

*Contribute to the production of
high quality concrete !*

**JAPANESE
SUPER SILICA
CEMENT ADMIXTURE**

--(JASSCA)--

《WHITE TYPE JIS A 6207》



SILICA JAPAN INC.



Material Safety Data Sheet (MSDS)

Company Info

SILICA JAPAN Inc.

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Product Name: JAPANESE SUPER SILICA CEMENT ADMIXTURE

Substance traits

Distinction between single and compound products: Mixed product

Material name: Zirconia and Silica Fume

Crystal type: Amorphous material

Harmful substances

Hazardous nature: None

Harmful effects: None

Environmental impact: None

First aid measures

Eye contact: Never rub but wash away with clean water

Skin contact: Wash away with water or lukewarm water

Ingestion: Wash the inside of mouth with water

(There is no problem even if the swallowed matter is left as it is.)

Measures at a fire: since it is nonflammable, there is no problem even if it is left as it is

(Harmful gas will not be generated.)

Accidental release measures: Remove it after sprinkling water to prevent dust from spreading

(Cleaning with a vacuum cleaner is preferable.)

Notes on handling, storing and keeping the product

Handling: Try to prevent dust from spreading as much as possible.

Storing and keeping: Avoid wet or humid place.

Exposure control

Concentration: 3.0 mg/m³

Preferable environment: Installation of dust collector is preferable.

Protection equipment: Wearing a dust mask is advisable depending on the situation.

Physical and chemical properties

Appearance/color: Tasteless, odorless ash white powder

Particle density: 2.30 g/cm³

Solubility: Insoluble in acid and alkali, practically insoluble in water and organic solvent

Hazardous information (stability/ reactivity)

Stability: Stable with conditions such as temperature, light, and shock

Reactivity: There are no known conditions such as acid, alkali or organic solvent, which may cause a dangerous reaction.

Information about harmful effects: None

Ecological Information: None

Disposal considerations:

Dispose of with consideration of dust arising prevention or consign to industrial waste disposal contractor.

JAPANESE SUPER SILICA CEMENT ADMIXTURE

In Japan, the quality standard of pozzolanic cement admixture like **JASSCA** was stipulated in JIS A6207 in July 2007.

For making smooth and tight concrete, **JASSCA** (5-20% of cement depending on the required concrete design strength) will added together with water reducing agent (or high performance water reducing agent). **JASSCA** will generate high-strength and high-durability concrete by generating calcium silicate hydrate through pozzolanic reaction with cement and reinforcing hardened bodies.

(1)JIS (Japanese Industrial Standard) specifies the standards used for industrial activities in Japan. The standardization process is coordinated by the Japanese Industrial Standards Committee and published through the Japanese Standards Association. It is generally called as JIS or JIS Standard.

Bucket Type 150N/mm²



Bucket Type 150N/mm²



JAPANESE SUPER SILICA (Cement Admixture)

--JASSCA--

Test data target strength 50N

50N-21-20 Formulation table

Type	Material	Concrete mixture plan (kg/m ³)	Batch (kg/m ³)
Cement	Portland cement	545	22.65
Fine aggregate①	Mountain sand	419	7.20
Fine aggregate②	Crushed stone sand	241	17.61
Coarse aggregate①	Crushed stone	949	10.49
Water	Tap water	180	39.74
Admixture	Chmical admixture	5.45	0.218
	JASSCA	15.0	0.60

Test result

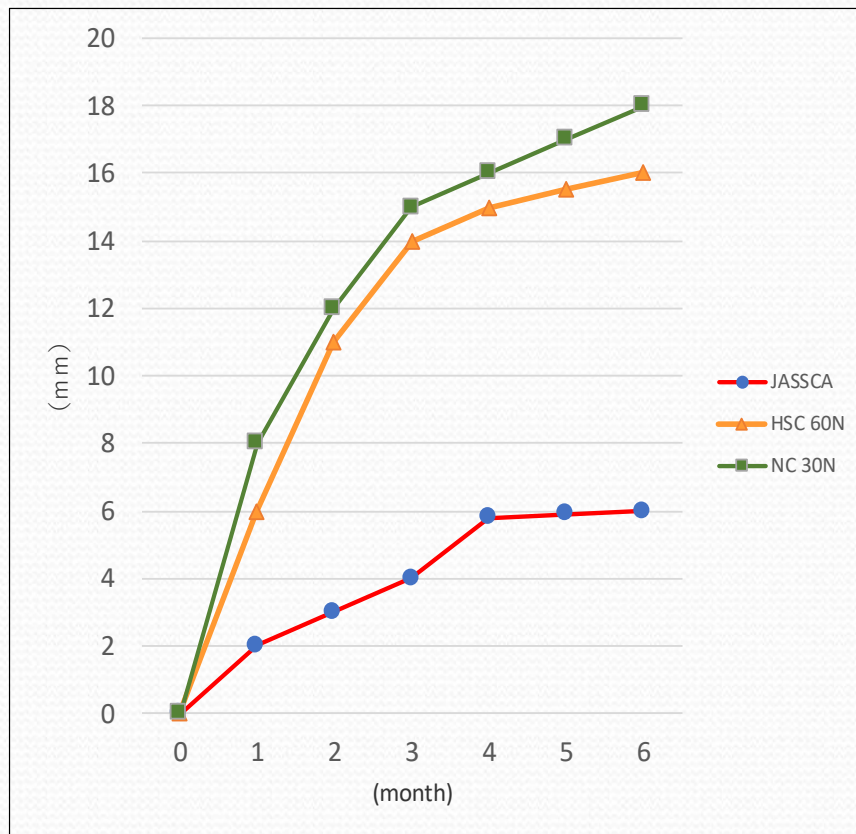
Test Date	Test No.	Age	Breaking Load	Compressive strength	Average value	Specimen
			KN	N/mm ²	N/mm ²	Mass(g)
2021 7/15	1	7	393	50.1	50.6	3.71
	2		403	51.3		3.73
	3		396	50.4		3.70
2021 8/5	1	28	491	62.6	63.2	3.64
	2		500	63.7		3.66
	3		496	63.4		3.66
2021 9/2	1	56	544	69.3	68.9	3.66
	2		539	68.7		3.69
	3		539	68.7		3.65

Confirmation testing of chloride ion penetration depth

For confirming the ion permeation resistance of **JASSCA 80**, a performance verification was performed by comparison with ordinary concrete (normal Portland cement of compressive strength 30N/mm²) and ordinary high-strength concrete (normal Portland of cement compressive strength 60N/mm²).

In the test method, each test piece was immersed in 3% NaCl solution for the predetermined period and the salt penetration depth was measured with the confirmation test results as shown in the following figure.

【Confirmation testing of chloride ion penetration depth】



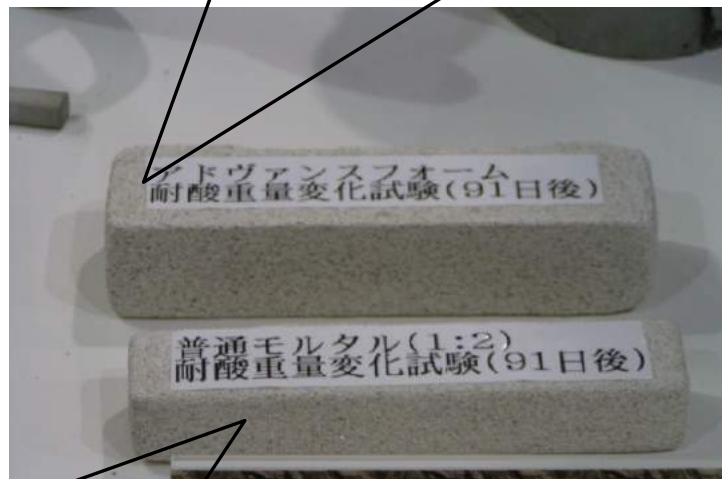
	1 month	2 month	3 month	4 month	5 month	6 month
JASSCA	2.0	3.0	5.0	5.8	5.9	6.0
HSC 60N	6.0	11.0	14.0	15.0	15.5	16.0
NC 30N	8.0	12.0	15.0	16.0	17.0	18.0

Regular Concrete 300 cycles



JASSCA

JASSCA : Weight change 91 days after the application of an acid-proof protective coating



Regular mortar: Weight change 91 days after the application of an acid-proof protective coating

JAPANESE SUPER SILICA CEMENT ADMIXTURE

CHEMICAL COMPOSITION

NAME			JASSCA (AMORPHOUS SUBSTANCE)
CHEMICAL COMPOSITION (%)	SiO ₂	Silicon dioxide	87.2
	Al ₂ O ₃	Aluminum oxide	3.7
	Fe ₂ O ₃	Iron oxide	0.9
	MgO	magnesium oxide	0.07
	CaO	Calcium oxide	0.8
	Na ₂ O	Sodium oxide	1.8
	K ₂ O	Potassium oxide	1.2
	Cl ⁻	Chloride ion	0.02
lg.Loss			4.4
Moisture content(%)			0.5
SPECIFIC SURFACE AREA(cm ₂ /g)			185,600
PH			5.8
SPECIFIC GRAVITY(g/cm ₃)			2.3

lg.Loss

20, Apr, 2021

Ig.Loss is volume of materials volatilized from ignited evaporation residues (30minutes at 600 ± 25° C) . It mainly shows the volume of organic matter.

Be sure to use "water-reducing admixture".

Recommendation : high range water-reducing admixtures



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JAPANESE SUPER SILICA CEMENT ADMIXTURE

《 ZIRCONIA – THE ORIGIN 》

JASSCA is one of the by-products generated when electrically dissolved Zirconia (Zirconium oxide: ZrO_2), which is used for refractory, grinding materials/abrasive, electronic industry material and ceramic industry pigment, etc., is refined.

We collect exhaust gas that is generated when zirconia sand ($ZrSiO_4$) is electronically dissolved at $2,200^{\circ}C$.

The main component contains as much SiO_2 as conventional MICRO SILICA. **JASSCA** particles are larger than previous varieties, and they are distributed between cement particles; therefore, **JASSCA** improves the liquidity of the cement and strength of the concrete.

Usage example ①

Sapporo Municipal Maruyama Zoo



One of the test results of compressive strength.

Design strength **N27-18-20**

Test No	Age	Breaking Load	Compressive strength	Average value	Specimen
		KN	N/mm ²	N/mm ²	Mass(g)
1	28	330	42.0	41.5	3.71
2		326	41.5		3.73
3		322	41.0		3.70

Be sure to use "water-reducing admixture".

Recommendation : high range water reducing admixtures.

MIXING PROCEDURE OF Japanese Super Silica Cement Admixture -(JASSCA)-

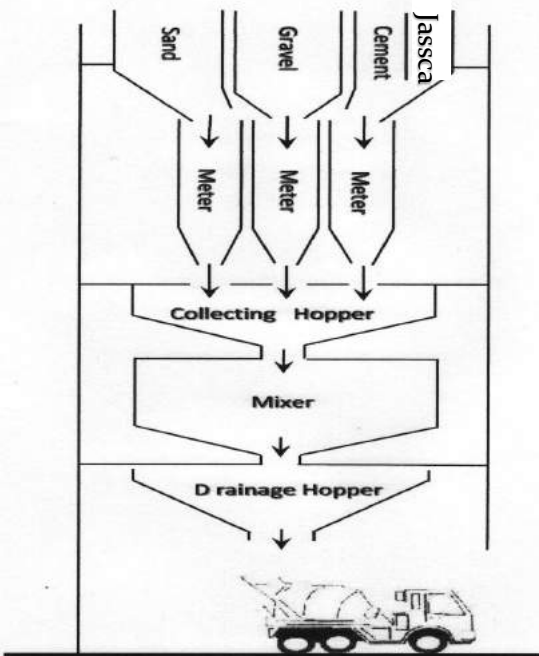
◇PROCEDURE

- ① MIX FINE AGGREGATE AND JASSCA
- ② MIX CEMENT
- ③ MIX COARSE AGGREGATE AND MIX DRY
- ④ ADD WATER AND AE WATER REDUCING AGENT AND MIX THEM

◇MIXING AMOUNT

MIXING AMOUNT OF JASSCA DEPENDS UPON THE USAGE. (ratio by weight)

Super Structure Concrete (Above Ground)	5~10~20% of the amount of cement
Sub Structure Concrete(Under Ground)	7 - 10% of the amount of cement
With Cement Mortar	20% of the amount of cement
With Cement Mortar	5 - 10% of the amount of cement
Marine Structure (Under Water)	20% of the amount of cement



◇PRECAUTION

※ SPECIFIC GRAVITY OF JASSCA IS 2.3 g / cm³
COMMON CONCRETE CONSTRUCTION
: SLUMP BETWEEN 15 ~ 21 cm

1. In case of mixing amount more than 7% of the cement amount.
Deduct the same weight of fine aggregate.
2. In case of mixing amount less than 5% of the cement amount.
No adjustment is required if the amount of JASSCA than 15 kg / m³.



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Usage example ②

The origin of **JASSCA** is zirconia, which is not a metal but a solid white substance. Unlike Micro Silica, it will not get oxidize or blacken even when mixed with water.



Bridge pier where **JASSCA** was used (Nigadai Bridge, Niigata Prefecture)

JAPANESE SUPER SILICA CEMENT ADMIXTURE

(Originated from zirconia)

JASSCA produces high-strength and high-durability concrete. With its high-durability (high resistance to saline infiltration, high water impermeability, resistance to abrasion, chemical stability, alkali aggregate reaction control, resistance to frost damage), it protects structures from above risks, lowers maintenance costs, and extends the lifecycle of structures.

《 Advantages in structures where **JASSCA** is used .
High durability, Low cost, Others 》

【High-durability】

1. High resistance to saline infiltration
2. Impermeability to water
3. High resistance to abrasion
4. Prevents the occurrence of hydration heat and decreases the occurrence of cracking
5. Resistance to chemical erosion
6. Effective in controlling alkali-aggregate reaction
7. High resistance to freezing and thawing

【Low-cost】

1. It is possible to place on the market at low-cost because neither special attention or equipment is required.
2. Low maintenance costs after construction due to high durability.

Some construction with JASSCA



A museum.



A police headquarters.

Achievement photo.



A protective dam.



A city hall.

Achievement photo.



A road protection wall.



A rental apartment.

Where to Buy

JAPANESE SUPER SILICA CEMENT ADMIXTURE

--(JASSCA)--

- **SILICA JAPAN INC.**

sells a series of SILICA products that help you construct safe and secure buildings and structures.

- **JASSCA** is an excellent concrete additive that we highly recommend. Concrete deteriorates over time. However, if JAPANESE SUPER SILICA CEMENT ADMIXTURE is mixed with the concrete, its whiteness will become more and more enhanced. Our products will ensure that the concrete surface remains in top condition and that you can expect long-lasting beauty for many years to come. Our products will always meet your highest expectations.

- Contact address

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