



Figure 10: Porosity test results

5. Results and Discussions

An analysis was made on the strength characteristics by conducting the tests on High strength Concrete with Silica fume and Recycled concrete aggregate. In mechanical strength results were 10% of silica fume and 30% recycled concrete aggregate replacements gives more strength comparing to other percentage of replacements. By comparing (0%SF to 10%SF) the compressive strength of concrete results at 28 days strength. It is observed that the strength of concrete is increase by 7.16MPa. By comparing (0%SF to 10%SF) the split tensile strength of concrete results at 28 days strength. It is observed that the strength of concrete is increase by 0.97MPa. By comparing (0%SF to 10%SF) the flexural strength of concrete results at 28 days strength. It is observed that the strength of concrete is increase by 3.34MPa. The result of ultrasonic pulse velocity were slightly increase the direct velocity with the permissible limit. The pulse velocity is (3-4.5), hence the concrete is of good quality. The water absorption and porosity of recycled concrete aggregate and silica fume replaced mixes are lower than normal mix. By comparing (0% SF-10%SF) the results of water absorption at 28 days. It is observed that the percentage of water absorption of concrete is decrease by 0.13%. By comparing (0% SF-10%SF) the results of porosity at 28 days. It is observed that the percentage of porosity of concrete is decrease by 0.19%.

6. Conclusion

From the results presented in this paper, using concrete containing 0–10% silica fume and 30% Recycled concrete aggregate, the main conclusions are:

- 1) In concrete mixtures with a constant slump of 90 ± 10 mm, those incorporating higher silica fume replacement levels tended to require more dosages of superplasticiser.
- 2) The results revealed that up to 10% replacement silica fume for cement and 30% replacement Recycled concrete aggregate for Coarse aggregate in concrete shows improvement in Compressive strength, Tensile strength, Flexural strength, Ultrasonic pulse velocity and Decrease in water absorption & porosity.
- 3) By comparing the results with Normal Mix (0% of silica fume & 30% of RCA) at 28 days, it is observed that the strength of concrete is increased when coarse aggregate is replaced beyond 30 % of RCA and 10% silica fume.
- 4) From the results, it is observed that adding silica fume in concrete gives more strength than normal concrete mix.

Reference

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