NIPPO

Сглаживающее эффект теплового острова и увеличивающее долговечность дорожного полотна
блокрующее тепловой нагрев дорог и тротуаров покрытие

PERFECT COOL

Площадь в парке при Императорском дворце,
Токио, Япония

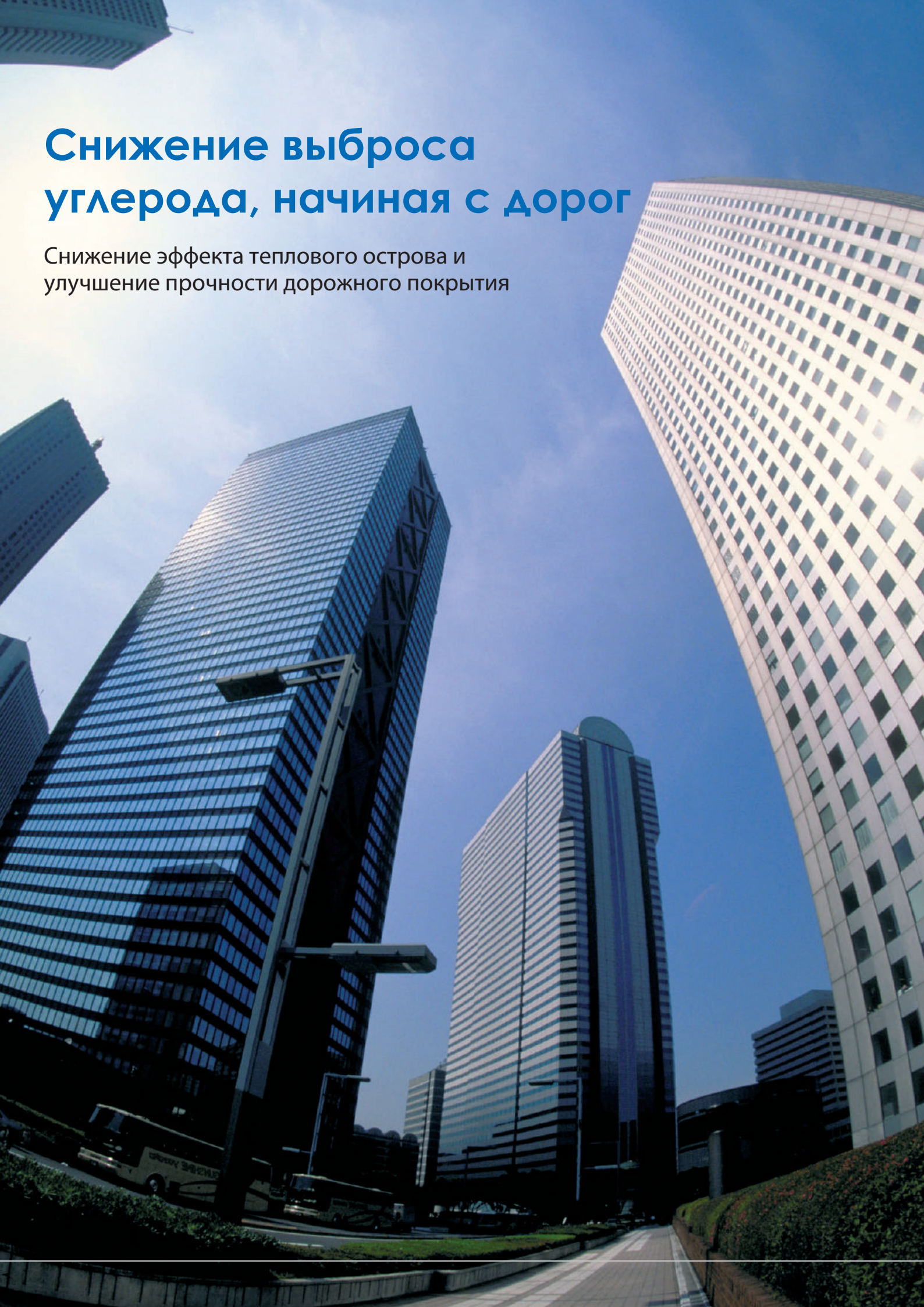
Japan Environmental Technology Verification
ETV Ministry of the Environment
http://www.env.go.jp/policy/etv/
PERFECT COOL verification NO.051-0965

ISO 14001

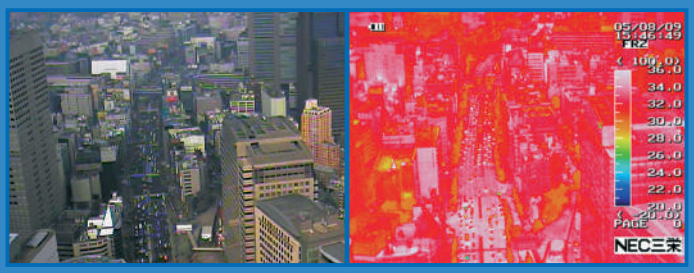
PATENTED TECHNOLOGY
MADE IN JAPAN

Снижение выброса углерода, начиная с дорог

Снижение эффекта теплового острова и
улучшение прочности дорожного покрытия



В городских районах явление теплового острова является фактором роста числа жарких дней с температурой выше 30 °C и горячими ночами, когда температура остается выше 25 °C. Для решения этой проблемы NIPPO разработала PERFECT COOL Solar Heat-Blocking pavement, которая включает в себя запатентованные технологии.
Нанесение слоя этого теплозащитного покрытия на поверхности дорожного покрытия подавляет повышение температуры поверхности дороги. Кроме того, технология значительно улучшает прочность дорожного покрытия.
Эта технология способствует низкоуглеродному обществу и является экологически чистой и дружелюбной к людям.

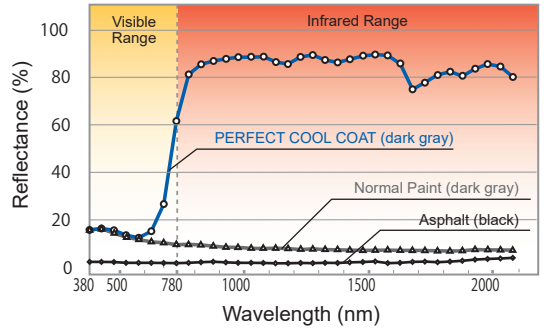


Термографическое изображение вокруг станции Синдзюку, взятой из многоэтажного здания в Йойоги, пригороде Сибуя, Токио.

Что такое PERFECT COOL?

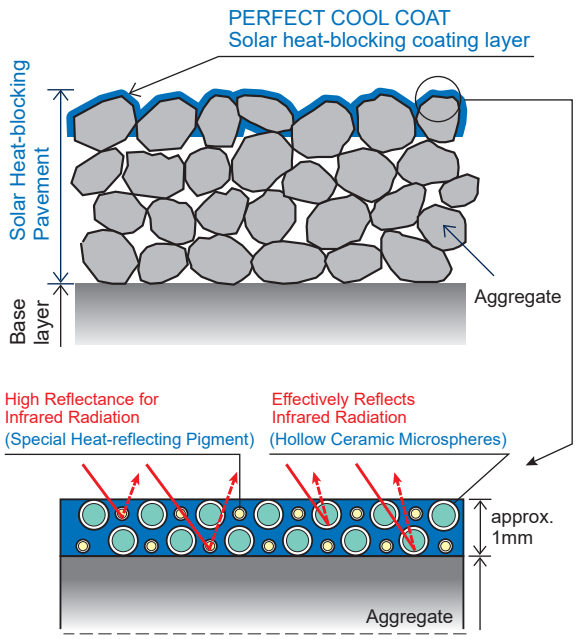
PERFECT COOL является дорожным покрытием, которое может уменьшить температуру поверхности, применяя PERFECT COOL COAT.
Покрытие может отражать инфракрасное излучение, часть солнечного излучения с сильными нагревательными эффектами, благодаря комбинации специального теплоотражающего пигмента, который характеризуется высокой отражательной способностью и полыми керамическими микросферами, которые эффективно отражают инфракрасное излучение. Это уменьшает увеличение температуры поверхности дороги в течение дня и снежает теплоотдачу ночью.

REFLECTIVE PROPERTIES

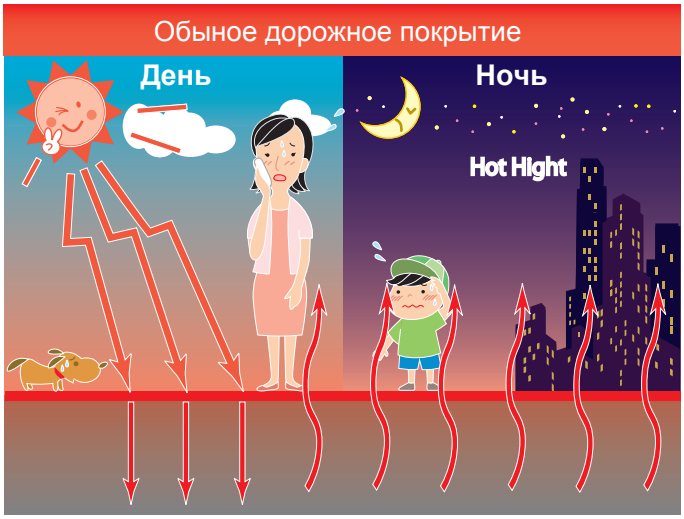


PERFECT COOL features low reflectance in the visible range but has much higher reflectance properties than normal paint or asphalt in the infrared range. Thus, while it may appear the same to the human eye, it is capable of suppressing increases in road surface temperature.

Schematic diagram of PERFECT COOL



Как PERFECT COOL работает



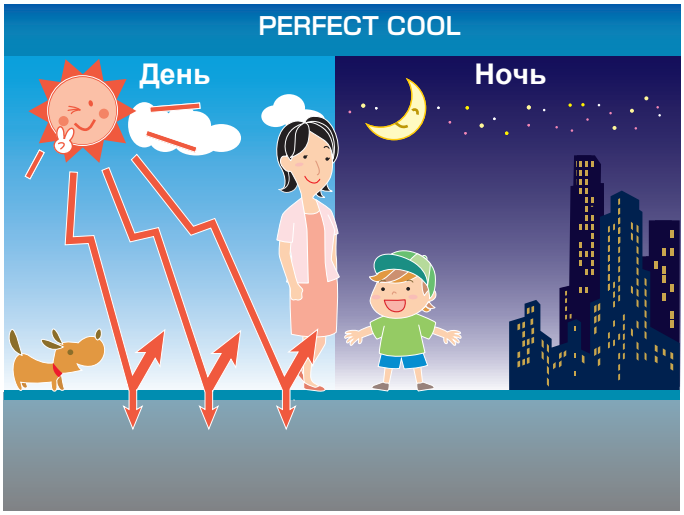
Тротуар поглощает и накапливает солнечную радиацию; при этом температура поверхности дороги увеличивается.

Грячая поверхность дороги нагревает воздух.

В ночное время накопленное тепло нагревает воздух над дорогой.

Обычное дорожное покрыт.

Дорога поглощает и накапливает солнечную радиацию; при этом температура поверхности увеличивается. Горячий тротуар нагревает окружающий воздух и, в течение ночи, высвобождает накопленное тепло и делает ночи еще теплее.



Слой Perfect cool отражает солнечное тепло.

Пдавляется накопление тепла.

Снижается отдача тепла в атмосферу.

PERFECT COOL теплоотражающее покрытие

Теплоотражающий слой покрытия рассеивает инфракрасное излучение, тем самым подавляя нагрев дорожного покрытия. Это предотвращает повышение температуры и накопление тепла.

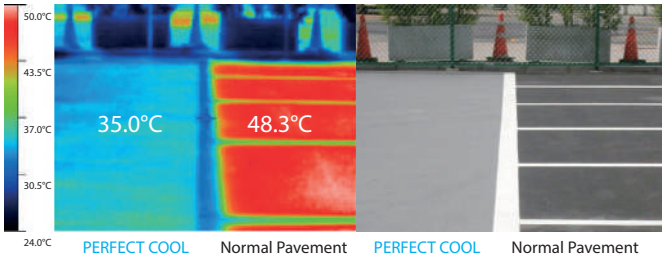
Colorful, Comfortable and Environmentally-friendly Pavement

A High-Performance Solar Heat-Blocking Coating Layer Significantly Reduces Road Surface Temperature

Features of PERFECT COOL

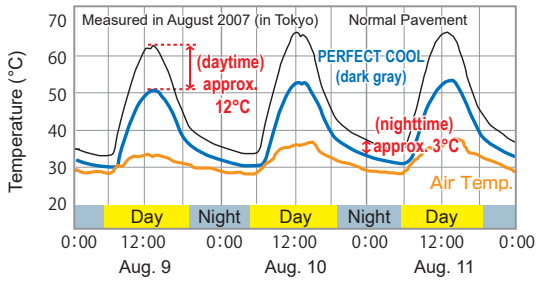
Temp. Increase Suppression	·NIPPO's unique heat-blocking technology suppresses increases in road surface temperature by about 10°C or more.
Comfort	·Improve ambient conditions in summer time.
Durability Improvement	·Reduces road wear by traffic by 50%, thereby doubling pavement life. ·Suppresses loss of aggregate from permeable pavement. (PERFECT COOL M/ML)
Low Cost	·Requires no additional costs after the initial investment.
Maintenance-free	·Requires no maintenance, such as water spraying.
Color Variation	·Increases visibility and improves safety. ·Suits the surrounding environment or a specific purpose, with different versions of the product to choose from.
Multifunctional Pavement	·is compatible with a wide range of pavement types, including permeable pavement.

Comparison of Road Surface Temperature via Thermography



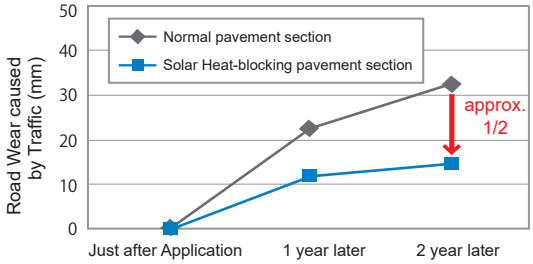
The effects of PERFECT COOL are obvious when you compare thermographic images of PERFECT COOL pavement (left) and normal pavement (right).

Example of road surface temperature



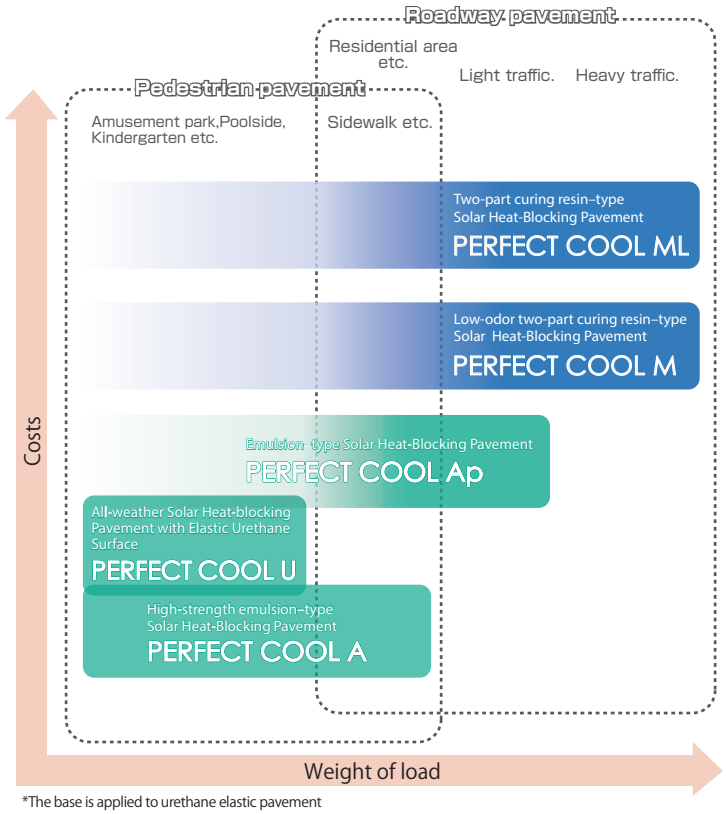
Compared to normal pavement, road surface temperatures are approximately 12°C lower during the day and 3°C at night.

Example of reduced road wear due to traffic



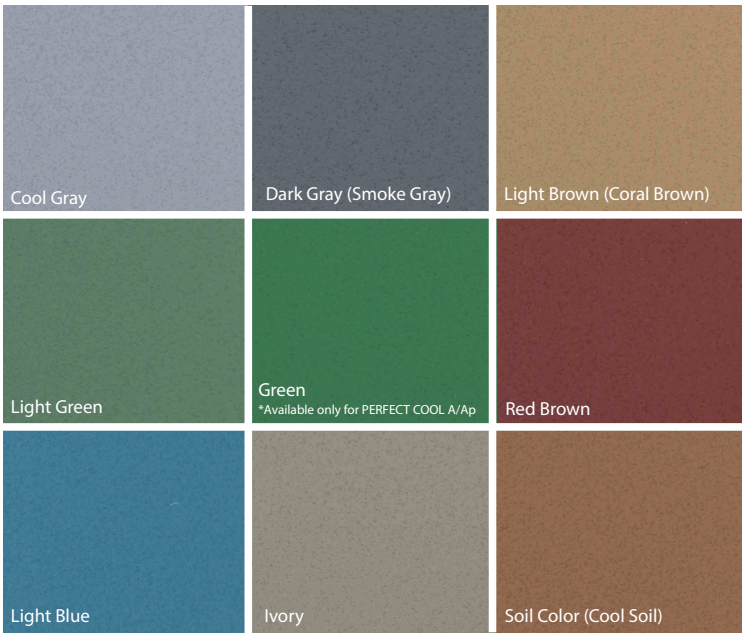
PERFECT COOL's temperature-suppressing properties reduce road wear by traffic by about 50%, resulting in improved pavement durability.

PERFECT COOL SERIES



*The base is applied to urethane elastic pavement

Standard Color Samples of PERFECT COOL



·The colors depicted in these materials may differ from those of the actual product.
·Please contact us regarding special colors besides the ones shown here.
·Price may vary slightly depending on the gradations of color.

Application Procedure

PERFECT COOL will perform its core function just by applying PERFECT COOL COAT to the existing road surface.

Two-pack curing resin–type Solar Heat-Blocking Pavement **PERFECT COOL M** / Low-odor two-pack curing resin–type Solar Heat-Blocking Pavement **PERFECT COOL ML**	Emulsion-type Solar Heat-Blocking pavement **PERFECT COOL A** / Emulsion-type Solar Heat-Blocking pavement High-strength emulsion-type Solar Heat-Blocking pavement **PERFECT COOL Ap**		All-weather Solar Heat-blocking Pavement with Elastic Urethane Surface **PERFECT COOL U**	
Spraying (Dense-graded, Permeable Pavement)	Spraying (Permeable Pavement, etc.)	Broom Application (Dense/Fine-graded Pavement)	New Elastic Urethane Pavement	Existing Elastic Urethane Pavement
Cleaning and Masking of existing Road Surface ❶				
				Primary Coat
Mixing and Adjusting Solar Heat-Blocking Coating				
Spraying, 1st Coat ❶	Spraying, 1st Coat	Coating, 1st Coat ❷	Spraying, 1st Coat	
Spraying of Slip-resistant Aggregate ❷				
Spraying, 2nd Coat ❸	Spraying, 2nd Coat	Coating, 2nd Coat ❸	Spraying, 2nd Coat	
Curing (30 min. to 1 hour) Open to Traffic	Open to Pedestrians (2–4 hours) Open to Vehicles (3–8 hours)		Open to Pedestrians (2–4 hours)	

❶ Spraying 1st Coat with specialized Sprayer

❷ Spraying Slip-resistance Aggregate

❸ Spraying 2nd Coat

❶ Cleaning and Masking of existing Road Surface

❷ Coating 1st Coat using Universal Broom (Roller Application also an option)

❸ Coating 2nd Coat

Creating Comfortable Environment Throughout Japan

Applicable in Various Places for Various Purposes


Bus Lane (Hyogo, Japan)


Intersection(Okinawa, Japan)


Bridge (Okinawa, Japan)

Two-pack curing resin–type Solar Heat-Blocking Pavement

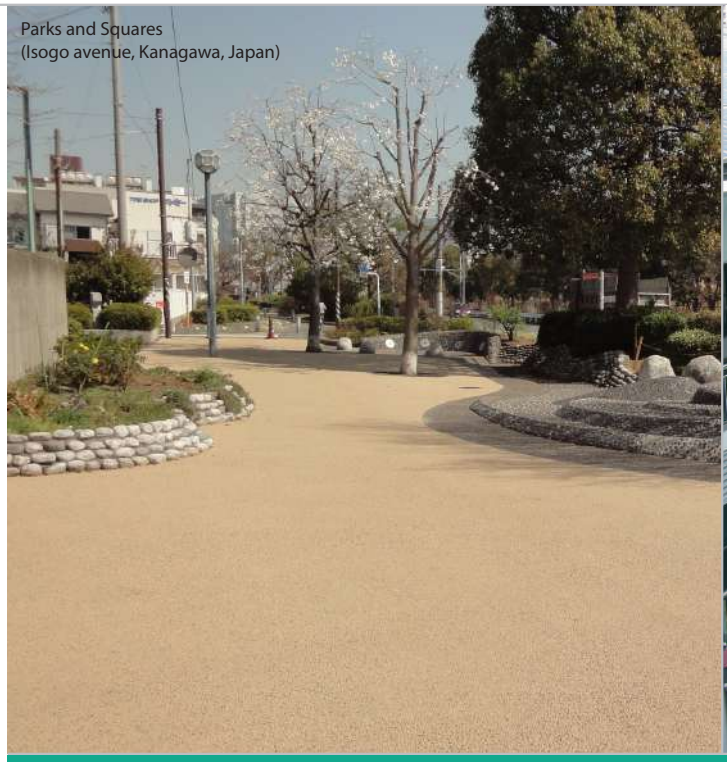
PERFECT COOL M

Low-odor two-pack curing resin–type Solar Heat-Blocking Pavement

PERFECT COOL ML

For Roads with Heavy to Light Traffic Including Sidewalks

Road(Kochi, Japan)



Parks and Squares
(Isogo avenue, Kanagawa, Japan)

Road inside
(Zero Energy Building (ZEB), Singapore)

High-strength emulsion–type Solar Heat-Blocking Pavement

PERFECT COOL A

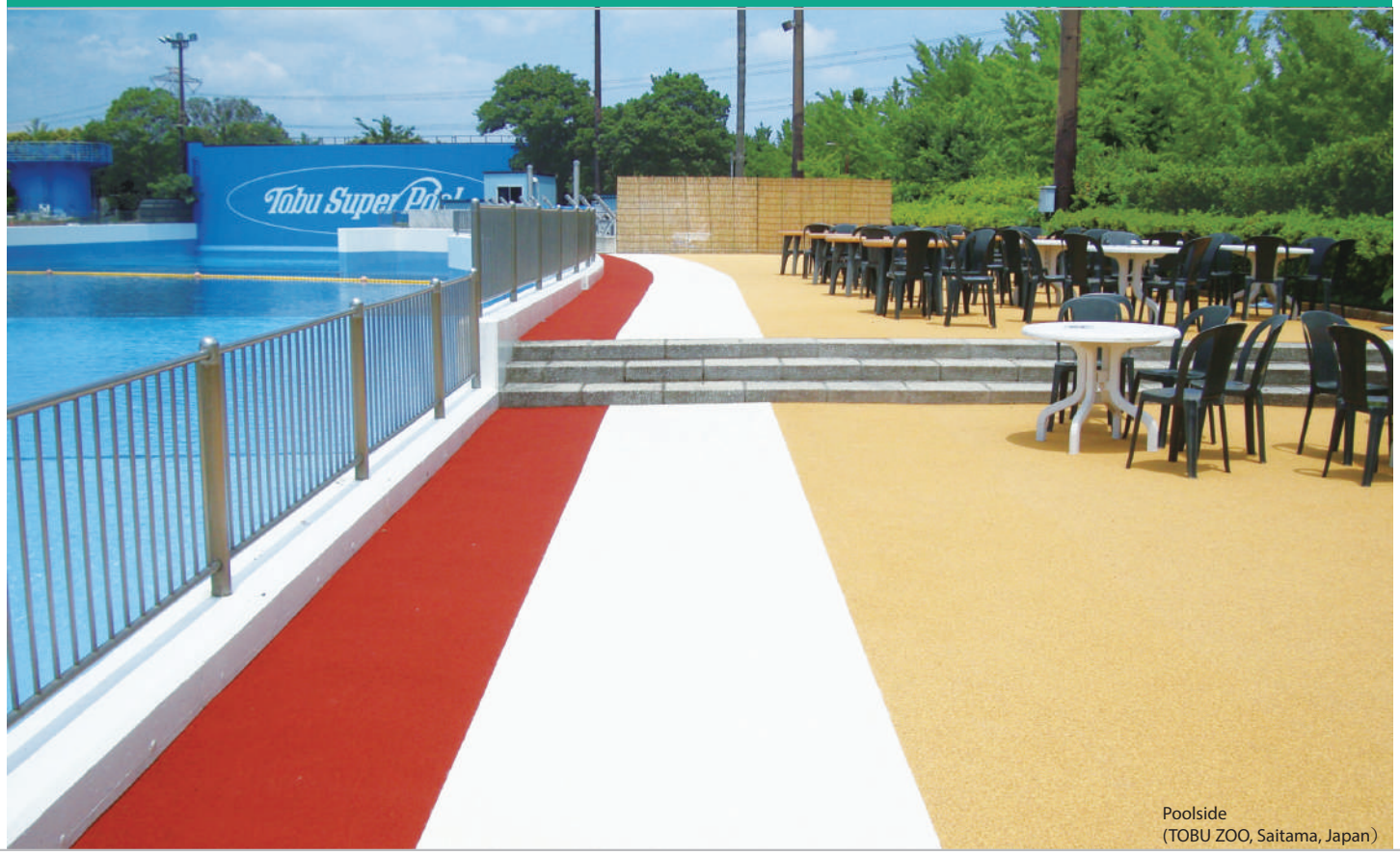
Emulsion–type Solar Heat-Blocking Pavement

PERFECT COOL Ap

All-weather Heat-blocking Solar Pavement with Elastic Urethane Surface Pavement

PERFECT COOL U

For Roads with Moderate to Light Traffic including Sidewalks



Poolside
(TOBU ZOO, Saitama, Japan)

NIPPO Awarded Prizes from Two International Road-Related Organizations

Awarded the Best Innovation Prize by the World Road Association (PIARC)

In September 2011 at the 24th World Road Congress (Mexico) held by the World Road Association (PIARC), NIPPO's paper on heat-blocking pavement received the Best Innovation Prize, the highest prize awarded at the congress. The prize is given to the most innovative and high-quality paper. Japanese paving company to receive this prize. Our product received high acclaim as a pavement capable of helping to resolve global issues, including global warming and the heat island phenomenon.

Plaque for Best Innovation Prize


The awards ceremony in Mexico City

* The World Road Association (PIARC) is an international association founded in 1909 to promote the construction, improvement, and maintenance of roads, as well improvements in traffic and road policies. Comprised of officials of road-associated agencies from various countries, the World Road Association currently counts as its members government officials from approximately 120 countries. The World Road Congress is held by the association once every four years. In the research paper competition, prizes are awarded to outstanding papers in eight fields, including road safety and road design and construction. These papers are selected from papers submitted from around the world. The Best Innovation Prize is awarded to the best paper across all fields.

Awarded Global Road Achievement Award by the International Road Federation (IRF)

In January 2009, our pioneering efforts in developing heat-blocking pavement was recognized and awarded the 2008 Global Road Achievement Award (GRAA) by the International Road Federation (IRF). This award recognizes outstanding performance in applying advanced technologies to road development. The award demonstrates global recognition of our efforts to develop green technologies in the area of road pavement.


The awards ceremony in Washington, D.C.


INTERNATIONAL ROAD FEDERATION
Better Roads, Better World

* The International Road Federation (IRF) is a nonprofit organization founded in 1948 to advance roads and road traffic worldwide. The global organization currently includes 518 road-associated organizations from more than 110 countries. IRF website: http://www.irfnews.org/

Environmental Technology Verification [ETV] program, organized by Ministry of the Environment of Japan, is a program to test usable "advanced environmental technology" for evaluation purposes. Technological effects are verified in the form of objective data. Our products are verified in the "Heat-island mitigation technology field" for reducing air conditioning loads by using building envelope systems.

This label is registered in the Ecolabel Database of the Ministry of the Environment of JAPAN.

·Environmental information for NIPPO's products -This label is attached to green pavement products that meet our company's self-regulatory standards.
·Intended environmental effect of this product - Suppression of the heat island phenomenon: the increase in road surface temperatures can be suppressed by 10°C or more compared to conventional products.*
·Method of suppression - Suppressing increases in road surface temperatures by applying a coating of heat-blocking resin.

* "Compared to conventional products" refers to a comparison of results using another of our company's products with identical functions but to which this technology has not been applied.