



TM
ECO-KARGRIP



**Anti-slip mats, made of recycled
rubber, for cargo securing**





““Every year we invent new ways to give a second life to thousands of tons of secondary raw materials from end-of-life tires””

Marco Ferramini

Who we are

CASEI ECO-SYSTEM is an ever-growing innovative and dynamic company that develops high-level products since 2003, starting from a simple but powerful idea: only those who produce with the environment in mind also think about the future.

CASEI ECO-SYSTEM is the market leader in the manufacturing of products made with recycled rubber from end-of-life tires. In fact, the main objective is the valorisation of secondary raw materials.

With twenty years of experience and two production plants located in northern and central Italy, the company is committed to continuous investments both in product innovation and in the production process. In 2023 alone **CASEI ECO-SYSTEM** has processed over 8,000 tons of tires otherwise destined for destruction.

From the use of this material, we obtain highly competitive products which include flooring and equipment for gyms, rolls for soundproofing, urban furniture, elements for road safety and special products upon customer's request.

The CASEI ECO-SYSTEM factory in Molino dei Torti (AL)

The historical plant of **CASEI ECO-SYSTEM** in Molino dei Torti is one of the most innovative in the world in the sector in which we operate. It uses the most advanced technologies available nowadays, completely designed within the company and putting to use the know-how gained in over 20 years of activity.

In the Molino dei Torti factory we produce several products for multiple applications, among which the most important ones are the flooring for sports, amateur and professional use, flooring for playgrounds, anti-vibration products and products for urban furniture.

Thanks to the expertise and experience of our entire team, we are among the market leading companies in many of these sectors.

The total covered area between production, offices and warehouses is over 7,000 m². In particular, the warehouse is equipped with over 700 pallet spaces to provide an adequate advanced logistics service to our customers, all in a total area of over 74,000 m².

The plant can be defined as "zero impact" on the environment, as all waste material is reused.

Factory in Molino dei Torti (AL)





We firmly believe in what we do,
Because one thing is talking about the environment
Another is putting it at the center of everything



The CASEI ECO-SYSTEM factory in Montepandone (AP)

CASEI ECO-SYSTEM firmly believes in the use of recycled rubber.

For this reason, since 2022 it has opened its second Italian production plant in Montepandone, whose main operation is the production of rolls and sheets from recycled rubber, intended for different sectors, of which the most important are construction, acoustics and professional sports flooring.

Thanks to this new, highly technological factory, **CASEI ECO-SYSTEM** has significantly expanded its range of products and production capacity.

The new factory is equipped with innovative and cutting-edge technologies, highly automated production lines in order to guarantee the quality and the compliance with the strict technical and performance characteristics that have always distinguished the products made by the **CASEI ECO-SYSTEM** brand.

In an increasingly global market, parallel to the quality of the product, that of the packaging must be aligned; to support this idea, **CASEI ECO-SYSTEM** has made significant investments in its packaging line, as well as in the storage area, to offer its customers the possibility of making use of just-in-time deliveries for the most common sizes.

From a long-term perspective, with the opening of the second factory in Montepandone, in the province of Ascoli Piceno, **CASEI ECO-SYSTEM** acquires greater flexibility in terms of production capacity and quality and adds an important asset in completing the range of its production.

This is an important strategic development of the company, according to its values both in terms of quality and eco-sustainability, which have always characterized its products and its vision of the green economy.



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ECO-KARGRIPTM

“ STABILITY FOR A
WORLD IN MOTION

Eco-friendly, reliable and
cost-saving solutions to
keep goods secure
across road, sea,
air and rail transport.



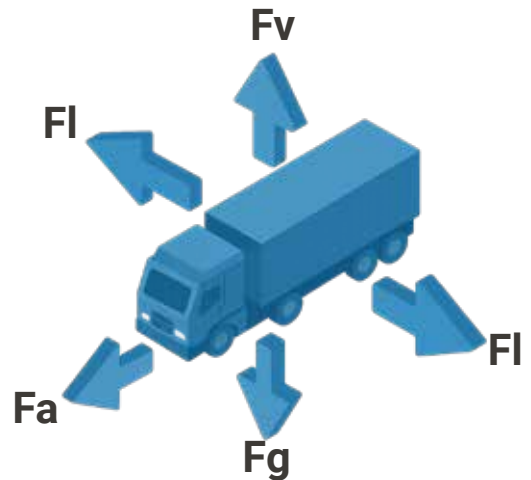
Safety is a matter of friction

Forces acting during transport:

During transport, a load is subject to multiple forces acting in different directions, depending on braking, acceleration, cornering, vibrations, and load platform inclination.

The main forces involved are:

- **Gravity force (F_g):** acts vertically downward according to the cargo mass.
- **Deceleration force (F_a):** mainly generated by sudden braking, it can push the cargo forward with a force up to 0.8 times its weight.
- **Lateral forces (F_l):** occur when cornering or changing direction.
- **Vertical forces (F_v):** caused by bumps, potholes, or uneven road surfaces.



According to the German standard VDI 2700 Part 1, load securing must consider longitudinal forces equal to 80% of the load weight and transverse forces equal to 50%. If these are not counteracted by friction or securing systems, the load will move.

The role of static and dynamic friction:

Static friction prevents an object at rest from starting to move relative to a surface, representing the initial resistance to slipping.

Dynamic friction occurs when the object is already in motion and is generally lower than static friction.

For load securing calculations, VDI 2700 refers to the dynamic coefficient of friction (μ), as it more accurately represents real transport conditions.

The friction value depends on the normal force (load weight) and on the coefficient of friction between the contact surfaces.

On clean, dry surfaces, the coefficient typically ranges between 0.3 and 0.4. With anti-slip materials such as **ECO-KARGRIP™**, values of $\mu \geq 0.6$ up to approximately 0.75 can be achieved, determined using methods consistent with VDI 2700.

A higher friction coefficient contributes to improving the overall effectiveness of load securing systems.

Why anti-slip materials are essential

The use of anti-slip mats does not replace securing systems, but enhances their effectiveness. A high-quality anti-slip material:

- Increases the friction coefficient between the load and the loading surface
- Improves the distribution of contact pressure
- Reduces wear on surfaces and packaging
- Helps reduce the forces that must be counteracted by lashing systems

VDI 2700 highlights that the correct use of anti-slip materials can significantly reduce the residual forces that must be restrained by mechanical securing devices.



Factors affecting load securing:

Load stability during transport does not depend only on the forces involved, but also on a range of operational and environmental variables that can significantly influence the effectiveness of load securing.

Key factors to consider include:



Type of contact surface

Smooth, wet, or oily materials reduce the available friction between cargo and floor. The use of anti-slip supports with a tested friction coefficient greatly improves stability.



Load distribution

Unbalanced or poorly positioned loads generate instability that increases the risk of slipping, tipping over, or deformation of anchoring systems.



Securing method used

The effectiveness of straps, chains, or bars depends on correct tensioning, angle, and the number of anchoring points. An anti-slip materials can reduce the forces required to hold the cargo in place.



Environmental conditions

Rain, frost, or temperature fluctuations can compromise the grip and resistance of both the cargo and the loading surface. Stable solutions must be employed even in the presence of moisture or sudden temperature changes.



Wear and condition of the loading surface

Deformed, rusty, or dirty surfaces reduce adhesion and load stability. Simple preventive cleaning and the use of anti-slip mats help restore optimal conditions

An effective load securing system does not rely on force alone, but on the correct combination of friction, load distribution, and material selection. Neglecting even one of these factors can compromise overall transport safety.

Reference Standards

Directive 2014/47/EU – Duties and responsibilities:

Directive 2014/47/EU regulates roadside technical inspections for commercial vehicles operating within the European Union.

A key aspect of the directive concerns load securing, considered essential for transport safety.

The directive highlights the need to ensure that:

- The load is positioned and secured in such a way as to remain stable during transport, even in the event of braking or sudden manoeuvres.
- All parties involved in the loading process (drivers, loaders, companies) ensure compliance with safety requirements.
- Authorities may take action, including suspending the journey, if the load is not properly secured.



VDI 2700 – Friction coefficients and test methods:

VDI 2700 is one of the main technical references in Europe for the calculation and verification of load securing. In particular:

Part 1 defines the acceleration values to be considered:

- **0,8g** in the longitudinal direction (braking),
- **0,5g** in the transverse direction (cornering),
- **0,5g** in the vertical direction (lifting/bouncing).

Part 14 defines the test method for determining friction coefficients relevant to load securing. For the design of securing measures, reference is made to the coefficient of friction (μ), determined in accordance with VDI 2700.

In practical applications, anti-slip materials with values of $\mu \geq 0.6$ are generally considered suitable, depending on test conditions and contact surfaces. These values form the basis for load securing calculations and are frequently required in technical specifications.

Why choose **ECO-KARGRIP™**

Discover the advantages:

ECO-KARGRIP™ is designed to provide effective support for load securing, offering reliable and consistent performance even after repeated use. Made from high-density recycled rubber, it maintains its effectiveness over time.

The production process ensures consistency and stable technical properties. The availability in different formats—rolls, strips and mats—allows targeted application based on specific load requirements, facilitating securing operations and improving stability during transport.

Italian excellence, practical value:

Choosing **ECO-KARGRIP™** means relying on a product designed, developed and manufactured entirely in Italy, in a facility specialized in processing recycled rubber from ELT (end-of-life tyres). Careful management of all production stages ensures consistent quality and operational efficiency.



ECO-KARGRIP™



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ECO-KARGRIP™
coefficient of friction
up to **0,75 μ^***

* Calculated with a dry loading surface and load distributed on a wooden EUR pallet.

Products Range

The **ECO-KARGRIP™** range includes a variety of solutions designed to meet the practical needs of cargo handling across road, rail, and maritime transport.

Each format is developed to simplify application in specific contexts, optimizing coverage, handling, and performance. From large continuous surfaces to localized contact points, the range offers reliable, ready-to-use solutions that integrate easily into loading operations.

Advantages:

- **Dimensionally stable:** maintains shape and grip even under load
- **Tear-resistant:** long-lasting, even under intensive use
- **High coefficient of friction:** reliable grip in all conditions
- **Durable:** resistant to wear and long-term degradation
- **Temperature resistant:** suitable for all weather conditions

Available versions:

ECO-KARGRIP™ is available in different formats to suit a wide range of load securing requirements.

A solution for every need: **ECO-KARGRIP™** can be supplied as rolls, strips, or mats, ensuring the right configuration for every type of load.

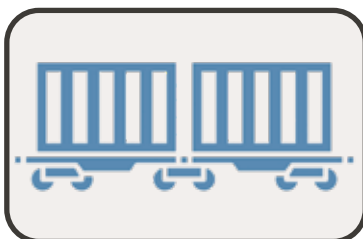
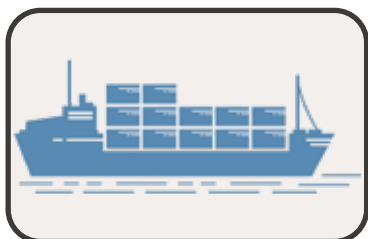
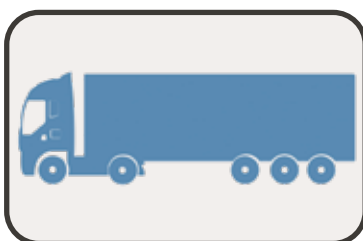
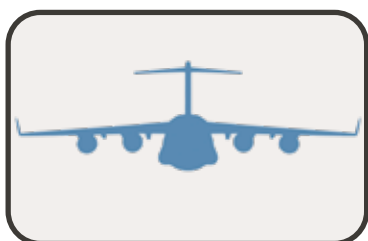
 **ECO-KARGRIP™ ROLL** > rolls ideal for covering large surfaces

 **ECO-KARGRIP™ STRIP** > custom-cut strips for linear contact points

 **ECO-KARGRIP™ MAT** > compact and versatile mats for localized applications

All products within the **ECO-KARGRIP™** range are available in multiple sizes and thicknesses.

Ideal for:



”

Supports compliance with
Directive 2014/47/EU
for load securing.
Tested according to **VDI 2700**.



ECO-KARGRIP™ ROLL

ANTI-SLIP ROLLS FOR LARGE SURFACE COVERAGE

ECO-KARGRIP™ ROLL is the ideal solution for protecting and stabilizing large surfaces. The roll format allows continuous application without interruptions, reducing discontinuity points and improving overall load grip.

Particularly suitable for large truck beds, loading platforms, and surfaces subject to repeated handling, this format ensures high coverage with reduced installation time. The flexibility of the roll also allows on-site custom cutting, adapting quickly to specific configurations.

Dimensions:

ECO-KARGRIP™ ROLL is available with a fixed width of 1250 mm and in various thicknesses and lengths. Please refer to the table for details.

THICKNESS (mm)	LENGTH (m)	HEIGHT (m)	SQM/ROLL
3	20	1,25	25
4	16	1,25	20
5	12	1,25	15
6	10	1,25	12,5
7	9	1,25	11,3
8	8	1,25	10
9	7	1,25	8,8
10	6	1,25	7,5

ECO-KARGRIP™ ROLL

Coefficient of friction:

ECO-KARGRIP™ ROLL offers a documented coefficient of friction higher than the reference value of $\mu = 0.6^*$, commonly used for anti-slip materials in load securing. The indicated value takes into account the declared test conditions and the evaluation method defined by VDI 2700.

** Contact us for details of the reference test.*

Standard colours:

The rolls are manufactured in black, with a textured surface obtained by the addition of EPDM granules.



ECO-KARGRIP™ STRIP

ANTI-SLIP STRIPS FOR LOAD SECURING

ECO-KARGRIP™ STRIP is produced by longitudinal cutting from anti-slip rubber rolls. This process allows the creation of slim and versatile formats, ideal for placement under pallets, beams, or linear elements. They are available in various widths and lengths to suit different load stabilization needs without taking up unnecessary space.

Dimensions:

ECO-KARGRIP™ STRIP is available in various thicknesses and sizes, with a minimum width starting from 50 mm, manufactured according to the following parameters:

FEATURES	VALUE	TOLERANCE
Length (mm)	Upon request	± 3 %
Width (mm)	Upon request (≥ 50 mm)	± 3 %
Thickness (mm)	3, 4, 5, 6, 7, 8, 9, 10	± 10 %

Coefficient of friction:

ECO-KARGRIP™ STRIP offers a documented coefficient of friction higher than the reference value of $\mu = 0.6^*$, commonly used for anti-slip materials in load securing. The indicated value takes into account the declared test conditions and the evaluation method defined by VDI 2700.

** Contact us for details of the reference test.*

Colori standard:

ECO-KARGRIP™ STRIP is manufactured in black, with a textured surface made with EPDM granules.



ECO-KARGRIP™ MAT

ANTI-SLIP MATS, COMPACT AND VERSATILE FOR LOCALIZED APPLICATIONS

ECO-KARGRIP™ MAT is made from recycled rubber rolls, mainly sourced from end-of-life tyres (ELTs), and cut to size in both length and width. They are designed to be placed under specific cargo support points. Their compactness makes them ideal for localized use, improving friction exactly where it is needed.

Dimensions:

ECO-KARGRIP™ MAT is available in various thicknesses and sizes, in square or rectangular formats, providing a versatile solution for a wide range of cargo transport applications.

FEATURES	VALUE	TOLERANCE
Length (mm)	Upon request (≥ 50 mm)	± 3 %
Width (mm)	Upon request (≥ 50 mm)	± 3 %
Thickness (mm)	3, 4, 5, 6, 7, 8, 9, 10	± 10 %

Coefficient of friction:

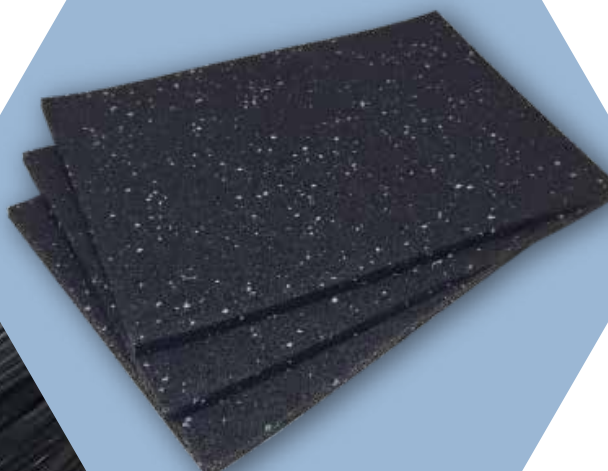
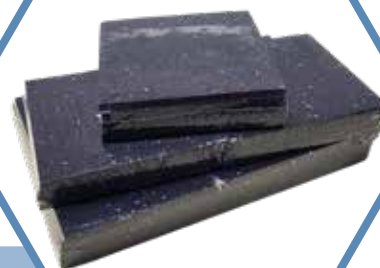
ECO-KARGRIP™ MAT offers a documented coefficient of friction higher than the reference value of $\mu = 0.6^*$, commonly used for anti-slip materials in load securing. The indicated value takes into account the declared test conditions and the evaluation method defined by VDI 2700.

** Contact us for details of the reference test.*

Standard colours:

ECO-KARGRIP™ MAT is manufactured in black, with a textured surface obtained by the addition of EPDM granules.

ALSO AVAILABLE
PACKAGED



ECO-COIL TRAP

STABILISING BASE FOR COILS

ECO-COIL TRAP is a stabilising base designed for the safe transport of heavy coils, such as steel coils and paper reels.

Made of recycled rubber from end-of-life tyres (ELT), the product features a central recess on both sides that creates a wedge effect, reducing the lateral movement of the transported coils.

This unique design ensures a secure grip on the coil, improving stability during transport. Reflective strips on both sides provide greater visibility and safety, even in low-light conditions.

Applications:

ECO-COIL TRAP is ideal for use in the transport and logistics of heavy metal coils and paper reels.

Its wedge effect on both sides of the recess keeps coils stable on trucks, containers and storage areas, preventing unwanted movements during transport.

Environmental Sustainability:

ECO-COIL TRAP is manufactured from secondary raw materials derived from end-of-life tyres and can be recycled again at the end of its service life.

This sustainable approach reduces environmental impact and promotes the circular economy, making it an eco-friendly solution for the transport industry.

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ECO-COIL TRAP
the ecological solution
for safely transporting
large coils

ECO-COIL TRAP



Dimensions:

ECO-COIL TRAP is available in a single standard size of 1 metre by 1 metre, with a thickness of 50 mm.

This dimension has been optimised to be versatile and suitable for the transport of coils of different sizes and weights.



Standard Colours:

The product is available exclusively in black and is equipped with two reflective bands on the sides to improve visibility and safety during transport.



ECO-COIL TRAP

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ECO-FRIENDLY

the stabilising base is
made from secondary
raw materials



Areas of application

Every transport operation presents specific challenges: type of load, contact surface, and operating conditions. **ECO-KARGRIP™** adapts to different scenarios, offering effective solutions to increase friction and improve stability, from pallet transport on road vehicles to localized applications under coils or supports.

Anti-slip mats contribute to improved grip between the load and the loading surface, reducing unwanted movement during braking, cornering, or multimodal transport (road, rail, sea).

Palletized goods:

When transporting palletized loads, the contact surface between the pallet and the vehicle bed is often smooth or affected by dust, moisture, or residues. Under these conditions, friction may not be sufficient to prevent unwanted movement during braking, cornering, or changes in direction.

The use of anti-slip strips such as **ECO-KARGRIP™ STRIP** between the pallet and the loading surface significantly improves load stability. The effect is twofold: it enhances safety while potentially reducing the number of lashing straps required, provided that applicable regulations are followed and certified friction values are known.



Pipes, beams and coils:

Cylindrical or linear loads (such as coils, metal beams, pipes, or profiles) have limited and often unstable contact surfaces, making them prone to rolling or slipping, especially during braking or directional changes.

The use of anti-slip mats such as **ECO-KARGRIP™ MAT** at contact points helps increase friction, even in the presence of shaped supports or uneven surfaces.

In steel coil transport, for example, it is common practice to place anti-slip materials within the coil "cradle" or between the coil and side blocks to limit movement and keep the load centered.

For long beams or pipes supported at multiple points, the targeted placement of anti-slip mats at contact areas reduces both longitudinal and transverse sliding, ensuring more stable and secure load restraint.



Contact points with spacers or supports:

Not all loads rest directly on the loading surface: in many cases, intermediate supports such as wooden spacers, metal elements, or shaped crossbeams are used to distribute weight or protect the cargo.

In these scenarios, **ECO-KARGRIP™** acts locally at each contact point, increasing friction between load and support, or between support and loading surface. This is particularly beneficial for delicate materials, unstable loads, or stacked elements, where even small variations in grip can make a significant difference.



Economic benefits

Beyond improving load safety, the use of **ECO-KARGRIP™** anti-slip mats enables significant cost savings across the entire logistics chain. A cost-effective investment that delivers measurable benefits from the very first loading operations. Here's how:

Reduced number of lashing straps:

According to VDI 2700 calculation principles, the use of anti-slip materials with a documented coefficient of friction can reduce the residual forces that must be restrained by lashing systems or other securing methods.

Faster loading and unloading:

A stabilized load requires fewer checks and adjustments, simplifying operator handling. This reduces overall handling time, improves logistics efficiency, and supports higher vehicle turnover.

Reduced packaging materials:

In many cases, the use of **ECO-KARGRIP™** makes it possible to reduce or eliminate pallets, stretch film, wedges, or other filling materials traditionally used to prevent slipping. This results in direct savings on both material costs and disposal expenses.

Reduced risk of cargo damage:

Limiting internal movement within the load compartment significantly reduces accidental damage to goods, such as dents, breakage, abrasion, or packaging deformation. This leads to fewer returns, fewer claims, and higher end-customer satisfaction.

ECO-KARGRIP™



Related risks

An inadequately secured load is not only a regulatory non-compliance, but a real risk for people, goods, and companies. Even small movements can generate considerable forces during braking or cornering, with serious and often avoidable consequences. Below are the main areas of impact:

Risks to driver and third-party safety:



In the event of sudden braking or a collision, an unstable load can effectively become a projectile.

Many accidents in heavy transport are caused or worsened by improperly secured cargo.

Vibrations, shocks, and loading surface inclinations further increase the risk, even at moderate speeds.

Economic damage and insurance claims:



Damage to goods is one of the most common consequences of an unstable load. Deformed packaging, broken or unusable products result not only in direct costs (returns, replacements, disposal), but also in indirect losses such as delivery delays, customer dissatisfaction, and reputational damage.

In addition, many insurance policies include limitations or exclusions if the load was not secured in accordance with applicable standards.

Penalties and legal responsibilities:



Responsibility for load securing does not lie solely with the driver, but may also involve the loader, consignor, and consignee.

According to Directive 2014/47/EU, roadside inspections include verification of load securing. In cases of non-compliance, administrative penalties may apply, along with vehicle immobilisation and, in more serious cases, legal liability in the event of harm to persons.

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Securing the load means protecting lives, goods, and reputation.





NOTE

[illegible]



Industrial **Vision**, Green **Spirit** to transform recycled rubber into innovative products, thus helping to reduce pollution and preserve the beauty of our planet.



VISIT THE WEBSITE



Scan



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