

Rectus Nordic Aps  
Erik Petersen  
Møgelgårdsvej 11, Dk-8520, Lystrup  
Denmark

## Test of Amalgam separator according ISO 11143:2008

### Test object

The test object was an amalgam separator labeled as 151191 with serial number: 19.256, classification type 3 (sedimentation and filter) in ISO 11143:2008. The system consists of a container with a built-in filter with the dimension (Height x diameter) 170 mm x 300 mm. The total volume for the entire system excluding the connection is approximately 4 L. The client also included an operation manual and installation instructions for the device.

Type: 3

Marking: 151191

Serial number: 19.256

Arrival date at RISE: June 6-2019

Date of testing: September 16 – 2019 to September 25 - 2019.

### Assignment:

Tests of applicable requirements according to section 5 (5.1-5.6) in ISO 11143:2008.

Test of separation efficiency with maximum flow rate 3L/min, 6 measurements. 3 tests with an empty amalgam separator (0%) and 3 tests with amalgam separator filled to 95% of maximum fillable volume.

Control of warning system for collecting container, alarm system for collecting container, removal of removable filled collecting container and maximum fillable volume of the removable collecting container were also checked.

Instruction for installation, use, maintenance and service according to section 11 in ISO 11143:2008 as well as marking according to section 12 in ISO 11143:2008 were also checked.

### RISE Research Institutes of Sweden AB

Postadress  
Box 857  
501 15 BORÅSBesöksadress  
Brinellgatan 4  
504 62 BORÅSTfn / Fax / E-post  
010-516 50 00  
033-13 55 02  
info@ri.se

Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg skriftligen godkänt annat.

**Method**

According to section 5 (5.1-5.6), section 11 (11.1-11.3) and section 12 (12.1-12.4) in ISO 11143:2008.

The standard amalgam samples used were 10 g amalgam with the manufacturer certificate, Charge: 005-08/18 supplied by Enretec GmbH.

The membrane filters used during the test of separation efficiency were the following:

Millipore 8.0 micron with SCWP, Millipore 3.0 micron with SSWP, Millipore 1.2 micron with RAWP in series with Millipore Woven Mesh Spacers as separating gauzes.

For tests of separation efficiency at the flow rate 3.0 l/min, the flow rate during the amalgam slurry addition was 2.5 l/min water + 0.5 l/min amalgam slurry followed by a flow rate 3.0 l/min during the flushing period.

The particles in the collecting vessel were collected on a filter and the weight of the particles were used to calculate the separation efficiency.

**Determining efficiency at 95% of the maximum fillable volume:**

The maximum volume capacity of removable collecting container is 1 L. Simulation of full collector were made according to the client’s specification of maximum fillable volume: The filling material consisted of 285 ml amalgam scrap with particle size < 0.3 mm and 665 ml glass pellets with 1.0 mm in particle size. The density of the filling scrap was 7.20 g/ml.

**Result**

**Clause 5.1 Efficiency**

Table 1. Efficiency calculated from the tests described below\*.

Test	Flow (L/min)	Filling level (%)	Sample Weight	Amount passing separator (g)	Efficiency of separation (%)
1	3	0	9,910	0,4012	95,952
2	3	0	9,964	0,318	96,809
3	3	0	9,972	0,4004	95,985
4	3	95	9,960	0,4697	95,284
5	3	95	9,977	0,4735	95,254
6	3	95	9,984	0,4854	95,138

*\*The result relate only to the items tested.*

The lowest value of the efficiency from all required test conditions is the value for the efficiency of the amalgam separator.(95,138 %)

The tests show that the amalgam separator fulfils the requirements in ISO 11143, clause 5.1 when tested with the maximum recommended flow rate (max. 3.0 L/min) with empty collecting container and collecting container filled to 95% of fillable volume.

**Clause 5.2 Warning system for collecting container**

The amalgam separator fulfills requirements.

**Clause 5.3 Alarm system for collecting container**

The amalgam separator fulfills requirements.

**Clause 5.4 Alarm system for malfunction of amalgam separator**

This requirement is not applicable

**Clause 5.5 Removal of removable filled collecting container**

The amalgam separator fulfills the requirements.

**Clause 5.6 Maximum fillable volume of the removable collecting container**

The amalgam separator fulfills requirements. The maximum fillable volume of the collecting container is 1.0 L.

**Clause 5.7 Electrical safety**

This requirement is not applicable

**Clause 11 Instruction for installation, use, maintenance and service**

The amalgam separator fulfills the requirement.

**Clause 12 Marking**

The amalgam separator fulfills the requirement.

**RISE Research Institutes of Sweden AB**  
**Kemi och material - Kemi**

Utfört av

Granskat av

Björn Nguyen

Marcus Vestergren

**Appendix**



*Figure 1. The separator*

# Manufacturer Certificate



for samples according  
to DIN EN ISO 11143

**Production date:** 13.09.2018 **Charge:** 005-08/18  
**Customer:** Rectus Nordic ApS  
 Møgelgårdsvej 11  
 8520 Lystrup  
**Sedigramm chart date:** 27.08.2018 **Order Number:** 2  
**Delivery Date:** 09.05.2019

Amalgam samples DIN EN ISO 11143

Fraction 1	500-3150 µm	6g ± 10mg
Fraction 2	100-500 µm	1g ± 5mg
Fraction 3	<100µm	3g ± 5mg
<b>Total</b>		<b>10g ± 5mg</b>

Sample No.:	Composition [g]			
	Fraction 1	Fraction 2	Fraction 3	Total
048	6,000	1,000	3,000	10,000
049	6,000	1,000	3,000	10,000
050	6,000	1,000	3,000	10,000
051	6,000	1,000	3,000	10,000
052	6,000	1,000	3,000	10,000
053	6,000	1,000	3,000	10,000

**Attachments:** Particle size distribution for d < 100µm  
 Report of the x-ray sedigraphical test on 27.08.2018

Velten, 09.05.2019

Stamp / Signature

enretec GmbH  
 Kanalstraße 17  
 16727 Velten  
 Germany  
 Tel: +49 3304 3919-0  
 Fax: +49 3304 3919-299  
 E-Mail: info@enretec.com  
 Internet: www.enretec.com

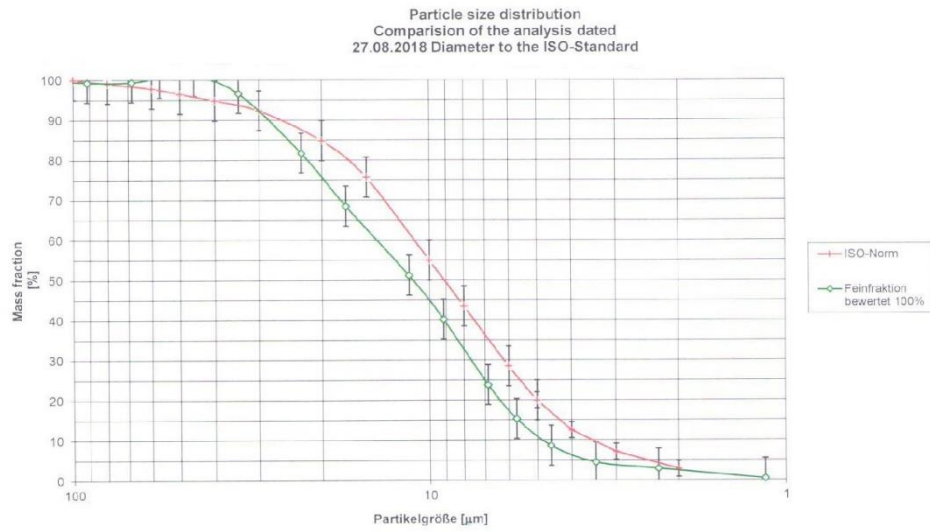
Berliner Volksbank eG  
 IBAN: DE50 1009 0000 2450 9930 02  
 BIC: BEVODE33XXX

Geschäftsführung:  
 Martin Dietrich  
 HRB 5745 NP  
 AG Neursuppin  
 UST-ID: DE813123627

Unser Zertifizierungsstandard



Figure 2. Certificate of the standard samples



*Figure 3. Particle size distribution graph*