Evaluation Report of effect on concrete compressive strength

Following key effects were found on concrete properties by adding 0.1% by weight of cement

1. There is **12 %** increment in concrete cube compressive strength for M30 grade of Concrete in 7 days.
2. Compressive strength of the test specimen is increased by **15%** at 14 days age of concrete.
3. We observed that the comparative 28 days **Compressive Strength** of same mix proportion is increased by **12%** with maintaining the workability of fresh concrete.

COMPARATIVE STUDY

Ingredients/Tests	Source/ Test Method	M-30 Concrete mix without Graphene Solution- Control Mix	M-30 Concrete mix with Graphene Solution	Remarks
		VST-26898-TR-65789/ TR-657993-94-95	**VST-26898-TR-65788/ TR-657990-91-92**	
Graphene Solution		-	500 ml per 50 kg Cement (0.1% by weight of Cement)	
Concrete Mix Details				
Cement, kg/Cum	Ultratech PPC	447	447	
20mm, kg/Cum (aggregate in SSD condition)	NA	537	537	
10mm, kg/Cum (aggregate in SSD condition)	NA	537	537	
C. Sand, kg/Cum (fine aggregate in SSD conditio	NA	757	757	
Water, lit/Cum	NA	163	158	
Concrete Plasticizer	Sikament 4101 NS	4.00	4.00	
Workability- Slump Retention (mm)	IS 1199 (Part 2) : 2018			
Initial		120	120	
After 30 Min		120	120	
Concrete Cube Compressive Strength (MPa)	S 516 Part-1 Sec-1: 2021			
7 Days		24.5	27.5	Increased By **12%**
14 Days		29.5	34.0	Increased By **15%**
28 Days		39.0	43.5	Increased By **12%**

Regd. Office: *Shanti Kunj, Farm Road, Sambalpur- 768002, Odisha, India*
Admin. Office: *1st Floor, 5/5, 4TH Cross Road, Jayanagar 7TH Block, Bangalore- 560078, Karnataka, India*
Contact: +91-8095300576
Email: preetish.agiresourcesltd@gmail.com

CONCRETE CUBE COMPRESSIVE STRENGTH TEST RESULTS

(*)CUBE SIZE(mm): 150*150*150
(*)GRADE OF CONCRETE:M-30
(*)AGE OF SPECIMEN(DAYS):7
(*)DATE OF CASTING: 20/02/2024
DATE OF TESTING : 27/02/2024

Sr No	Master Equipment Description/ Equipment ID	Range/Resolution	Cal Certificate No.	Calibration Done on	Calibration Due Date	Calibrated by
1	Compression Testing Machine (Automated)/CTM-02	3000kN/0.1kN	VSC-6289-CR-623086	02/11/2023	01/11/2024	

Sr. No	(*)ID Mark of Specimen	Dimension of specimen, mm			Cross sectional area mm^2	Weight(kg)	Maximum Load, kN	Compressive Strength N/mm^2	Type of Failure occurred as per IS 516 Part-1 Sec-1
		Length	Width	Thickness					
1	M-30 Concrete mix without Graphene Solution- Control Mix	150.2	150.1	150	22544	8.310	541.4	24	Fig No-1
2	M-30 Concrete mix without Graphene Solution- Control Mix	150.1	150	150	22529	8.356	548.6	24.5	Fig No-1
3	M-30 Concrete mix without Graphene Solution- Control Mix	150	150.1	150	22517	8.349	556.2	24.5	Fig No-1
							Average Value =	24.5	

Remark:(*) Mark Information furnished by the Customer.
Curing Declaration: Curing of the sample (s) submitted to the laboratory for testing was in the customer's scope till the successful registration of the test request.

REMARKS:

i) As Per IS 516 Part-1/sec-1 Clause no 3.6, the individual variation should not be more than ±15% of the average. If more, The test results of the sample are invalid.
ii) Acceptance criteria of Compressive Strength is given in IS 456: 2000 in clause No 16.1

CONCRETE CUBE COMPRESSIVE STRENGTH TEST RESULTS

(*)CUBE SIZE(mm): 150*150*150
(*)GRADE OF CONCRETE:M-30
(*)AGE OF SPECIMEN(DAYS):7
(*)DATE OF CASTING: 20/02/2024
DATE OF TESTING : 27/02/2024

Sr No	Master Equipment Description/ Equipment ID	Range/Resolution	Cal Certificate No.	Calibration Done on	Calibration Due Date	Calibrated by
1	Compression Testing Machine (Automated)/CTM-02	3000kN/0.1kN	VSC-6289-CR-623086	02/11/2023	01/11/2024	

Sr. No	(*)ID Mark of Specimen	Dimension of specimen, mm			Cross sectional area mm^2	Weight(kg)	Maximum Load, kN	Compressive Strength N/mm^2	Type of Failure occurred as per IS 516 Part-1 Sec-1
		Length	Width	Thickness					
1	M-30 Concrete mix with Graphene Solution	150	150	150.1	22501	8.412	622.9	27.5	Fig No-1
2	M-30 Concrete mix with Graphene Solution	150.1	150	150	22518	8.416	629.3	28	Fig No-1
3	M-30 Concrete mix with Graphene Solution	150	150	150	22504	8.401	619.0	27.5	Fig No-1
							Average Value =	27.5	

Remark:(*) Mark Information furnished by the Customer.
Curing Declaration: Curing of the sample (s) submitted to the laboratory for testing was in the customer's scope till the successful registration of the test request.

REMARKS:

i) As Per IS 516 Part-1/sec-1 Clause no 3.6, the individual variation should not be more than ±15% of the average. If more, The test results of the sample are invalid.
ii) Acceptance criteria of Compressive Strength is given in IS 456: 2000 in clause No 16.1

CONCRETE CUBE COMPRESSIVE STRENGTH TEST RESULTS

(*)CUBE SIZE(mm): 150*150*150
(*)GRADE OF CONCRETE:M-30
(*)AGE OF SPECIMEN(DAYS):14
(*)DATE OF CASTING: 20/02/2024
DATE OF TESTING : 05/03/2024

Sr No	Master Equipment Description/ Equipment ID	Range/Resolution	Cal Certificate No.	Calibration Done on	Calibration Due Date	Calibrated by
1	Compression Testing Machine (Automated)/CTM-02	3000kN/0.1kN	VSC-6289-CR-623086	02/11/2023	01/11/2024	

Sr. No	(*)ID Mark of Specimen	Dimension of specimen, mm			Cross sectional area mm^2	Weight(kg)	Maximum Load, kN	Compressive Strength N/mm^2	Type of Failure occurred as per IS 516 Part-1 Sec-1
		Length	Width	Thickness					
1	M-30 Concrete mix without Graphene Solution-Control Mix	150	150.1	150	22510	8.396	694.1	31	Fig No-1
2	M-30 Concrete mix without Graphene Solution- Control Mix	150	150.1	150.1	22516	8.402	657.9	29	Fig No-1
3	M-30 Concrete mix without Graphene Solution- Control Mix	150	150	150	22506	8.388	639.8	28.5	Fig No-1
							Average Value =	29.5	

Remark:(*) Mark Information furnished by the Customer.
Curing Declaration: Curing of the sample (s) submitted to the laboratory for testing was in the customer's scope till the successful registration of the test request.

REMARKS:

i) As Per IS 516 Part-1/sec-1 Clause no 3.6, the individual variation should not be more than ±15% of the average. If more, The test results of the sample are invalid.
ii) Acceptance criteria of Compressive Strength is given in IS 456: 2000 in clause No 16.1

CONCRETE CUBE COMPRESSIVE STRENGTH TEST RESULTS

(*)CUBE SIZE(mm): 150*150*150
(*)GRADE OF CONCRETE:M-30
(*)AGE OF SPECIMEN(DAYS):14
(*)DATE OF CASTING: 20/02/2024
DATE OF TESTING : 05/03/2024

Sr No	Master Equipment Description/ Equipment ID	Range/Resolution	Cal Certificate No.	Calibration Done on	Calibration Due Date	Calibrated by
1	Compression Testing Machine (Automated)/CTM-02	3000kN/0.1kN	VSC-6289-CR-623086	02/11/2023	01/11/2024	

Sr. No	(*)ID Mark of Specimen	Dimension of specimen, mm			Cross sectional area mm^2	Weight(kg)	Maximum Load, kN	Compressive Strength N/mm^2	Type of Failure occurred as per IS 516 Part-1 Sec-1
		Length	Width	Thickness					
1	M-30 Concrete mix with Graphene Solution	150	150	150.1	22512	8.389	758.7	33.5	Fig No-1
2	M-30 Concrete mix with Graphene Solution	149.8	150	150.1	22470	8.454	796.4	35.5	Fig No-1
3	M-30 Concrete mix with Graphene Solution	150.1	150	150.1	22513	8.416	750.9	33.5	Fig No-1
							Average Value =	34	

Remark:(*) Mark Information furnished by the Customer.
Curing Declaration: Curing of the sample (s) submitted to the laboratory for testing was in the customer's scope till the successful registration of the test request.

REMARKS:

i) As Per IS 516 Part-1/sec-1 Clause no 3.6, the individual variation should not be more than ±15% of the average. If more, The test results of the sample are invalid.
ii) Acceptance criteria of Compressive Strength is given in IS 456: 2000 in clause No 16.1

CONCRETE CUBE COMPRESSIVE STRENGTH TEST RESULTS

(*)CUBE SIZE(mm): 150*150*150
(*)GRADE OF CONCRETE:M-30
(*)AGE OF SPECIMEN(DAYS):28
(*)DATE OF CASTING: 20/02/2024
DATE OF TESTING : 19/03/2024

Sr No	Master Equipment Description/ Equipment ID	Range/Resolution	Cal Certificate No.	Calibration Done on	Calibration Due Date	Calibrated by
1	Compression Testing Machine (Automated)/CTM-02	3000kN/0.1kN	VSC-6289-CR-623086	02/11/2023	01/11/2024	

Sr. No	(*)ID Mark of Specimen	Dimension of specimen, mm			Cross sectional area mm^2	Weight(kg)	Maximum Load, kN	Compressive Strength N/mm^2	Type of Failure occurred as per IS 516 Part-1 Sec-1
		Length	Width	Thickness					
1	M-30 Concrete mix without Graphene Solution- Control Mix	150	150.1	150.1	22517	8.340	865.5	38.5	Fig No-1
2	M-30 Concrete mix without Graphene Solution- Control Mix	150	150	150.1	22507	8.450	896.3	40	Fig No-1
3	M-30 Concrete mix without Graphene Solution- Control Mix	150	150	150	22510	8.368	876.0	39	Fig No-1
							Average Value =	39	

Remark:(*) Mark Information furnished by the Customer.
Curing Declaration: Curing of the sample (s) submitted to the laboratory for testing was in the customer's scope till the successful registration of the test request.

REMARKS:

i) As Per IS 516 Part-1/sec-1 Clause no 3.6, the individual variation should not be more than ±15% of the average. If more, The test results of the sample are invalid.
ii) Acceptance criteria of Compressive Strength is given in IS 456: 2000 in clause No 16.1

CONCRETE CUBE COMPRESSIVE STRENGTH TEST RESULTS

(*)CUBE SIZE(mm): 150*150*150
(*)GRADE OF CONCRETE:M-30
(*)AGE OF SPECIMEN(DAYS):28
(*)DATE OF CASTING: 20/02/2024
DATE OF TESTING : 19/03/2024

Sr No	Master Equipment Description/ Equipment ID	Range/Resolution	Cal Certificate No.	Calibration Done on	Calibration Due Date	Calibrated by
1	Compression Testing Machine (Automated)/CTM-02	3000kN/0.1kN	VSC-6289-CR-623086	02/11/2023	01/11/2024	

Sr. No	(*)ID Mark of Specimen	Dimension of specimen, mm			Cross sectional area mm^2	Weight(kg)	Maximum Load, kN	Compressive Strength N/mm^2	Type of Failure occurred as per IS 516 Part-1 Sec-1
		Length	Width	Thickness					
1	M-30 Concrete mix with Graphene Solution	150	150.1	150	22509	8.402	988.8	44	Fig No-1
2	M-30 Concrete mix with Graphene Solution	150	150	150	22505	8.396	982.5	43.5	Fig No-1
3	M-30 Concrete mix with Graphene Solution	150.1	150	150.1	22509	8.378	974.7	43.5	Fig No-1
							Average Value =	43.5	

Remark:(*) Mark Information furnished by the Customer.
Curing Declaration: Curing of the sample (s) submitted to the laboratory for testing was in the customer's scope till the successful registration of the test request.