AfriSam

Build with Confidence

Asphalt Aggregate

Aggregate - product brochure

Asphalt Aggregate

Product overview
Asphalt aggregates are those materials used in asphalt pavements. Asphalt is defined as a mixture of inert mineral matter, such as aggregate, mineral filler and bituminous binder in predetermined proportions.

Types of asphalt

- Continuously graded asphalt are mechanically mixed asphalts in which the aggregates and the filler are distributed in size from coarse to fine fractions within a specific smooth grading envelope.
  - LAMBS (Large aggregates mixes for bases and surfaces) - A graded asphalt containing large aggregates up to 37.5 mm and meeting prescribed engineering properties for the use as base course material.
    BTB (Bitumen treated base) - A graded base course layer with aggregate up to 26.5 mm mixed with bituminous binder.
  - ACM (Asphalt continuously graded medium) - An asphalt layer with aggregate up to 13.2 mm.
    ACF (Asphalt continuously graded fine) - An asphalt with aggregate up to 9.5 mm.
  - Slurry Seal - An ultra thin layer with sand and bitumen, applied in a flowable form.

- Gap graded and semi-gap graded asphalt are mechanically mixed asphalts from which some intermediate aggregate sizes are omitted to comply with a stepped grading envelope. These asphalt layers either contain a 19 mm or 26,5 maximum aggregate size.

- Open graded asphalt (aggregate skeleton mixes) are mixes which normally require single sized crushed aggregate (refer to table for single sized crushed aggregate). It is a mechanically mixed asphalt constituted to give a rough surface texture in the compacted state. This type of layer is also used when ultra thin pavement is done using pavers. This design normally focuses on the very single size material of either 13.2 mm or 9.5 mm combined with a minus 3 mm sand having a high dust content. Some of the names used in the industry are:
  - SMA (Stone Mastic Asphalt)
  - Nova Chip
  - Gripphalt
  - Braso (Bitumen rubber asphalt semi-open)
  - BRAC (Bituman rubber asphalt course)

Quality requirements for asphalt
Due to the importance of the aggregate in the mix, understanding the impact of the following properties is critical:

- Aggregate gradation
- Coarse and fine aggregate
- Clay content cleanliness
- Toughness / hardness
- Soundness
- Deleterious material
- Water absorption and relative density
- Particle shape and surface texture

The customer must conduct the necessary tests to produce and maintain a mix meeting the design requirements.

Factors to consider when selecting an aggregate source
AfriSam has the expertise to ensure the correct selection of aggregates in your region. The following should be considered:

- Quality
- Physical properties
  - grading limits
  - fines content
  - dust content
  - flakiness index
  - 10% FACT
  - aggregate crushing value and polished stone value
- Geological properties
- Skid resistance
- Traffic
- Moisture sensitivity
- Availability
- Local experience
- Cost
- Climate

AfriSam aggregates comply to specifications as listed in the following tables.*

Concrete aggregate properties and requirements (course aggregates).

Gradient limits, dust content, flakiness index, 10% FACT value and aggregate crushing value								
Property	**SABS Requirements**							
Grading limits, % (m/m) passing sieve sizes, mm	Normal aggregate size mm							
	75,0	53,0	37,5	26,5	19,0	13,2	9,5	6,7
75,0	100	100						
53,0	0 - 50	85 - 100	100					
37,5	0 - 25	0 - 50	85 - 100	100				
26,5	0 - 5	0 - 25	0 - 50	85 - 100	100			
19,0		0 - 5	0 - 25	0 - 50	85 - 100	100		
13,2			0 - 5	0 - 25	0 -50	85 - 100	100	
9,5				0 - 5	0 - 25	0 - 55	85 - 100	100
6,7					0 - 5	0 - 25	0 - 55	85 - 100
4,75						0 - 5	0 - 25	0 - 55
2,36							0 - 5	0 - 25
1,18								0 - 5
Dust Content, *% (m/m), maximum	2,0							
Flakiness index, %, maximum	35							
10% Fact value, %, Kn maximum	110 for aggregates used in concrete subject to surface abrasion, and for structural elements of reinforced concrete and prestressed concrete							
	70 for aggregates used in concrete not subject to surface abrasion							
Aggregate crushing value, %, maximum	29							
*Material passing 0,075 sieve				from SABS 1083:1994 table 2				

Concrete sand properties and requirements (fine aggregates).

Grading limits, dust content and fineness		
Property	**SABS requirements**	
Grading Limits, % (m/m), passing sieve sizes, mm 4,75 0,150	Natural Sand	Crushed Sand
	90 - 100 5 - 25	
Methylene blue absorption value, maximum	0,7	
Clay content, **% m/m, maximum	2,0	
Dust content, *% m/m, maximum	5	10
Fineness Modulus	1,2 - 3,5	
*Material passing 0,075 mm sieve	from SABS 1083:1994 table 1	
**Material smaller than 5 µm		

The mean grading (minimum of six results) of the trial section meeting the requirements for the approved target grading, producing a smooth grading curve, is classified as the approved target grading for a specific project. All future gradings are evaluated against the target grading.

Grading

Rolled - in chips

Property	COLTO requirement	
Grading limits, % (by mass) of material passing sieve sizes, mm	19,0 mm	13,2 mm
19,0	100	
13,2	0 - 20	100
9,5	0 - 5	0 - 20
6,7	0 - 1	0 - 5
0,425	0,5 maximum	0,5 maximum
	from COLTO table 4202/11	

Note: All SABS specifications will be replaced by SANS specifications, but the data contained therein will remain constant.

Note: All typical gradings and aggregate properties may be obtained, on request, from the product technical department.

***Note: As members of ASPASA (Aggregate & Sand Producers Association of South Africa) we comply with COLTO specifications except where amended by ASPASA.**

AfriSam

Aggregate Quarry Locations

Gauteng	**KwaZulu-Natal**
Eikenhof	Coedmore
Ferro	Ladysmith
Jukskei	Newcastle
Olifantsfontein	Pietermaritzburg
Roodekrans	Umlaas
Rooikraal	Verulam
Vogels	
Zeekoewater	**Western Cape**
	Peninsula
	Philippi (Depot)
	Rheebok

Contact the regional office in your area for Sales or Technical Services or any other information.

Gauteng:	**0860 141 141**	**(011) 670 5666**
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SABS

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