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# Comparing the Properties of Conventional Concrete Machinery with Solid Concrete Machinery: A Study of the Impact of Bricks on SSC Compounds, Fly Ash Affects and Fine Particles with Brick Dust

**Kanishk Dangi, Ajit Singh**

Transportation Engg., CBS Group Of Institutions, Jhajjar, India

A.P Civil Dept., CBS Group Of Institutions, Jhajjar, India

**ABSTRACT:** The results of this research may be broken down into three groups, each of which can help us get a better understanding of the methods by which fly ash and brick ash interact with concrete. Incorporating fly ash and brick ash into Portland cement concrete in the right amounts has traditionally reduced the number of massive collapses. In the same way that sand is used to fill the gaps between aggregate coarse particles and cement grains are used to fill the spaces between the grains of composite materials, this substance serves primarily as a filler due to its fineness. Cracks may easily form in a Portland cement adhesive, either between or within of the CH crystals. Strong concrete's strength, durability, and other properties might be jeopardized in this way. There are two types of pozzolanic reactions: those that produce cement products and those that reduce the quantity of CH in the starting material. Both the mechanical properties and the item's longevity benefit from the strengthened joint surface or bond. The fundamental mechanism that underlies these variations affects both the pozzolanic reactions to the optical connection and the microstructure structure (including variations in CH orientation, porosity, and thickness of the transition area). Solid concrete (SCC) has been shown to be durable and compact using loose flow and U-tube probes. The pressure is enhanced in proportion to the quantity of fly ash and brick dust applied to it. The amount of compressive energy available has increased dramatically. Fly ash's pozzolanic response is fast in the early stages, and brick dust's pozzolanic activity against fine aggregates is in addition to its filler function. All blends showed an increase in flexural strength over all days compared to control mixtures.

**KEYWORDS:** CH crystals, Pozzolanic Reactions, Fly Ash, Brick Ash, Portland cement concrete

## I. INTRODUCTION

Concrete mixing is a long-standing method. The use of non-adhesive concrete for special applications such as underwater mixing has long been a necessity. Vibration was not possible in such a situation. To reduce bleeding and reduce bleeding, the mixes require special and well-controlled placing procedures, and a high percentage of cement paste makes this vulnerable. The total cost is affordable, and this will only be used to a greater extent going forward.Because there was no possible way to monitor the entire concrete mixing process at the construction site, the purpose of this is to avoid the concentration of cohesiveness, which can be achieved by vibrating in any other way. and prominent Japanese contractors. Using this strategy, contractors stay home and work on their SSC technology. To test the SCC mix, each business has designed its own hybrid designs and trained its experts. To test this new technology, various contractors have built their own testing facilities. The SCC was best known only to a small group of people in Japan in the early 1990's. large companies kept basic and practical information in order to maintain their own privacy limits.

Many countries in the past have used solid concrete in their construction work. In the late 1990's, when the SCC was first made available in Japan, the construction industry made extensive use of materials. The Japanese are now working to achieve the goal of eliminating the moniker "special concrete" attached to the SCC and embedded in the daily production of concrete (Okamura, 1997). As a result of this study, PCI is also a pioneer in the application of SCC technology in various projects. In the first three months of 2015, it is expected that precast and pressurized industries in the United States will generate approximately 18000 m3 of SCC daily. In addition, a recent study in the United States found that 23 other government departments of transportation and engineering use technology similar to those discussed here. It is expected that the use of SCC will increase significantly in the United States over the next several years for these reasons, in addition to the production of this new concrete. However, even if these are created from the same everyday use of the industry, the whole process, which begins with the design of the mix and continues with the use of various techniques, including quality control methods, must be adapted so that the latest technology can be used effectively and efficiently.A few years after the solid and compacted concrete became popular in Japan, Canadian scientists began to work on related projects. The Canadian Precast / Pre-Stress Concrete Institute, the Institute for Research in Construction, and CONMET-ICON are just a few of the major initiatives looking at new technological advances in construction. TC145-WSM's "Special Concrete Performance" is an important feature of the international

organization RILEM, France's efforts to bring this type of SCC to Europe. SCC's primary functions were housing, tunnelling, and bridge building for the Swedish National Road Administration.
SCC is the largest construction company in the Netherlands and Germany, with a predicted market share of 9% in 2013. Despite the fact that solid concrete is being tested worldwide, there is no universally accepted method of self-testing. -Bounding skills of this type of concrete. Self-adhesive concrete has recently gained widespread acceptance in many lands. Concrete laying problems associated with the concrete construction industry and businesses should be minimized with the use of adhesive concrete. However, there is still a need for further research and development in the evaluation and implementation of the qualities and characteristics of a strong SCC integration.

## II. RESULT

### Compressive Strength

In order to investigate the effect, it has on the positive effects of compressive strength, self-adhesive concrete cubes are composed of various percentage of fly ash surkhi and brick dust. This was true of all mixes. Another possible explanation for this is that concrete and cement undergo a continuous process of rehydration.

**Fig. 1:** Self compacted concrete cubes

**Fig. 2:** Compressive testing machines

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| Volume 10, Issue 6, June 2023 |

**Table 1:** Compressive Strength of SCC mix

| MIX | Compressive Strength (N/mm$^2$) | | | Average (N/mm$^2$) | Compressive | Strength |
|---|---|---|---|---|---|---|
| | 7 days | 28 days | 56 days | 7 days | 28 days | 56 days |
| Normal mix | 38.97 | 51.29 | 67.34 | 38.37 | 51.99 | 66.35 |
| | 37.80 | 52.15 | 65.23 | | | |
| | 38.35 | 52.66 | 66.49 | | | |
| Mix 1 | 39.99 | 53.98 | 68.85 | 39.92 | 54.29 | 69.01 |
| | 39.68 | 54.12 | 69.90 | | | |
| | 40.13 | 54.78 | 68.33 | | | |
| Mix 2 | 41.21 | 55.65 | 69.89 | 41.55 | 55.44 | 69.41 |
| | 41.20 | 54.89 | 69.02 | | | |
| | 42.23 | 55.78 | 69.34 | | | |
| Mix 3 | 43.12 | 56.78 | 71.67 | 43.45 | 57.96 | 71.20 |
| | 43.85 | 58.67 | 70.97 | | | |
| | 43.34 | 58.45 | 71.23 | | | |
| Mix 4 | 44.89 | 61.78 | 73.20 | 44.65 | 62.75 | 74.15 |
| | 44.45 | 62.89 | 74.02 | | | |
| | 44.56 | 63.45 | 75.23 | | | |

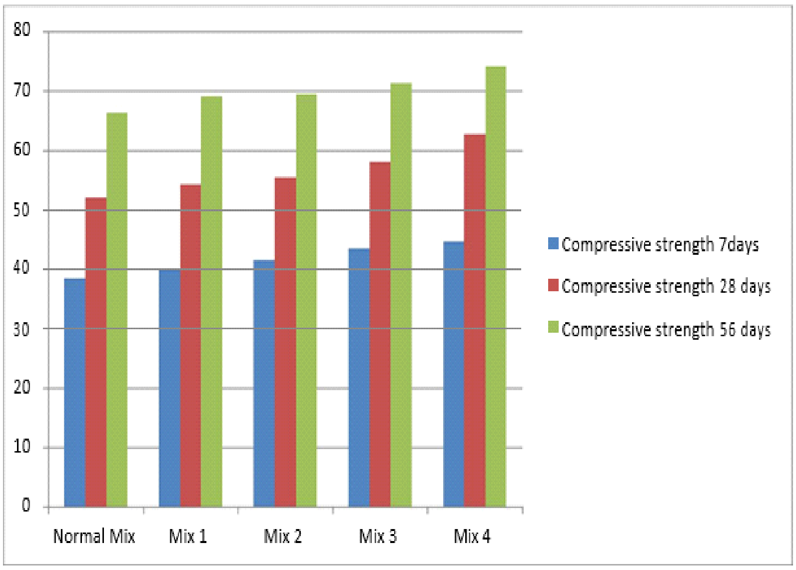


**Fig. 3**: Compressive strength bar chart

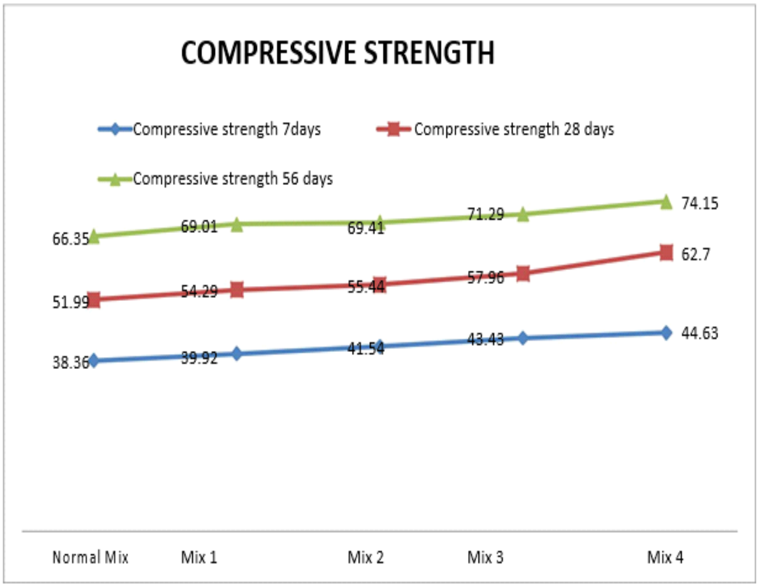


**Fig. 4:**Compressive strength graph chart

**Splitting Tensile Strength**

Flying ash and brick dust may be used as composite alternatives to increase the initial strength of the concrete. This was possible. The graph also shows that the strength of the strength increases as part of the Fly ash and brick dust grows.

**Fig. 5:** Tensile Strength Testing Machines

**Table 2:** Tensile Strength Properties

| MIX | Tensile Strength (N/mm$^2$) | | Average Tensile strength (N/mm$^2$) | | | |
|---|---|---|---|---|---|---|
| | 7 days | 28 days | 56 days | 7 days | 28 days | 56 days |
| Normal mix | 2.74 | 3.45 | 4.21 | 2.72 | 3.45 | 4.19 |
| | 2.45 | 3.67 | 4.15 | | | |
| | 2.98 | 3.23 | 4.23 | | | |
| Mix 1 | 2.88 | 3.67 | 4.44 | 3.00 | 3.77 | 4.38 |
| | 3.10 | 3.76 | 4.49 | | | |
| | 3.02 | 3.88 | 4.23 | | | |
| Mix 2 | 3.31 | 3.89 | 4.56 | 3.22 | 3.85 | 4.68 |
| | 3.21 | 3.69 | 4.78 | | | |
| | 3.15 | 3.97 | 4.71 | | | |
| Mix 3 | 3.56 | 4.11 | 4.89 | 3.59 | 4.25 | 4.95 |
| | 3.78 | 4.21 | 4.95 | | | |
| | 3.43 | 4.45 | 5.01 | | | |
| Mix 4 | 3.87 | 4.62 | 5.23 | 3.92 | 4.61 | 5.37 |
| | 3.92 | 4.78 | 5.34 | | | |
| | 3.97 | 4.45 | 5.55 | | | |

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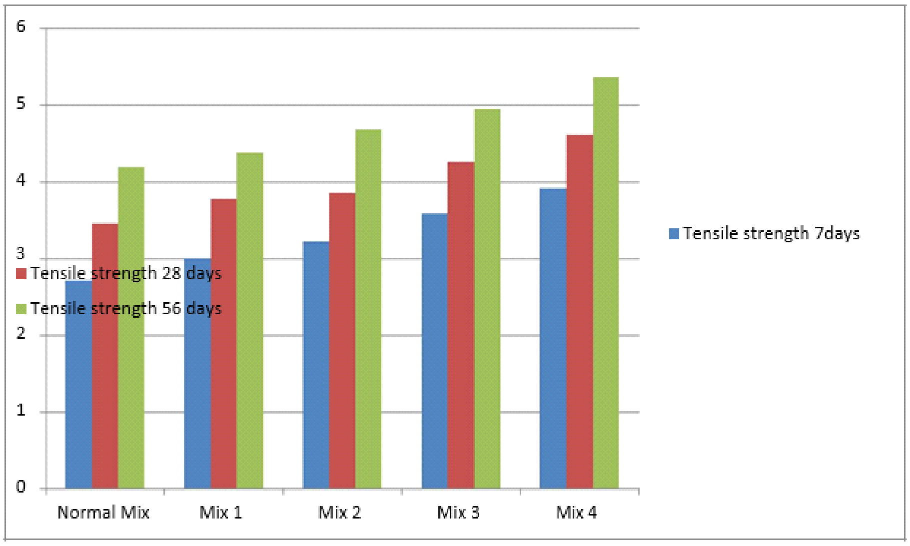


**Fig. 6:** Tensile Strength Bar Chart

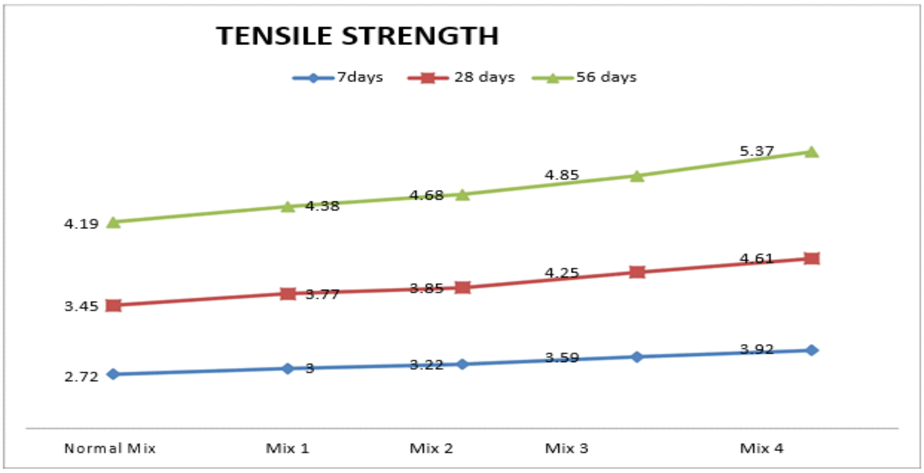


**Fig. 7:** Tensile Strength Graph Chart

## Flexure Strength

Using a universal test machine, the flexibility of the concrete mix is tested in seven, 28 and 56 days (100mmx100mmx500mm). The flexural strength of all compounds has been shown to increase compared to the control compound on a daily basis.

**Fig. 8:** Self Compacted Concrete Beam

**Fig. 9:** flexure testing machine

**Table 3:** Flexure Strength

| MIX | Flexure Strength (N/mm$^2$) | | | Flexure Strength (N/mm$^2$) | | |
|---|---|---|---|---|---|---|
| | 7 days | 28 days | 56 days | 7 days | 28 days | 56 days |
| Normal mix | 4.23 | 5.65 | 6.34 | 4.33 | 5.51 | 6.35 |
| | 4.41 | 5.54 | 6.45 | | | |
| | 4.36 | 5.34 | 6.28 | | | |
| Mix 1 | 4.45 | 5.67 | 6.67 | 4.50 | 5.71 | 6.54 |
| | 4.49 | 5.73 | 6.44 | | | |
| | 4.56 | 5.75 | 6.53 | | | |
| Mix 2 | 4.76 | 5.86 | 6.65 | 4.78 | 5.85 | 6.71 |
| | 4.81 | 5.89 | 6.78 | | | |
| | 4.78 | 5.81 | 6.70 | | | |
| Mix 3 | 4.89 | 5.98 | 6.91 | 4.89 | 5.92 | 6.85 |
| | 4.83 | 5.87 | 6.86 | | | |
| | 4.96 | 5.92 | 6.79 | | | |
| Mix 4 | 5.34 | 6.08 | 7.01 | 5.62 | 6.05 | 7.15 |
| | 5.55 | 6.12 | 7.08 | | | |
| | 5.98 | 6.97 | 7.36 | | | |

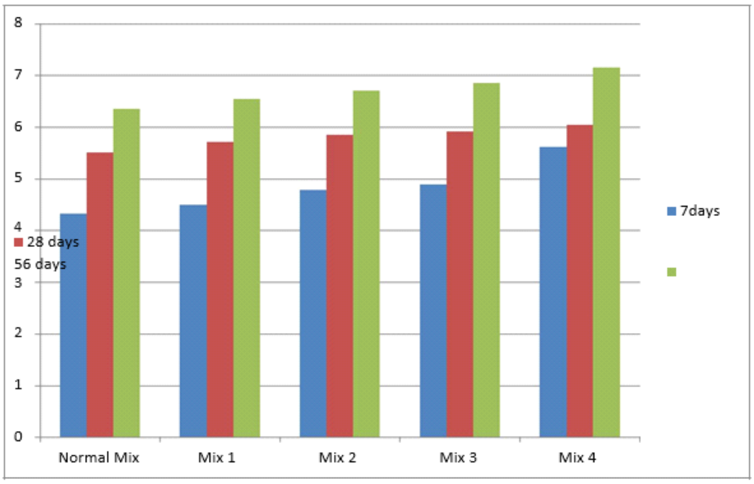


**Fig. 10** Flexure Strength Bar Chart

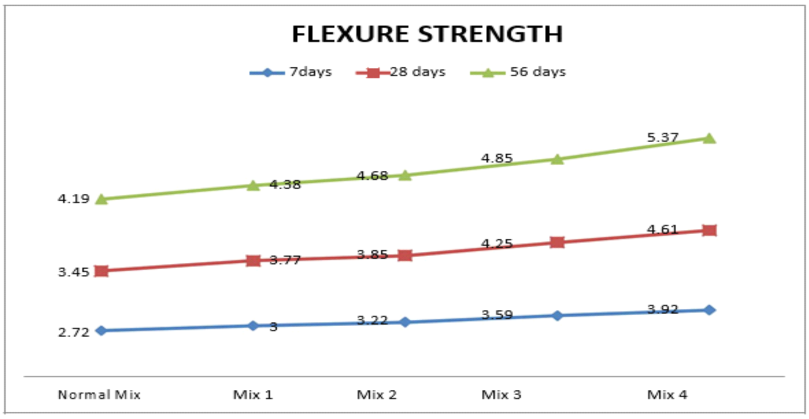


**Fig. 11:** flexure strength line graph

**Effect Of Percentage of Fly Ash**

Results of the pressures on the SCC composites that were tightly bonded. Between 5 and 12 percent of any Fly ash and brick dust, SCC compounds produced a compressive strength of between 38.36 and 44.63 MPa in 7 days, 51.99 to 62.70 MPa in 28 days, and -66.35 to 74.15 MPa in 56 days, depending on the design of the mixture. The compressive strength improves as the dust content of Fly ash & Bricks increases. The acquisition of compressive power was most evident in the younger years, according to the results.

At 28 days after curing, the strength values, as reported by Xieet al. (2000), were significant. Stiff compacting concrete SCC4 (20 percent Fly Ash and Brick dust) achieves the following strengths at seven and 28 days: 23.98 MPa and 30.66 MPa.

Fly ash is a renewed pozzolanic material due to the exceptional readiness of its particles and the high amount of amorphous silicon dioxide contained. Power of 25.52 MPa and 31.47 MPa obtained by SCC 3 after 7 days and 28 days, respectively. The mixture consisted of 15% dust bricks and fly ash.

In order to better understand the mechanisms by which fly ash and brick ash interact in concrete, we may divide the research into three categories:

Throughout the ages, the volume of large holes is greatly reduced when using fly ash and brick ash as good measurements in Portland cement concrete. Because of its fineness, it acts primarily as a filler in the same way as sand filling gaps between aggregate coarse particles and cement grains filling the gaps between composite grains of material.Cracks may easily spread between or inside CH crystals in common Portland cement adhesives, compromising the strength of strong concrete, durability, and other properties. There are two types of Pozzolanic Reactions: those that lead to the production of cement products and those that lead to a decrease in the CH content of the object.Both the mechanical properties and the durability of the object improve as a result of increased strength of the joint surface or bond. pozzolanic reactions to the optical connector, as well as changes in microstructure structure (such as changes in CH orientation, porosity, and thickness of the transition area), are all affected by the core process of this condition.

## III. CONCLUSIONS

The results of an examination of this kind may be:
Solid concrete (SCC) has been shown to be durable and compact using loose flow and U-tube probes. Concrete's resilience in the face of extreme conditions exemplified this point. This is feasible due of the unique ingredient used, which makes for a thick concrete mixture.

- As more fly ash and brick dust are added, the pressure builds and the pressure is more effective.
- Compressive energy has increased by a large percentage.
- Fly ash's pozzolanic response is quick in the early stages.
- Brick dust is a filler and also has pozzolanic activity against fine aggregates. Flexural strength was observed to increase for all blends throughout all days, even when compared to the control mixtures.

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