

Revision of SANS 1083

Aggregates from Natural Sources

Aggregates for Concrete

Road Pavements Forum

May 2018



Outline

- **Short term changes**
- **Long term changes**

Short term changes

- Latest version contains all sieve sizes in one table
- Confusion

Table 2 — Coarse aggregate for concrete

1	2	3	4	5	6	7	8	9	10
Property	Requirement								Test method subclause
	Nominal size of aggregate mm								
Grading ¹⁾ , mass percentage of material that passes sieves ⁴⁾ of nominal aperture size, mm	75,0	53,0	37,5	26,5	19,0	13,2	9,5	6,7	6.2
75,0	100	100							
53,0	0 – 50	85 – 100	100						
50,0	0 – 43	70 – 85	98 – 100						
37,5	0 – 25	0 – 50	85 – 100	100					
28,0	0 – 7	0 – 28	15 – 55	90 – 100					
26,5	0 – 5	0 – 25	0 – 50	85 – 100	100				
20,0		0 – 7	0 – 28	15 – 55	90 – 100				
19,0		0 – 5	0 – 25	0 – 50	85 – 100	100			
14,0			0 – 7	0 – 28	15 – 55	90 – 100			
13,2			0 – 5	0 – 25	0 – 50	85 – 100	100		
10,0				0 – 7	0 – 28	15 – 55	90 – 100		
9,5				0 – 5	0 – 25	0 – 55	85 – 100	100	
7,1					0 – 9	0 – 30	25 – 58	92 – 100	
6,7					0 – 5	0 – 25	0 – 55	85 – 100	
5,0						0 – 7	0 – 28	15 – 55	
4,75						0 – 5	0 – 25	0 – 55	
2,36							0 – 5	0 – 25	
2,0							0 – 4	0 – 28	
1,18								0 – 5	
1,0								0 – 4	
Dust content, material that passes a 75 µm sieve ⁴⁾ , mass percentage, max.	2								6.3
Aggregate crushing value (ACV) ³⁾ , of less than 13,2 mm and more than 9,5 mm fraction (dry), mass percentage, max.	29								6.11
10 % FACT value, of less than 13,2 mm and more than 9,5 mm fraction (dry), kN, min.	Coarse aggregate for use in concrete subject to surface abrasion, structural elements of reinforced or prestressed concrete (or both): 110								6.12
Flakiness index, max.	35								6.13
1) Other gradings are permitted if so required (see annex A). Such a grading shall be specified in terms of the appropriate nominal sizes specified in the table.									
2) Complying with SANS 3310-1 or SANS 3310-2.									
3) Optional alternative to the 10 % FACT value.									

Amdt 3; amdt 5



Short term changes

- Latest version contains all sieve sizes in one table
- Confusion
- Proposed changes

Table 2 A — Coarse aggregate for concrete (new sieve sizes)

1	2	3	4	5	6	7	8	9	10
Property	Requirement								Test method sub-clause
	Nominal size of aggregate (mm)								
Grading ¹⁾ , mass percentage of material that passes sieves ²⁾ of nominal aperture size, mm	75,0	50,0	37,5	28,0	20,0	14,0	10,0	7,1	6.2
75,0	100	100							
50,0	0 - 50	85 - 100	100	100					
37,5	0 - 25	0 - 50	85 - 100	100					
28,0	0 - 5	0 - 25	0 - 50	85 - 100	100				
20,0		0 - 5	0 - 25	0 - 50	85 - 100	100			
14,0			0 - 5	0 - 25	0 - 50	85 - 100	100		
10,0				0 - 5	0 - 25	0 - 55	85 - 100	100	
7,1					0 - 5	0 - 25	0 - 55	85 - 100	
5,0						0 - 5	0 - 25	0 - 55	
2,0							0 - 5	0 - 25	
1,0								0 - 5	
0.075	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	6.3
10% FACT value, of less than 14,0 mm and more than 10,0 mm fraction (dry), kN, min.	Coarse aggregate for use in concrete subject to surface abrasion, structural elements of reinforced or prestressed concrete (or both): 110								6.12
Aggregate crushing value (ACV) ³⁾ , of less than 14,0 mm and more than 10,0 mm fraction (dry), mass percentage, max.	29								6.11
Flakiness index, max.	35								6.13
1) Other gradings are permitted if so required (see annex A). Such a grading shall be specified in terms of the appropriate nominal sizes specified in the table.									
2) Complying with SANS 3310-1 or SANS 3310-2.									
3) Optional alternative to the 10% FACT value.									



Table 2 B — Coarse aggregate for concrete (old sieve sizes)

1	2	3	4	5	6	7	8	9	10
Property	Requirement								Test method sub-clause
	Nominal size of aggregate (mm)								
Grading ¹⁾ , mass percentage of material that passes sieves ²⁾ of nominal aperture size, mm	75,0	53,0	37,5	26,5	19,0	13,2	9,5	6,7	6.2
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 - 25	0 - 25	0 - 55	85 - 100	100	
6,7				0 - 5	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	
0.075	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	6.3
10% FACT value, of less than 13,2 mm and more than 9,5 mm fraction (dry), <u>kN</u> , min.	Coarse aggregate for use in concrete subject to surface abrasion, structural elements of reinforced or prestressed concrete (or both): 110								6.12
Aggregate crushing value (ACV) ³⁾ , of less than 13,2 mm and more than 9,5 mm fraction (dry), mass percentage, max.	29								6.11
Flakiness index, max.	35								6.13
1) Other gradings are permitted if so required (see annex A). Such a grading shall be specified in terms of the appropriate nominal sizes specified in the table.									
2) Complying with SANS 3310-1 or SANS 3310-2.									
3) Optional alternative to the 10% FACT value.									



Long term changes

- 1976 Aggregates from natural sources
- Version contained:
 - Sand for concrete
 - Sand for bituminous paving mixtures
 - Sand for slurry seals
 - Stone for concrete
 - Single-sized stone for roads
 - Aggregates for base courses
- Guidance on additional tests, when required and appropriate limits in very detailed Appendices



Long term changes (cont.)

- 1994 Aggregates from natural sources – Aggregates for concrete
- Version contained:
 - Sand for concrete
 - Stone for concrete
 - No guidance
- C&CI published “Commentary on SABS 1083” containing guidance



Long term changes (cont.)

- Industry discussions:
 - Need for specification for other aggregates
 - Should tie up with revised COTO
 - Attempt to reduce grading options (40 DR)
- Working Group set up under SANS TC 81 SC 01
- Aggregates for Construction



Long term changes (cont.)

- Aggregates for Construction
- Will be one document with 6 parts:
 - Concrete
 - Plaster and Mortar
 - Ballast and Gabions
 - Granular materials (G1 to G10)
 - Asphalt mixes
 - Seals and Micro-surfacing



Long term changes (cont.)

- Two sub-groups
- Sub Group 1 Chair B Perrie covering:
 - Concrete
 - Plaster and Mortar
 - Ballast and Gabions
- Sub Group 2 Chair D Rossmann covering
 - Granular materials (G1 to G10)
 - Asphalt mixes
 - Seals and Micro-surfacing



Long term changes (cont.)

- Will reflect new COTO approach
- Requirements
- Will provide guidance on test methods, possible additional tests, when needed and appropriate limits for each
- Hoping to rationalise grading requirements if possible
- Will provide guidance in SANS document



Current Status

- Sub Group 1 Chair B Perrie covering:
 - Concrete
 - Plaster and Mortar
 - Ballast and Gabions
- Sub Group 2 Chair D Rossmann covering
 - Granular materials (G1 to G10)
 - Asphalt mixes
 - Seals and Micro-surfacing



Current Status

- Sub Group 1
 - Concrete
 - Draft document with commentary

Current Status

1	2	3	4	5	6
Requirement	Property	Fine aggregate derived from the natural disintegration of rock or from the mechanical crushing or milling of manufactured material or recycled material and any mixture (blend) of fine aggregate derived from the natural disintegration of rock and fine aggregate derived or from the mechanical crushing or milling of rock or manufactured material or recycled material	Fine aggregate derived from the mechanical crushing or milling of rock	Test method	Information clauses
Geometric	Grading, mass percentage that passes sieves ¹⁾ that have square apertures of nominal size 5,0 mm 150 µm	90 – 100 5 – 25	90 – 100 5 – 25		A A
	Dust content, mass percentage that passes a sieve that has a square aperture of nominal size 75 µm	0 - 5 ²⁾	0-10 ²⁾		B
	Methylene blue adsorption value ³⁾ , max.		0.7		B
	Clay content ⁴⁾ , material of particle size smaller than 5 µm, mass percentage, max.		2.0		B
	Fineness modulus		1.2 – 3.5		C
Physical					
Chemical	Chloride content ⁵⁾ , expressed as Cl ⁻ , mass percentage, max.	Fine aggregate for concrete for prestressing : 0,01 normal reinforced concrete : 0,03			D
	Organic impurities	The colour of the liquid above the fine aggregate shall not be darker than the colour of the reference solution, except that this requirement shall not be applicable if the fine aggregate complies with the requirement for soluble deleterious impurities.			E
	Presence of sugar	Free from sugar unless the fine aggregate complies with the requirement for soluble deleterious impurities.			F
	Soluble deleterious impurities	The strength of specimens made with the fine aggregate shall be at least 85% of that of the specimens made with the same fine aggregate after it has been washed, except that this requirement shall not be applicable if the fine aggregate complies with the requirements both for organic impurities and for the presence of sugar.			G

Current Status

1	2	3	4
Requirement	Property	Test methods	Interpretation notes
Physical	Water demand	SANS 5837	G
	Drying shrinkage and wetting expansion		H
	Content of material of low density		I
	Sand equivalent		J
	Clay and silt content		K
	Shell content		L
Chemical	Other impurities (such as sulphates, sulphides, mica and shale)		M
Durability	Soundness		N



Current Status

- Sub Group 1
 - Concrete
 - Draft document with commentary
 - Duplicate commentary between coarse and fine
 - Duplicate commentary between various parts
 - Meeting on 14 June to finalise
 - Meeting with SABS to agree on format
 - Work on other parts
 - Circulate draft to Industry for comment



Current Status

- Sub Group 2
 - Waiting for draft from Sub Group 1

Questions?



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Thank you

