Visual Inspection for Glass Construction Aggregate

Material: Recycled Glass

Issue: *Visual inspection is a common procedure for the initial assessment of the acceptability of construction aggregate. The inspection is usually performed at storage sites prior to any laboratory testing of the material. Sometimes, visual inspection is performed as a field screening procedure. In some cases, the acceptability of the material for a particular application may be based solely on the results of the field visual inspection.*

Recycled glass is a relatively new construction aggregate material, so there is little background for standardized visual inspection procedures. Such procedures will allow effective information exchange and ultimately increase the use of recycled glass in construction. The inspection should be simple, easy to perform, and provide an initial classification of debris content and material gradation.

Best Practice: **Debris Content** A simple method has been used to obtain a percentage level of debris content of a glass cullet sample. The debris includes metal caps, plastic, paper, and any other non-glass materials. The method is based on the Percent Composition Charts developed by American Geological Institute (Comparison Chart for Estimating Percentage Composition, AGI Data Sheets 23.1 and 23.2). These charts show the estimated percentage of composition of debris in a sample from 1 to 50%.

The method uses a test pan of eight to ten inches in diameter and one to two inches in depth. One to three pounds of glass cullet is placed and leveled in the test pan. The test pan is then placed next to the standard charts and an estimated percentage is selected based on the comparison of the composition shown on the charts and the debris present on the test pan. It is important to disregard the aggregate and compare only the contaminants with the charts. The results can be recorded quantitatively using percentages, or qualitatively using terms such as *low* for 1 to 3%, *medium* for 3 to 15%, and *high* for over 15%. Inter-medium terms such as *low to medium*, and *medium to high* can also be considered.

The visual inspection and classification test should be used for sub-samples retrieved from various portions of the glass storage. The number of tests should be based on the quantity and homogeneity of the bulk material. In general, at least one test should be conducted for every 50 cubic yards of material. The test results for all sub-samples should be reported.

The visual inspection is based on the two-dimensional view of debris. Since the debris in recycled glass is typically platy, the visual inspection method will generally produce results higher than the debris content measured by physical tests such as the measurement of percent debris by weight or volume. A comparison of the visual inspection and the physical test results can be found in Reference 1 listed at the end of this document.

Maximum Particle Size The tendency of particle breakdown increases as the maximum particle size of glass aggregate increases. For example, there will be more breakdown during placement of 3/4" aggregate than during placement of 3/8" aggregate. Therefore, limits on maximum particle size are usually specified for recycled glass used as aggregate. Such requirements can be easily checked using a measuring ruler. In addition, an estimate on the percentage of over-sized particles should be obtained using the same visual inspection procedure presented above.

Implementation: Reproduce the Percent Composition Charts and distribute to contractors, suppliers, test agents, and consultants. Seminars or discussions with the permitting offices of the city, county, and state should be held so that the inspection method becomes part of the permitted use of recycled glass. Information should also be disseminated among designers and engineers.

Benefits: This best practice presents a simple field screening method for initial characterization of recycled glass. The method is simple, easy to perform, and can provide characteristics that are critical to the acceptability of the material. For some construction applications, this method may be the only procedure in assessing the material acceptability. The implementation of such practical methods can greatly increase the efficiency in initial material characterizations and ultimately increase the potential use of the material.

Application Sites: Recycled glass storage and processing facilities, construction sites, and testing laboratories.

Contact: For more information about this Best Practice, contact CWC, (206) 443-7746, e-mail info@cwc.org.

References:

Glass Feedstock Evaluation Project: *Engineering suitability Evaluation*, Report #GL-93-5, Clean Washington Center, 1994.

Glass Feedstock Evaluation Project: *Environmental suitability Evaluation*, Report #GL-93-3, , Clean Washington Center, 1994;

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