



Grange Quarry Ltd, Kirkburn Ind Estate, Lockerbie, DG11 2FF

**Certificate of Aggregate Physical Properties**

Source : Kelhead  
 Aggregate Type : Crushed Limestone Conglomerate  
 Date of Issue : 12<sup>th</sup> May 2017

Aggregates for Concrete, Bituminous Mixtures, Unbound and Hydraulically Bound

	Mean Value	Ukas Certificate Available
Polished Stone Value(PSV) BSEN 1097-8	57	Yes
Micro Deval BS EN 1097-1 : 2011	26	Yes
LA Abrasion BS EN 1097- 2:2010 CLAUSE 5	27	Yes
Magnesium Sulphate Soundness Value(MSSV) BS EN 1367-2	8	Yes
Resistance to Surface Abrasion(AAV) BS EN 1097-8	11	Yes
Frost Heave BS 812: Part 124: 2009	8.8	Yes
Particle Density CRS BS EN 1097-6	Oven Dry	Yes
	Saturated Surface Dry	Yes
	Apparent	Yes
	Water Absorption	Yes
Methylene Blue Absorption	0.7g/kg	Yes
Total Sulphur Content	0.1	Yes
Water Soluble Chlorides EN 1744-1	0.002%	Yes
Water Soluble Sulphates EN 1744-1	0.006%	Yes
Acid Soluble Sulphate EN 1744-1	0.1%	Yes

Organic Substances-Humous Content BS EN 1744-1:2009	Negative	Yes
Volume Stability (Drying Shrinkage) BS EN 12620	0.031%	Yes
ASR Reactivity	Normal	NA
Bulk Density 10/20mm Aggregate (Compacted)	1.56	Yes
Bulk Density 10/20mm Aggregate (Uncompacted)	1.45	Yes
Bulk Density 4/10mm Aggregate (Compacted)	1.54	Yes
Bulk Density 4/10mm Aggregate (Uncompacted)	1.44	Yes
Bulk Density 0/4mm Aggregate (Compacted)	1.49	Yes
Bulk Density 0/4mm Aggregate (Uncompacted)	1.37	Yes

### Petrographic Description

The quarried rock is composed of a Limestone dominant Breccia(90%) and crystalline Limestone(10%). Clasts (fragments) of limestone are well cemented along with quartz sand within a well developed calcite cement. The fragments are reddened. This in part is due to the presence of iron bearing carbonate minerals, but also due to the occurrence of iron oxide rims on sand grains. The limestone occurs as individual particles released during processing

Douglas Stewart

12/05/2017

Technical Manager

