

# HARO Sports Floors

Dominating the game.



COMPETITION

POWER

PERFORMANCE

SPIRIT

TEAM

CHAMPIONS

STRATEGY

RESPECT





**1866**

Franz Paul Hamberger  
founds a farm with  
forestry, sawmill, brick-  
yard and matchstick  
production

**1936**

The first modern  
sawmill goes into  
operation

**1950**

Start of parquet  
production

**1955**

Manufacture of hardwood  
sports floorsystems

**1959**

First patent on a  
HARO Sports Floor

**1972**

Introduction of the  
module technology

**1985**

Patenting of portable  
sports flooring

**1992**

Cooperation with the  
Technical University of  
Rosenheim

**1994**

HARO becomes the first  
partner of the FIBA Study  
Centre in the Wooden  
Flooring category

**1997**

Introduction  
of the PERMADUR  
surface finish

**2000**

The new HARO  
Logistic and Service  
Center is built

**2008**

Provider of the Olympic  
Games Beijing WuKeSong  
Basketball floor

**2010**

HARO installed the  
biggest sports hall in the  
world: 8.000 m<sup>2</sup>, joint less

**2011**

HARO plays Tennis with  
ReboundAce® surface

**2012**

HARO goes outdoor  
with the event floor  
"Rome Outdoor"



# COMPETITION



## We just love competition.

Since 1866, Hamberger has been successfully meeting the challenge of competition. A long tradition which has given us a competitive edge unrivaled to this day: Our experience in wood that has been handed down through the generations.

We have been producing the most important indoor sports equipment – the sports floor – on the most advanced machinery for over 50 years. A HARO Sports Floor is a high-tech product of the finest quality, designed for the benefit of arena operators, athletes and investors alike. The athletes love its superior performance, investors and building owners the low maintenance costs of the floor, and arena managers profit from the possibility of multi-purpose use. HARO Sports is always a win-win decision.

HARO Sports Floor offers the best basis for a powerful performance. Reason enough to be chosen for over 7,000 arenas, multi-purpose halls and the major professional stadiums worldwide. HARO – competence that covers all bases.





## The only essential rule is that you have to be better than the others.

To ensure the high quality of our sports flooring, HARO developed the module technology – the first German sports flooring manufacturer to do so. We do not supply single components. Instead, we provide installation modules that have been preassembled at our plant in strict compliance with the ISO 9001 standard. Production is done with millimeter accuracy: In the ingenious design of our sports floor systems, each component, each dimension and each connection is of special importance.

No matter whether our sports floors are installed in the U.S.A., in Japan or in Germany: Thanks to our production processes, the performance of the floor will always meet the stringent HARO quality standards.





The American Sports Center in Anaheim, California, USA. The biggest Sportshall in the world was completely covered with now 15.000 m<sup>2</sup> of HARO Sportsfloor HELSINKI 10 oak. Without any gaps.

# POWER 2



HARO Sports engineered hardwood flooring



Solid hardwood floor

Property	HARO Sports Floor	Solid wood floor
Swelling and shrinkage behavior	Its engineered construction makes HARO Sports hardwood flooring approx. 7 times more dimensionally stable than solid wood; this means 7 times less swelling and shrinkage. The floor installation is completely seamless, independent of the surface area. This makes maintenance and care much more economical. Refinishing is only necessary after years of intensive use.	7 times more swelling and shrinking than HARO Sports engineered hardwood flooring. Expansion gaps need to be maintained in the sports flooring system — the expansion gap to the wall is approx. 50 mm. Strong swelling and shrinking hurts the finish, the floor needs to be refinished regularly.
Top layer	The actual wear layer of a sports floor is its surface finish. Beneath the finish HARO Sports engineered hardwood flooring offers the same hardwood wear layer as a solid wood floor. Below the top layer, HARO uses 100% northern birch plywood, which gives the hardwood floor a higher dimensional stability and better resilience. This also protects the environment since approx. 65% less precious hardwood is used.	Most hardwood floors are attached to a subconstruction by staples or nails. The actual wear layer of a solid hardwood floor thus is not — as often assumed — as thick as the hardwood floor itself, since only the portion of the hardwood above the staple can be sanded.
Surface finish	The UV-hardened PERMADUR® finish offers the best grip for ball sports. PERMADUR® is more abrasion resistant than any other finish applied on site. Refinishing is only necessary after 10 to 15 years of use.	The surface finish is applied on site, in a significantly less controlled environment. Airborne particles can settle on this finish, which is nowhere near as hard as the UV cured PERMADUR®. It therefore wears down faster and requires regular refinishing.
Performance	All HARO Sports Floors meet and exceed the requirements of DIN 18032.2 and offer the athletes the best performance and injury prevention. With the engineered hardwood sports floor, resilience starts where it is needed most — right at the surface.	The resilience of solid hardwood flooring is usually provided by the rubber pads. The thick solid wood top layer itself is far less resilient than the multilayer engineered hardwood top layer in a HARO floor.
Low life cycle costs <div>Acquisition costs + all maintenance costs</div> <div>Expected lifetime in years</div>	With proper maintenance and use, HARO Sports engineered hardwood flooring will only need to be refinished after 10 to 15 years of use. A comparison of the total costs over the full life cycle shows substantial advantages for HARO Sports engineered hardwood flooring systems over solid hardwood flooring due to the low maintenance costs.	Solid hardwood flooring needs to be sanded and refinished regularly. These relatively high running maintenance costs have a direct effect on the life cycle costs of a solid hardwood floor, thus negating any initial advantage of the lower purchase price.
Care and maintenance	Besides a comprehensive range of accessories, HARO offers cleaning and care products that are specially formulated for the PERMADUR® finish. They ensure that the sports floor looks and performs to its full potential for years.	Open joints and gaps make maintenance and care difficult.

## The PERMADUR® Finish

is the actual wear layer of a hardwood sports floor. Unlike the surface finishes of other manufacturers, the patented UV-cured PERMADUR® finish is applied under completely dustfree conditions right at the manufacturer's plant. PERMADUR® has an exceptionally long lifetime, which the results of various Taber Abraser tests demonstrate.





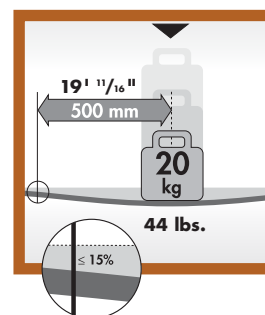
#### Shock Absorption (KA)

The Shock Absorption or Force Reduction is the ability of a sports floor to absorb the shock of an impact. In this test, the athlete must not be exposed to more than 47% of the impact when compared to a non-resilient floor.



#### Standard Deformation (StVv)

The Standard Deformation or Resilience defines the vertical deflection of the sports floor under load. The minimum deflection required by this test is  $3/32''$  (2.3 mm).



#### Deformation Control (W500)

The Deformation Control is a floor's ability to control the area spread of a deformation. It is measured in a distance of  $+19\frac{11}{16}''$  (500 mm) from the point of vertical impact (by a falling weight of 44 lbs./20 kg). The maximum deformation must not be higher than 15%.

All HARO Sports Floors comply with the most recent DIN V 18032.2 Standard of April 2001. The annual RAL Quality Audit assures continued DIN-certified quality.

## PERFORMANCE

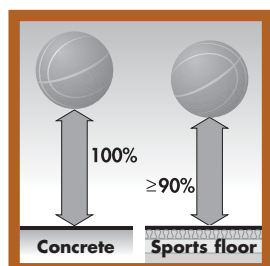
# 3

## Don't worry about your opponents. Believe in yourself.

A sports floor has to satisfy a variety of demands. Certification to the DIN 18032.2 standard, known worldwide as the "DIN Standard," is a key factor on which buyers base their decisions. It provides essential information on the durability, performance and protective properties of a sports floor.

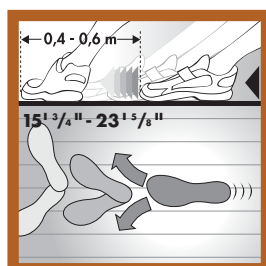
The excellent shock absorption and resilience of our sports flooring minimize impact to the athlete's musculoskeletal system. This prevents injuries and premature tiring. An excellent ball rebound makes the game fast.

HARO's DIN CERTIFIED sports floor not only meet, but far exceed all six requirements of the most recent DIN 18032.2 – 2001 tests. Additionally, the annual RAL Quality Audit performed by the independent German test firm "Gütegemeinschaft Sporthallenböden e.V." proves that HARO Sports Floors continue to pass the DIN tests year after year. Beware the claims of companies using terms such as "DIN approved", "DIN compliant" or "DIN tested", as it is evident these floors could not pass all six tests to achieve certification under the international DIN standard.



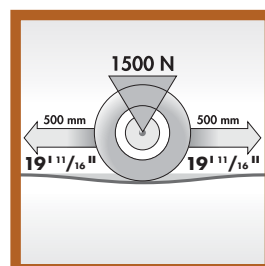
### Ball Rebound (BR)

Defines the height in % terms a basketball bounces on an area-elastic sports floor, when compared to the ball rebound on a non-resilient floor. The ball rebound must be at least 90%.



### Friction (GV)

The friction test determines the properties of a sports floor surface, with regard to quick turns by the athlete and the prevention of uncontrolled sliding. The required sliding distance is  $15\frac{1}{4}''$  to  $23\frac{1}{8}''$  (0.4 to 0.6 m).



### Behaviour Under Rolling Load (VRL)

This test shows the ability of an area-elastic sports floor to withstand loads from seating areas/bleachers, portable basketball goals or transport carts for aerobic mats. Minimum requirement: the sports flooring should withstand a load per axle of 1500 N without damage.





**FIBA**  
EQUIPMENT  
& VENUE

For over 20 years, HARO SPORTS has been an official partner of the International Basketball Federation (FIBA), the independent world governing body for basketball.

Our membership in many other leading sports associations worldwide and our close cooperation with the Technical University of Rosenheim are proof of the high quality of our products.

Halkapinar Spor Salonu, Izmir, Turkey – HELSINKI 10, beech. Hosting venue of FIBA Basketball World Championship 2010.







## Never underestimate the heart of a champion.

Many major international sports associations know that a HARO Sports Floor is always the best choice. Arena operators, too, choose our sports floors because we offer the ideal solution for nearly every need.

Which sports floor will suit your specific requirements depends not only on the sport disciplines the facility should be suitable for, but also on the job site conditions. Whether you want competent consultation right from the start or whether you're already in the planning phase, with HARO you can only win. Discuss your requirements with our experts, from pro to pro.

Selection criteria				
Permanent floor/Portable floor				
Sport discipline or multi-purpose use	Job site conditions	Top layer		Budget
<ul style="list-style-type: none"><li>• Basketball</li><li>• Handball</li><li>• Volleyball</li><li>• Soccer</li><li>• Hockey</li><li>• Fitness</li><li>• Other</li></ul>	<ul style="list-style-type: none"><li>• Concrete</li><li>• Dry floor screed</li><li>• Underfloor heating</li><li>• Subfloor evenness</li><li>• Permissible sports floor thickness</li></ul>	<ul style="list-style-type: none"><li>• Hardwood</li><li>• Synthetic</li></ul>		<ul style="list-style-type: none"><li>• Acquisition costs</li><li>• Maintenance</li><li>• Life cycle costs</li></ul>
Systems				
Construction	Elastic floors	Sprung floors		Portable floors
Structure		Single swing beam	Double swing beam	
Hardwood flooring	Helsinki	Stockholm Melbourne Barcelona	Berlin	Rome
Synthetic flooring	Athens Montreal	London	Munich	

# There are always winners and losers. It's up to you.



Oak



Canad. Maple



Ash



Beech

Whichever HARO Sports Floor you select, you're sure to choose a winner. Be it a hardwood, synthetic or portable sports floor system, HARO is the perfect solution for new buildings as well as refurbishments and renovations.

**Hardwood flooring:** HARO Sports engineered hardwood flooring is available in four different wood species: Oak, Canadian Maple, Beech and Ash. The factory grading displays the natural diversity of the hardwood's color and texture, thus giving a unique and desirable appearance. Important: HARO Sports hardwood flooring has been approved for first-level competition and is used at Olympic Games and World Cups!

**Synthetic flooring:** Basically, every suitable coating, such as linoleum, PVC or rubber, can be used with a HARO subconstruction. Due to its technical properties, synthetic sports flooring is definitely an alternative to hardwood sports flooring and offers an almost unlimited palette of available colors.

**Portable flooring:** HARO is the only sports floor manufacturer worldwide to offer a FIBA approved and DIN 18032 certified portable hardwood sports floor with a special, patented interlocking system. This floor is ideal for use in multi-purpose arenas and in professional sports.

Hangtime Sports,  
Midland, Michigan, USA.  
Model HELSINKI 10,  
Canad. Maple



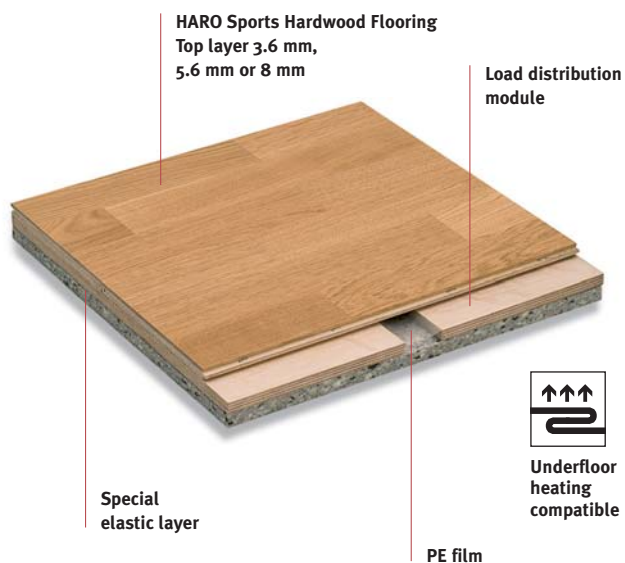


# TEAM 5

## HELSINKI

This multi-talent is at home in major sports arenas around the world: for example, in the American Sports Center in Anaheim, California, USA.

The area-elastic sports floor succeeds through its high-tech performance. The special elastic layer consists of a polyurethane composite foam. It is designed to maintain the same elastic properties throughout its entire life cycle. Load distribution strips are placed on top of the elastic layer. The hardwood top layer is stapled or nailed to these strips. Its low construction height also makes HELSINKI a perfect choice for refurbishments and renovations.



Underfloor  
heating  
compatible



Underfloor  
heating  
compatible

## BARCELONA

The re-launch of an obsolete flooring system combined with improved material results in a perfect sports floor. Technical values such as a great force reduction and a perfect ball rebound together with very fast installation make the Barcelona a powerful floor.

The plywood beams, narrowed down in spacing, offer a solid sub construction that can even be leveled if necessary. Lay out the beams, nail the parquet and your sport floor is ready for play.

You are only limited  
by your own imagination.

## BERLIN

Our classic is used in many thousands of sports facilities all over the world: for ULEB Cup teams, in the FIBA Euroleague, in universities, multi-purpose halls and schools. BERLIN features a factory-assembled double swing beam system and is a high-performance floor with excellent sport-physiological properties. It can be installed directly on raw concrete. A minor unevenness in the subfloor can be leveled by placing equalizing material under the swing-beam pads and fixing them in place.



## STOCKHOLM

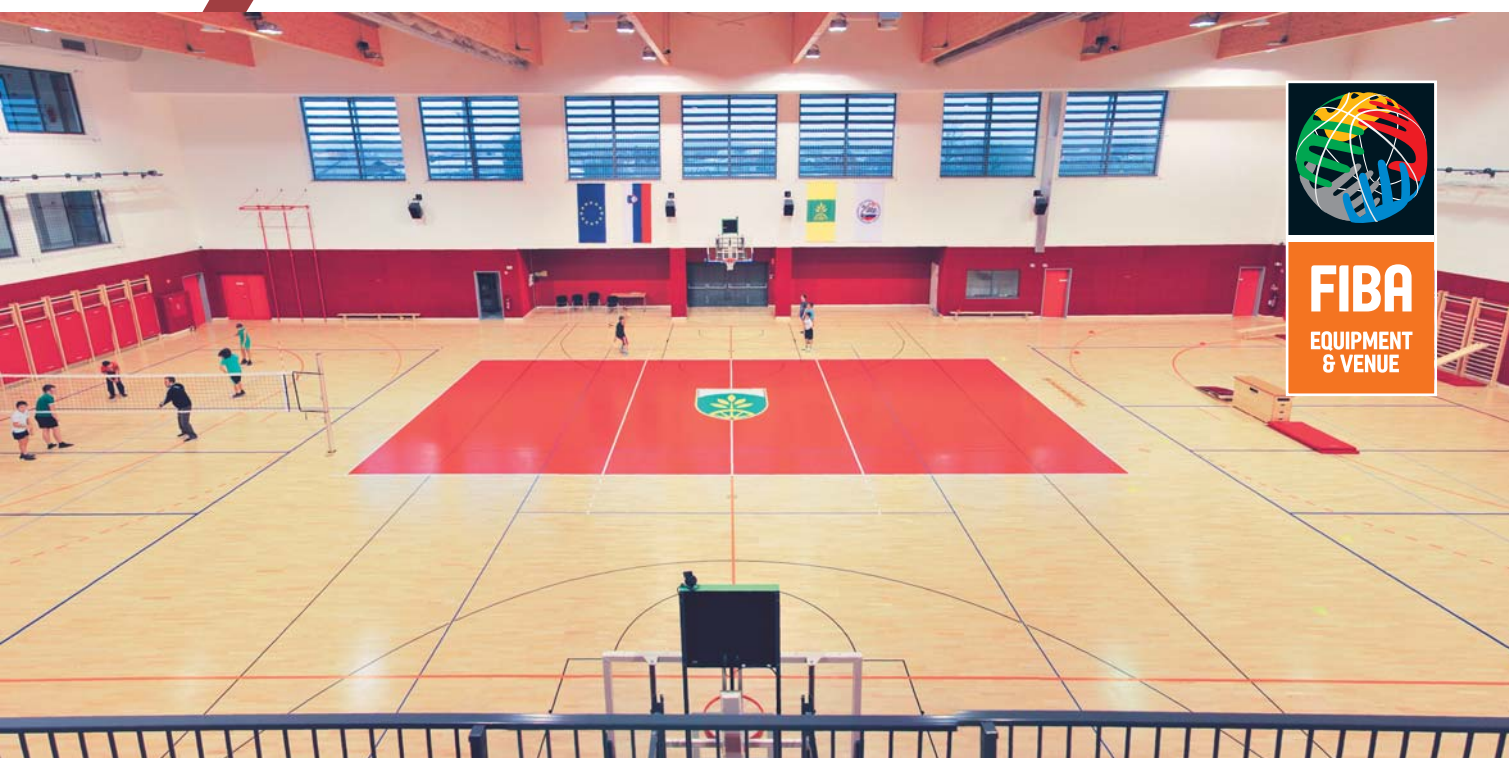
STOCKHOLM is the cost-effective alternative to the double swing beam systems. It consists of a factory-assembled elastic batten, a counterfloor module and HARO Sports hardwood floor. It can be installed directly on raw concrete. A minor unevenness in the subfloor can be leveled by placing equalizing material under the swing-beam pads and fixing them in place. This is money in the hand as no screed needs to be laid.





# CHAMPIONS

# 6



**FIBA**  
EQUIPMENT  
& VENUE

Hoče Slovenia, 1.320 m² Berlin 12 in Ash



Gimlehallen Norway, 1.660 m² Stockholm 10 in Oak



Discover the differences that separate us from the second best.



Grand Slam Cup 2013,  
Frankfurt Airport, Melbourne 65

# MELBOURNE



Our specialist for squash and racquetball is a HARO Sports hardwood floor that is sealed with the SST special finish developed exclusively for this purpose. The depth-impregnated surface ensures a perfect grip, preventing the risk of slipping or sliding due to sweat drops on the court. MELBOURNE is officially approved by the World Squash Federation and is used for international squash competitions such as World Cups and European Cups.



# ROME

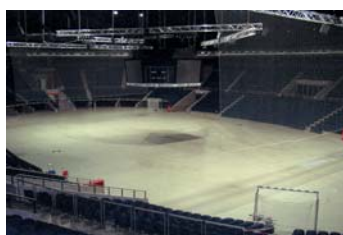
CHAMPIONS



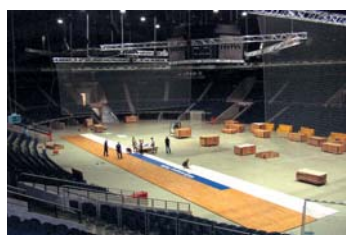
ROME 20 is the only portable sports floor worldwide that has been officially approved by the International Basketball Association (FIBA) and fully complies with the DIN V 18032.2 standard. The modules of this portable floor weigh less than 35 kg and thus allow easy handling. They are connected with a patented interlocking system. The spring clips ensure a tight fit of adjacent modules, which gives the floor surface an almost seamless appearance. Tests conducted in cooperation with Schelde International and the Fachhochschule Rosenheim technical university have proven the exceptional durability of this floor. In addition, ROME 20 only takes up about 1/3 of the storage area required for most other portable hardwood floors.



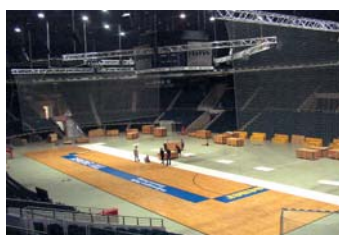
Eurobasket 2013, Jesenice Slovenia,  
627 m² Rome 20 in oak



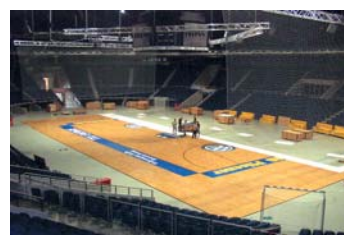
The Volkswagenhalle in Braunschweig ...



... which the operating company also uses  
for concerts ...



... is turned into a 1080 m² large  
sports arena ...



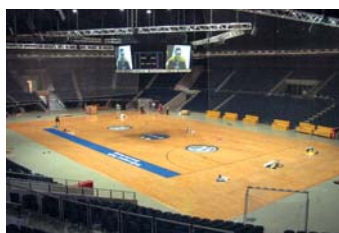
... in less than **three hours** thanks to our  
portable sports floor ROME 20.



The light-weight modules ...



... are connected with a special  
interlocking system.



The result is a top-quality indoor  
sports floor...



... that amazes installers and athletes alike.

# The taste of victory is an experience you don't want to miss.

Are you looking for an alternative to hardwood flooring? Then a HARO Sports Floor with an elastic coating is just the right choice. Depending on your specific requirements, you can choose from different synthetic coatings—usually linoleum, PVC or rubber—which are glued to the HARO subconstruction on site.

As always, it is the hidden qualities that make the difference! What is much more important than the coating itself is the subconstruction manufactured in the proven HARO quality. It takes the HARO modular construction with a sprung-floor or elastic-floor system to turn a normal sports floor into a superior high-tech product with a convincing performance. Athletes and arena operators know the difference.



Linoleum



PVC



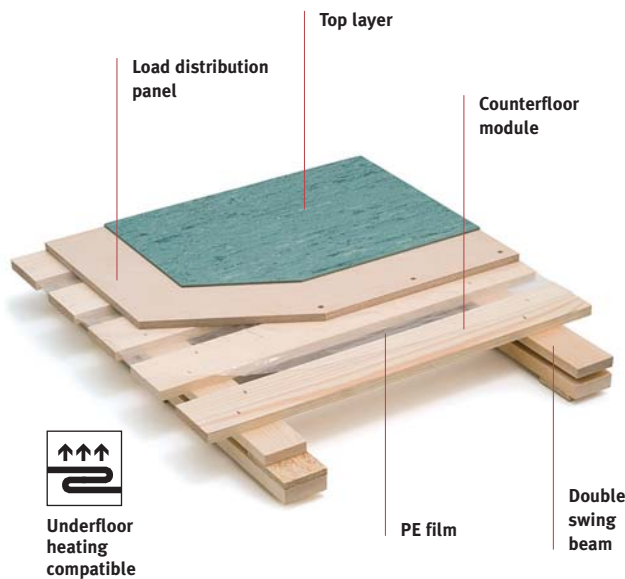
PU



Sport hall Puchov Slovakia, 726 m² München 35

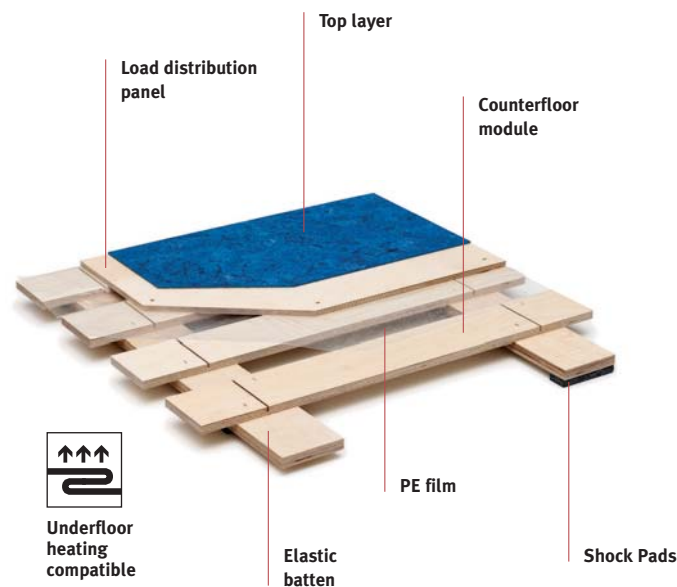


# CHAMPIONS 8



## MUNICH

MUNICH has earned a strong reputation all over the world for years. Designed primarily for multi-purpose applications, this sports floor has been installed in over 1000 sports facilities. The MUNICH model consists of factory-assembled double swing beams, a counterfloor and a load distribution panel, which is made of OSB or special plywood. The synthetic coating is glued to the load distribution panel.



## LONDON

Just right, just reasonable: LONDON is the cost-effective alternative to our double swing beam systems. The factory-assembled elastic battens are provided with shock-absorbing pads at the bottom of the battens. The counterfloor and a load distribution panel ensure excellent area-elastic properties. The synthetic coating is glued to the load distribution panel.

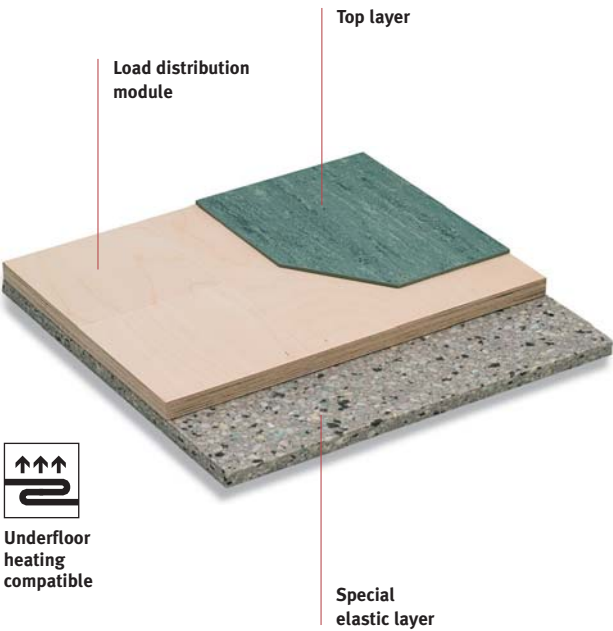


Winning isn't everything,  
but you don't want to lose.

## ATHENS

A real “Olympic champion:” ATHENS, with the Taraflex Sport M elastic coating from Gerflor, was successfully used in the main competition hall “Faliro – House of Handball” at the Olympic Games in Athens in 2004.

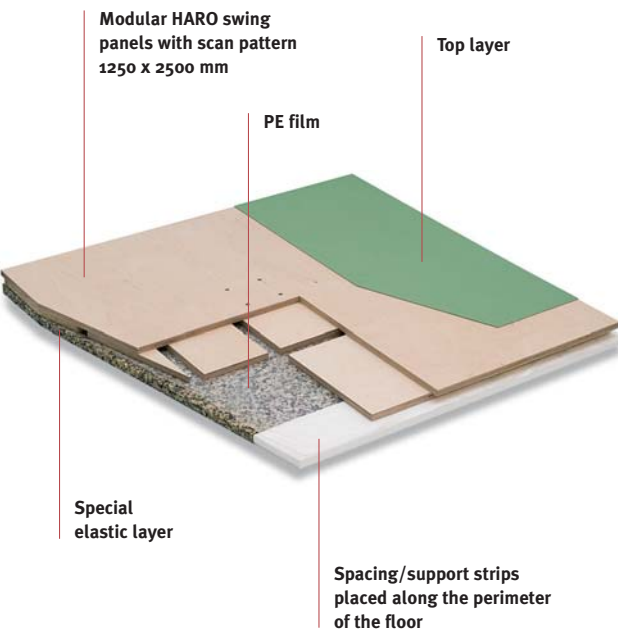
The special elastic layer, which is made of a polyurethane composite foam, ensures an exceptional durability. A two-layer load distribution panel is installed on top of the elastic layer. The synthetic coating is then glued to the load distribution panel.



## MONTREAL

MONTREAL is the perfect solution when the time schedule is tight. The preassembled modules make this sports floor fast and easy to install. The modules are simply screwed together on site.

Most of the assembly work has already been done in the HARO factory. MONTREAL consists of a composite foam based on polyurethane and factory-assembled swing panels. The synthetic coating is then glued to these panels. Its low construction height makes MONTREAL a perfect choice for refurbishments and renovations.





# CHAMPIONS 9



City Sport Hall, Velký Krtís, Slovakia – ATHENS



High school Bisingen, Germany – MONTREAL 21

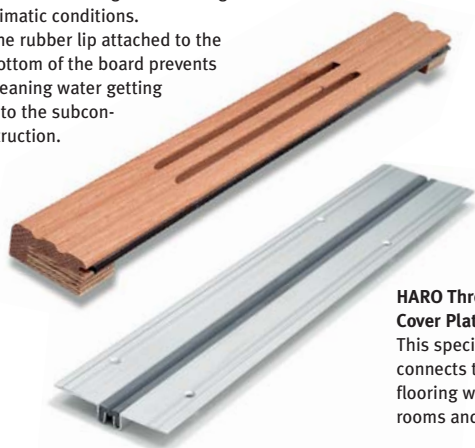


Safe use, perfect details and a long lifetime are the characteristics of every HARO Sports Floor. Prime examples, to name just a few, are the module technology developed by HARO SPORTS and the safety and care packages.

#### **HARO Base Boards**

A practical solution with appealing advantages: The factory-assembled HARO base boards with ventilation slits ensure a permanent ventilation of the flooring construction and provide the floor with sufficient space for moving due to changes in the climatic conditions.

The rubber lip attached to the bottom of the board prevents cleaning water getting into the subconstruction.



#### **HARO Threshold Cover Plate**

This special moulding connects the sports flooring with adjoining rooms and doors.

#### **HARO Floor Plates**

HARO floor plates have been designed as an integral part of the floor surface and are incorporated in a waterproof and flush way. Due to its interlocking system, there is no danger of injury as the floor plate is securely fixed. Damage arising from mop water entering the subconstruction is also eliminated.



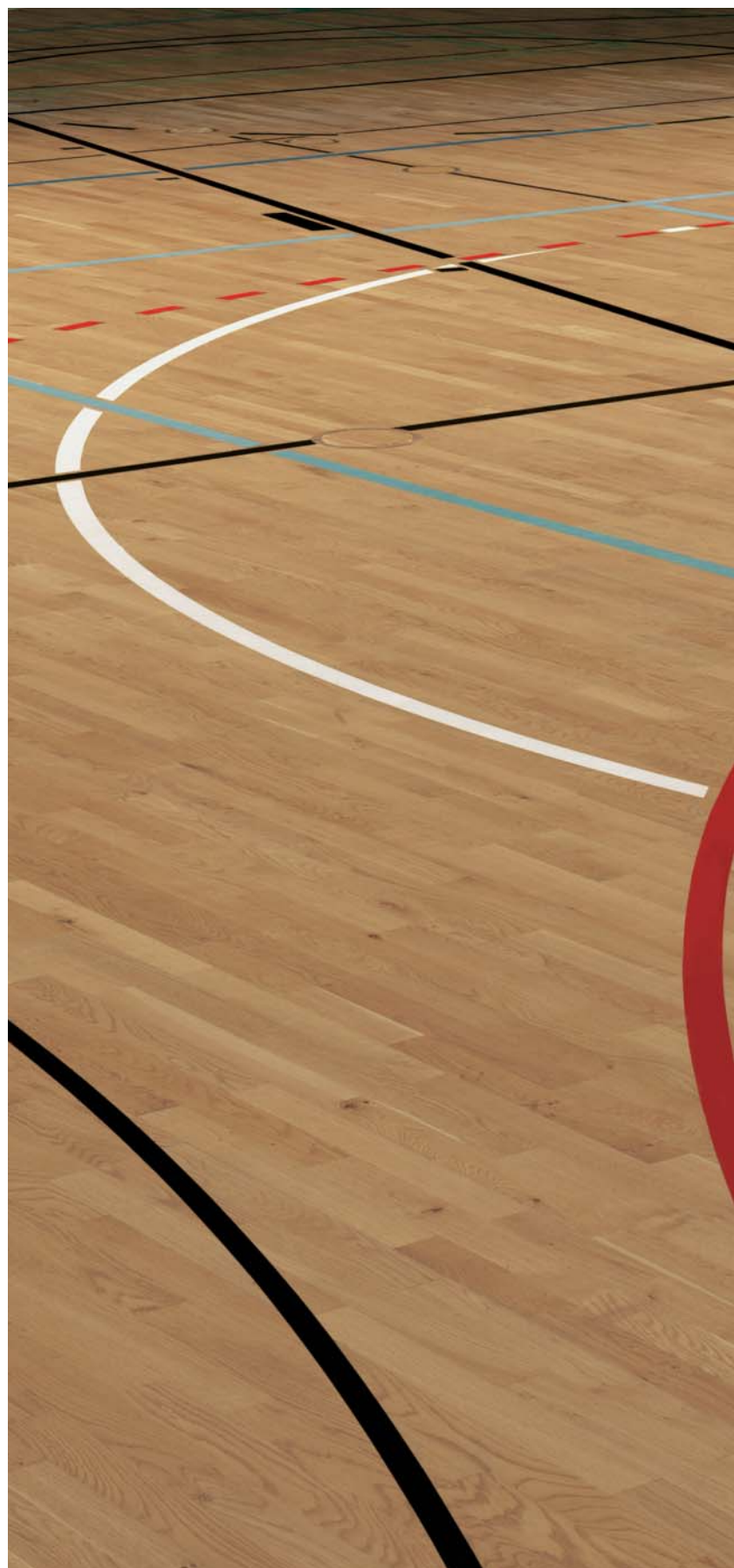
#### **Vacuum lifting pad**

With this special tool, the HARO floor plates can be quickly unlocked and removed.



#### **Cleaning and care program**

To ensure that a sports floor performs to its full potential even after years of use, it should be treated regularly with the proper floor care products. We have developed a comprehensive, tried-and-tested floor care program that is optimally formulated for the different materials used in our sports flooring.





Exclusive to HARO:  
The lines are applied with a special two-component paint that creates a chemical bond with the PERMADUR® finish. No further coat of finish needs to be applied over the game lines to protect them. Simple. Effective. Easy to maintain.

# STRATEGY 10

## You want to have HARO on your team when your game is on the line.

HARO stands for first-class consultation and comprehensive service. Our services are not just limited to selling you a sports floor, but go far beyond that – from the project planning phase through to its completion and beyond. Our experts provide technical support on every continent of the world. We are your reliable partner for assessing the current condition of your floor, for optimizing project planning and for a qualified installation. In addition, we provide advice in all aspects of routine cleaning and maintenance. Perfect full service – from kick-off to the final whistle.

### HARO Sports Floor

- Construction and assembly in our own plant
- Consultation for renovations and new buildings
- Plan optimization and technical design
- Support and end-to-end handling of installation
- Refurbishment and renovation work
- Care instructions
- Cleaning and care products





Since 1971, Peter Hamberger has successfully guided the company's destiny as the managing director. Dr. Peter M. Hamberger joined the management board in 2002. Today, the fourth and fifth generations are jointly managing the company.

## Trusting through experience

With sports floors from HARO you experience the ultimate sportive performance, technical competence and personal safety for students, amateurs and professional athletes, for planners and architects, associations, municipalities and public institutions. All of them rely on a large and reliable manufacturer with more than 50 years of experience. As a manufacturer of branded quality products, it goes without saying that environmental awareness is a key element of our corporate philosophy. After all, we work with nature each and every day and as anyone who does, we treat nature with great respect. Not the exploitation of the forest, but its ecologically sustainable management governs our actions.

We have been certified according to DIN EN 14001 and validated to the EU Eco Audit since 1998 for our commitment to the preservation of natural resources. In 2003, we were awarded the European PEFC certificate, which is proof that the timber we use can be traced and tracked throughout the entire product supply chain – called the “chain of custody” – from the certified, sustainable forest all the way through to the final product.

**HAMBERGER®**

**ISO 9001**  
quality system approved

**HAMBERGER®**

**ISO 14001**  
environmental quality





# RESPECT



**The HARO headquarters:**  
Aerial view of the company's  
250,000 m<sup>2</sup> premises  
located in the foothills of  
the Bavarian Alps.

Our commitment to environmental safety is also reflected by our entire production cycle. We think not only in terms of economy, but also ecology. For this reason, we operate a high-performance combined heating and power station. Here, a modern furnace unit converts the waste wood into heat for the production processes and heating facilities and into ecological power. The output corresponds to the power requirement of 60,000 households.

To preserve and protect the environment, we will continue to invest in progressive ecological technologies. In times of a growing shortage of resources, we rise to meet this challenge.

# HARO<sup>®</sup>

## Sports Flooring

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