MIGHTY V-10

Concrete pumping aid

Description

Concrete pumping allows for shorter construction periods and labor reduction. However, pipe blockages can occur that lead to maintenance/repair downtime as well as serious accidents. Blockage prevention is hence extremely important.

With 'MIGHTY V-10', concrete pumping performance is improved; allowing for smooth pumping even in severe conditions.

Features

- Increases fresh concrete pumping performance without changing its characteristics. Air entraining properties are not significantly altered by MIGHTY V-10, and quality control management can be done as per normal.
- Pumping performance can be improved even for low-cement concrete. Water-retention, anti-separation properties are enhanced; minimizing pipe blockage.
- Concrete pumping restart after interruption is possible. Concrete flow retention performance is improved, mitigating flow reduction during pumping.
- Allows for long-distance pumping. Through lubrication and fine bubbles introduction, pumping performance is enhanced.

Experimental Test Results

Fresh concrete deformation tests[1] were performed to evaluate concrete pumping performance. Experimental conditions were adjusted[2] (discharged concrete slump vs unit cement content) to first ensure pumping performance, and then evaluated in three regions (low cement, mid cement, high cement content) to simulate expected pumping conditions.

Low region: Arching phenomenon occurs due to low cement content – blockage risk
Mid region: Relatively optimal pumping zone
High region: Excessive viscosity – blockage risk

Also, pumping performance are broadly classified and evaluated as 1) smooth pumping, 2) unstable pumping, 3) blocked.

[1]In accordance with JSCE-509-2010 standards)
[2]Japan Society of Civil Engineers: Concrete Library Issue 145, Guidelines for Mix Design and Construction of Concrete Based on Construction Performance (2016 Edition)

Fig: Deformation evaluation apparatus

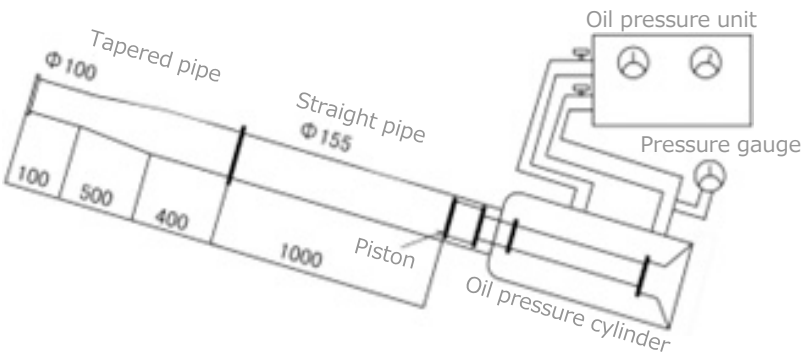
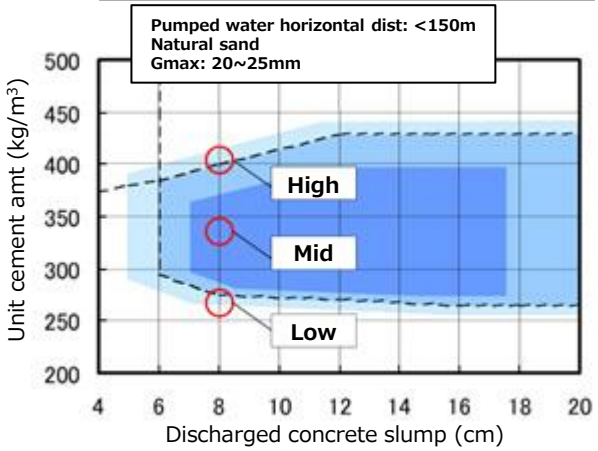


Fig: Experimental Conditions



MIGHTY V-10

Concrete pumping aid

kao

Pumping test various states

Steady extrusion

Intermittent extrusion/blockage

Complete blockage

【Materials】

Material	Sym	Comments
Water	W	Water
Cement	C	OPC, density: 3.15g/cm^3
Fines	S	Sea sand, dry density: 2.59g/cm^3, F:M: 2.82
Coarses	G	Gravel, dry density: 2.75g/cm^3, Gmax:20mm, actual rate: 59.4%
Admixtures	-	AE water-reducer (lignosulfonate type)
	-	MIGHTY V-10
	-	Defoamer (Polyalkylglycol derivative)

【Mix Design】

Mix	W/C (%)	s/a (%)	Unit weight (kg/m3)						
			W	C	S	G	AE WR	V-10	Antifoam
1	61	43	162	266	789	1111	1.73	-	-
2								1.0	-
3	62	46	165	266	841	1048	1.60	-	-
4								1.0	-
5	48	43	162	338	764	1075	1.35	-	-
6								1.0	-
7	48	46	165	344	811	1011	1.58	-	-
8								1.0	-
9	40	43	164	410	736	1036	2.50	-	0.8
10								1.0	

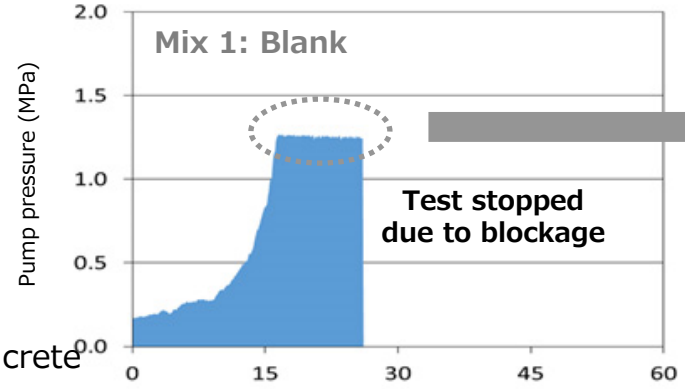
【Pumping test results】

Mix	Fresh state concrete		Mighty V-10 Usage?	Pumping condition	
	Actual slump (cm)	Actual air volume (%)		Still time in pipe: 0mins (std. pumping)	Still time in pipe: 15mins (pumping restart simuln.
1	9.0	4.7	No	Blocked	-
2	8.5	4.7	Yes	Unstable	
3	8.5	4.7	No	Smooth	
4	8.5	5.0	Yes		
5	9.0	4.7	No	Smooth	Blocked
6	8.5	4.1	Yes		Unstable
7	9.5	3.7	No		Smooth
8	9.5	5.0	Yes		
9	8.5	4.0	No	Smooth	-
10	8.5	4.1	Yes		

MIGHTY V-10

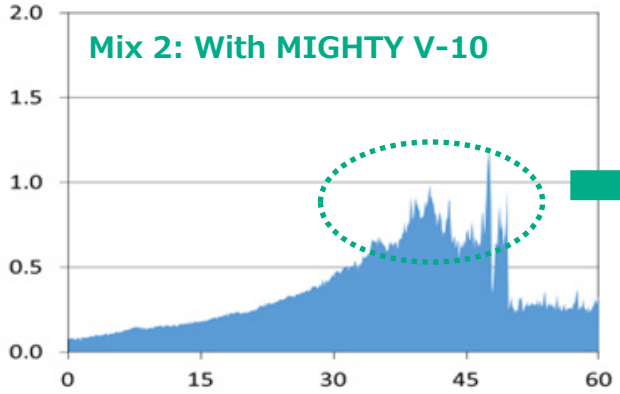
Concrete pumping aid

Low zone test results / Standard pumping conditions



Concrete

Completely blocked pipe

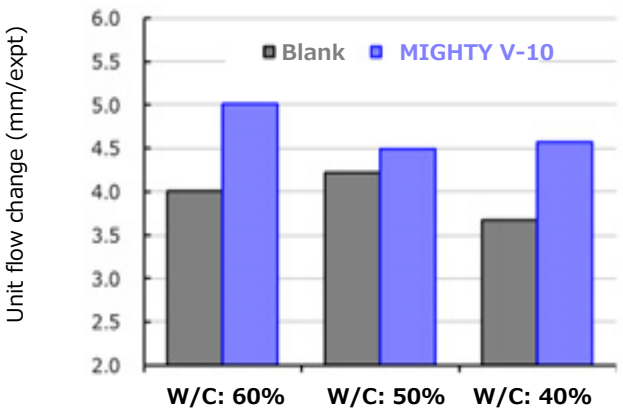


Continuous pumping without stopping

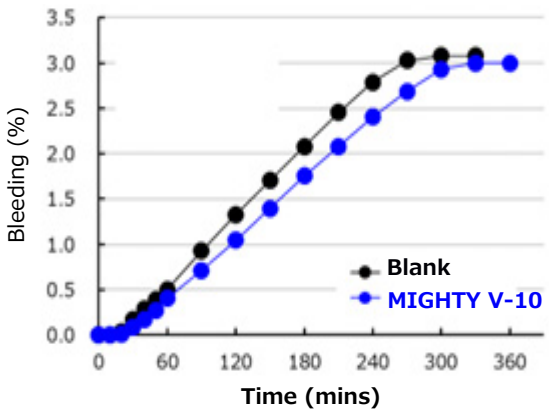
MIGHTY V-10 Performance

By enhancing concrete deformation/water retention effects, lubrication between concrete and pipe wall is increased, allowing for improved pumping performance even under severe conditions.

Lubricant/deformation effect



Water retention effect



MIGHTY V-10

Concrete pumping aid

Usage Method

1) On-site agitator truck charging

Standard MIGHTY V-10 dosage is 0.1~2.0kg/m^3. Adjust accordingly within 0.3~1.5kg/m^3 depending on pump capabilities. After addition, mix at middle speed for an additional 60~90 seconds.

2) Ready-mixed plant charging

Standard MIGHTY V-10 dosage is 0.1~2.0kg/m^3. Adjust accordingly within 0.3~1.5kg/m^3 depending on pump capabilities. Use together with AE water-reducers/high range AE water-reducers; and mix at standard plant conditions.

Product Information

Composition	Special surfactant and cellulose-type thickener blend
Appearance	Pale yellow liquid
Density (g/cm^3, 20°C)	1.02~1.05 (20°C)

Usage Precautions

- In the event that the product gets into the eyes or skin, wash copiously with water and seek medical attention as necessary.
- In case of accidental ingestion, consume copious amounts of water and seek immediate medical attention.
- Refer to the product SDS before usage.

Packaging

- 18kg can
- 200kg drum

Kao Corporation Chemical Business Eco Infrastructure
Sumida Office 2-1-3 Bunka, Sumida-ku, Tokyo 131-8501
Osaka Office 1-4-1 Itachibori, Nishi-ku, Osaka, Osaka Prefecture 550-0012
HP : https://chemical.kao.com/jp/ Mail : chemical_eif@kao.com

2021.04