

To

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Subject

Final report

Mandate: M/395 'Characterization of waste from extractive industries'

Agreement: SA/CEN/ENTR/395/2007-08

0. Summary

The present report constitutes the final report under agreement SA/CEN/ENTR/395/2007-08. The work on the total mandate was performed in the period from January 2009 to December 2012.

On December 8, 2008 the agreement was signed between the European Commission and CEN on Mandate M/395 'Development of standardized methods relating to the characterisation of wastes from the extractive industries'.

The mandated work consisted out of the development and publication of five standardised European documents. By a public call for tender a consortium existing out of 10 technical experts was selected for the drafting of documents. A new working group under the responsibility of CEN/TC 292 'Characterization of waste' was established to provide the conditions for discussion of the drafts between the members of the consortium and others interested. The secretariat of this Working group was also selected by a public call for tender.

The draft European documents have been prepared by this Working group under consensus. Were after a public commenting period of three months was organized in order to have all stakeholders informed and given the change to comment the drafts. In the case of comments were received these were discussed and handled were after CEN/TC 292 approved final publication.

This project resulted in the publication of the following five standardized European documents.

Standard number	Title
EN 15875:2011	Characterization of waste - Static test for determination of acid potential and neutralisation potential of sulfidic waste
CEN/TR 16363:2012	Characterization of waste - Kinetic testing for assessing acid generation potential of sulfidic waste from extractive industries
CEN/TR 16376:2012	Characterization of waste - Overall guidance document for characterization of waste from extractive industries
CEN/TS 16229:2011	Characterization of waste - Sampling and analysis of weak acid dissociable cyanide discharged into tailings ponds
CEN/TR 16365:2012	Characterization of waste - Sampling of waste from extractive industries
EN	is European Standard
CEN/TR	is European Technical Report
CEN/TS	is European Technical Specification

1 Introduction

Directive 2006/21/EC¹ lays down requirements for the safe management of waste from extractive industries. To implement the technical requirements as mentioned in the directive Mandate 395 'Development of standardized methods relating to the characterisation of wastes from the extractive industries' has been granted to CEN (European Committee for Standardization).

The development of standards for characterization of extractive waste is proceeding under the responsibility of CEN Technical Committee (CEN/TC) 292 'Characterization of waste'. Since 1991 the secretariat of CEN/TC 292 is held by NEN, the Netherlands. The standardization work on extractive waste is initiated by the establishment of Working Group (WG) 8 'Wastes from the extractive industry'. The secretariat of CEN/TC 292/WG 8 is held by VTT, Finland.

2. Structure of CEN/TC 292

The objective of CEN/TC 292 is to support European parties in waste characterisation (legislators, companies dealing with production, (trans-national) transport or treatment of waste, laboratories), by providing them with CEN standardized methodology. This includes the relevant standardized terminology as well as standardized and validated test methods to characterize the wastes under consideration. Standards are developed underlying legal requirements as well as commercial interests. This includes characterisation of wastes that may become secondary raw materials. The test results should enable European parties to verify that the considered waste satisfies the criteria of the envisaged (final) destination of the waste, which may be treatment, re-use, incineration or landfill.

The objectives above lead to the formation of the following operational structure. For the development of the five documents under the mandated Working Group 8 was established.

CEN/TC 292	Characterization of waste Secretariat: NEN (Mr M. van Rijn)
CEN/TC 292/WG 1	Sampling
CEN/TC 292/WG 2	Leaching test procedures
CEN/TC 292/WG 3	Parameters related to species soluble in mineral acid or water: analysis and digestion methods
CEN/TC 292/WG 4	Terminology
CEN/TC 292/WG 5	Analysis of waste/Selected group parameters
CEN/TC 292/WG 6	Basic characterization tests for leaching behaviour
CEN/TC 292/WG 7	Ecotoxicological properties
CEN/TC 292/WG 8	Wastes from the extractive industry Secretariat: VTT (Mrs. M. Wahlstrom)

3 Working Group 8

WG 8 was established by CEN/TC 292 to draft documents in accordance with the work specifications, guidelines and time schedule as mentioned in the grant agreement.

A public call for tender for the execution of mandate M395 "Development of standardized methods relating to the characterization of wastes from the extractive industries" started at 8-12-2008 and closed at 15-01-2009. This call for tender has been published at the websites of CEN (www.cen.eu) and at the website of NEN (www.nen.nl) for execution of Mandate M/395, two separate tender requests were launched:

1. request for tender for the **secretariat of CEN/TC 292 WG 8** 'Wastes from the extractive industry' regarding the development of standardized methods for characterization of wastes from the extractive industry under Mandate M/395
2. request for tender for **technical project leaders** on the development of standardized methods for characterization of wastes from the extractive industry under Mandate M/395

¹ Directive 2006/21/EC on the management of waste from extractive industries and amending directive 2004/35/EC

Received tenders

1. **secretariat of CEN/TC 292 WG 8:** for this tender, one offer was received by VTT Technical Research Centre of Finland
2. **technical project leaders:** for this tender one offer was received from a consortium, led by SveMin, Sweden

The full evaluation report was sent to and approved by the EC before the work started. After the evaluation report was approved the consortium was expanded with one member because of change of employer. This was also communicated and approved by the commission.

The members of the consortium are:

DHI (represented by O. Hjelm)
ECN (represented by H. van der Sloot, later A. van Zomeren)
Hans van der Sloot Consultancy (represented by H. van der Sloot)
Institute of Environmental Engineering (represented by I. Twardowska)
Kjeoy Research and Education Centra (represented by I. Walder)
K. Liphard (not representing an organization, involved for specific expertise)
SGL (represented by D. Bendz)
SveMin (represented by L.-A. Lindahl)
University of Miskolc (represented by F. Madai)
VTT Technical Research Centre of Finland (represented by M. Wahlstrom, T. Kaartinen)
WRc (represented by J. Turell)

Contracts between NEN and the partners in the consortium were signed in the period April-May 2009. Also the contract between NEN and VTT was signed for the secretariat of WG 8.

Next to the members of the consortium this working group is open for all interested experts which have been appointed by national standardization bodies. Furthermore liaison officers from three organizations (Euromines, IMA-Europe, TBE) as well as CEN associate member ECOS are involved in WG 8 activities.

From the start of the Mandate (January 2009) until now (October 2012) WG 8 organized 8 official meetings.

- January 20, 2009 in Oslo, Norway
- May 18, 2009 in Stockholm, Sweden
- September 30, 2009 in Brussels, Belgium
- March 1-2, 2010 in Espoo, Finland
- September 28-29, 2010 in Paris, France
- January 17-18, 2011 in Warsaw, Poland
- May 11-12, 2011 in Amsterdam, the Netherlands
- June 2012 in Stockholm, Sweden

In addition to the official WG 8 meetings the consortium organized a number of preparatory ad hoc meetings when necessary.

Furthermore, the standardization work in CEN/TC 292/WG 8 has been presented by WG 8 experts in two international conferences in 2010. 1) Mine Closure 2010 in Chile (November 23-26, 2010) and 2) IMWA 2010 in Canada (September 5-9, 2010). This was done to promote and inform the mining industry on the activities in this field in Europe.

4 Standard development

Amendments

According to the original grant agreement all five deliverables must be sent to the Commission 36 months after the start of the action.

Difference in interpretation between CEN and EC on the eligible costs for the WG secretariat created an unclear financial situation for VTT. As a consequence of the financial situation for VTT

a delay of maximum 9 months for all deliverables was foreseen. A request for this first amendment of the contract was accepted by the Commission on March 24, 2010.

Due to technical discussions in the Working Group consensus on the drafts was delayed. Consequently there was a change in the order of submitting the deliverables to the Commission and this led to a second amendment granted November 27, 2011.

Public enquiry

The documents drafted by the consortium and approved by Working Group 8 have been published by CEN Management center (CCMC, Brussels) and distributed to all European national standardization bodies for commenting and approval.

The comments received during this period were discussed in Working Group 8 and handled by the consortium.

Enquiry period

Standard number	Short title	Enquiry period
prEN 15875	Static test	2008-11-13 to 2009-04-13
prCEN/TR 16363	Kinetic test	2011-12-08 to 2012-03-08
prCEN/TR 16376	Overall guidance	2012-02-23 to 2012-05-23
prCEN/TS 16229	Weak acid dissociable cyanide	2011-01-13 to 2011-04-13
prCEN/TR 16365	Sampling	2012-01-12 to 2012-04-12
prEN is draft European Standard prCEN/TR is draft European Technical Report prCEN/TS is draft European Technical Specification		

After this CEN enquiry the draft European Standard (EN 15875) was approved and finalized for validation as agreed in the Mandate. The consortium decided to arrange an "inter-laboratory comparison exercise" of this method, because it is new and it is important that the test instructions are clear and easily understandable. This pre-study on 2 samples sent and 25 participating European laboratories took place in November-December 2009. The actual validation study (inter-laboratory comparison) as demanded for in the mandate was performed in February 2010. The test was performed with 5 samples and 18 European laboratories that took part in the official inter-laboratory comparison. 17 laboratories reported the results for all five samples. The report 'Inter-laboratory exercise on determination of neutralization potential according to prEN 15875' has been discussed in WG 8 before acceptance of the results.

CEN/TC 292 was kept informed during the whole process by detailed progress reports. All Work Items were officially accepted by CEN/TC 292 based on available draft texts prepared by WG 8.

5. Final results

The grant agreement for an action SA/CEN/ENTR/395/2007-08 Characterisation of waste from extractive industries of which details are described in Mandate M/395 'Development of standardized methods relating to the characterisation of wastes from the extractive industries' is finalized according specifications and resulted in five deliverables. Four standardized documents (CEN/TR and CEN/TS) and one fully validated European Standard.

Final deliverables

Standard number	Title	Date of publication
EN 15875:2011	Characterization of waste - Static test for determination of acid potential and neutralisation potential of sulfidic waste	2011-10-26
CEN/TR 16363:2012	Characterization of waste - Kinetic testing for assessing acid generation potential of sulfidic waste from extractive industries	2012-12-05
CEN/TR 16376:2012	Characterization of waste - Overall guidance document for characterization of waste from extractive industries	2012-10-31
CEN/TS 16229:2011	Characterization of waste - Sampling and analysis of weak acid dissociable	2011-06-29

	cyanide discharged into tailings ponds	
CEN/TR 16365:2012	Characterization of waste - Sampling of waste from extractive industries	2012-10-31
EN	is European Standard	
CEN/TR	is European Technical Report	
CEN/TS	is European Technical Specification	

In addition to the standards published a scientific paper by two of the consortium members has been published.

H.A. van der Sloot and A. van Zomeren, *Characterisation Leaching Tests and Associated Geochemical Speciation Modelling to Assess Long Term Release Behaviour from Extractive Wastes Mine Water and the Environment*, Journal of the International Mine Water Association (IMWA), ISSN 1025-9112, 2012

ANNEXES

ANNEX 1

FprCEN/TR 16363:2012, *Characterization of waste - Kinetic testing for assessing acid generation potential of sulfidic waste from extractive industries*

ANNEX 2

CEN/TR 16365:2012, *Characterization of waste - Sampling of waste from extractive industries*

ANNEX 3

CEN/TR 16376:2012, *Characterization of waste - Overall guidance document for characterization of waste from extractive industries*