2018 AMESA Long Term Sampling System Work Plan

Issue Date: October 17, 2018

Executive Summary

This AMESA (Adsorption Method for Sampling Dioxins and Furans) Work Plan, as well as the previous plans, outlines the evaluation procedures utilized to evaluate the Long Term Sampling System (LTSS) in conformance with Environmental Compliance Approval 7306-8FDKNX (ECA) Condition 7. (3) (a). Pursuant to the execution of the 2017 AMESA Work Plan, short term validation data collected in 2017 indicated that the AMESA may at times provide an accurate estimate, but monthly evaluation data remained as an inconsistent estimate of dioxins and furans emissions from the DYEC. Prior to the implementation of the 2018 strategy, inconsistent monthly AMESA data has prevented determining dioxins and furans trends. The objective of this 2018 AMESA Work Plan is to set forth an outline of a revised strategy to improve the consistency of monthly data while continuing the performance evaluation of the LTSS. Results following the initial implementation of the 2018 strategy show promise to improve data quality and also consistency between Unit 1 and Unit 2 results.

The 2018 AMESA Work Plan is as follows:

Task	Implementation Date(s)	Evaluation Period
1. Improved annual maintenance of the AMESA system using a checklist provided by Environnement S.A. Deutschland (ESAD).	**March 2018 March 2019**	**March 2018 – December 2019**
2. Swap AMESA Sampling Probes between units.	**April 2018**	**April 2018 – December 2019**
3. Isokinetic Flow demonstration for AMESA sample collection	**May 2018 Sept 2018 Sept 2019**	**May 2018 – December 2019**
4. Install new gas meters	**May 2018**	**May 2018 - December 2019**
5. Conduct 12 (twelve) hour AMESA validation test concurrently with the three (3) EPS 1/ RM2 compliance samples for each unit.	**Sept 2018 Sept 2019**	**September 2018 – December 2019**
6. Adjust long term sampling procedures to allow for additional cleaning and proofing of the AMESA sampling assembly in conformance with outlier data generation	**October 2018**	**October 2018 – December 2019**
7. If significant deviations in AMESA results between the two units remain following completion of the sampling probe swap, new gas meter installation and two annual maintenance periods, swap the entire AMESA sampling system between units.	**September 2019**	**September 2019 – September 2020**

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1.0 Introduction

The AMESA (Adsorption Method for Sampling Dioxins and Furans) Long Term Sampling System (LTSS or AMESA), installed on each of the two units at the Durham York Energy Centre (DYEC), is a dioxin and furan continuous sampling system designed to meet the requirements of ECA Condition 7. (3). It is designed to extract a sample of flue gas from the outlet of the air pollution control system on a continuous and isokinetic basis for the duration of the sampling period. Dioxins and furans are adsorbed on a replaceable trap filled with adsorbent resin (XAD-2) which is spiked with an internal standard by the laboratory that will complete the analyses following the designated sampling period. This AMESA Work Plan, as well as the previous plans, outlines the evaluation procedures utilized to evaluate the LTSS in conformance with ECA Condition 7. (3) (a). Pursuant to the execution of the 2017 AMESA Work Plan, validation data collected in 2017 indicated that the AMESA may at times provide an accurate estimate, but subsequent monthly evaluation data provide an inconsistent estimate of the emissions of dioxins and furans from the DYEC. Prior to the implementation of the 2018 strategy, the inconsistent data quality appears to prevent its use as a predictive tool of dioxin emissions. The objective of this 2018 AMESA Work Plan is to set forth an outline of a revised strategy to improve the consistency of data while continuing the performance evaluation of the LTSS. Results following the initial implementation of the 2018 strategy show promise to not only improve data quality but also consistency between Unit 1 and Unit 2 results.

2.0 Historical Operation and Test Methodology Summary

Operation of the LTSS was initiated in 2015 and was maintained in accordance with initial guidance from the AMESA manufacturer, Environnement S.A. Deutschland (ESAD, the European manufacturer of the AMESA system), the North America vendor Altech and the AMESA Technical Manual (June 2010). An - AMESA Trap Replacement Standard Operating Procedure (SOP) (DYEC ENV 001) was initially developed and implemented based upon Altech guidance. This SOP was subsequently updated, once to include revised Altech Guidance which was implemented following the initial DYEC source test in October 2015, and subsequently to include ESAD cleaning procedures by rinsing with water, acetone and toluene and later changed to water, acetone and hexane in conformance with EPS 1 RM/2.

Initial AMESA sampling operation was done with blank traps to ensure the system was able to withdraw a sample iso-kinetically. Subsequently, the AMESA probe was removed from the duct during refractory cure of the boiler when natural gas was combusted. The AMESA LTSS probe was put back into service just prior to the conduct of initial Relative Accuracy testing of the Continuous Emission Monitoring System (CEMS).

The AMESA probe was initially managed in accordance with the original Altech procedures that stated:

1. LTSS probes are to be cleaned utilizing instrument air only by back flowing instrument air through the nozzle and into the duct,
2. LTSS is “purged” of any contamination buildup followed by sampling with a blank trap for a period up to 48 hours.
3. No chemical or physical cleaning of LTSS probes or the sampling system was recommended.

Using the above procedures and in conformance with the Source Test Plan submitted to the Ministry of the Environment, Conservation and Parks (MECP), the initial evaluation of the AMESA LTSS on October 27th and 28th 2015 consisted of three (3) paired tests utilizing a minimum sampling period of four hours. Each paired set included a single point AMESA sampling result with multi-point source testing in accordance with EPS 1 RM/2. The term "multi-point" means that an EPS 1 RM/2 nozzle was used to extract flue gas and moved to various points across the duct diameter during the test program, as is done for conventional stack tests. The AMESA system uses a single fixed point in the center of the duct to sample the flue gas.

As recommended by ESAD, subsequent validation testing of the AMESA system in 2016 continued to utilize a Relative Accuracy approach, as utilized in the initial validation program which is also consistent with the procedures ESAD has utilized in European installations. These subsequent paired sets, completed in May 2016 and November 2016, however, also extended the sampling period to six (6) hours in accordance with discussions with ESAD, the Regions and the MECP. The extended sampling period provided additional AMESA sample volume consistent with the total sample volume collected with EPS 1/ RM2. Using that procedure, nine (9) valid AMESA samples were collected concurrently with EPS 1/ RM2 samples for each DYEC unit, in accordance with the initial Source Test Plan. In addition to the extended sampling time, new ESAD system cleaning procedures were implemented which included a rinsing process of the nozzle and inner tube with distilled water, acetone and toluene. During the conduct of the compliance testing program in 2016, representatives of ESAD were present to train Covanta personnel on this procedure and to thoroughly review and make any adjustments to ensure the proper operation of the AMESA system. Although, not part of the relative accuracy procedure, probe/inner tube rinse cleaning samples were also collected and analyzed separately from the XAD resin trap from the AMESA system.

Validation testing in 2017, following consultation with the Regions and ESAD, modified the AMESA validation testing program which: (1) incorporated AMESA sampling system cleaning procedures that more fully replicate reference method procedures, specifically EPS 1/RM 2; (2) substituted the paired relative accuracy approach with the validation protocol included within the proposed Technical Specifications for long term sampling systems for PCDD/PCDF as published by the British Standards Institution (BSI) in April 2015; and (3) modified the reference method to replicate the AMESA sampling approach.

As a result, validation testing in 2017 consisted of five manual method tests of eight hours duration conducted sequentially and was compared to a single AMESA test spanning the entire 40-hour period covered by the manual tests. Unlike previous standard reference tests, the 2017 tests utilized a fixed sampling point in the centre of the duct to mirror the behavior of the AMESA system.

Additional relative accuracy validation data for both units was also collected during the Fall 2018 compliance test. As required by the ECA, triplicate compliance source test methods were conducted during that program. The AMESA was operated such that the AMESA sampling periods are coincident with the three (3) reference method start and stop times for each unit resulting in a total AMESA sampling period of approximately 12 hours per unit.

The following Table 1 compares the validation methodology used in all tests conducted to date. Covanta obtained paired sets of data where a manual method test is conducted at the same time, for the same duration and at the same proximate location as the AMESA system. The results of the manual method tests were compared to the corresponding AMESA tests to assess AMESA's accuracy.

Table 1: Summary of AMESA Validation Test Procedures

Test Date	October 2015	May 2016	November 2016	May 2017	September 2018
Reference Method	EPS 1/RM 2	EPS 1/ RM 2	EPS 1/RM 2	EPS 1/RM 2 (Modified)(1)	EPS 1/RM 2
Number of Reference test runs	3	3	3	5	3
Manual method sample period (hours)	4	6	6	8	4
Single point or traverse	Traverse	Traverse	Traverse	Single Point	Traverse
AMESA Parameters					
Single point or traverse	Single	Single	Single	Single	Single
Number of AMESA Runs	3	3	3	1	1
AMESA Sampling Period (hours)	4	6	6	40	12
Source Testing Contractor	Ortech	Ortech	Ortech	Ortech	Ortech
XAD trap preparation	ALS	Maxxam	Maxxam	ALS	ALS
Probe cleaning before installation	No	Water, Acetone, Toluene Rinse	Water, Acetone, Toluene Rinse	Laboratory procedure used for EPS 1/RM 2	No(2)
Probe rinse after sampling event	No	No	Yes	Yes	No

Notes:
(1) Fixed sampling point
(2) Although it was intended that probe cleaning occur prior to the 2018 test, probe cleaning did not occur. Probe cleaning will occur prior to all future validation tests.

3.0 Isokinetic Flow Evaluations

An initial evaluation of the LTSS was conducted to determine if the flue gas sample system met isokinetic standards. The specified range for the sampling system evaluation is 95 – 115% isokinetic flow pursuant to the AMESA vendor. A minimum of nine flow measurements were taken on each unit. This evaluation concluded that the AMESA system is capable of sampling at an isokinetic rate from a single point at 108% and 106% for Unit 1 and Unit 2 respectively. The ability to maintain this isokinetic flow successfully is understood to be a key parameter for any dioxin sampling system to generate representative data of long term DYEC operation. This includes the ability of the system to automatically adjust to changes in flow due to changes in the steam generation rate and resultant flue gas flow rate.

As part of the 2018 AMESA Work Plan, the evaluation to determine if the flue gas sample system continued to meet isokinetic standards was repeated during the voluntary spring source test program which followed the installation of new gas meters on both AMESA sampling systems. Ortech Report No. 21840-2 compared the average velocity measured by the AMESA for several coincident particulate, metals and SVOC test periods. This testing demonstrated successful isokinetic sampling at 102.7% and 101.5% on average for Unit 1 and Unit 2 respectively.

4.0 Summary of AMESA Validation Data

4.1 Initial RA Validation Data

Initial validation data utilized for evaluation was limited to nine (9) paired sets of samples taken on October 28th – 29th, 2015, May 9th – 11th, and October 27th – 31st, 2016. Data files for these test runs were presented in the associated Ortech Source Test Report No. 21546-1 dated November 25, 2015, Ortech Source Test Report No. 21656 dated June 13, 2016, and Ortech Source Test Report No. 21698 dated December 22, 2016. Table 2 summarizes the AMESA relative accuracy testing results and reference method results.

The relative accuracy of the AMESA data as compared to the reference method is significantly greater than the evaluation criteria (+/-10%) suggested to be utilized by the ECA, i.e. Performance Specification 4. Following a peak measured value by the AMESA, TEQ results appear to decline steadily in the following test periods. ESAD has commented that such data trends are typical of results in which the sampling system is plagued with insufficient cleaning which is expected to occur naturally by cooling the sample by the AMESA. As a result, Covanta began to rinse the AMESA sampling system in house between monthly sampling events for additional cleaning. As single rinses appeared to be insufficient from validation testing results, the sampling system was subsequently double and triple rinsed. Implementation of these procedures suggest a possible improvement in data quality by reducing the contribution of contaminants on the sampling system, however, these procedures also have the potential to increase potential contamination leading to new high spikes in AMESA monthly results and were, therefore, discontinued. Validation test results appear to suggest that process variability has declined over time for all data.

Table 2: Summary of Unit 1 and Unit 2 AMESA Relative Accuracy Validation Data [1]

RUN #	DATE	Unit 1 AMESA Dioxin Concentration	Unit 1 Reference Method	Unit 2 AMESA Dioxin Concentration	Unit 2 Reference Method
1	28 Oct 2015	843	25.9	559	19.5
2	29 Oct 2015	273	29.6	258	23.8
3	29 Oct 2015	121	25.5	182	23.2
4	9 May 2016	430	1169	12.4	14
5	10 May 2016	61.3	678	7.5	9.0
6	11 May 2016	24.3	606	8.9	12
7	27 Oct 2016	26.2	7.6	34.1	6.8
8	28 Oct 2016	15.7	5.9	31.3	6.5
9	31 Oct 2016	12.7	14.8	19.9	6.0
	Relative Accuracy (%)	162	N/A	1862	N/A

Notes:
(1) All results presented as pg TEQ/Rm^3 corrected to 25°C and 1 atmosphere, adjusted to 11% O_2, using NATO/CCMS (1989) toxicity equivalency factors with full detection limit.

4.2 40 Hour Validation Test Data

During 2017, the AMESA sampler was operated to collect data for both a short term sampling period of 40 hours during the spring source testing program as well as collecting long term sampling periods (28-day periods as DYEC operations allows) to continue the performance evaluation of the LTSS.

ORTECH Consulting Inc. (ORTECH) completed a 40-hour dioxin and furan emission testing program in conformance with the AMESA Work Plan dated April 11, 2017 as submitted to the MECP to determine the deviation of the DYEC AMESA dioxin and furan sampling monitor results from reference method test results. This test program procedure was implemented as a best efforts approach to evaluate the performance of the AMESA Long Term Sampling System in accordance with ECA Condition 7. (3). A summary of this AMESA evaluation data for Unit 1 and Unit 2 is provided below on Table 3.

During the 40 hour validation test, measured dioxin concentrations for both Unit 1 and Unit 2 were consistent between the two units regardless of the measurement methodology utilized. The reference method mean resulted in an average of 6.14 pg TEQ/Rm^3 and 7.59 pg TEQ/Rm^3 for Unit 1 and Unit 2, respectively while the AMESA monitor reported 5.7 pg TEQ/Rm^3 and 12.5 pg TEQ/Rm^3 for Unit 1 and Unit 2, respectively.

During the conduct of the 40-hour test program, the deviation between the mean of the five eight hour reference method tests and the single AMESA monitor sample at each location was within the maximum deviation criterion listed in BSI Standards Publication PD CEN/TS 1948-5:2015 (Table I.1) of ± 100%. Also, the dioxin and furan dry adjusted TEQ concentration for each of the five RM tests and for the AMESA test at the BH Outlet of each Boiler was well below the maximum in-stack emission limit stated in ECA 7306-8FDKNX of 60 pg TEQ/Rm^3, adjusted to 11% oxygen.

Table 3: Forty Hour AMESA Results in Comparison to Reference Method

Sampling Location and Method		pg TEQ/Rm^3 @11% O_2 (1)	DEVIATION PERCENTAGE (2)
Unit 1	Reference Method Mean	6.14	7.2
	AMESA Monitor	5.70	
Unit 2	Reference Method Mean	7.59	64.7
	AMESA Monitor	12.5	

Notes:
(1) NATO/CCMS (1989) toxicity equivalency factors with full detection limit.
(2) Calculated using the Dry Adjusted TEQ Concentration data (Deviation = [(RM-AMESA)/RM]*100)

4.3 Long Term Data Evaluation

As the AMESA appeared to report consistent results during the 2017 validation test program, subsequent long term sample results were included as part of the current AMESA performance evaluation. Since the successful completion of the 2017 validation test program, fourteen (14) monthly samples have been collected for each unit. Sample volumes and dioxin concentrations are summarized on Table 4. Sample volumes collected for both units appear to be consistent with actual boiler operating hours and averaged 499.1 m^3 and 486.0 m^3 for Unit 1 and Unit 2, respectively. Unlike the validation test results, the AMESA monitor reported a significant variation, approximately 3 orders in magnitude in dioxin concentrations between Units 1 and 2, even when excluding two apparent outliers until April 2018. During the initial 10 monthly periods following the 2017 validation tests, however, dioxin concentrations from Unit 1 were extremely consistent, ranging between 0.019 and 0.081 pg TEQ/Rm^3. During that same period, dioxin concentrations from Unit 2, excluding outliers from July-September 2017 of 521 pg TEQ/Rm^3 and from March to April 2018 of 162.6 pg TEQ/Rm^3 are also consistent, but consistently higher than Unit 1, ranging between 5.7 and 35.5 pg TEQ/Rm^3.

Table 4: Summary of Monthly AMESA Data Collected Post 2017 Validation Testing

	Unit 1		Unit 2	
Date Range (Start – Stop)	Sample Volume [1]	Dioxin Concentration [2]	Sample Volume [1]	Dioxin Concentration [2]
01 Jun 2017 - 30 Jun 2017	545.5	0.081	512.5	5.7
30 Jun 2017- 28 Jul 2017	504.0	0.063	483.3	8.0
28 Jul 2017 – 07 Sep 2017	383.3	0.080	371.7	521
07 Sep 2017 - 05 Oct 2017	514.9	0.049	500.9	35.5
05 Oct 2017- 02 Nov 2017	516.5	0.019	501.6	16.1
02 Nov 2017 – 01 Dec 2017	481.9	0.021	467.5	8.8
01 Dec 2017 – 29 Dec 2017	515.5	0.025	505.8	6.9
29 Dec 2017 – 26 Jan 2018	477.6	0.039	462.9	7.0
27 Jan 2018 – 01 Mar 2018[3]	531.5	0.037		
27 Jan 2018 – 21 Mar 2018[3]			454.5	14.1
02 Mar 2018 – 24 Apr 2018[3]	500.4	0.023		
21 Mar 2018 – 24 Apr 2018[3]			554.5	162.6
24 Apr 2018 – 22 May 2018	510.6	3.2	516.7	49.1
22 May 2018 – 22 Jun 2018[3]			517.6	8.7
22 May 2018 – 3 Jul 2018[3]	558.1	29.9		
3 Jul 2018 – 31 Jul 2018	473.4	22.9	476.2	9.3
31 Jul 2018 – 28 Aug 2018	474.0	12.8	478.2	4.7
Long Term Average	499.1	4.9	489.8[4]	14.5[4]

Notes:

(1) **Sample volume presented as cubic meters corrected to 25°C and 1 atmosphere.**

(2) **All results presented as pg TEQ/Rm^3 corrected to 25°C and 1 atmosphere, adjusted to 11% O_2, using NATO/CCMS (1989) toxicity equivalency factors with full detection limit.**

(3) **Sampling times extended/shortened due to boiler outages.**

(4) **Average excludes samples collected between 28 July and 7 September 2017 and 21 March and 24 April 2018 which appears to have been compromised and represent outliers.**

A review of boiler operations during the July-September 2017 outlier period identified that both boilers were tripped offline due to a severe thunderstorm. Also, Unit 1 was shut down due to a carbon monoxide (CO) emission issue and the ID fan tripping due to a plugged superheater. Unit 2 experienced a superheater tube leak and a feed chute water jacket leak.

A review of boiler operations during the March-April 2018 outlier period identified that both boilers went black plant due to a turbine issue. Unit 1 shut down 3 times due to turbine issues while Unit 2 shut down 6 times, also due to turbines issues.

To the extent possible, auxiliary burners were utilized for shutdown, except in the cases of power failures and black plant. Only a single CO emission excursion occurred during the two periods in question.

Even though both units experienced similar shutdown events during the outlier periods, only Unit 2 reported higher dioxin emissions, on top of significantly higher average emissions in comparison to Unit 1. Unit 1 dioxin emissions did not significantly vary during the two outlier operations periods, even though Unit 1 experienced operational issues during the outlier periods as well. As a result, it appears that the underlying sampling system bias by Unit 2 likely contributes more significantly to the generation of outliers than the impact on dioxin emissions during transitory boiler operation.

In April of 2018, the AMESA sampling systems were swapped between Unit 1 and Unit 2 to ascertain the inconsistency of results. Then, in May of 2018, new gas sampling meters were installed. Both of these actions appear, at this time, to have led to more consistent results between Unit 1 and Unit 2.

5.0 AMESA Work Plan Recommendations for 2018

The objective of this work plan is to improve the consistency of data collected while continuing the performance evaluation of the LTSS. The following recommendations are suggested to ongoing data collection activities.

1. Improved maintenance of the AMESA system is being performed in conjunction with a checklist provided by ESAD. These activities have identified that the deviation of the Unit 2 gas meter was significant and justified replacement.
2. New gas flow meters have been installed on both units and began operation for the long term sampling period which was initiated on May 22, 2018.
3. Although the LTSS initially demonstrated the ability to collect a sample in conformance with isokinetic standards, this demonstration was repeated utilizing isokinetic data collected from particulate/metals and semi-volatile organic compounds tests during the spring 2018 voluntary source test program, particularly due to the operation of new gas flow meters. The continuation of demonstrating isokinetic flow was made from concurrent AMESA LTSS operational flow records matched against reference method test flows. Ortech Report No. 21840-2 presents those results.
4. Following the completion of the improved maintenance program in conformance with the ESAD checklist in March 2018, the AMESA sampling probe assembly was swapped between Unit 1 and Unit 2, starting with the sampling period of April 24, 2018. The impact on reported dioxin emissions will be observed to ascertain if variations between reported emissions from Unit 1 and Unit 2 are due to the sampling probe assembly.

5. Additional relative accuracy validation data for both units was collected during the fall 2018 compliance test. As required by the ECA, triplicate manual compliance source test methods were conducted during that program. The AMESA was operated such that the AMESA sampling periods are coincident with the reference method start and stop times resulting in a total AMESA sampling period of approximately 12 hours. The AMESA system was paused between source test method runs. This data, when it becomes available, will be reviewed with other relative accuracy data collected to date.
6. As the AMESA appears to generate data outliers on occasion, Covanta has reviewed with ALS Laboratory (ALS) a procedure to more systematically clean the sampling assembly for long term sampling (28 +/- day) on a periodic basis. At this time, Covanta is proposing to have ALS clean the sampling system monthly and store the rinses. If test results from analysis of the XAD-2 trap are greater than 100% of the emission limit value for dioxins and furans, then the archived rinse sample will be analyzed to verify that a clean sampling system was utilized to obtain the monthly sample and also to evaluate the test results including isomer profiles. This procedure will be implemented once additional sample assemblies are acquired as spare sampling assemblies would need to be cleaned by ALS concurrently to the monthly sampling period.
7. The improvement of data quality to date and the variability of monthly data suggests that a longer reporting period may be appropriate to review AMESA monthly data moving forward. As a result, Covanta proposes that a 12 month rolling average begin to be utilized to evaluate the trend of dioxin emissions. Data utilized in the rolling average should have consistent dioxin isomer profiles which will be reviewed using XAD-2 trap analyses but also rinse analyses when collected.
8. If significant deviations in AMESA results between the two units remain following the implementation of the 2018 AMESA Work Plan recommendations, i.e. probe swap, new gas meter installation and two annual maintenance periods, the entire AMESA sampling system (not just the sample probe assembly as previously conducted) will be swapped between units.

Once the AMESA sampler generates more consistent data, long term data will be used to assess the ongoing performance of the air pollution control system. All measurements obtained from the AMESA sampler, whether short term or long-term sampling periods, are not meant to be used for verifying compliance with the regulatory limits for dioxins and furans. The proposed modifications to the 2018 AMESA Work Plan are considered to be a continuation of a best efforts approach to evaluate the performance of the AMESA Long Term Sampling System.

APPENDIX: Validation Test Program 2018 Procedures

In conformance with ALS procedures developed specifically for sampling SVOCs, the AMESA sampling system will be removed and sent to ALS prior to the conduct of any validation testing program. The AMESA sampling sections, probe, elbow and inner tube assembly will go through a multistep cleaning process, much like all ORTECH's reference method testing glassware following ALS documentation ID: *BU-WI-3000, Organic Glassware/Equipment Cleaning, Proofing and Maintenance*. Covanta will maintain duplicate sampling components such that monthly AMESA sampling can continue in operation while the spare sampling components are laboratory cleaned and proofed to be subsequently reinstalled prior to the conduct of the Validation Test program. ALS will utilize hexane in substitution for toluene in conformance with reference method procedures.

In recognition of the variability of emission results for the range of TEQ expected, BSI specifications referenced as CEN/TS 1948-5 (which to date have not been verified), incorporate a sliding scale for the maximum deviation in relation to the TEQ concentration as enumerated in Table I.1 in Annex I of the BSI specifications and is provided below. Due to the uncertainty of results collected to date, Covanta proposes that a maximum deviation of 100% is appropriate to apply to all DYEC relative accuracy validation data.

Concentration ng I-TEQ/m^3 (at standard conditions, dry)	Maxim. deviation %
0,02	100
0,03	60
0,04	45
0,06	40
0,08	37
0,1	35