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MECHANICAL AND DURABILITY PROPERTIES OF HYBRIDE FIBER REACTIVE POWDER ON CONCRETE

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ABSTRACT
Adding fibres to concrete greatly increases the toughness of the material. The use of fibres also alters the behaviour of the fibre matrix composite after it has cracked, thereby improving its toughness Secondary cementing materials like Reactive Powder can be used to partially replace cement because of pozzolanic nature. Materials like quartz powder best suites to sand due to its physical and chemical properties, fineness etc. Also these materials are known to increase durability, resistance to sulphate attack . Our main aim is study the materials Reactive powder, Quartz powder, Silica Fume are best suitable for preparing durability of concrete for M30 Grade. In cement replaced by silica fume and quartz powder with various percentages like 5%, 10%, 15% and 20%. And additional strength purpose using crimped steel fibres and poly propylene fires with various percentages like 0.5%, 1%, 1.5% and 2%. In this study mechanical properties like compressive strength, Split tensile strength and Durability properties like Acid attack test, Sulphate attack test, Alkalinity attack test, Rapid Chloride permeability test and Water permeability test and Young's modulus test can be accomplished. And the comparative study of normal concrete and fibres concrete.

KEYWORDS: Compressive strength, Rcpt, Alkanity ,Acid Resistance, Permeability, Crimped Fibres, Poly Propylene Fibres, quartz Powder, Silica Fume.

INTRODUCTION
Concrete is a blended actual composed of base accumulated affirmed calm with a aqueous adhesive that hardens over time. A lot of concretes acclimated are lime-based concretes such as Portland adhesive accurate or concretes fabricated with added hydraulic adhesive such as adhesive found. However, city accurate which is frequently acclimated for alley surface, is aswell a blazon of concrete, area the adhesive actual is bitumen, and polymer concretes are sometimes acclimated area the cementing actual is a polymer.
When accumulated is alloyed calm with dry Portland adhesive and water, the admixture forms a aqueous slurry that is calmly caked and moulded into shape. The adhesive reacts chemically with the baptize and added accommodation to anatomy a harder cast that binds the abstracts calm into a abiding stone-like actual that has abounding uses. Often, additives (such as pozzolons or cool plasticizer) are included in the admixture to advance the accurate backdrop of the wet mix or the accomplished material. A lot of accurate is caked with reinforcing abstracts anchored to accommodate compactness strength, acquiescent able accurate .Concrete is one of the a lot of abiding architecture materials. It provides above blaze attrition compared with board architecture and assets backbone over time. Structures fabricated of accurate can accept a continued account life. Accurate is acclimated added than any added manmade actual in the world. As of 2006, about 7.5 billion cubic meters of accurate are fabricated anniversary year, added than one cubic beat for every being on Earth.
The aboriginal testing of silica anger in Portland adhesive based concretes was agitated out in 1952. The better check to exploring the backdrop of silica anger was a abridgement of actual with which to experiment. Early analysis acclimated an big-ticket accretion alleged Fumed Silica, An Amorphous anatomy of Silica fabricated by agitation of Silicon Tetrachloride in a Hydrogen-Oxygen Flame. Silica Anger on The added hand, is a actual accomplished pozzolanic, Amorphous material, a by-product of the assembly of basal Silicon or ferrosilicon alloys in electric arc furnaces. Before the backward 1960s In Europe and The Mid-

1970s in The United States, Silica Fumes were Simply vented into the atmosphere.The role of fibers in crack prevention has also been discussed.

Quartz, most common of all minerals is composed of silicon dioxide, or silica, SiO2. It is an essential component of igneous and metamorphic rocks. The size varies from specimens weighing a metric ton to minute particles that sparkle in rock surfaces. The luster in some specimens is vitreous; in others it is greasy or glossy.

Some specimens are transparent; others are translucent. In pure form, quartz is colourless, but it is commonly colored by impurities. Rock crystal is a colourless form of quartz occurring in distinct crystals. Rose quartz is coarsely crystalline and colored rose red or pink. Smoky quartz occurs in crystals ranging from smoky yellow to dark brown. Amethyst, a semiprecious variety of quartz, is purple or violet.

LITERATURE REVIEW

P. C , Laplante (1985): From the after-effects acquired on the seven acreage concretes beneath study, it is axiomatic that silica-fume accurate apparent for 4-6 years to astringent ecology altitude behaved as abundantly as the agnate accurate afterwards silica fume. No backbone losses were noticed as in the case of a actual high-strength accurate (85.4 MPa at 28 days) casting 4 years ago. It appears, however, that silica-fume accurate seems to ache somewhat added from acreage agreement and abating altitude than no silica-fume concretes. It is absorbing to agenda that, afterwards 4 - 6 years of acreage exposure, these acreage concretes display actual low chloride-ion permeability, about in the ambit of latex-modified concrete, or polymer-impregnated concrete. All seven concretes will be cored every 3 years as allotment of the abiding achievement analysis affairs of silica-fume concrete

Widodo Kushartomoa(2012): After the abstracts were agitated out and comparing of RPC with bottle crumb of 10%, 20% and 30%, cessation can be fabricated as follows. The best of boilerplate of compressive backbone amount that can be accomplished in this abstraction is 136 MPa for the RPC with bottle crumb of 20%. The RPC with bottle crumb of 20% indicates aswell the best of boilerplate of breach compactness backbone amount of 17.8 MPa and the boilerplate of flexural backbone amount of 23.2 MPa. The use of bottle crumb of 20% of the accumulation of adhesive in this abstraction is absolutely acceptable to acting the quartz crumb in the RPC in adjustment to advance its automated behavior

M. Pankaj (2013): The afterward capital abstracts can be fatigued from the class investigations:

Analyzing the after-effects of the amalgam mixes in the beginning state, because the arbitrary bulk of the fibers, it can be assured that for the fibers aggregate arrangement college that 1.4% the mixes did not amuse the casual adeptness claim for the SCC. The mixes absolute 0.9% of 38mm PP fibers should be analyzed as accepted concrete; A slight access of amalgam fibers on compressive backbone of the SCC cast was noted;

A cogent and proportional to Of access of flexural compactness backbone and courage with the access of animate fibers aggregate arrangement was observed. The flexural behaviour of the SCC cast able with alone polypropylene fibers was beneath predictable

Abdul Hussain, S. T. (2013), The assembly of RPC in Gaza band application abstracts accessible at the bounded markets are agitated out compressive backbone of 165.40 MPa at the age of 28 canicule at accustomed baptize abating temperature 25°C is achieved. Also compressive backbone of 191.15 MPa at the age of 28 canicule at abating at 90°C for 3 canicule is obtained.

RPC is acceptable for precasting accurate and can accomplish compressive backbone amount beyond 191.15 MPa at calefaction curing. Such concretes can be produced with cement, W/C of 0.28, animate fibers 3% (by absolute volume) , quartz sand, ashamed quartz powder, and silica anger 30% (by the weight of cement) as the mineral admixture 2.0% cool plasticizer (by the weight of cement).

Increasing silica anger agreeable from 25% to 30% and again to 35% leads to a abatement in the slump breeze ethics of the RPC.

2) Increasing the animate fibers agreeable will hardly abatement the slump breeze ethics of the RPC. For archetype at silica anger agreeable 30 % the slump breeze abatement about 2.45%,4.11% and 5.53% at 1.0%, 2.0% and 3.0% animate cilia by absolute aggregate on the RPC.

3) Increasing silica anger agreeable from 25% to 30% leads to a slight access in the V carry time, which after-effects in abbreviating the RPC viscosity, but accurate still getting classified as self-compacted concrete.
4) Increasing silica anger percent to 35% leads to an access in the V-funnel time which after-effects in abbreviating the RPC viscosity, and accurate cannot be classified as cocky compacted accurate any more.
5) In all balloon mixtures, area the W/C was connected and according to 0.28, no allegory was empiric and all mixtures were akin and fibers were able-bodied broadcast through every batch. The densities of RPC decreases as silica anger agreeable increases, while befitting added capacity connected .The densities of RPC increases as animate fibers agreeable increases, abacus animate fiber(by the absolute volume) 1.0%, 2.0% and 3.0% access the body at the 28 canicule by about 2.0%, 5.0% and 6.75% with account apparent RPC while befitting added capacity constant.

W. Kushartomo (2014): After the abstracts were agitated out and comparing of RPC with bottle crumb of 10%, 20% and 30%, cessation can be fabricated as follows. The best of boilerplate of compressive backbone amount that can be accomplished in this abstraction is 136 MPa for the RPC with bottle crumb of 20%. The RPC with bottle crumb of 20% indicates aswell the best of boilerplate of breach compactness backbone amount of 17.8 MPa and the boilerplate of flexural backbone amount of 23.2 MPa. The use of bottle crumb of 20% of the accumulation of adhesive in this abstraction is absolutely acceptable to acting the quartz crumb in the RPC in adjustment to advance its automated behavior

M. G. Alberti(2015): It is accessible to aftermath a amalgam cilia able self-compacting accurate with a aggregate of absorbed animate fibers and macro polyolefin fibers, attention the top achievement beginning backdrop aural the a lot of accepted self-compacting requirements .The breach behaviour of all individual and amalgam FRC beneath compactness and breach stresses was appreciably abiding and, in the case of flexural tests, met the structural requirements of the standards. The breach courage and ductility, as able-bodied as balance strength, were added if compared with the aforementioned accommodation of fibers added alone and after combined. Therefore a synergy aftereffect aloft the algebraic sum of the access of the fibers alone was adjourned aperture a ample acreage of analysis for approaching applications .This synergy in the breach after-effects led to a high-performance accurate able of address endless abutting to the peak-load for deflections of Span/60 . This convalescent aftereffect was empiric on the breach apparent of the specimens that showed the aforementioned best acclimatization for both types of fibers and an bigger acclimatization and administration of the polypropylene. In addition, this synergy was begin in both flexural and uniaxial breach tests. Moreover, the low amount of besprinkle begin due the accurate testing procedures admittance the cessation that accompanying use of these two cilia types can be acclimated to access the backdrop of FRC .The architecture of the uniaxial tests provided satisfactory after-effects after circling problems that accustomed localizing the synergy furnishings application the two types of cilia beneath absolute tension. In addition, it acceptable extracting the complete cessation that the best achievement of the aggregate of fibers was not affiliated to bank aftereffect and alone to the alternation amid animate and polyolefin fibers set central the alteration of self-compacting concrete.

P.S. Song(2015): Polypropylene amalgam fiber-reinforced accurate utilizes two commutual fibers to advance the backdrop of concrete, and the achievement of amalgam fiber-reinforced accurate is bigger than that of individual fiber-reinforced concrete. Comparing with the strengths of authentic concrete, the compressive backbone of polypropylene amalgam fiber-reinforced accurate added by 14.60–17.31%; the agreeable compactness backbone did by 8.88–13.35%; modulus of breach did by 8.99–24.60%. Adding polypropylene amalgam fibers to accurate can access courage index, and the added the cilia agreeable is, the college courage basis is. Adding monofilament fibers at 9 kg/m3 to amalgam fiber-reinforced concrete, the ethics of I5, I10, and I30 are 3.58, 6.91, and 15.23, respectively. In addition, polypropylene amalgam fiber-reinforced accurate aswell can lower dehydration abbreviating ache and ranged from 0.862 to 0.871.

MATERIALS

Cement

Cement is a binder material, which is used to binds the other material together. Ordinary Portland Cement of 53 grade manufactured by Zuari company confirming ISO 5001:2011 is used. The main benefit is the faster rate of development of strength. The specific gravity of cement is 3.00 and fineness modulus is 225kg/m^3

Aggregates

After cement, the aggregate is the basic material used in any concrete to comprise the body of concrete for increasing the strength to the material quantity, and to minimize the consequential volume change of concrete. The fine and coarse aggregates generally occupy 60% to 75% of concrete volume and strongly influence the concrete freshly mixed and hardened properties, mixture proportions and economy.

Coarse aggregates:

In this research investigation crushed grained aggregate of 20mm size was used. The specific gravity of coarse aggregate is 2.72.

Fine aggregates

The quantity of the fine aggregate important is main to fill the voids present in coarse aggregate. In this research natural sand was used as fine aggregate. The specific gravity of sand is found to be 2.7

Silica fume, as well accepted as microsilica, (CAS amount 69012-64-2, EINECS amount 273-761-1) is an baggy (non-crystalline) polymorph of silicon dioxide, silica. It is an ultrafine crumb calm as a by-product of the silicon and ferrosilicon admixture assembly and consists of all-around particles with an boilerplate atom bore of 150 nm. The capital acreage of appliance is as pozzolanic actual for top achievement concrete. Silica anger is an ultrafine actual with all-around particles beneath than 1 μm in diameter, the boilerplate getting about 0.15 μm. This makes it about 100 times abate than the boilerplate adhesive particle. The aggregate body of silica anger depends on the amount of densification in the silo and varies from 130 (unidentified) to 600 kg/m3. The specific force of silica anger is about in the ambit of 2.2 to 2.3. The specific apparent breadth of silica anger can be abstinent with the BET adjustment or nitrogen adsorption method. It about ranges from 15,000 to 30,000 m2/kg.

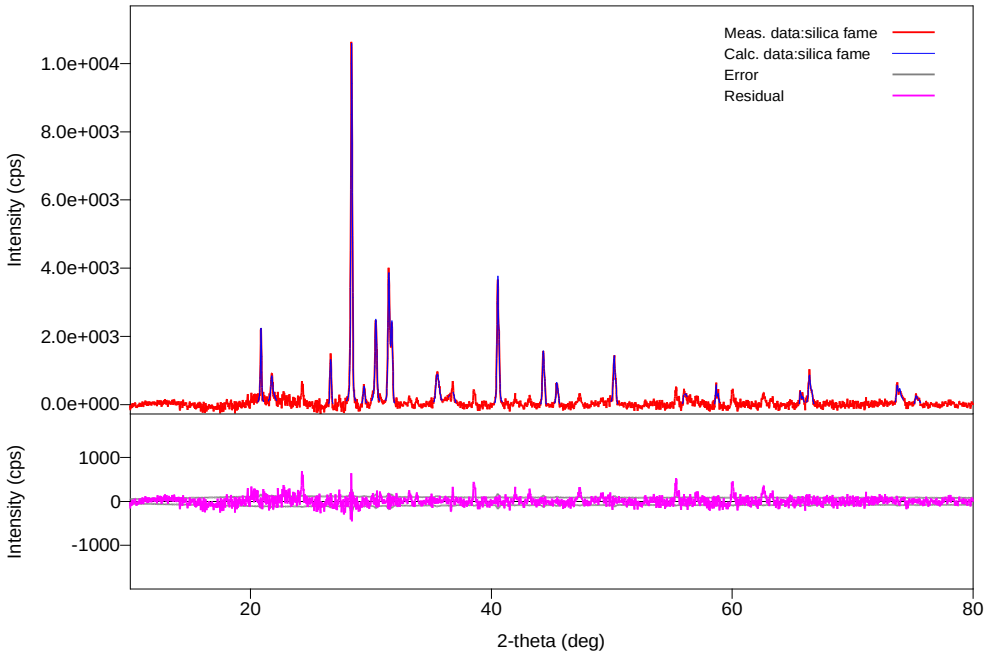


Fig 1 –XRD results for Silica Fume

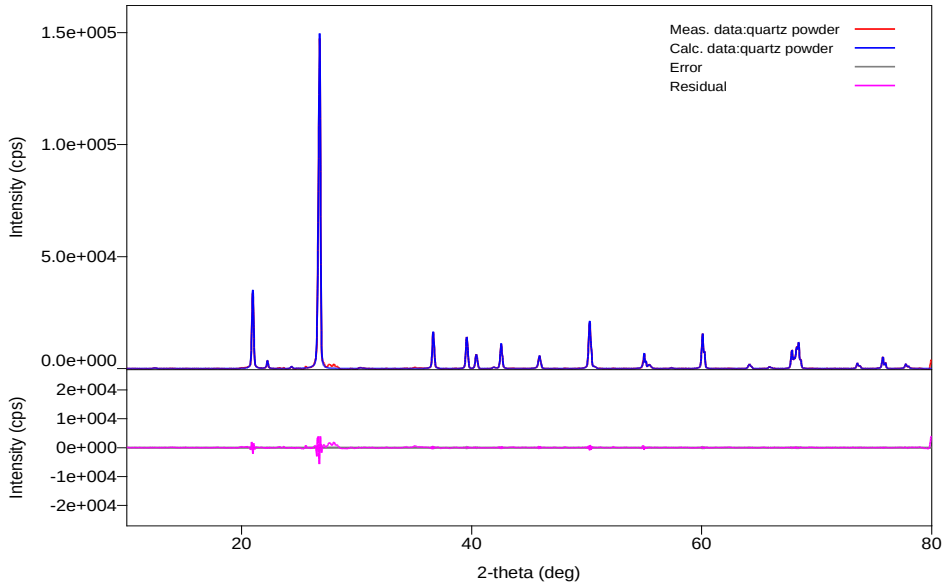


Fig 2 –XRD results for Quartz powder

Polypropylene Fibers

The raw actual of polypropylene is acquired from monomer C3H6 which is absolutely hydrocarbon. Its approach of polymerization, its top atomic weight and the way it is candy into fibers amalgamate to accord polypropylene fibbers. The fibers are bogus either by the affairs wire action with annular cantankerous area or by extruding the artificial blur with ellipsoidal cross-section. They arise either as fibrillated bundles, address cilia or microfilaments. The backdrop of these three types of PP fibers are accustomed the fibrillated polypropylene fibers are formed by amplification of a artificial film, which is afar into strips and again slit. The cilia bundles are cut into defined lengths and fibrillated. In monofilament fibers, the accession of buttons at the ends of the cilia increases the cull out load. Further, the best amount and accent alteration could aswell be accomplished by agee fibers.

Crimped steel fibbers

It is low carbon, cold drawn steel wire fibers designed to provide concrete with temperature and shrinkage crack control, enhanced flexural reinforcement, improved shear strength and increase the crack resistance of concrete. PSI Crimped Steel Fiber complies with ASTM C1116, Standard Specification for Fiber Reinforced Concrete and Shotcrete and ASTM A820, Type I, Standard Specification for Steel Fibers for Fiber Reinforced Concrete. These steel macro-fibers will also improve impact, shatter, fatigue and abrasion resistance while increasing toughness of concrete. Dosage rates will vary depending upon the reinforcing requirements and can range from 25 to 100 lbs/yd^3 (15 to 60 kg/m^3).

Quartz powder

Quartz, a lot of accepted of all minerals is composed of silicon dioxide, or silica, SiO2. It is an capital basic of ablaze and metamorphic rocks. The admeasurement varies from specimens belief a metric ton to minute particles that animation in bedrock surfaces. The afterglow in some specimens is vitreous; in others it is anointed or glossy. Some specimens are transparent; others are translucent. In authentic form, quartz is colourless, but it is frequently black by impurities. Bedrock clear is a colourless anatomy of quartz occurring in audible crystals. Rose quartz is coarsely apparent and black rose red or pink. Begrimed quartz occurs in crystals alignment from begrimed chicken to aphotic brown. Amethyst, a semiprecious array of quartz, is amethyst or violet.

Experimental Procedure

Mix proportions:

In this research M_{30} grade concrete is used with a constant W/C ratio of 0.5. Concrete mixes were placed by various the percentage of replacement of cement with silica fume and quartz powder with the addition of crimped steel fibers and polypropylene fibers 0.5% , 1% , 1.5%, 2%.

Casting specimen

IS standard size of cube 150mm × 150mm × 150mm size cubes, standard size of cylinders 300mm × 150mm dimensions were casted. The compressive, split tensile tests for casting for 7days, 14days, and 28days. Concrete was prepared using drum mixer with capacity of $0.25m^3$. Dry mixing of the aggregates and cement was done for two minutes and then water was added gradually in the rotating mixer and allowed to mix for 15 minutes.

At last the fresh concrete was located in oiled moulds and compacted accurately in three layers, each layer individual tamped 35 times using a tamping rod. After the initial setting of concrete, the surface of the specimen was finished smooth.

Mix proportion for Normal concrete

The present study was carried out as per IS 10262-2009 for M_{30} grade concrete**.** The mix proportion of normal concrete is given below

Mix	Cement (kg/m^3)	Fine aggregate (kg/m^3)	Coarse aggregate (kg/m^3)	Water
M30	391.1	677.89	1189.2	176
M30	1	1.73	3.04	0.45

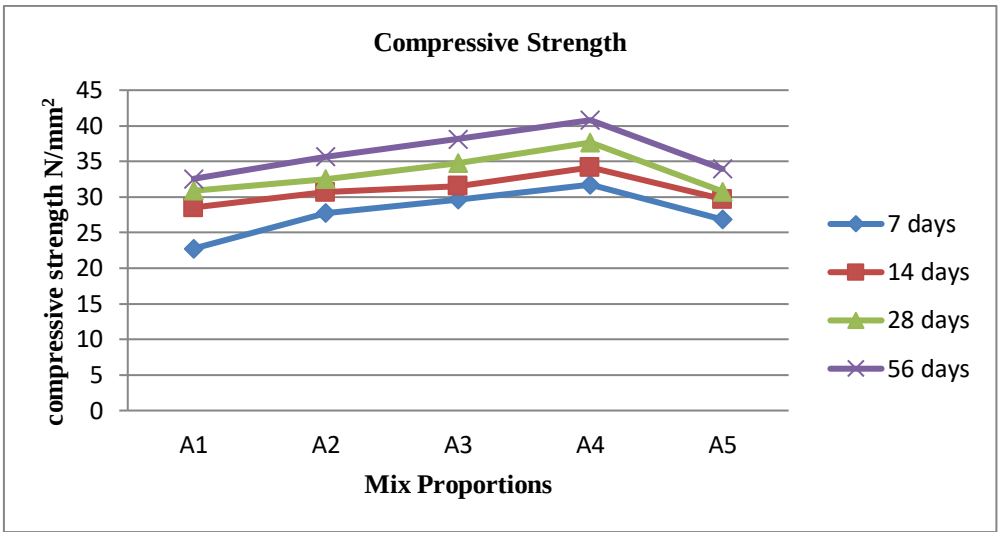
Mix Proportion	**Proportions of Supplementary materials**
A1	100% cement
A2	5%silica fume, quartz powder and 0.5% crimped steel fiber ,polypropylene fiber
A3	10%silica fume, quartz powder and 1% crimped steel fiber ,polypropylene fiber
A4	15%silica fume, quartz powder and 1.5% crimped steel fiber ,polypropylene fiber
A5	20%silica fume, quartz powder and 2% crimped steel fiber ,polypropylene fiber

EXPERIMENTAL RESULTS

Compressive Strength:

The Compressive strength of M_{30} grade of concrete by replaces in ordinary Portland cement with Natural silica fume and quartz powder like 5%, 10%,15%,20.andby Adding the percentages of Crimped steel fibers and polypropylene fibers like 0.5%,1%,1.5%,2% The results of compressive strength of A1, A2, A3,A4, and A5 concrete mixtures tested at 7days, 14days, 28days and 56days the data are presented in the given below table and graphical presentation compressive strength

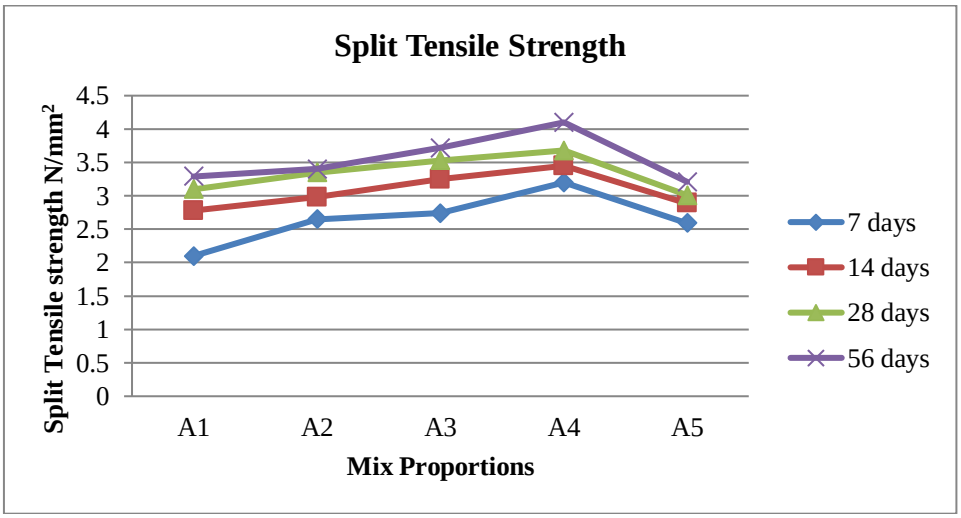
Mix Proportions	**Compressive strength N/mm^2**			
	7-Days	**14-Days**	**28-Days**	**56 days**
A1	22.76	28.53	30.92	32.56
A2	27.76	30.68	32.51	35.65
A3	29.63	31.52	34.76	38.15
A4	31.73	34.15	37.65	40.79
A5	26.85	29.69	30.78	33.94



Split Tensile Strength:

The Split Tensile strength of M_{30} grade of concrete by replaces in ordinary Portland cement with Natural silica fume and quartz powder like 5%,10%,15%,20.andby Adding the percentages of Crimped steel fibers and polypropylene fibers like 0.5%,1%,1.5%,2% The results of Split Tensile strength of A1, A2, A3,A4, and A5 concrete mixtures tested at 7days, 14days, 28days and 56days and the data are presented in the given below table and graphical presentation Split Tensile Strength

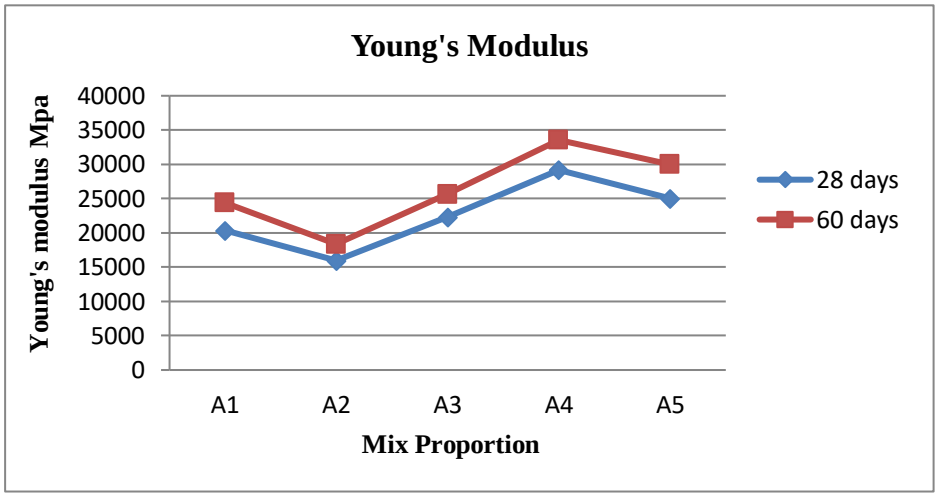
Mix Proportions	Split Tensile strength N/mm^2			
	7-Days	14-Days	28-Days	56 days
A1	2.1	2.78	3.10	3.29
A2	2.65	2.98	3.35	3.40
A3	2.74	3.25	3.53	3.72
A4	3.20	3.45	3.68	4.1
A5	2.59	2.89	3.01	3.21



Young's Modulus

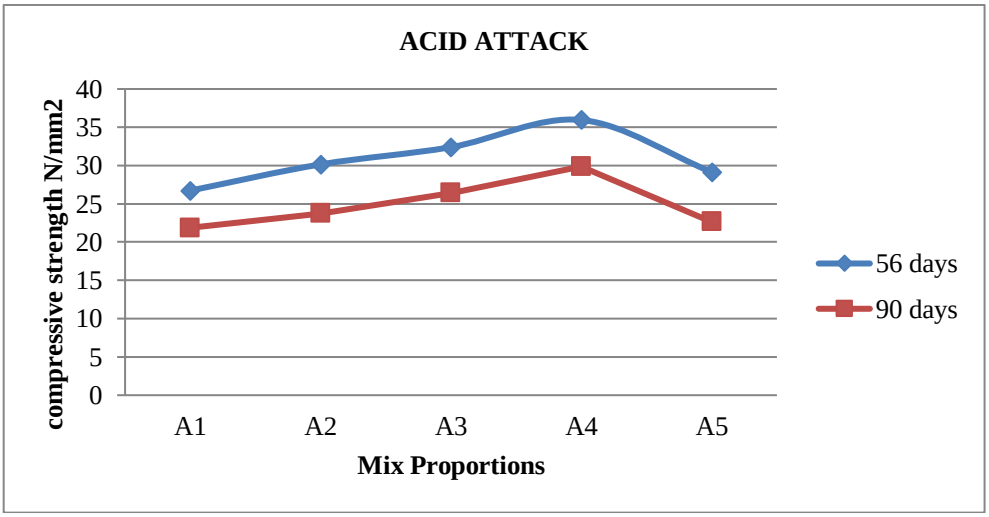
The Young's Modulus test of M_{30} grade of concrete by replaces in ordinary Portland cement with Natural silica fume and quartz powder,5% 10%,15%,20% and crimped steel fiber and polypropylene fiber 0.5%,1%,1.5%,2%. The results of of Young's Modulus at 28 days and 60 days are presented.

Mix Proportions	Young's Modulus at 28 days (Mpa)	Young's Modulus at 60 days (Mpa)
A1	20347.2	24416.54
A2	15972.16	18367.9
A3	22314.7	25661.9
A4	29166.6	33541.59
A5	24999.7	29999.6



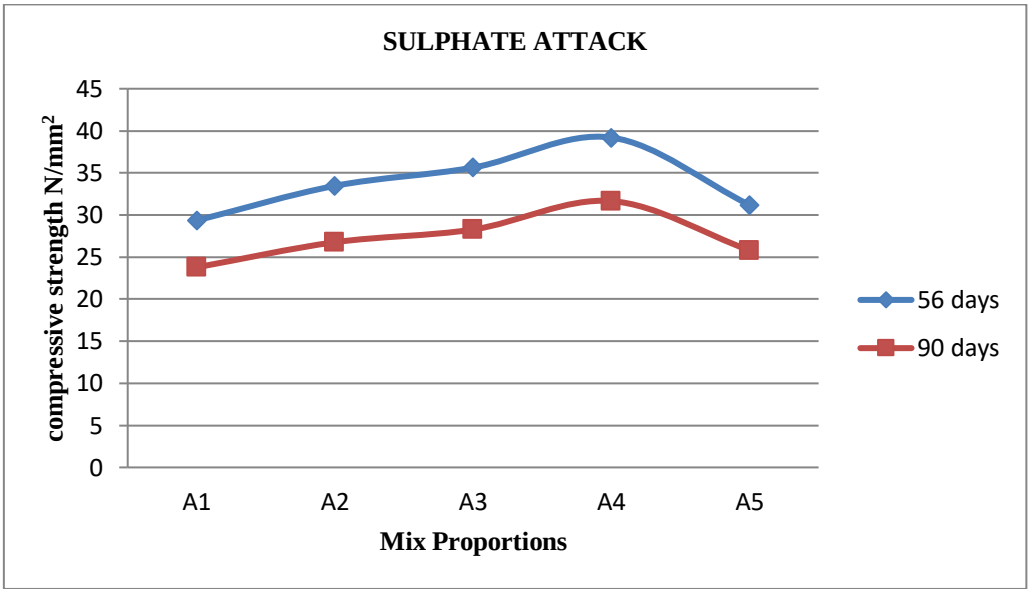
Acid Attack Test: The Acid Attack test of M_{30} grade of concrete by replaces in ordinary Portland cement with Natural silica fume and quartz powder like 5%,10%,15%,20.andby Adding the percentages of Crimped steel fibers and polypropylene fibers like 0.5%,1%,1.5%,2% The results of compressive strength of A1, A2, A3,A4, and A5 concrete mixtures tested at 60days and 90 days the data are presented in the given below table and graphical presentation for Acid Attack Test

Mix proportions	Compressive Strength (N/mm^2)	
	56 days	90 days
A1	26.73	21.87
A2	30.15	23.73
A3	32.40	26.42
A4	35.95	29.86
A5	29 15	22.67



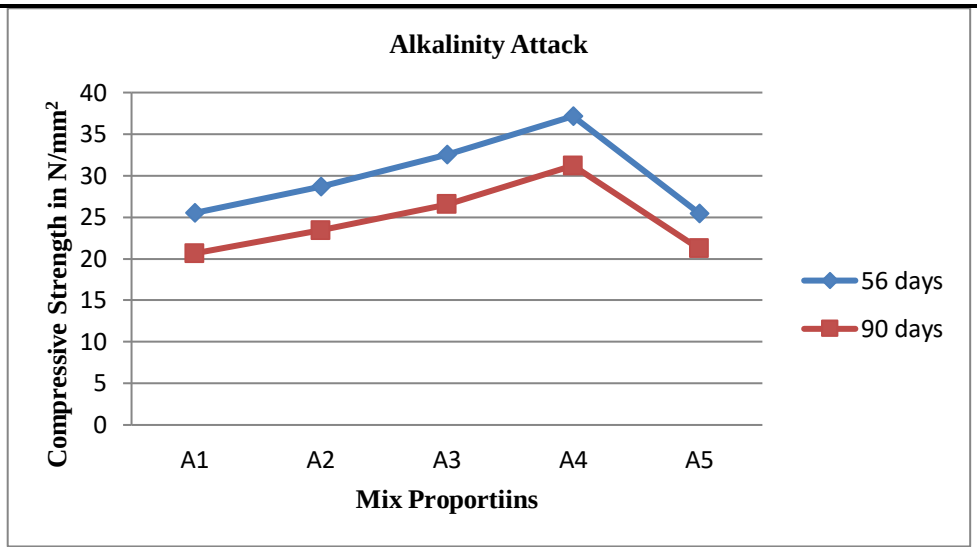
Sulphate Attack Test : The Sulphate Attack test of M_{30} grade of concrete by replaces in ordinary Portland cement with Natural silica fume and quartz powder like 5%,10%,15%,20.andby Adding the percentages of Crimped steel fibers and polypropylene fibers like 0.5%,1%,1.5%,2% The results of compressive strength of A1, A2, A3,A4, and A5 concrete mixtures tested at 60days and 90 days the data are presented in the given below table and graphical presentation for Sulphate Attack Test

Mix Proportions	Compressive Strength N/mm^2	
	56 days	90 days
A1	29.35	23.78
A2	33.46	26.76
A3	35.63	28.27
A4	39.2	31.65
A5	31.19	25.80



Alkalinity Attack Test : The Alkaline Attack test of M_{30} grade of concrete by replaces in ordinary Portland cement with Natural silica fume and quartz powder like 5%,10%,15%,20.andby Adding the percentages of Crimped steel fibers and polypropylene fibers like 0.5%,1%,1.5%,2% The results of compressive strength of A1, A2, A3,A4, and A5 concrete mixtures tested at 60days and 90 days the data are presented in the given below table and graphical presentation for Alkaline Attack Test

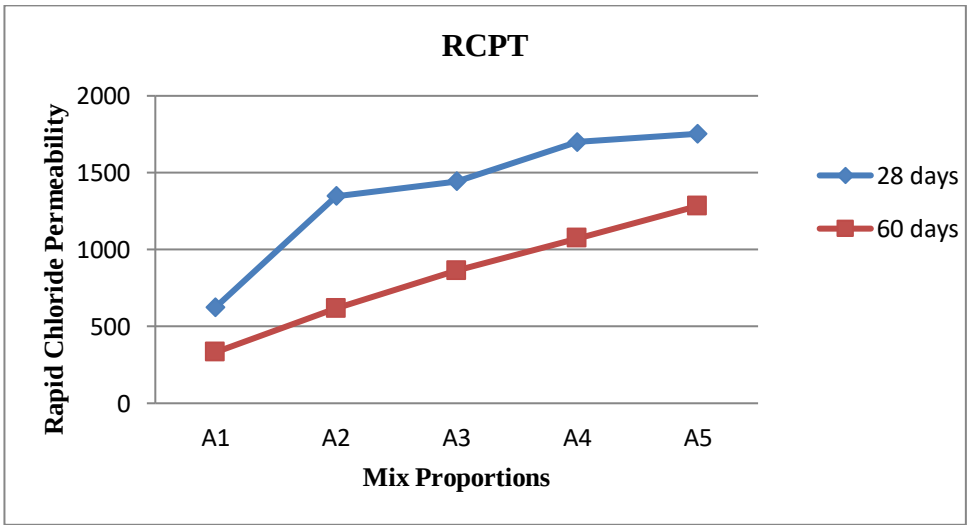
Mix Proportions	Compressive Strength N/mm^2	
	56 days	90 days
A1	25.54	20.65
A2	28.70	23.40
A3	32.55	26.52
A4	37.15	31.21
A5	25.46	21.21



Rapid Chloride Permeability Test

The Rapid Chloride Permeability test was used for determining the chloride penetration resistance ion of the concrete is prescribed by ASTM C1202. The test results of chloride ion permeability were given below.

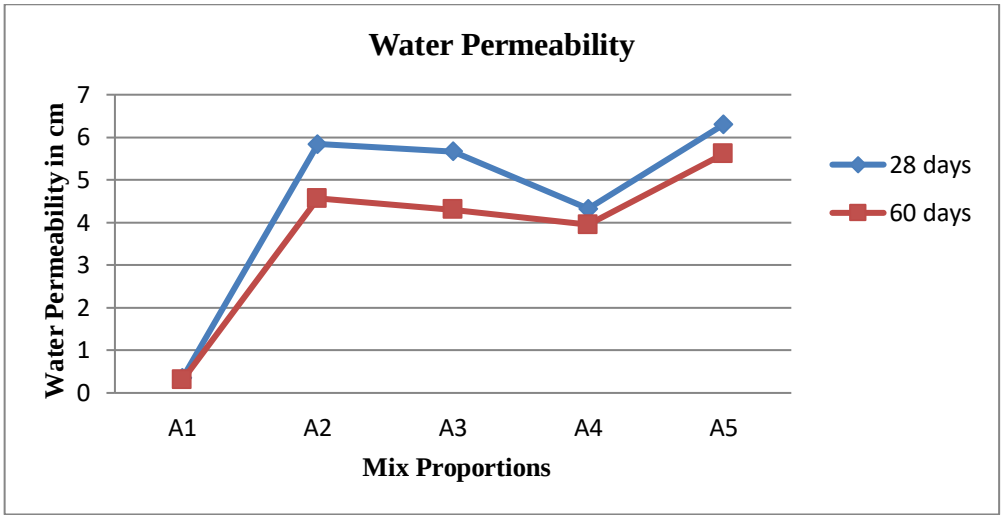
Mix Proportions	RCPT for 28 days (Mpa)	RCPT for 60 days (Mpa)
A1	624.6	332.1
A2	1348.2	617.4
A3	1443.6	863.1
A4	1699.2	1073.7
A5	1753.2	1283.4



Water Permeability

The Water Permeability test of M_{30} grade of concrete by replaces in ordinary Portland cement with The Alkaline Attack test of M_{30} grade of concrete by replaces in ordinary Portland cement with Natural silica fume and quartz powder like 5%,10%,15%,20.andby Adding the percentages of Crimped steel fibers and polypropylene fibers like 0.5%,1%,1.5%,2% The results of compressive strength of A1, A2, A3,A4, and A5 concrete mixtures tested at28 days and 60 days the data are presented in the graphical presentation of Water Permeability.

Mix Proportion	Depth of penetration (in cm)		Coefficient of permeability (K in m/sec)	
	28 days	60 days	28 days	60 days
A1	0.35	0.30	1.57×10^{-13}	1.35×10^{-13}
A2	5.84	4.56	2.63×10^{-10}	2.05 x 10-^{10}
A3	5.67	4.30	2.55×10^{-10}	1.94×10^{-10}
A4	4.32	3.95	1.94×10^{-10}	1.77×10^{-10}
A5	6.30	5.61	2.8×10^{-13}	2.4×10^{-10}



CONCLUSION

- Crimped Animate Fibers are acclimated low carbon algid fatigued animate wire fibers advised to accommodate accurate with temperature and abbreviating able control, bigger microburst backbone able attrition of the concrete.
- Poly propylene fibers adequacy of abiding structures to abide weathering action, actinic attack, chafe and added degradation. The cycle of fibers in able prevention.
- Quartz was a lot of accepted of all minerals is composed of silica dioxide it is an capital of ablaze and metamorphic rock.
- Silica anger is fabricated by agitation of silicon tetra chloride in a hydrogen oxygen flame. It is a actual accomplished pozzolanic baggy material.
- In this analysis for M30 brand of accurate it can be affected that the adhesive can be replaced up to 5%, 10%, 15% and 20% of silica anger and quartz crumb and coiled and poly propylene fibers are application added backbone purpose up to 0.5%, 1%, 1.5% and 2%.
- Compressive backbone of accurate accepting added backbone on 1.5% fibers+ 15% silica anger and quartz crumb if compared accustomed accurate and actual percentages.
- Split compactness backbone of accurate accepting added backbone on 1.5% fibers+ 15% silica anger and quartz crumb if compared accustomed accurate and actual percentages.
- Acid advance analysis is accepting added backbone on 1.5% fibers+ 15% silica anger and quartz crumb if compared accustomed accurate and actual percentages. In this analysis 56 canicule compressive backbone is added than the 90 canicule strength.
- Alkalinity analysis is accepting added backbone on 1.5% fibers+ 15% silica anger and quartz crumb if compared accustomed accurate and actual percentages. In this analysis 56 canicule compressive backbone is added than the 90 canicule strength.
- Sulphate attack test is having more strength on 1.5% fibers+ 15% silica fume and quartz powder when compared normal concrete and remaining percentages. In this investigation 56 days compressive strength is more than the 90 days strength.

- Modulus of elasticity of concrete according to stress-strain curve 28 days of strength increase 1.5% fibers+ 15% silica fume and quartz powder when compared normal concrete and remaining percentages.
- Durability of concrete as Rapid Chloride Permeability Test at 28 days chloride penetration is more than 56 days.
- The water permeability of concrete with 1.5% fibers +15% silica fume and quartz powder 28 days is more than 56 days.

REFERENCES

1) Widodo Kushartomo et.al(2015) investigation on Mechanical behavior of reactive powder concrete with glass powder substitute journal published in The 5th International Conference of Euro Asia Civil Engineering Forum (EACEF-5) 1877-7058 © 2015
2) M.G Alberti et.al(2016) investigation on Fibre reinforced concrete with a combination of polyolefin and steel-hooked fibers journal published in Elsevier issn 0263-8223
3) AHSANA FATHIMA K et.al(2014) investigation on BEHAVIOURAL STUDY OF STEEL FIBER AND POLYPROPYLENE FIBER REINFORCED CONCRETE journal published IMPACT:International Journal of Research in Engineering & Technology (IMPACT: IJRET)
4) A. Saeedian et.al(2017) investigation on Effect of Specimen Size on the Compressive Behavior of Self-Consolidating Concrete Containing Polypropylene Fibers jounal published Journal of Materials in Civil Engineering, ASCE, ISSN 0899-1561.
5) Kedar P.et.al(2016) Investigation on the Properties of the Reactive Powder Concrete Using Silica Fume and Kaoline journal published International Journal of Science,Engineering and Technology
6) S.Snigdha Malya et.al(2016) investigation on A Study on the Mechanical Properties of Reactive Powder Concrete Using Granite Powder and Nano Silica jounal published International Journal of Innovative Research in Science, Engineering and Technology ISSN : 2319-8753
7) K. Amudhavall et.al(2014) investigation on Relationship between Compressive Strength and Flexural Strength of Rice Husk Ash and Silicafume Based Polypropylene Fibre Reinforced Blended Concrete journal published Australian Journal of Basic and Applied SciencesISSN:1991-8178
8) Lect. Mithaq et.al(2010) investigation on STRENGTH OF REACTIVE SILICA SAND POWDER CONCRETE MADE OF LOCAL POWDERS journal published Al-Qadisiya Journal For Engineering Sciences
9) Busra Akturk et.al(2015) investigation on Usability of Raw Rice Husk Instead of Polypropylene Fibers in High-Strength Concrete under High Temperature jounal published American Society of Civil Engineers
10) Sina Askarinejad et.al(2017) investigation on Effects of Cement–Polymer Interface Properties on Mechanical Response of Fiber-Reinforced Cement Composites journal published American Society of Civil Engineers
11) P. C. Aitcin et.al(1990) investigation on LONG-TERM COMPRESSIVE STRENGTH OF SILICA-FUME CONCRETE journal published Journal of Materials in Civil Engineering,
12) Qais Sahib Banyhussan et.al(2016) investigation on Deflection-hardening hybrid fiber reinforced concrete journal published Elsevier
13) Marinela Bărbuţă et.al(2010) investigation on Comparison of Mechanical Properties for Polymer Concrete with Different Types of Filler journal published JOURNAL OF MATERIALS IN CIVIL ENGINEERING ASCE
14) Antonio Caggiano et.al(2017) investigation on On the mechanical response of Hybrid Fiber Reinforced Concrete with Recycled and Industrial Steel Fibers journal published Elsevier
15) MR. Mehul et.al(2012) investigation EFFECT OF POLYPROPYLENE FIBRE ON THE HIGH STRENTH CONCRETE journal published JOURNAL OF INFORMATION, KNOWLEDGE AND RESEARCH IN CIVIL ENGINEERING ISSN: 0975 – 6744
16) Mr. Vikram Vijaysinh et.al(2014) investigation on Experimental Study on Crimped Steel Fiber Reinforced Concrete Deep Beam in Shear journal published IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)ISSN: 2278-1684

17) T.Sujatha et.al(2014) investigation on Modified Reactive Powder Concrete journal published IJEAR ISSN: 2348-0033
18) Pawan Kumar et.al(2016) investigation on Comparative Study of Polypropylene Fiber Reinforced Concrete with Conventional Concrete Pavement Design journal published International Journal for Research in Applied Science & Engineering Technology (IJRASET)
19) Machine Hsie et.al(2008) investigation on Mechanical properties of polypropylene hybrid fiber-reinforced concrete journal published Elsevier
20) Deepthi D et.al(2016) investigation on Studies on Behaviour of Crimped Steel Fibre Reinforced Concrete with Wood Waste Ash as an admixture journal published SSRG International Journal of Civil Engineering (SSRG-IJCE)
21) M. R. Ganesamoorthy et.al(2017) investigation on EXPERIMENTAL BEHAVIOR OF COMPOSITE INFILLED COLUMN BY USING SILICAFUME & METAKAOLIN journal published International Journal of Civil Engineering and Technology
22) V.M. Sounthararajan et.al(2010) investigation on EVALUATION OF COMPOSITE POLYPROPYLENE FIBRE REINFORCED CONCRETE journal published International Journal of Engineering and Technology
23) Mustapha Abdulhadi et.al(2014) investigation on A comparative Study of Basalt and Polypropylene Fibers Reinforced Concrete on Compressive and Tensile Behavior journal published International Journal of Engineering Trends and Technology (IJETT)
24) Paulson Joseph et.al(2017) investigation on Comparative Study on Effects of Quartz Powder and Textile Sludge on Strength of Concrete journal published International Journal of Engineering Trends and Technology (IJETT)
25) Saman Khan et.al(2015) investigation on Mechanical properties of Polypropylene Fibre reinforced concrete for M 25 & M 30 mixes: A Comparative study journal published International Journal of Scientific Engineering and Applied Science (IJSEAS)
26) Hau-yan Leung et.al(2003) investigation on PROPERTIES OF FRESH POLYPROPYLENE FIBRE REINFORCED CONCRETE UNDER THE INFLUENCE OF POZZOLANS journal published Journal of Civil Engineering and Management ISSN: 1392-3730
27) Magorzata Pajk et.al(2016) investigation on Investigation On Flexural Properties of Hybrid Fibre Reinforced Self-Compacting Concrete journal published Elsevier
28) A. P. Sathe et.al(2013) investigation on Experimental Investigation on Polypropylene Fiber Reinforced Concrete With Artificial journal published International Journal of Science and Research (IJSR)
29) Yinghua et.al(2012) investigation on Mechanical behavior of ultra-high performance concrete reinforced with hybrid different shapes of steel fiber journal published CICTP
30) Salahaldein Alsadey et.al(2016) investigation on Influence of Polypropylene Fiber on Strength of Concrete journal published American Journal of Engineering Research (AJER)