, high-quality materials, and patented technology, it protects your systems, reduces downtime, and increases efficiency.



# SAFE AND RELIABLE

## With innovative breakaway protection

Our laser cleaning machine sets new standards in precision and safety. Thanks to the permanently integrated breakaway protection, cracks in the laser guide cable and contact failures in the electrical cable are effectively prevented.

This laser cleaning machine with safety feature is patent pending (pat. pend.) and offers the following advantages:

- Protection against cable and line damage
- Ergonomic design for easy handling
- Precise cleaning through flexible laser guidance

# UNIQUE REASONS TO BUY

## The Apani Sapphire Surface Cleaning

- **Patentiertes Design**

The pyramid shape ensures stability, better heat dissipation, and minimal maintenance.

- **330 watt Apani Sapphire Laser Power**

40,000 Apani® Sapphire laser pulses per mm per second

**1 No chemicals, no water**  
Reduces environmental impact and lowers operational and disposal costs.

**2 Schonung der Oberflächenintegrität**  
Keeps the original surface intact, ideal for sensitive materials.

**3 Easy handling**  
High cleaning speed reduces working time and increases productivity.

**4 Quick amortization**  
Pays for itself within 6 months in small to medium-sized body shops with a price of 39,000 CHF.

**5 Extreme adaptability**  
works reliably under extreme conditions and at high altitudes. (-30°C to +70°C and up to 5000 meters altitude.)

# SPECIFICATIONS AT A GLANCE

## Features Details



**Apani Laser Module**  
Integrated high-precision laser module.



**Apani AFMD**  
Automatic Focus and Modulation Control.



**Apani LOPI**  
Optimized light output and efficiency.



**Laser power**  
330 watts.



**Apani High Speed Oscillation Motor**  
Optimized for fast and uniform scans.



**Apani HTL optical Lenses**  
Precision lenses for the highest optical quality.



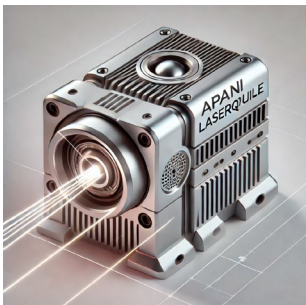
**Apani Optical Fibre**  
High-quality optical fiber with a 100 micron diameter.



**Energy**  
5.0 mJ.



**Apani BAWP (Patent Pending)**  
Unique Break-Away Protection Safety.



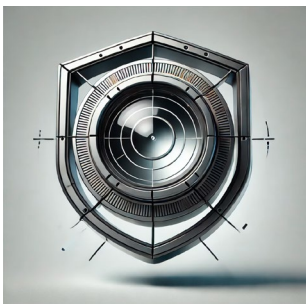
**Apani Laser Source**  
Robust and durable laser unit.



**Apani HEIS**  
High-efficiency inverter system.



**Scan speed**  
35.000-40.000 mm/s.



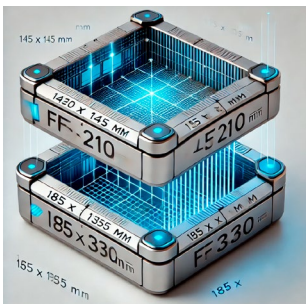
**Apani Protective Lenses**  
High-quality protective lenses for maximum durability.



**Apani SLUF**  
Special laser head with remote control and distance meter.



**Patented Pyramid & Cone Design**  
Unique shape for stability and efficiency.



**Scan area**  
F210 Lens (145x145mm) und F330 Lens (185x185mm).



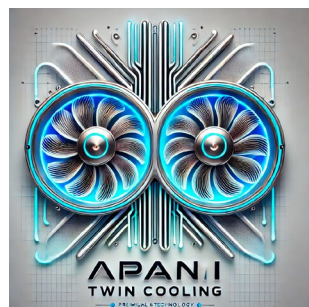


**Apani protective lenses with double coating**

Increased resistance to contamination and abrasion.



**Altitude capability**  
Up to 5,000m.



**Apani Twin Cooling**

Dual cooling fans for efficient heat dissipation.  
Cooling: Air-cooled.



**Voltage range**  
110 V-264 V  
(automatic protection).



**Operating temperature range**  
-30°C bis + 70°C.  
Heat dissipation.  
Cooling: Air-cooled.

# APANI® MAKES THE DIFFERENCE.

**Your benefits at a glance.**

- **Patented design**  
Exclusive pyramid shape ensures better stability, precision, and heat dissipation.
- **Environmental Responsibility**  
Chemical-free and waterless operation aligns with modern sustainability goals.
- **User-Friendliness**  
Intuitive controls and remote monitoring make operation easy, even for first-time users.

# INVESTMENT AND ROI

**Price:** 39,000 CHF

## Amortization

Amortization: Within 6 months through reduced labor costs, faster cleaning, and the elimination of chemical or water-based costs.

Amortization is possible in medium-sized SMEs in just nine months.

# APANI® SAPHIRE LASER EXPERIENCE CENTER

**Operated by Remo Marty**

**Learn all about the Apani® Saphire Laser Experience Center and the opportunities it offers you:**

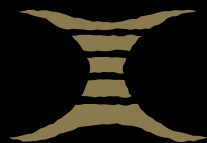
- Live demonstrations of chemical-free cleaning, precise cutting, and welding.
- Training on the practical application of Apani® Saphire laser technology.
- Innovation platform to discover the benefits of sustainable and precise technologies.



**Learn everything about the Apani Saphire® Laser Experience Center and the opportunities it offers you:**

- Live demonstrations of chemical-free cleaning, precise cutting, and welding.
- Training on the practical application of Apani Saphire® laser technology.
- Innovation platform to discover the benefits of sustainable and precise technologies.





**APANI®**

**As Pure As Nature Intended®**

**Swiss Corporation** 

**The Apani Saphier Technologie**

**Isenses by**



RESEARCH DEVELOPMENT + DESIGN COMMUNICATION