

Report No. 0500/5e-1/20

dated 18.01.2021/Lo/gie

Client:	DC Halsvik Aggregates Sløvåg 1 N-5960 Dalsøyra
Order:	Quality monitoring of aggregates for EN 13450 "Aggregates for railway ballast"
Production plant:	DC Halsvik Aggregates, 5960 Dalsøyra, Norway
Origin:	Halsvik, Norway
Material:	Gneiss
Grading:	31,5/63 mm (Cat. F) Railway ballast - approx. 150 kg
Sampling:	26.10.2020 by client
Sampling point:	Stockpile
Sample receipt:	11.11.2020
Requirements:	EN 13450:2002/AC:2004

This report includes 7 pages.

1. Laboratory tests

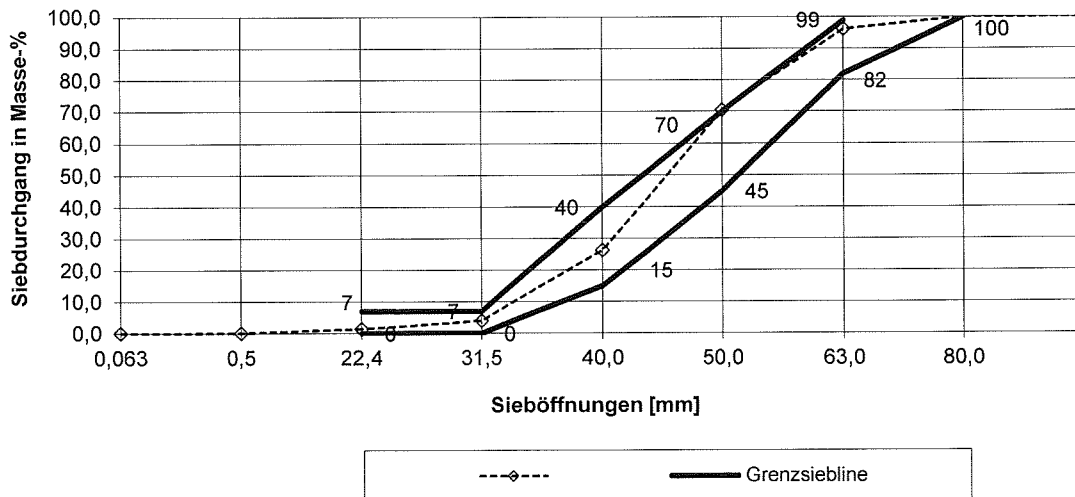
The laboratory tests were performed according to the test methods specified in EN 13450:2002/AC:2004.

Comply with the requirements of EN 13450:2002/AC:2004.

1.1 Grading

Test method: EN 933-1:2012 (washing and sieving)

sieve [mm]	sieve passage [M.-%]	
	value	set
22,4	1	0 - 7
31,5	4	0 - 7
40,0	26	15 - 40
50,0	70	45 - 70
63,0	96	93-99
80,0	100	100
31,5 - 63,0	92	≥ 85



Set category:..... F
 Value Category: F
 Deviation: no
 Assessment: conform to the requirement

1.2 Fines content ($\leq 0,5$ mm)

Test method: EN 933-1:2012

Property	value [M.-%]	set [M.-%]
Fines content $\leq 0,5$ mm	0,0	$\leq 0,6$

Set Category:A
 Value Category:A
 Deviation:no
 Assessment:conform to the requirement

1.3 Fines content ($\leq 0,063$ mm)

Test method: EN 933-1:2012

Property	value [M.-%]	set [M.-%]
Fines content $\leq 0,063$ mm	0,0	$\leq 0,5$

Set Category:A
 Value Category:A
 Deviation:no
 Assessment:conform to the requirement

1.4 Particle shape**1.4.1 Shape index**

Test method: EN 933-4:2015

Property	value [M.-%]	set [M.-%]
Shape index SI	3	≤ 10

Set Category:SI₁₀
 Value Category:SI₁₀
 Deviation:no
 Assessment:conform to the requirement

1.4.2 Flakiness index

Test method: EN 933-3:2012

Property	value [M.-%]	set [M.-%]
Flakiness index FI	2	≤ 15

Set Category: FI₁₅
 Value Category: FI₁₅
 Deviation: no
 Assessment: conform to the requirement

1.5. Particle length > 100 mm

Test method: EN 13450:2002/AC:2004

Property	value [M.-%]	set [M.-%]
Particle length > 100 mm	1,3	≤ 4

Set Category: A
 Value Category: A
 Deviation: no
 Assessment: conform to the requirement

1.6 Resistance to fragmentation**1.6.1 Los-Angeles-coefficient**

Test method: EN 1097-2:2020 and EN 13450:2004, annex C

Property	value [%]	set [%]
LA-coefficient	13	≤ 14

Set category: LA_{RB} 14
 Value Category: LA_{RB} 14
 Deviation: no
 Assessment: conform to the requirement

1.6.2 Impact value

Test method: EN 1097-2:2020 and EN 13450:2004, annex D

Property	value [%]	set [%]
Impact value	16	≤ 18

Set category: SZ_{RB} 18
 Value Category: SZ_{RB} 18
 Deviation: no
 Assessment: conform to the requirement

1.7 Resistance to wear**1.7.1 Micro deval coefficient**

Test method: EN 1097-1:2011 and EN 13450:2004, annex E

Feature	value [%]	set [%]
Micro deval coefficient M _{DE} RB	5	≤ 5

Set category: M_{DE}RB 5
 Value Category: M_{DE}RB 5
 Deviation: no
 Assessment: conform to the requirement

1.8 Thermal and weathering properties**1.8.1 Water absorption**

Test method: EN 1097-6:2013, annex B

Property	value [M.-%]	set [M.-%]
Water absorption WA _{cm}	0,3	≤ 0,5

Deviation: no
 Assessment: conform to the requirement

1.8.2 Magnesium sulfate test

Test method: EN 1367-2:2010 and EN 13450:2002/AC:2004, annex G

Property	value [M.-%]	set [M.-%]
Particle loss	0,2	≤ 1,0

Deviation: no

Assessment: conform to the requirement

1.9 Density

Test method: EN 1097-6:2013, annex B

Property	value [g/cm ³]	set [g/cm ³]
Density ρ_{cm}	2,69	≥ 2,6

Deviation: no

Assessment: conform to the requirement

1.10 Purity / Quality**1.10.1 Foreign material content**

The sample does not contain any organic contamination or any clayey or marly material (EN 13450:2002/AC:2004, clause 8).

2. Assessment

The aggregates can be assigned to the following categories and values according EN 13450:

	<u>Category</u>
• Grading	F
• Fine content (< 0,5 mm)	A
• Fines content (< 0,063 mm)	A
• Flakiness index	FI ₁₅
• Shape index	SI ₁₀
• Particle length	A
• Los-Angeles coefficient	LA _{RB} 14
• Impact value	SZ _{RB} 18
• Micro deval coefficient	M _{DERB} 5
• Water absorption	WA _{cm} = 0,3 %
• Magnesium sulfate test	MS = 0,2 M.-%
• Density	ρ _{cm} = 2,69 Mg/m ³

a s p h a l t - l a b o r
Arno J. Hinrichsen GmbH & Co.


Dipl.-Ing. Lütjhe
lab management