

DENKA PLUS MERIT

Sludge-Reducing Additive

Description

DENKA PLUS MERIT is a cement additive used to minimize sludge formation in concrete pile construction.

Features

- Mitigates the need for sludge disposal during pile construction
- As sludge formation is minimized, the internal thickness of concrete pile can be maintained as per designed. Concrete dosage can thus be reduced.
- Improves internal appearance of the concrete pile
- Does not affect concrete pile strength

Applications

- Concrete pile

Packaging and General Information

- 20kg paper bags
- 1000kg bulk bags

Shelf Life

- 8 months from production date
- Determine the production date by reference to the lot number. A lot number of "1AXXX" corresponds to production in Jan 2001; "2BXXX" to Feb 2002 and so on.

Standard Usage Instructions

- Use **DENKA PLUS MERIT** in a 1:10 dilution with water. For example, mix 1kg of **DENKA PLUS MERIT** with 10 liters of water to form a slurry.
- Add water, water reducer, and the **DENKA PLUS MERIT** into the mixer at the same time.
- If water reducer is to be added only later, add **DENKA PLUS MERIT** after adding the water reducer.

Mix Design / Construction Considerations

- For every 1kg/m³ of **DENKA PLUS MERIT** added, the unit quantity of water will be increased by 4kg/m³. As such, adjust the s/a ratio and water reducer quantity accordingly in order to keep the w/c constant.

- Water reducer amount
 - An arbitrary example is shown in Fig.1. Depending on the water reducer amount, the sludge generation time varies. As such, it is necessary to optimize the water reducer amount. Also, the optimum water reducer amount is dependent on the mixing method, materials, and water reducer brand.
 - The correction factor for each item in the mixture is shown in the following table.

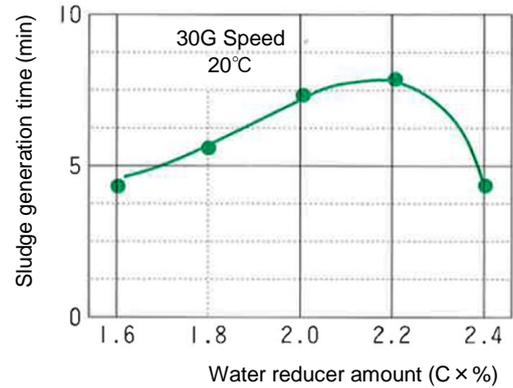


Fig 1: Sludge generation time against water reducer amount

Table 1: Correction factor for mixture elements

PLUS MERIT	±1kg	Against water	±3~4kg
s/a	±1%	Against water	±3~4kg
Water reducer	±0.15%	Against water	±3~4kg
Slump	±1cm	Against water	±3~4kg

- Design Considerations
 - When **DENKA PLUS MERIT** is added, there is a tendency for slump to decrease.
 - Typically, it is recommended to increase the amount of coarse aggregates. In return, the mortar amount should be decreased.
 - With the decrease in slump, concrete viscosity as well as concrete permeation through the rebar frame is improved; resulting in excellent workability.
- Construction Method
 - Low Speed – Because a more plastic, less liquid concrete is formed, set centrifugation speed to below 1~2G for ≥3 minutes to prevent poor formation of concrete.
 - Medium Speed – When centrifugation is carried out at 10~15G for ≥3 minutes, coarse aggregates move outwards. As such, G number or rotation time can be reduced.
 - High Speed – Adjust G number and rotation time in trial tests to minimize concrete spalling from the rebar frame.

Physical Properties (Arbitrary Values)

Table 2: Compressive strength and elastic modulus of centrifugal specimen (Day 7, prestruck)

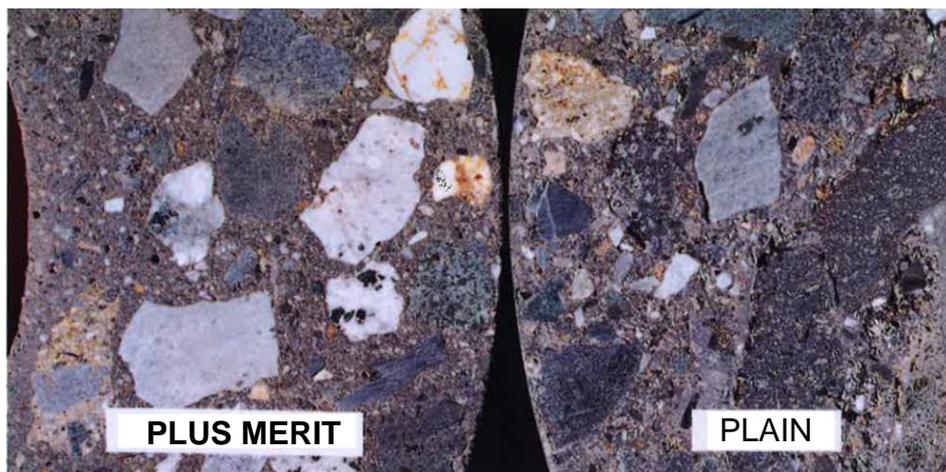
Type	Centrifugal Specimen (φ20 × 30 × 5t cm)	Pile (Type A) (φ300 × 1m × 60t)	
	Compressive strength (psi)	Compressive strength (psi)	Elastic modulus (kgf/cm ²)
PLUS MERIT	924	887	44.8 × 10 ⁴
Standard	918	862	43.8 × 10 ⁴

Table 3: Static bend test results (Post-struck, 400 × 8m, Type C)

Type	Bending moment (t-m)	
	M c	M u
PLUS MERIT	12.63 (1.36)	23.65 (1.30)
Standard	11.68 (1.26)	23.08 (1.26)

Values within the brackets represent relative values to the standard values

Cross-sectional Image of Concrete Pile with **PLUS MERIT** added



With the addition of **PLUS MERIT**, moisture is rendered immobile and as such, gaps do not occur around the aggregates. Additionally, while a 5~10mm soft paste layer forms on the inner surface of the concrete pile, the resultant strength of that layer is the same as the main body and as such can be used as-is.

Usage Instructions / Handling Precautions

- Refer to the Safety Data Sheet (SDS) before use.
- Dosage Rate: Standard dosage is approximately 4~5kg / m³ of concrete. However, the dosage differs when used in conjunction with additives like $\Sigma 1000$, or in asphalt concrete. Also, the dosage will also differ depending on the raw materials and mixing method.
- Temperature-dependence: If the concrete temperature is $\geq 25^{\circ}\text{C}$, and the effect of the water reducer is too great leading to sludge production, decrease the G number or the water reducer amount by ~0.2%.
- The product should be stored in a dry area, indoors, and out of direct sunlight.
- For further information, please contact DENKA.

Limitation of Liability

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