MIGHTY 21VS
MIGHTY 21VS-R

High Performance Water Reducer for Concrete Products

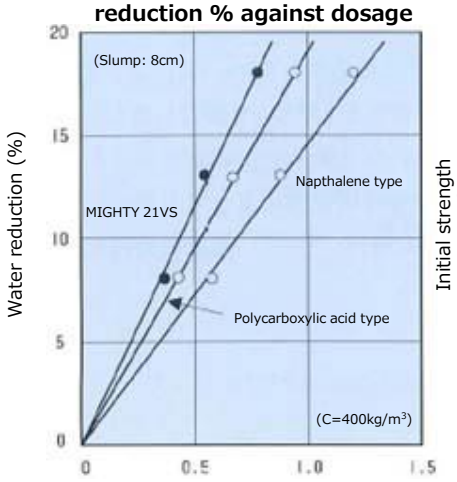
Features

- Applicable for use in a wide range of concrete applications (from standard strength to high strength)
- Fast setting, excellent initial strength development
- Superb dispersibility with high fluidity retention
- Aesthetically pleasing concrete with minimal surface bubbling can be achieved

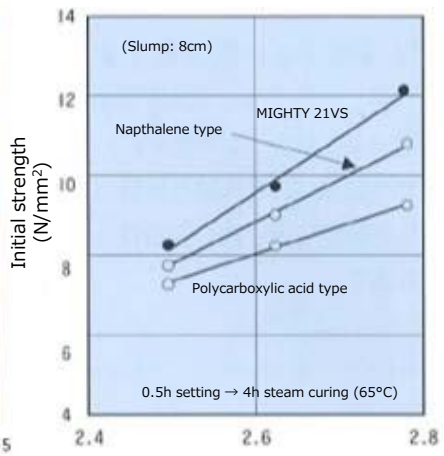
MIGHTY 21VS Experimental Data

<Features>

High performance WR water reduction % against dosage



Initial strength against C:W



<Surface appearance comparison>

Naphthalene	21VS (SL: 8 cm)	21VS (SL: 21 cm)

<Experiment mix compositions>

Mix	Slump (cm)	Air vol. (%)	W/C (%)	S/A (%)	Unit quantity (kg/cm³)			
					Water	Cement	Fines	Coarses
①	8	4.5	40.3	40.0	161	400	678	1044
②			38.0		152		686	1060
③			36.0		144		696	1070
④	21		38.0	42.0	165	434	696	989

Cement:	OPC (density: 3.16g/cm³)
Fines:	Wakayama Kinokawa river sand / Chiba Kimitsu mountain sand (5:5 mix, density: 2.54g/cm³, fineness modulus: 2.58)
Coarses:	Wakayama Nara crushed stone 2005 (density: 2.61g/cm³, fineness modulus: 6.64, largest diameter: 20m)
WR:	High performance water reducer (MIGHTY 21VS, naphthalene-type, polycarboxylate-type)
AE:	MIGHTY AE-03
Mixing conditions:	After material charging, mixing for 90s with a forced action mixer
Steam curing conditions:	4h steam mixing at 65°C after setting for 30 minutes

<Concrete experiment results example>

Admixture	Mix no.	Dosage (% × C)	Slump (cm)			Air vol. (%)[1]	Setting time (h:mm)		Compressive strength (N/mm²)			Freeze-thaw resistance (relative dynamic modulus of elasticity %, 300 cycles)
			0min	15min	30min		Start	End	Steam curing[2] 4h	Standard curing 7d	Standard curing 28d	
MIGHTY 21VS	①	0.35	8.5	8.0	6.5	4.2			8.7	45.9	56.5	96
	②	0.55	8.5	8.0	7.0	4.4	4:45	6:35	9.7	48.1	61.2	95
	③	0.75	8.0	7.5	7.0	4.1			12.2	50.0	67.4	96
	④	0.70	21.5	19.0	17.0	4.5	5:05	6:45	9.0	48.4	62.1	95
Napthalene-type	①	0.60	8.5	7.5	5.0	4.0			7.8	45.4	56.3	94
	②	0.90	8.0	7.0	4.5	4.2	5:00	5:50	9.2	48.4	60.2	95
	③	1.20	8.0	7.5	4.5	4.6			10.9	50.2	67.4	96
Polycarboxylate-type	①	0.40	8.0	7.5	6.5	4.4			6.9	42.1	55.3	94
	②	0.65	8.5	8.0	7.0	4.2	6:01	7:45	7.9	48.5	59.5	95
	③	0.85	8.0	7.5	7.0	4.3			8.1	50.6	66.8	95

[1]Air volume was adjusted using specified AE admixtures (MIGHTY AE-03, C × 0.028wt%)
[2]Setting (30 mins) → Steam curing (65°C, 4h). Measurements were done in conformance with JIS A 1148.

Properties & Specifications

[Specification] JIS A 6204: Chemical admixtures for concrete (Type 1)

Composition ·····	Carboxylate-containing polyether compound
Appearance ·····	Pale brown liquid
pH ·····	4.0~8.0
Density (g/cm³·20℃) ·····	1.030~1.070
Standard dosage (%/powder) ··	0.5~2.0

Usage Precautions

①Avoid usage in conjunction with different brands/types of water reducers with different active formulations.
②There may be adverse effects on concrete properties in the event of over-dosage. As such, take due precautions while handling. Carry out trial mixes before-hand; and check that there are no major issues.
③Store carefully and prevent external contamination from other admixture types or rainwater. In the event of solidification, stir while heating to melt before usage.
④While there are no risks during standard usage, in the event that the product comes into contact with skin, eyes etc., wash copiously with water and seek medical attention as necessary.

Packaging

MIGHTY 21VS	Tank lorry / 1000kg container / 200kg drum / 18kg can
MIGHTY 21VS-R	Tank lorry / 1000kg container / 200kg drum / 18kg can

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