



Elements India Pvt. Ltd.

(An ISO 9001 & 14001 Certified Company)

IS : 16715



CM/L-7200196412

Build Green for Next Generation



Highly Improved Concrete Strength



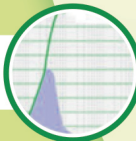
Improved Concrete Workability



Improved Slump and Flow



Proper Particle Size Distribution



SUYOGTM
MiCROFiNE

MATERIAL FOR SMART & DURABLE CONSTRUCTION

HSN Code : 26180000

SUYOG ELEMENTS INDIA PVT LTD is company of Suyog group. Suyog is a leading group in the field of manufacturing and distribution of cementitious products. Suyog is a well known for its excellent product quality and related services.

We Are Best In Class For

- ✓ Product of Highest Class
- ✓ Consistent product Quality
- ✓ Customized Technical Services
- ✓ Customer Centric Approach
- ✓ On Time Delivery & Competitive Price



What is Suyog Microfine.....??

Suyog Microfine is Build Green for the Next Generation, It's Ultrafine Slag / Microfine Material much finer than other hydraulic materials like Cement, Fly Ash, Ground Granulated Blast Furnace Slag, Microsilica etc. being manufactured in India.

Suyog Microfine has special attributes to enhance the performance of concrete in the fresh stage & hardened stage because of its optimized particle size distribution. Suyog Microfine can be utilized as a option for Microsilica as it has an optimum particle size distribution. Suyog Microfine is Produced in completely controlled conditions with special types of equipment / Instruments for manufacturer-optimized particle size distribution which is its unique property.

Some of the key area of Suyog Microfine use are

- ❖ In Highrise structures with challenging situations to pump the concrete with ease
- ❖ RCC residential, commercial structures durable concrete
- ❖ High performance concrete with extremely low water to binder ratio
- ❖ Work with Smart Dynamic concrete or Self-compacting concrete
- ❖ Precast concrete elements for tunnels, bridge, segmental construction, blocks, hollow core slab
- ❖ Commercial precast units and durable special precast unit
- ❖ Post tension / Pre stressed concrete slab
- ❖ Construction grouts, plasters, repair mortars
- ❖ Shotcrete with improved cohesion and faster initial strength gain
- ❖ Temperature controlled mass concrete for mass concrete like raft and pile foundations
- ❖ The use of Suyog Microfine results in improved early strength and impermeability, higher slump, and higher retention even better than any other Ultrafine SCM (Supplementary Cementitious Materials)



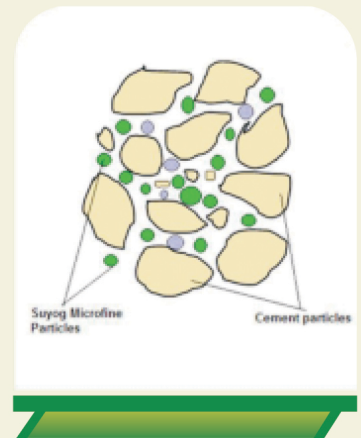
FLOW PROPERTIES

- ❖ High flowability
- ❖ Improved slump retention
- ❖ Good vertical pumpability (Ideally >300 meters)
- ❖ Low bleeding and segregation
- ❖ Reduces stickiness of concrete and improve cohesiveness
- ❖ Improved packing density results good flowability
- ❖ Low pressure on pump improves mechanical Integrity of machinery.



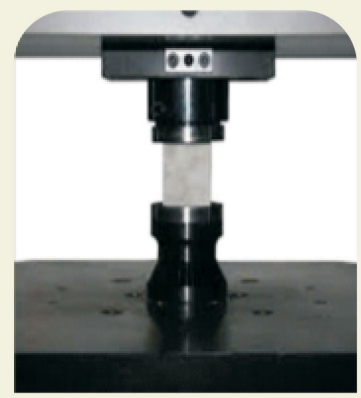
COMPACTION PROPERTIES

- ❖ Uniformly distributed particle size enhances packing density of concrete.
- ❖ Low void in concrete
- ❖ Ultrafine Particles of Suyog Microfine releases water entrapped between cement grains which results in enhanced pumpability & Cohesiveness of Concrete
- ❖ Uniformly distributed particle size provides a dense matrix pore structure resulting in better cohesiveness and superior volume stability (shrinkage).



HIGH & IMPROVED COMPRESSIVE STRENGTH

- ❖ Lower water to cementitious ratio (<0.3)
- ❖ Lower heat of hydration and to prevent shrinkage
- ❖ High Cohesiveness of concrete results in enhanced Strength
- ❖ Suyog Microfine results in the formation of a dense pore structure and React with in-built Ca(OH)_2 due to cement hydration, provides an increased secondary hydrated product resulting in improved strength gain at early as well as later stage.



CHEMICALLY STABLE SUPPLIMENTRY MATERIAL

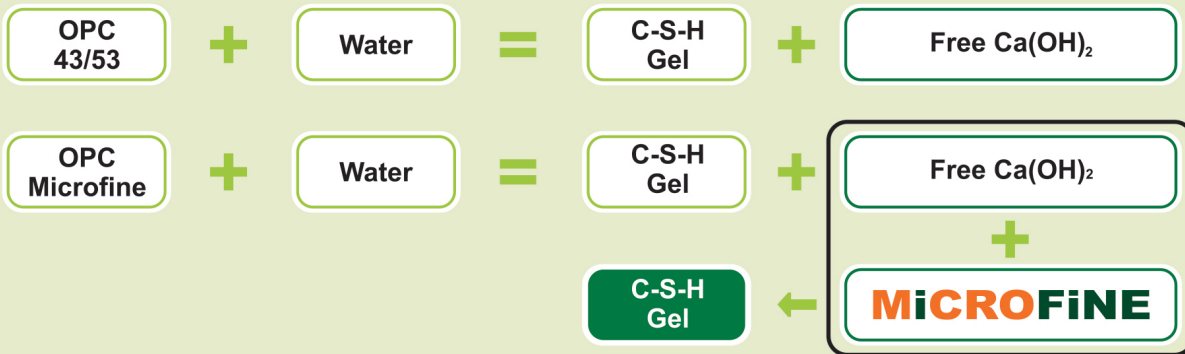
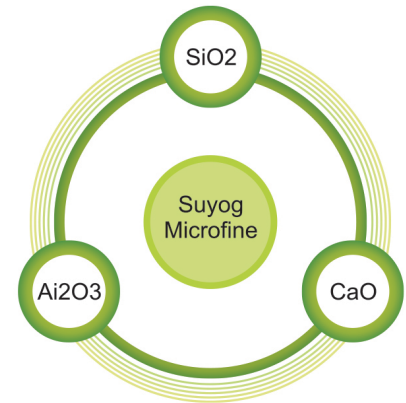
Suyog Microfine is chemically stable material of CaO, Al₂O₃ and SiO₂

Ordinary cement reacts with water and forms C-S-H gel as well as Ca(OH)₂. This process is known as Hydration process. Ca(OH)₂ again reacts with SCM material and forms C-S-H gel.

This secondary process is known as pozzolanic reaction.

C-S-H gel is acts as glue to bind all the aggregates together and makes concrete more stable.

Suyog Microfine containing concrete will have increased amount of strength enhancing C-S-H gel



IMPROVED DURABILITY

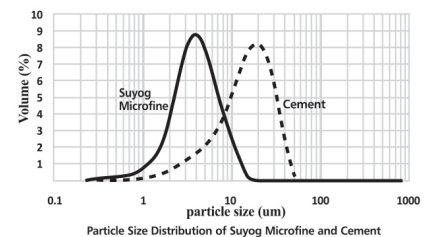
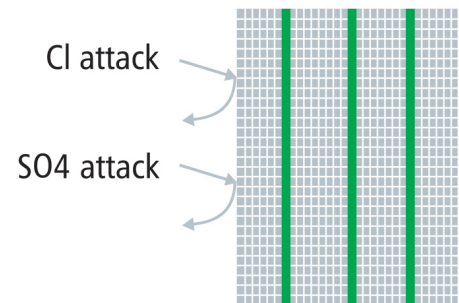
Suyog Microfine results dense pore structure which restricts Penetration & migration of

- ◆ Chloride ion
- ◆ Sulphate ion
- ◆ Other Chemical & Water

Above properties improve durability of structure.

Suyog Microfine makes concrete more alkaline, thereby protecting the reinforced steel in concrete and providing a long life of structure.

Suyog Microfine facilitates high strength, high performance for durable structure



Comparison of Suyog Microfine v/s Microsilica

| Microsilica | Properties | SUYOG MiCROFiNE TM |
|--------------------------|-----------------------------|--------------------------------------|
| Critical | Dispersion in concrete | Proper |
| 10% max | Replacement to Cement | Up to 10% |
| High | Water Demand | Low (~10-15%) |
| Reduced | Workability | Improved |
| Increased | Super plasticizer dosage | Reduced |
| Fast | Rate of Slump loss | Slow |
| Increased | Initial Heat of Hydration | Lower |
| Reduced | Alkalinity of Pore Solution | Maintained |
| Generally only collected | Particle size distribution | Properly controlled |
| Lower | Compressive strength | Higher (~1.5 times) |
| High | Product cost | Low |

**Sudarshan Setu (Signature Bridge)
Okha, Dwarka, Gujarat**



**DELHI MUMBAI
EXPRESSWAY**

The New Narmada Bridge at Bharuch



Government Projects Approved > Suyog Microfine

- Approved by Mumbai Coastal Road Project, Mumbai
- Approved by NHAI - National Highways Authority of India -Shamlaji to Mota Chiloda NH - 8 Project, Gujarat
- Approved by NHDP - National Highways Development Project - Vadodara to Kim Expressway, Gujarat
- Approved by NHAI- National Highway Division, Signature Bridge between Okha & Beyt Dwarka, Gujarat
- Approved by EIL- Engineers India Ltd for HRRL - HPCL Rajasthan Refinery Project Barmer, Rajasthan
- Approved by CIDCO (City & Industrial Development Corporation of Maharashtra Ltd) Mumbai
- Approved by NHAI-151A Under Bharatmala Pariyojna, Const. of 6 Lane Elevated Structure at Rajkot
- Approved by GMRCL - Gujarat Metro Rail Corporation Limited, Surat Metro Project
- Approved by CMRCL - Chennai Metro Rail Ltd, Chennai Metro Rail Project, Tamilnadu
- Approved by NHSRCL, Mumbai - Ahmedabad Bullet Train Project

Our Valuable Clients used > Suyog Microfine

- L&TLtd- Statue of Unity - World's Tallest Statue in Vadodara, Gujarat
- SP Singla Construction Pvt Ltd -Signature Bridge between Okha & Beyt Dwarka
- Ashoka Buildcon Ltd – Narmada Major Bridge & Narmada River Bridge, Ankleshwar
- Ultratech Cement Ltd, RMC Plant, Ahmedabad,Vadodara & Surat
- PSP Projects Ltd – Precast Plant at Ahmedabad - Bullet Train Project – NHSRCL
- TATA Projects Ltd, HRRL - HPCL Rajasthan Refinery Project Barmer, Rajasthan
- Shapoorji Pallonji & Co Pvt Ltd, HRRL - HPCL Rajasthan Refinery Project Barmer, Rajasthan
- Bridge & Roof Co India Ltd, HRRL - HPCL Rajasthan Refinery Project Barmer, Rajasthan
- Montecarlo Ltd, HRRL - HPCL Rajasthan Refinery Project Barmer, Rajasthan
- L&T Hydrocarbon Engineering Ltd,HRRL - HPCL Rajasthan Refinery Project Barmer, Rajasthan
- Megha Engineering & Infrastructure Ltd, HRRL - HPCL Rajasthan Refinery Project Barmer, Rajasthan
- Patel Infrastructure Ltd, Road & Bridge Projects, Tamilnadu
- L&T Ltd – NHSRCL, Mumbai - Ahmedabad Bullet Train Project
- Gulermark India Pvt Ltd/ RDC Concrete (India) Pvt Ltd -Surat Metro Rail Project, Surat

Delhi - Mumbai Expressway, Vadodara



Delhi - Mumbai Expressway, Navsari



SUYOG MICROFINE USED IN KEY PROJECTS

Constructed by Sree Infratech, Tamilnadu



- SUYOG MICROFINE Products are used by our various customer in various application. SUYOG MICROFINE is gaining its place in special concrete application apart from conventional concrete. The product is adding value to our customers with our technical support for various application.



Some Renowned Projects we are Proud to be Associates with

SUYOG MICROFINE USED IN KEY PROJECTS



Construction by : L & T Construction

It is a dream project of Government of India for Tribute to Iron Man of India Mr. Sardar Vallabhbhai Patel. Project is lead by L&T Construction. It is situated at Sardar Sarovar Dam on Narmada River near Rajpipla district of Gujarat state. Statue of Unity is one of the tallest statue in the world.



HPCL Rajasthan Refinery Ltd



SUYOG MICROFINE USED IN KEY PROJECTS

SURAT METRO RAIL PROJECT



**BULLET TRAIN PROJECT:
TRACK LAYING BEGINS FOR MUMBAI-AHMEDABAD
HIGH SPEED RAIL CORRIDOR**



Cement Production is a Process of High Pollution & High Emission

Cement is the most widely used building material, However, cement production is a process of high pollution and high emission. The production of 1 ton of cement consumes about 73 kg of fuel and 75 kWh of electricity and emits about 0.63 tons of CO₂- Replacing part of cement with industrial solid wastes as supplementary cementitious materials is an effective way to develop green and low-carbon cement

- **QA / QC LAB - Set up Testing Facilities**
- **It's a lot more than UGGBS Testing Cement, Aggregates / Sand Testing, Admixture, Concrete Testing,**
- **Concrete Mix Design services to our Prospective & Existing Clients**



➤ DISPENSING AND DOSAGE:

A Measured Quantity of Suyog Microfine shall be added to the concrete mix along with cement and other pozzolanic powder materials. Mixing time shall be adequate to facilitate the uniform inter-dispersion of all powder materials in the concrete. Dosage: 4% to 8% by weight of total binder content as per the grade of concrete. For special-purpose concretes, dosage beyond the above-stated range can be used to achieve the desired performance parameters.

➤ STORAGE AND SHELF LIFE

Bags of Suyog Microfine should be stored in a well-ventilated, Sheltered, Dry Area and Protected from Water, Moisture, Rain, and Heat. Under such Storage Conditions, the Shelf life of the Sealed Product is a Minimum of Six Months from the date of manufacture

➤ PACKAGING

Suyog Microfine is available in 25 Kg bags and Loose in Bulk. - Other pack sizes are available on request

TECHNICAL DATA SHEET OF SUYOG MICROFINE - ULTRAFINE GGBS

| PARAMETER | Test character | Unit | Specification IS : 16715 : 2018 | SEIPL Typical Range |
|--------------------------|--|--------------------|------------------------------------|--|
| Physical Property | | | | |
| 1 | Specific Gravity | - | Not specified | 2.86 ± 0.04 |
| 2 | Bulk Density | Kg/m ³ | Not specified | 600 - 900 |
| 3 | Fineness (Surface Area) Min. | m ² /Kg | 1500 | 3200 <small>(Computed Blain Based on PSD)</small> |
| 4 | Particle Size Distribution (PSD) | | | |
| | (a) D ₅₀ | µm | 5 Max. | < 4.50 |
| | (b) D ₉₅ | µm | 15 Max. | < 12 |
| 5 | Moisture Content | % | <=1 | < 0.5 |
| 6 | Slag Activity Index | 7 Days | Not Less than 85 % | 90 % - 130 % |
| | | 28 Days | Not Less than 100 % | 100 % - 150 % |
| Setting time | | | | |
| 7 | Initial Minutes | Minute | Not specified | 150 - 230 |
| 8 | Final Minutes | Minute | Not specified | 230 - 300 |
| Soundness | | | | |
| 9 | Le-Chatelier Expansion (mm) | MM | Not specified | < 5 |
| Chemical Property | | | | |
| 1 | Loss on Ignition (LOI) | % | 3.0 Max. | < 1.50 |
| 2 | Insoluble Residue (IR) | % | 3.0 Max. | < 1.50 |
| 3 | Silica as SiO ₂ | % | Not specified | 32% to 36% |
| 4 | Alumina (Al ₂ O ₃) | % | Not specified | 16% to 19% |
| 5 | Iron oxide (Fe ₂ O ₃) | % | Not specified | 1% to 2% |
| 6 | Calcium oxide (CaO) | % | Not specified | 36% to 40% |
| 7 | Magnesium oxide (MgO) | % | 17.0 Max. | 6% to 11% |
| 8 | Sulphur trioxide (SO ₃) | % | 3.0 Max. | < 1.50 |
| 9 | Sulphide Sulphur (S), Max | % | 2.0 Max. | < 0.70 |
| 10 | Chloride Content (Cl) | % | 0.10 Max. | < 0.05 |
| 11 | Manganese oxide (Mn ₂ O ₃) | % | Not specified | < 1.0 |
| 12 | Manganese oxide (MnO) | % | 5.5 Max. | < 3.0 |
| 13 | Calcium Sulphide (CaS) | % | Not specified | < 2.0 |
| Chemical Moduli | | | | |
| (A) | CaO + MgO + SiO ₂ | % | Not specified | 75 to 80 |
| (B) | CaO + MgO/SiO ₂ | % | Not specified | 1.2 to 1.3 |
| (C) | CaO/SiO ₂ | % | Not specified | 1.0 to 1.2 |
| (D) | Glass Content | % | 85 % Min. | 94 % to 97 % |
| (E) | (CaO + MgO + 1/3 Al ₂ O ₃) / (SiO ₂ + 2/3 Al ₂ O ₃) | % | 1.0 Min. | >=1 |
| (F) | (CaO+MgO+Al ₂ O ₃) / SiO ₂ | % | 1.0 Min. | >=1 |
| (G) | (CaO + CaS + 1/2MgO + Al ₂ O ₃) / (SiO ₂ + MnO) | % | 1.5 Min. | >=1.5 |

Suyog Key Esteem Customers are



ASHOKA

Ashoka Buildcon Ltd.



AFCONS

AFCONS INFRASTRUCTURE LIMITED
A Shapoorji Pallonji Group Company



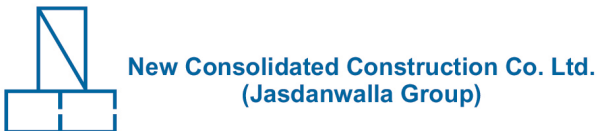
IRB
INFRASTRUCTURE DEVELOPERS LTD



BRIDGE & ROOF CO. (INDIA) LTD.
(A Government of India Enterprise)
A Miniratna Company



ENGINEERS INDIA LIMITED



PRISM JOHNSON LIMITED
(FORMERLY PRISM CEMENT LIMITED)



ATLAS CONSTRUCTIONS PVT. LTD.

NUVOCO

Mfg. Marketed by :



Marketed by

COASTLINE
SERVICE AGENCY

K. Ramakrishna Murthy

Cell : 9866640141

✉ coastlineagencies@gmail.com

🌐 www.coastlineserviceagency.com

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