

Water-repellent, Anti-corrosive

Calcium silicate thermal insulation material
Equivalent to JIS A 9510 Type. 1-15 product

DAIPALITE-Ei

DAIPALITE-Ei is a calcium silicate thermal insulation material which is pre-formed for pipe and block section and used for facilities. DAIPALITE-Ei is inorganic, asbestos free and noncombustible. DAIPALITE-Ei provides both water-repellent function and corrosion inhibition effect and is supplied to various industrial fields, such as refinery plants, power plants, petrochemical plants and others.

Special effects of DAIPALITE-Ei

DAIPALITE-Ei is attached a special liquid which contains soluble ingredients (Na^+ , SiO_3^{2-}). When the ingredients dissolved in water, it cause the water pH to be 10.6 (surface part) and forms passive film. The passive film coats a pipe and inhibits corrosion of iron.



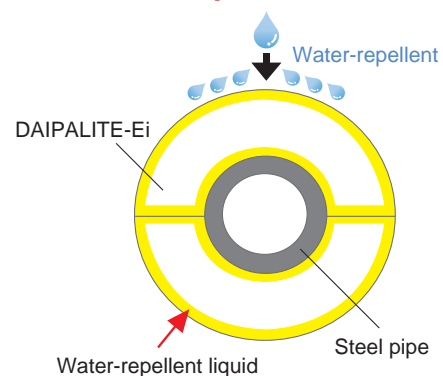
◀ Clued oil piping at a thermal power plant (7 years)
A white small circle on the piping was a trace of water flowing for years as a hole has been opened accidentally after an inspection. Still it's been in good condition.



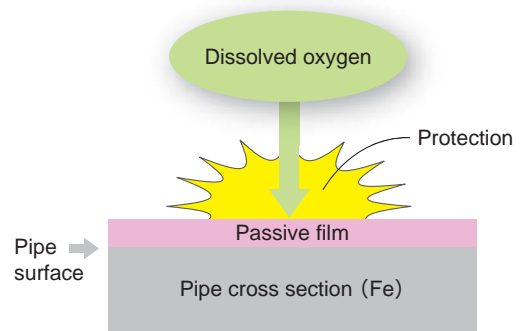
▶ Steam (12K) piping at a steel plant (14 years)
The left side was covered with our water-repellent material, the right side was covered with mineral wool.



Water-repellent function



Corrosion inhibition function



Economical and Environmentally production process

JIC is the first and the only one that succeeded in inventing the production process using rice husk. Rice husk is used as energies for reaction of raw materials and drying formed products. The rice husk ash is used for as a raw material instead of Silica rock. This unique process is certificated as an environment-conscious business by Viet Nam Government. The process contributes to reduce 4,200 ton CO_2 / year.



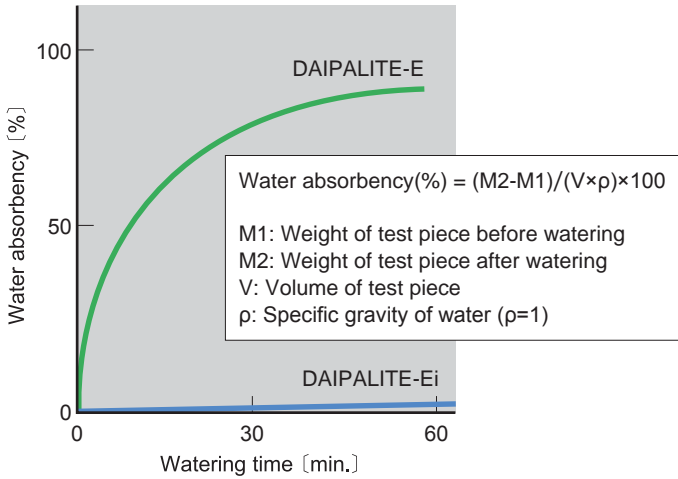
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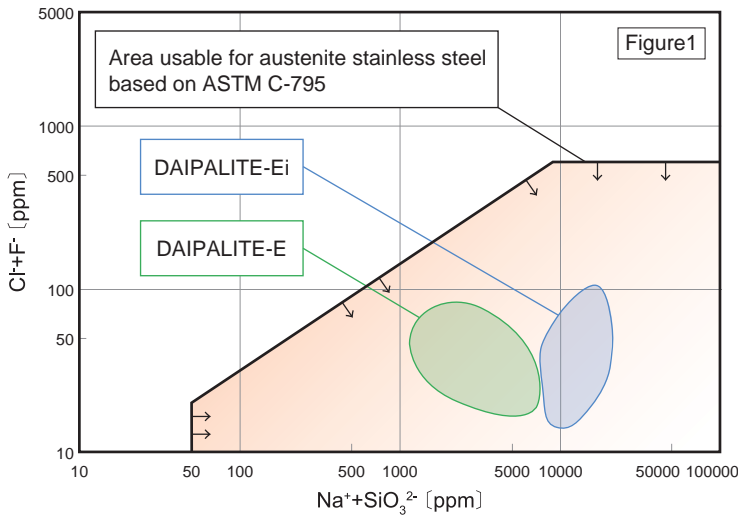
Water-repellent performance

Materials were watered for 60 minutes to measure water repellencies and absorbencies. The result is showed as below.



Stress corrosion cracking inhibition : Passed in test per ASTM C-795

These calcium silicate materials have performance to satisfy ASTM standards as a thermal insulation material in contact with austenitic stainless steel.



- DAIPALITE-Ei is a water-repellent material, not water-proof. The functions of water-repellent and corrosion inhibition of DAIPALITE-Ei will be effective with correct installation and keeping in good condition. It is not always a guarantee of your facilities and incorrect use may result in accidents.
- The recommended temperature in use DAIPALITE-Ei is under 250°C of the surface temperature of the facilities as the water-repellent function will be lost over it.

Standard dimensions [mm]

	Internal Diameter	Thickness	Width	Length
Pipe cover	22 ~ 610	25 * 30 40 50 65 75	—	914
Board	—		303 × 914 150 × 914	

※ The 25mm thickness is for board only.

Standard physical properties (reference values)

Apparent Density	155kg/m ³ or less
Heating Linear Shrinkage	2.0% max.
Maximum Service Temperature	1000° C
Thermal Conductivity W/(m·K) (θ : temperature [°C])	$[200 \leq \theta \leq 300]$ $\lambda = 0.0407 + 0.000128 \cdot \theta$ $[300 < \theta \leq 600]$ $\lambda = 0.0555 + 2.05 \times 10^{-5} \cdot \theta + 1.93 \times 10^{-7} \cdot \theta^2$

Corrosion test of steel piece immersed in eluent of thermal insulation material

Pulverize a certain volume of thermal insulation material and make each eluate extracted with distilled water. Steel piece (SS-41) is immersed in each eluate and left at 70°C for 4 weeks.



DAIPALITE-Ei
Almost no corrosion



Rock wool
Many Corrosion of about 600µm depth can be seen.



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Water-repellent, Anti-corrosive

Calcium silicate thermal insulation material
ASTM C 533 Type I product

DAIPALITE-Ei^A

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Special effects of DAIPALITE-Ei^A

DAIPALITE-Ei^A is attached a special liquid which contains soluble ingredients (Na^+ , SiO_3^{2-}). When the ingredients dissolved in water, it cause the water pH to be 10.6 (surface part) and forms passive film. The passive film coats a pipe and inhibits corrosion of iron.



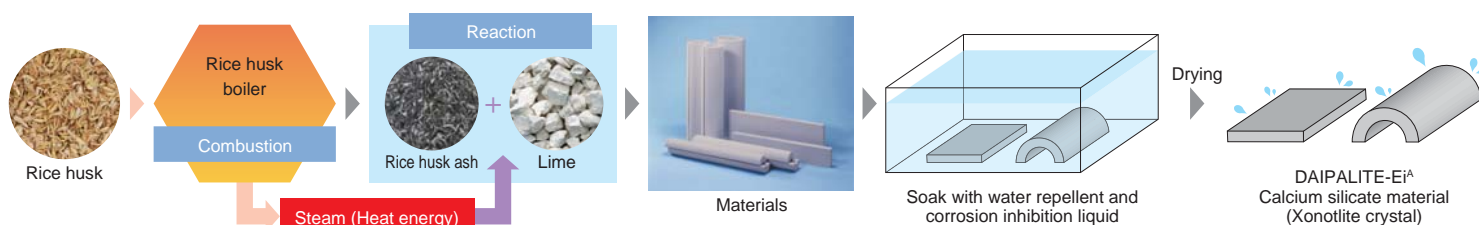
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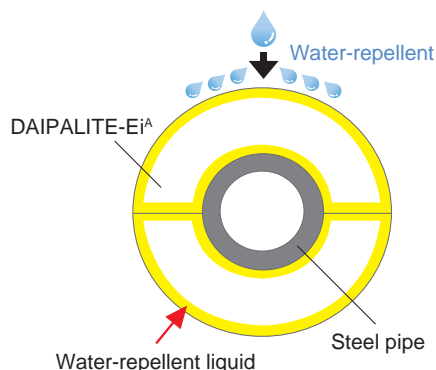


Economical and Environmentally production process

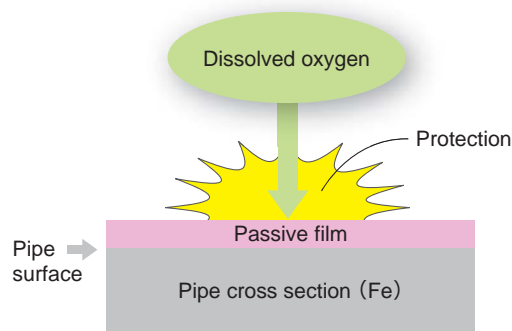
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Water-repellent function



Corrosion inhibition function



Standard dimensions [mm]

	Internal Diameter	Thickness	Width	Length
Pipe cover	22 ~ 610	25 30 40 50	—	914
Board	—	65 75	303 × 914 150 × 914	

Standard physical properties (reference values)

Apparent Density	170kg/m ³
Heating Linear Shrinkage	2.0% max.
Maximum Service Temperature	1000°C
Thermal Conductivity W/(m·K) (θ : temperature [°C])	Pipe cover $\lambda = 0.0489 + 7.885 \times 10^{-5} \cdot \theta + 2.032 \times 10^{-10} \cdot \theta^3$ Board $\lambda = 0.0516 + 7.240 \times 10^{-5} \cdot \theta + 1.884 \times 10^{-10} \cdot \theta^3$

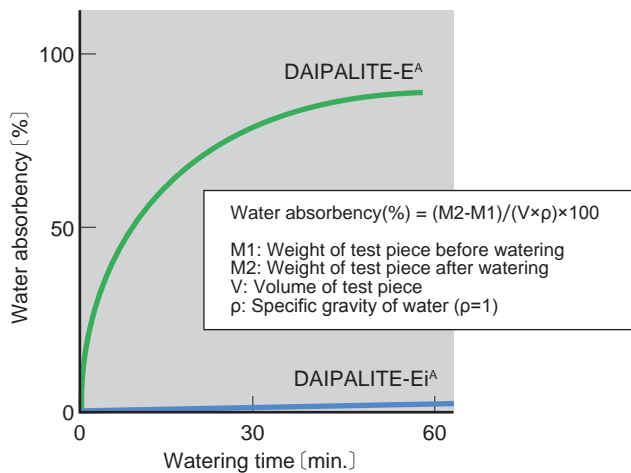
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ASTM C 533 Type I product

DAIPALITE-Ei^A

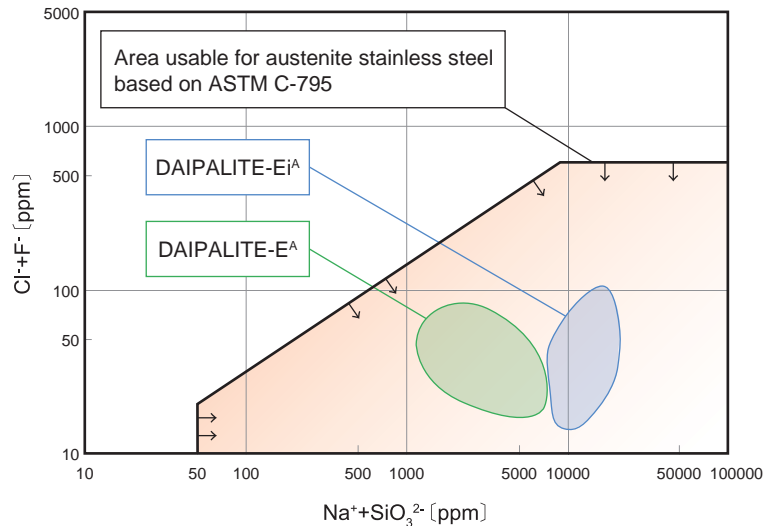
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Technical Data

Property	Test Methods	ASTM C533 Requirement	Test Results
Density (Dry) Average*	ASTM C302	≤ 240 kg/m ³	Pass
Flexural Strength*	ASTM C203	≥ 344 kPa (50 psi)	Pass
Compressive Strength*	ASTM C165	≥ 688 kPa (100 psi)	Pass
Abrasion Resistance Weight Loss by Tumbling*	ASTM C421	After the first 10 min <20%, After the second 10min <40%	Pass
Linear Shrinkage after Heat Soaking*	ASTM C356	Less than 2% after 24hr, Soaking period at 650°C	Pass
Hot Surface Performance of High Temperature*	ASTM C411	Warpage ≤ 6mm Cracking : no cracks completely through the insulation thickness. Surface cracks on hot face are acceptable	Pass
Maximum Service Temperature*	ASTM C447	649°C (1200°F)	Pass
Surface Burning Characteristics*	ASTM E84	Flame spread - 0, Smoke Developed-0	Pass
Apparent Thermal Conductivity*	ASTM C177/GHP ASTM C518/HFM ASTM C335/Pipe cover ASTM C1045	Temp. [°C] 38 93 149 204 260 316 371	Pass
		λ W/(m·K) ≤ .059 ≤ .065 ≤ .072 ≤ .079 ≤ .087 ≤ .095 ≤ .102	Pass
Stress Corrosion Performance* (Austenitic Stainless Steel)	ASTM C795 ASTM C692 ASTM C871	① Na ⁺ + SiO ₃ ²⁻ ions : ≥ 50ppm ② Acceptable range of Cl ⁻ + F ⁻ and Na ⁺ + SiO ₃ ²⁻ ③ pH ≤ 12.5 (at 25°C) ④ The stress corrosion test (C-692) must be passed.	Pass
Moisture Content*	ASTM C1616	≤ 20%	Pass
Combustibility*	ASTM E136	Non-Combustible	Pass
Corrosion* (DAIPALITE-Ei ^A)	ASTM C1617	Mass Loss Corrosion Rate (MLCR) ≤ DI (The MLCR of Type 1 materials, when tested with extracted solutions, shall be equal to or less than that determined when tested with DI Water)	Pass

■ This material is a water-repellent thermal insulation material, not waterproof thermal insulation material. Incorrect use may result in accidents.

■ The maximum effective temperature of the water repellent is 250°C, beyond which its water-repellency is lost. Even if the internal temperature exceeds 250°C, the water repellent will be sufficiently effective as long as the surface temperature of the thermal insulation material does not exceed 250°C. No problem occurs under normal conditions of use.

* DAIPALITE-Ei^A is a material based on DAIPALITE-E^A.



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