

# Teijin's Solutions in Anticipation of the Next 100 Years

Products and services that offer value to help solve social issues concerning the global environment

## Environmental Value Solutions

Faced with increasingly serious environmental issues, tighter regulations, and heightened needs for materials offering enhanced environmental performance, the Teijin Group is working to reduce CO<sub>2</sub> emissions and enhance fuel economy. To do so, the Teijin Group is harnessing technologies for reducing weight and increasing efficiency that it has developed over the years. By doing so, the Teijin Group aims to make a contribution to a 'low-carbon society,' a contribution to a 'recycling-based society,' and a contribution to a 'society to preserve the global environment.'



Products and services that support the healthy and happy lives of all people in every age group

# Demographic Change and Increased Health Consciousness Solutions



Japan's population has been aging rapidly with fewer children, and there has been an increase in the incidence of lifestyle diseases. These and other factors have only increased people's awareness of the importance of staying healthy and preventing diseases.

Through its home healthcare network platform and IT-driven solutions unique to the Teijin Group, the Company will make a contribution to "building a happy aged society," a contribution to "new-born/infant care," and a contribution to a "healthy life."



Products and services that protect human life and people's lifestyles from various natural disasters, accidents, crime and conflicts

# Safety, Security and Disaster Mitigation Solutions

Following a string of natural disasters, initiatives to ensure safety, security and disaster mitigation have been attracting more and more public interest.

Teijin is actively engaged in solutions that balance both safety and performance, including high-performance materials. We aim to make a contribution to "urban disaster prevention/mitigation," a contribution to "reducing fires and fatality/casualty accidents," and a contribution to "preventing and reducing crime, terror attacks, and conflicts."



Advanced fiber reinforced wood (AFRW) helps to increase the longevity of structures



The ultra-lightweight ceiling material *Kal-ten* helps to mitigate hazards during earthquakes



Highly heat-resistant aramid fiber is used on the front lines of firefighting



High-strength aramid fiber serves as a reinforcement material at public works sites



The emergency blanket *Motanka* that does double duty as a stretcher helps to reduce the time required to conduct rescues



Protecting human life with bullet-resistant vests made of aramid fiber



Supporting safety confirmation activities during disasters through emergency call systems

## An Innovative Ceiling Material Inspired by an Earthquake Recovery Project



# Ultra-lightweight ceiling material *Kal-ten*

### What is *Kal-ten*?

*Kal-ten* is an ultra-lightweight ceiling material made of *V-Lap*, Teijin's non-woven polyester fabric with vertically oriented fibers. This thin, lightweight ceiling material is able to minimize any damage that might be caused if parts of the ceiling were to fall to the floor. In addition, *Kal-ten* has outstanding sound absorbency and heat insulation properties and complies with rules for non-flammable materials prescribed by the Building Standards Act.

◎ Compared with conventional ceiling materials

Weight 1/10

Thickness 1/2



#### Needs of customers and society

- Mitigate damage during major earthquakes
- The need for safety measures for ceilings



#### Teijin's Strengths

- Technologies developed in the fibers field
- Ability to propose solutions



## Inspired by an Earthquake Recovery Project to Develop a New Ceiling Material

In the past, suspended ceilings had often fallen to the floor during major earthquakes. This has sparked renewed public awareness of the dangers posed by the collapse of ceilings, and there was a need for stronger safety measures for ceilings, including through amendments to the Building Standards Act. Previously, Teijin had used *V-Lap*, a non-woven polyester fabric with outstanding sound absorbency and heat insulation properties, as wall materials for temporary housing built following the Great East Japan Earthquake. This experience inspired Teijin to begin developing a ceiling material based on *V-Lap* that would be light and difficult to crack. *V-Lap* was modified and enhanced using Teijin's existing fiber technologies. As a result, we successfully developed a ceiling material that simultaneously realizes the desired lightweight, nonflammable, and surface rigidity properties.

At the time, Teijin had very few direct business dealings with the construction industry and we initially had to search in the dark for ways to develop the market. However, we gradually broke through this impasse by building and proposing total system solutions including installation methods. The *Kal-ten* TA Installation Method, an ultra-lightweight ceiling system that integrates *Kal-ten* with an aluminum framework, obtained general recognition as Japan's first lightweight ceiling structure to achieve compliance with regulatory requirements. Teijin earned a positive response from customers for its commitment to quality encompassing the pursuit of safety, and for providing total solutions spanning materials to installation methods. Teijin's ultra-lightweight ceiling system is now being successively adopted for use at large-scale shopping facilities, airports and other locations.



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Another attractive quality of *Kal-ten* is its wide variation of design options, offering expansive interior design possibilities.  
Fuji Speedway Restaurant "Orizuru" (Sunto District, Shizuoka Prefecture)

### Toward Further Growth

We will solve issues faced by the construction industry by offering comprehensive solutions spanning materials development to design proposals.

*Kal-ten* received the Good Design Award in 2017, in recognition of the safety afforded by this lightweight ceiling material should it fall during an earthquake, as well as its heat insulation and sound absorbency properties, high-quality texture and thoughtful design features reflecting factors ranging from settings of use to installation methods. Going forward, we will increase the competitiveness of *Kal-ten* by further refining installation methods, as we strive to realize an innovative ceiling material that turns conventional thinking in the construction industry on its head.