

## Final Report

### Flammability (solids) of Ferro Niobium

#### Guidelines

EC method A.10

#### Study Director

Dieter Walter, Dipl.-Ing. (FH)

#### Date

02/02/2010

#### Testing Facility

eurofins-GAB GmbH  
Eutinger Str. 24  
D-75223 Niefern-Öschelbronn  
Germany

#### Sponsor

CBMM Europe BV  
WTC H-tower, Zuidplein 96  
1077 XV Amsterdam  
The Netherlands

#### Study Identification Code

Test Item: Ferro Niobium  
Study Code: S09-02894  
Trial/Lab Phase Code: S09-02894-L1\_PCFS

## Statement of Confidentiality

This report contains confidential and proprietary information of CBMM Europe BV. which must not be disclosed to anyone except the employees of this company or to persons authorized by law or judicial judgement without the expressed and written approval of CBMM Europe BV.

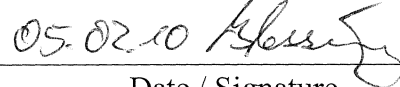
## Statement of Compliance with the Principles of Good Laboratory Practice

The study described in this report was conducted in compliance with the most recent edition of:

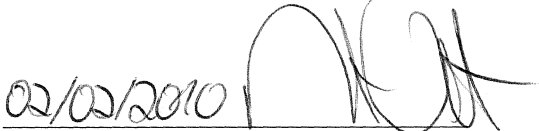
- The Principles of Good Laboratory Practice (GLP), (Chemikaliengesetz, attachment 1, Federal Republic of Germany).
- The OECD Principles of Good Laboratory Practice.

The German requirements are based on the OECD Principles of Good Laboratory Practice which are accepted by regulatory authorities throughout the European Community, the United States of America (FDA and EPA) and Japan (MHW, MAFF and METI) on the basis of intergovernmental agreements.

Head of testing facility  
(Dr. Susanne Timmermann/ Björn Blessing)

05.02.10   
Date / Signature

Study director  
(Dieter Walter, Dipl.-Ing. (FH))

02/02/2010   
Date / Signature

### Statement of Quality Assurance Unit

**Study code:** S09-02894

**Study title:** Flammability (solids) of Ferro Niobium

This study has been audited by the relevant Quality Assurance Unit(s) in accordance with the OECD principles of Good Laboratory Practice and respective national regulations. Dates of inspection and reporting are listed in this section, or in the phase reports supplied by the test site(s). Facilities and/or processes and systems are monitored as part of a regular program.

	Date of audit	Date of report to PI	Date of report to Study Director*	Date of report to Management <sup>+</sup>
Study Plan	04 Sep 2009	-	04 Sep 2009	04 Sep 2009
Experimental Phase <sup>#</sup>	29 Sep 2009	-	29 Sep 2009	29 Sep 2009
Amendment No. 1	02 Oct 2009	-	02 Oct 2009	02 Oct 2009
Final Report	29 Jan 2010	-	29 Jan 2010	29 Jan 2010

<sup>#</sup> process based audit; recipients of audit reports may be different to those in this study

\* including Lead QA and test facility management if audit reported to PI

<sup>+</sup> test site management if audit reported to PI, otherwise test facility management

- not applicable

According to the inspections detailed above, and the QA Statements provided by the test sites it can be confirmed that the methods, procedures, and observations described in this final report are a full and accurate account of the raw data.

Quality assurance  
(Claudia Breuninger)

04 Feb 2010 Breuninger  
Date / Signature

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## 1 Summary

The flammability of the test item Ferro Niobium was determined following EC method A.10.

In contact with the flame the test item glowed. The glowing immediately extinguished after removal of the burner.

Since no burning or glowing over the length of the pile was observed the test item was classified as “not highly flammable“.

## 2 Time Schedule

Study initiation date:	08/09/2009
Start of the experimental phase:	01/10/2009
End of the experimental phase:	01/10/2009
Draft report:	26/01/2010
Study completion date:	02/02/2010

## 3 Study Objective

The aim of this study was the determination of the flammability of the test item. The test was performed following EC method A.10. The data are required for the classification and labelling of the test item.

## 4 Material and Methods

### 4.1 Test Item

Name:	Ferro Niobium
GAB code:	20091476
Lot no.:	AD/4204
CAS no.:	Not available
Content:	Nb: 65.9 % Fe: 29.4 %
Appearance/colour:	Silver gray metallic
Physical state:	Solid
Safety precautions:	Avoid respiration and contact with skin and eyes. Do not swallow. Do not inhale dust.
Storage conditions:	Ambient temp., dark, dry

### Purity and composition

All specifications of purity and composition of the test item are provided by the sponsor.

## 4.2 Test Method

For the determination of the flammability of the test item the following method was used:

In a preliminary screening test the test item is formed into an unbroken strip (powder train) of 250 mm length. Then an attempt is made to ignite the sample with a gas burner. The kind of ignition (whether the substance burns or glows) is checked. If propagation over 200 mm of the train occurs within less than 4 minutes, a full test is to be conducted.

## 4.3 Equipment and Chemicals

Equipment

- metal form and tile for forming the pile and burning
- fume hood

## 5 Performance of the Test

### 5.1 Handling

The test item was loosely filled into a mould. The mould to form an unbroken strip (powder train) was made of metal, had a length of 250 mm and a triangular cross section with an inner height of 10 mm and an inner width of 20 mm. On both sides of the mould in a longitudinal direction two metal sheets were mounted as lateral limitations which project 2 mm beyond the upper edge of the triangular cross section. The mould was then dropped three times from a height of 2 cm onto a solid surface. Then the lateral limitations were removed and the excess substance was scraped off. A tile plate was placed on top of the mould, the apparatus was inverted and the mould was removed.

#### Test conditions

The pile was placed crossways to the air stream under a fume hood. The air stream was not changed during the performance of the test.

The flame for the ignition was a gas burner flame with a diameter of 5 mm.

The test was performed by using a clean, cool plate of tile.

## 5.2 Preliminary Test

The test was started by trying to ignite the pile at one end over a period of 5 minutes and was repeated by ignition of the pile at the other end under the same conditions.

## 5.3 Main Test

No main test was performed following the results of the preliminary test.

## 6 Deviations to the Study Plan

The study was performed according to the study plan dated 08/09/2009 and amendment No. 1 dated 01/10/2009 without any deviation. This report reflects the conduct of this study.

## 7 Results

### 7.1 Preliminary Test

The test was started by trying to ignite the pile at one end with a gas flame. During heating the test item glowed. During the ignition period of 5 minutes the test item was not ignited. When the flame was removed glowing was observed for the following 130 seconds. Afterwards no further reaction was observed. No burning or glowing spreaded over the length of the pile was observed. The test was repeated with the same results at the other end of the pile.

### 7.2 Main Test

The main test was not performed because no burning or glowing over the length of the pile was observed in the preliminary test.

## 8 Discussion and Conclusions

The aim of the study was the determination of the flammability of Ferro Niobium.

In contact with the flame the test item glowed. 130 seconds after removal of the burner the glowing stopped. No further reaction was observed.



Since no burning or glowing over the length of the pile was observed the test item was classified as “not highly flammable“.

## 9 Archiving

For the periods demanded by the principles of GLP the following documents and materials will be archived:

- Study plan, raw data, comments of the sponsor on the draft report and the final report.
- All documentation generated by the Quality Assurance Unit
- A sample of the test item.

All documents and materials will be stored in the archives of eurofins-GAB GmbH. The premises for storing the documents and materials are settled according to the principles of Good Laboratory Practice in the organization of the testing facility.

## 10 References

ANNEX TO COMMISSION DIRECTIVE 92/69/EEC of 31 July 1992 adapting to technical progress for the seventeenth time Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances. Official Journal of the European Communities No L 383 of 29.12.1992 Part A, A.10.

## 11 Distribution

### 11.1 Study Plan

Original: Sponsor (1 x)  
 Testing facility (1 x)

### 11.2 Final Report

Original: Sponsor (1 x)  
 Testing facility (1 x)

### 11.3 Raw Data

Original: Testing facility

## 12 Appendix

### A 1 Certificates




 COMPANHIA BRASILEIRA DE METALURGIA E MINERAÇÃO Córrego da Mata S/N - C.P. 08 - Araxá - Minas Gerais - Cep: 38.183-970 - Brasil Phone: (55-34) 3669-3000 - Facsimile: (55-34) 3669-3300			
CERTIFICATE OF ANALYSIS		NUM	DATE
PRODUCT	LOT	SIZING	QUANTITY
FERRO NIOBIUM STD	AD/4204		15.0
MARK	CUSTOMER	PACKAGING	
	REACH	1/1	
Element		Analysis	
% Al		1.4	
% C		0.1	
% Cu		0.042	
% ESC		0.1	
% Fe		29.4	
% Mn		0.334	
% Nb		65.9	
% P		0.2	
% Pb		0.15	
% S		<0.1	
% Si		1.0	
% Sn		0.054	
% Ta		0.1	
% Ti		0.49	
% Zn		0.013	
Size Distribution			
Screen (mm)		(% ) Analysis	
Observation			
Emitted by		Approved by	
 /s/ Leandro Oliveira Lima Chemist		 /s/ Andreia Duarte Menezes Teixeira Lab. Manager	

Figure 1: Certificate of analysis of Ferro Niobium



## Baden-Württemberg

UMWELTMINISTERIUM

Gute Laborpraxis / Good Laboratory Practice

### GLP-Bescheinigung / Statement of GLP Compliance

(gemäß /according to § 19b Chemikaliengesetz)

Eine GLP-Inspektion zur Überwachung der Einhaltung der GLP-Grundsätze gemäß Chemikaliengesetz bzw. Richtlinie 2004/9/EG wurde durchgeführt in: Assessment of conformity with GLP according to Chemikaliengesetz and Directive 2004/9/EC at:

 Prüfeinrichtung/Test facility     Prüfstandort/Test site

eurofins - GAB GmbH
Eutingerstraße 24
75223 Niefern-Öschelbronn

(Unverwechselbare Bezeichnung und Adresse/Unequivocal name and address)

Prüfungen nach Kategorien/Areas of Expertise

(gemäß/according ChemVwW-GLP Nr.5.3/OECD guidance)

- |  |  |
|--|--|
| 1 Prüfungen zur Bestimmung der physikalisch-chemischen Eigenschaften und Gehaltsbestimmungen                         | 6 Prüfungen zur Bestimmung von Rückständen   |
| 4 Ökotoxikologische Prüfungen zur Bestimmung der Auswirkungen auf aquatische und terrestrische Organismen            | 7 Prüfungen zur Bestimmung der Auswirkungen auf Mesokosmen und natürliche Ökosysteme |
| 5 Prüfungen zum Verhalten im Boden, im Wasser und in der Luft; Prüfungen zur Bioakkumulation und zur Metabolisierung | 8 Analytische Prüfungen an biologischen Materialien                                  |

Datum der Inspektion/Date of Inspection

(Tag, Monat, Jahr/day, month, year)

02.11./23.11.2006

Die/Der genannte Prüfeinrichtung/Prüfstandort befindet sich im nationalen GLP-Überwachungsverfahren und wird regelmäßig auf Einhaltung der GLP-Grundsätze überwacht.

Auf der Grundlage des Inspektionsberichtes wird hiermit bestätigt, dass in dieser Prüfeinrichtung/diesem Prüfstandort die oben genannten Prüfungen unter Einhaltung der GLP-Grundsätze durchgeführt werden können.

The above mentioned test facility/test site is included in the national GLP Compliance Programme and is inspected on a regular basis.

Based on the inspection report it can be confirmed, that this test facility/test site is able to conduct the aforementioned studies in compliance with the Principles of GLP.

Unterschrift, Datum/Signature, Date


Hofmann (Referatsleiter) Stuttgart, 23.05.2007

(Name und Funktion der verantwortlichen Person/Name and function of responsible person)



Umweltministerium Baden-Württemberg

Kernerplatz 9, 70182 Stuttgart

(Name und Adresse der GLP-Überwachungsbehörde/Name and address of GLP Monitoring Authority)

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Figure 2: GLP Certificate of testing facility