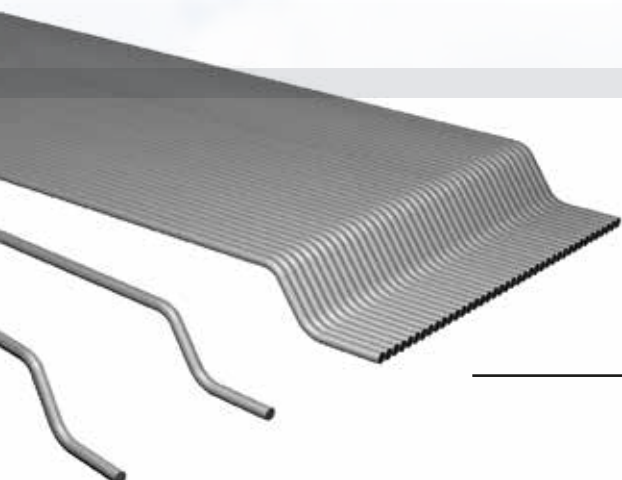




# STEEL FIBER

FOR CONCRETE REINFORCEMENT





KAYSERİ FABRİKA



# ABOUT US

Kemerli Metal was established in Kayseri, one of the leading industrial centers of Turkey. Kemerli has a wide range of activities and strong infrastructure in the steel industry and produces steel fiber for concrete reinforcement with Kemerix brand and industrial staples under the Kemerli brand.

Kemerli supports creativity and team spirit for its employees. it offers a transparent working environment that allows personal development, where company goals are internalized at all levels, and where ideas can be shared freely. in this regards; with organizational culture and effective teamwork, young and dynamic management team analyzes the market data in the best way and provides the most accurate solutions to the expectations of its customers.

Sustainability is one of the core values of Kemerli Metal and it aims to act in harmony with our customers and the world within the framework of this value. In accordance with this purpose; Clean production methods and circular economy principles are at the center of our production processes. We are on our way to becoming carbon neutral by supporting the amount of carbon generated as a result of our activities with renewable energy studies. While we use resources more effectively with energy efficiency strategies, we continuously evaluate the environmental impacts of our products through life cycle analysis and make improvements. In this way, we are committed to fulfilling our responsibilities for a sustainable future by providing environmentally friendly and high quality products and services.

Kemerli supports its sensitivity to quality, environment, occupational health and safety with TS EN ISO 9001 Quality Management System, TS EN ISO 14001 Environmental Management System, TS ISO 45001:2018 Occupational Health and Safety Management System certificates.

It offers services and products with CE and TSE product conformity certificates for compliance with international standards. it continues its research & development activities continuously.

Kemerix is used in many brand projects in Turkey and around the world, saving labor, cost and time.

Kemerix uses internationally recognized design and calculation methods. it provides static design reports with university collaborations and qualified expert staff. it provides effective solutions to customer expectations by providing technical support on site at the time of product application.





SMALL IN SIZE

**BIG IN IMPACT**

## What Is Kemerix?

Kemerix Steel Fiber Reinforcement is produced from high-strength steel raw material in accordance with CE and TSE standards and added to concrete.

Studies on improving the properties of materials by reinforcing them with fibers date back to ancient times. It is known that mudbrick material was used by mixing it with vegetable fiber and straw.

The tensile strength of concrete is quite low, so static tensile stresses should be avoided in the design of concrete elements.

Tensile stresses are inevitable under dynamic loading. Tensile stresses cause crack widening, resulting in many deformations from one crack in concrete. Reinforcement of concrete with steel fibers is the most effective way to increase ductility and the resistance of concrete against crack development.

The steel fibers are distributed homogeneously in a controlled and safe manner in all directions of the concrete, including the surface and edges. This results in a 3D reinforcement system.

Kemerix adds ductility to the fragile concrete structure. By absorbing more structural load, concrete gains effective resistance against deformations such as cracking. Thus, the service life of the structure, which we can express as durability increases.



## Economic



- The labor of placing and connecting mesh steel is eliminated. Installation errors that may occur with traditional reinforcement are eliminated. (Rust allowance, overlap length etc.)
- Saves time by adding directly into the concrete.
- Eliminates the rust margin in shotcrete application in tunnels and significantly reduces rebound.
- Concrete is saved.
- Provides 10-15% economy in total project cost compared to steel mesh.
- Reduces maintenance and repair costs

## Technical

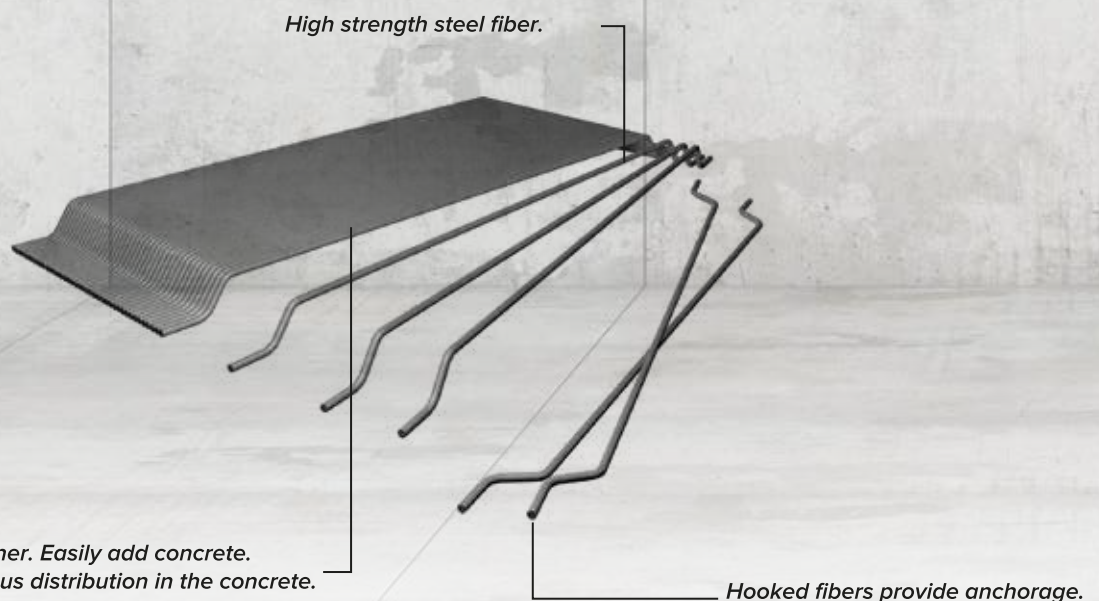


- Ductility increases (Ductility, Plastic deformability)
- Ability to fulfill its functions throughout the service life of the structure property increases (Durability)
- Acts as primary reinforcement. No need for rust allowance and trestles.
- Increases fatigue and impact resistance against repeated loads.
- Exhibits effective anchorage and high tensile strength.
- Reduces surface permeability, dusting and abrasion.
- Increases thermal shock resistance (Freezing - Thawing)
- Increases energy absorption capacity (Toughness).
- Load carrying capacity increases after cracking
- Effective crack control control is ensured
- Increased flexural strength

## Practical



- Kemerix, which is produced with glued and optimum length/diameter ratio for homogeneous mixture and easy application, is easily added to the concrete batching plant or in the trans mixer.
- The vibration used during pumping and placement ensures that the steel fibers rotate and align in certain directions. 3D dimensional reinforcement system is obtained. Improves many material properties.





# Industrial Floors

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Industrial floor concretes are an important part of the building system. During the service period, there should be no deformations such as cracking and abrasion.

Industrial floor concretes exposed to traffic loads of transportation vehicles such as trucks, lorries and forklifts should also be able to carry the storage and shelf loads of materials with high unit volume weight. The fatigue resistance of the floor slab should be high due to the repeated load effect.

Slab concretes should have as few joints as possible that do not interfere with the operation of material handling and storage systems and do not require excessive maintenance. Abrasion resistance must be high to prevent dusting on the surface.

The floor slab must have sufficient flexural strength to transfer loads to the subfloor without deformation. For this reason, slab concrete should be designed to meet the needs and expectations of the user. An industrial floor concrete in need of maintenance will bring both high repair costs and cause loss of work during the repair period.

## ***Advantages of using Kemerix in industrial floor concretes;***

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- Steel fiber reinforcements are homogeneously distributed in concrete. 3 dimensional reinforcement system is obtained.
- The load carrying capacity of concrete increases.
- Fatigue and impact resistance increases with the increase in the energy absorption capacity of concrete.
- Effective crack control is provided. It significantly improves the mechanical properties of concrete by cutting the path of micro cracks and prevents the formation of macro cracks. Maintenance costs are reduced.
- The ability of the structure to fulfill its functions throughout its service life, durability increases.
- Eliminates steel mesh labor by adding directly to the concrete in the concrete plant or trans mixer.
- Installation errors that may occur with traditional reinforcement (rust allowance, overlap length, etc.) are eliminated.
- Total project cost is reduced.



# Tunnels and Mines

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Shotcrete is applied by spraying specially designed concrete with finer grain and higher cement ratio than normal concrete with a high pressure pump. Shotcrete is used in projects such as tunnels, subways, mines, dams and slope stabilization. The use of steel mesh in shotcrete brings along the following problems that arise during and after the application.

These problems are;

- Placing steel mesh is difficult, takes a lot of time and causes work accidents.
- In steel mesh applications, the adhesion of shotcrete varies a lot and the rebound is very high, especially on the ceiling as 40%.
- In shotcrete applications with steel mesh, the cross-sectional geometry has disadvantages. It causes the steel mesh not to be placed with the appropriate pass allowance and causes excessive amounts of shotcrete to be used.
- The use of steel mesh causes the gap between the tunnel geometry and the steel mesh not to be filled. therefore, the coating is open to external factors such as moisture and water, which reduces the strength.

## ***Benefits of using Kemerix for shotcrete applications;***

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- There is no need to use steel mesh, saving labor and time. Work accidents do not occur.
- Due to the load bearing properties of steel fiber reinforced shotcrete, the coating thickness is smaller compared to steel mesh coating. and with the benefit of steel fiber reinforced shotcrete coating in terms of cross-sectional geometry against shotcrete coatings containing steel mesh, less shotcrete is used. thus economizing the total project cost.
- In case of sudden and highly destructive dynamic stresses such as rock explosion, the most important function of steel fiber reinforced shotcrete is ductility. with shotcrete pavements.
- Shotcrete pavement is subject to shrinkage, the use of explosives and the dynamic effect of rock blasting. Effective control of cracks caused by cracks is possible with the use of steel fiber reinforcements with high energy absorption capacity.
- Prevents the formation of cracks.



# Concrete Roads

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Concrete roads are designed depending on factors such as bearing capacity of the soil, traffic load, current and expected traffic volume, driving safety and comfort, ground and environmental conditions.

During the service period, the road superstructure must be of sufficient strength and durability as it is directly exposed to traffic load and environmental conditions. Factors that wear out the concrete used in concrete pavements include temperature and humidity variations and differences, freeze-thaw, overloads, repetitive loads and harmful chemicals.

The most important issue in the design of concrete roads is the determination of the concrete pavement thickness. The behavior of the concrete pavement resting on the foundation layer is theoretically similar to the behavior of rigid slabs resting on elastic soil.

## ***Benefits of using Kemerix on concrete roads;***

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- The bearing capacity of the concrete road is increased and the loads on it are spread over a much wider area and safely transmitted to the subgrade.
- Provides fatigue resistance to concrete under repeated loads.
- Longitudinal cracks are effectively reduced, ensuring driving safety and comfort.
- Prevents the formation of macro cracks by blocking the path of micro cracks that may occur as a result of freeze-thaw effect.



# Precast Structures

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In traditional reinforced infrastructure elements, the preparation and application of reinforcement is labor and time consuming.

Tightness, compressive strength and resistance to chemical effects are the most sought after properties of concrete and reinforced concrete infrastructure materials.

Covered problems and the inability to keep the reinforcement fixed in the mold cause major problems.

## ***Use of Kemerix in precast elements;***

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It provides great benefits in terms of labor, time and cost. When steel fibers are used in concrete infrastructure elements, they prevent segregation and make great contributions to the solution of sealing problems.

In steel fiber peak compressive strength tests, concrete infrastructure elements perform a ductile fracture instead of a brittle fracture, and the structure continues to carry load up to a certain limit value.



## Coastal and Harbor Structures

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Unlike other coatings, port coatings are designed to meet the container traffic of heavy cargo ships. Possibilities such as humidity, wind and salt water effects, loading and unloading, impact effects, wave movements, tides and overloads are taken into consideration in port coatings.

Here, coating thicknesses and joint spacing can be reduced by using Kemerix steel fiber. With the 3D dimensional reinforcement system, effective crack control is provided, ensuring a longer life of the structure. Impact resistance is increased under repeated loads. Load carrying capacity of the floor increases.



## Other Application Areas

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- In the construction of earthquake resistant structures, in the column-beam joint area,
- Bulletproof Walls, Armories and Outposts, Security Structures
- Slope Stabilization
- Outdoor-Indoor Parking Lot Floor Concretes and Other Traffic Areas
- Fuel Stations
- Metro stations
- Topping Concretes
- Cold Storage Floor Concretes
- Landscaping and Walkways
- Under Rail Concretes
- Logistics Bases
- Waiting and Walking Areas
- Housing Screeds
- Animal Shelters
- Outdoor and Indoor Pool Concretes
- Irrigation Projects
- Hydrology and Flood Studies
- Channel Structures
- Drinking Water and Sewerage Projects
- Piled Floors
- Anti Seismic Structures
- Highway Curbs





# “ THE WORLD'S LARGEST AIRPORT PROJECT

We are  
proud to use  
**KEMERIX**  
at Istanbul New Airport



# Technical Support



Kemerli offers Static Design and Dosage Calculation Report Prepared with the KEMERIX RIJIT program according to Steel fiber Reinforced Industrial Floor Concretes TR 34 (Technical Report 34, Concrete Industrial Ground Floors - 3rd Edition, EUROCODE 2) Specification.

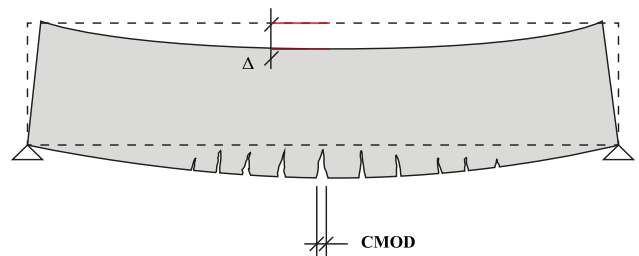
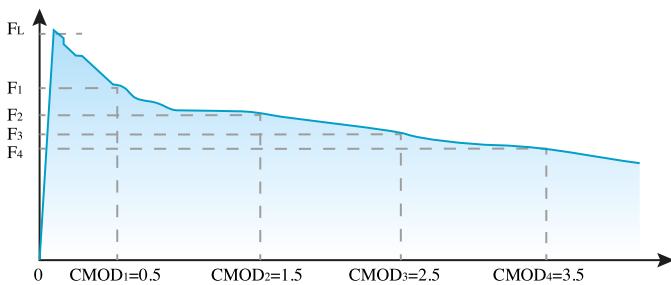
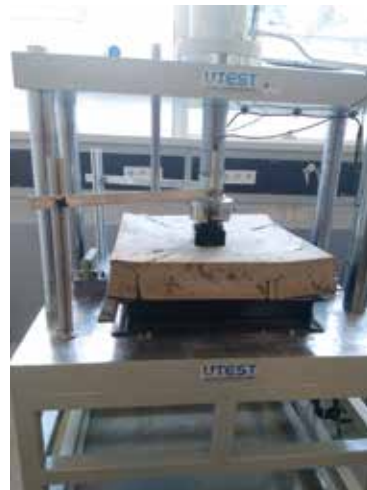
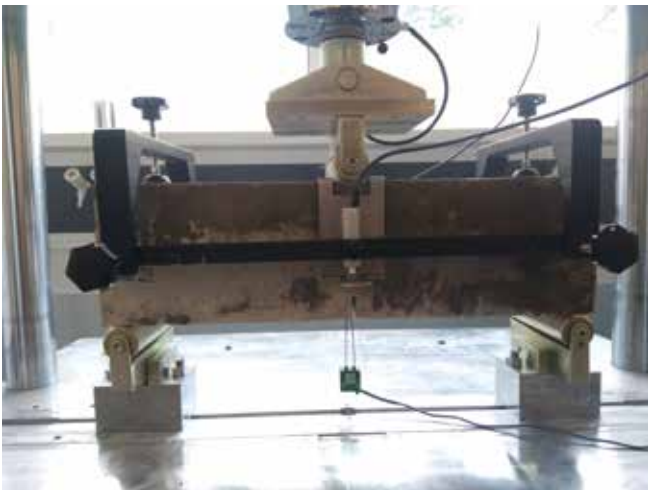
With university collaborations and qualified expert staff, EN 14651 - CMOD (Crack Opening Displacement) 3-point beam bending tests and EN 14888-5 concrete slab tests are carried out and special solutions are offered for projects.

It responds to customer expectations by providing technical support at the construction site during product application.

Kemerli recommends the use of glued products for homogeneous mixture and easy application.

The ACI (American Concrete Institute) committee believes that the best numerical parameter to describe a steel fiber is the equivalent fiber length. is the "aspect ratio", which is obtained by dividing the aspect ratio by the diameter. Kemerix is produced in the optimum length/diameter (slenderness) ratio. The presence of steel fiber reinforcement in the concrete in sufficient dosage improves both flexural strength and energy absorption capacity. In addition, the amount of fiber and fiber slenderness have a significant effect on the flexural strength, fracture energy and has a significant effect on satiety. You can contact our technical support staff for usage dosage.

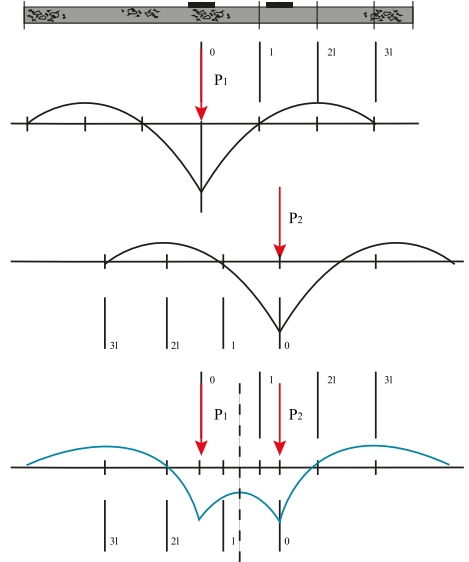
## *Kemerix Applied Concrete Test*



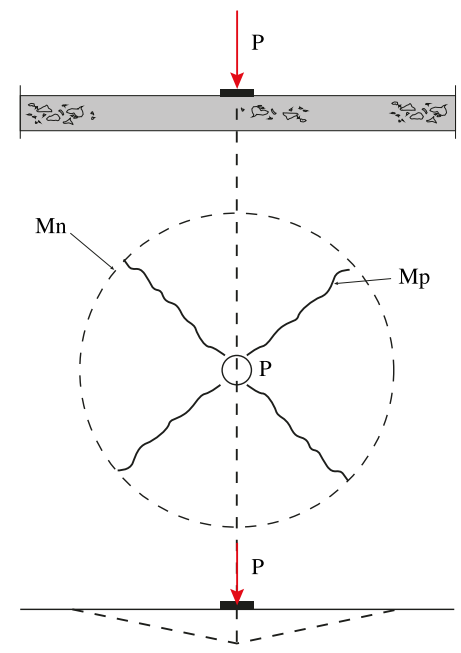
# Kemerix Static Design and Reporting



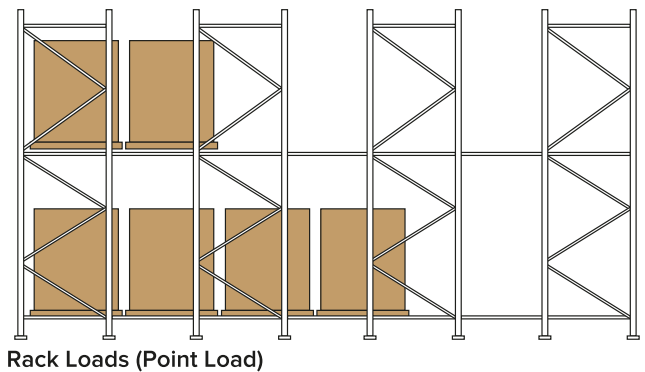
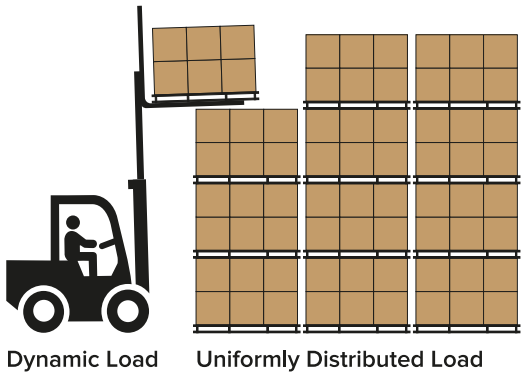
Static Design and Dosage Calculation Report of KEMERiX® Steel Fiber Reinforced Industrial Ground Floors Concrete according to TR 34 (Technical Report 34, Concrete Industrial Ground Floors - 3rd Editon, EUROCODE 2) Specification



## YIELD LINE THEORY



## LOADS ACTING ON THE STRUCTURE





**SUSTAINABLE  
DEVELOPMENT  
GOALS**



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