

## **Guiding Principles for the contents of EAM drafts (version approved at the WGP on 17 March 2004)**

'European approval for materials` means a technical document defining the characteristics of materials intended for repeated use in the manufacture of pressure equipment, the type of which is not covered by any harmonized standard. It shall describe material properties in a:

- concise
- complete and
- correct

manner and in general not contain rules on their use in calculation and design.

### **1. Language**

A proposed EAM submitted under Article 11, shall be in 2 languages one of which shall be English.

Should the Notified Body choose to submit the proposed EAM to the Working Party Materials (WPM) prior to initiating the Article 11 procedure, the draft need only be in English.

### **2. Numbering**

Each individual material shall be contained in a separate document. Different product forms are to be considered as different materials. This document must contain all relevant information in itself. In order to provide a unique reference, each document/material shall be numbered as follows:

The text " EAM"

+ number of the Notified Body

+ sequential number of the EAM (to be unique for the Notified Body)

+ date submitted by Notified Body under Article 11 (year and month)

*e.g. EAM 0041-15:2003/05*

Note. When submitted for review by WPM the word „draft“ shall precede the EAM number and a revision number added.

*e.g. draft EAM 0041-34 rev 3*

### 3. Naming

*It is not mandatory to provide a material name as the main reference for an EAM should be its number. However, if a commonly used name for the material exists, this name should be used and combined with the letters “EAM”. If the original specification is modified, this should be indicated in the name.*

*e.g. EAM – Monel<sup>®</sup> 400 (modified).*

In the case of steels it is recommended to assign a European steel number to an approved EAM, which includes a unique name.

### 4. Origin

The origin of the material specification shall be given, e.g. the technical code it is sourced from. However, the actual data should not be included by reference to the source document but shall be included in the text of the draft EAM. The same applies to the way in which all the other relevant technical requirements are stated within the EAM text, e.g. permissible deviations from the limits for cast analysis.

References to comparable materials in other standards should be avoided in the body of the EAM, as it is likely to be confusing. Such information, when considered useful, should be communicated outside the actual draft EAM text.

The text should be specific and unambiguous. No possibly conflicting references should be made.

### 5. Scope

The scope should describe the material and specify the temperature range and thickness range.

### 6. Recognized safe use (applies only where a history of safe use is claimed)

In the case of materials recognized as being safe to use before 29 November 1999, the relevant information shall be specified, where appropriate. In particular, this includes information about

- the specific field of application (where it was actually used)
- the context of the code applied (where relevant)

It is of importance in the context of materials recognized as being safe to use in the past, that the application is linked to the field where it was actually used, even though the specification itself may allow a more general application. In order to avoid mis-interpretation the following note may be added to the text of the draft EAM: “NOTE:

This reference does not necessarily indicate, that this material cannot be used safely for a different application.”

Where actual material deliveries have significantly overachieved one or more particular values of the original specification, the values specified in the draft EAM should be brought in alignment with actual deliveries. This is necessary, as the material safe to be used is actually the material typically delivered rather than the material specified in the original document. (See WGP Guideline 9/11).

The draft EAM shall not omit any relevant technical specification stated in the source document.

If the history of safe use is based on safety factors different from those in Annex I section 7.1, these safety factors and the code used shall be stated in the EAM.

Some supporting evidence is to be given for the history of safe use, such as quantities of tons produced/used in the PE field, examples of applications/temperature range or similar information.

## **7. Contents of Data Sheet**

For materials recognized as being safe to use in the past, in general the specification of the original material specification should be taken over. Where some of the data are not contained in the original document, these data must be established in an appropriate manner. In particular, both mechanical property values at elevated temperatures, where relevant, and impact property values, where relevant, must be contained in the EAM. The values shall be specified for the worst direction. For specific cases, provisions analogous to comparable European Standards (ENs) should be used.

The EAM shall clearly indicate that these values (except creep data) are minimum values.

In general temperature ranges in steps not greater than 50 °C for yield strength data should be given. If data are only available at bigger intervals, the following note should be added in the text: “For design calculations no interpolation between stated values is permitted (unless the design code explicitly provides for it). The value at the higher temperature should be used.”

Information on creep data, where required, shall be given in temperature steps not greater than 10 °C. If data are only available at bigger intervals, the following note should be added in the text: “For design calculations no interpolation between stated values is permitted (unless the design code explicitly provides for it). The value at the higher temperature should be used.”

If the creep data specified are not sufficient to define the intersection between the creep curve and the elevated temperature proof strength curve, the first value for creep listed should be used for all lower temperatures.

The method used for the derivation of the minimum values (elevated temperature properties) and average values (creep data) and the confidence level should be given.

## **8. Structure of document**

The draft EAM should be structured as in EN 764-4 Annex A.6 with the following deviations:

- a) No material producer qualification; however production methods may be specified.
- b) No guideline for processing (except if in the original specification).
- c) Information as per item 2 and 3 above to be included in the Material designation.
- d) Information as per item 5 above to be included in the Scope.
- e) Deviations as per item 6 above (including additional specifications needed) to be referenced in the Material designation.
- f) When normative references are made to standards/technical specifications, such documents shall be dated individually or generically.
- g) Where standards/technical specifications are referenced for information only, such documents should be included in a separate informative bibliography.

## **9. Verification testing requirements**

In general, testing (sampling, frequency of testing, and test method) is to be performed as foreseen in the original specification.

However,

- the testing methods have to be compatible with the PED requirements. In particular, the test results have to be consistently comparable;
- if a European testing standard (EN or EN ISO) is available, the testing method employed shall be replaced by the tests contained in the respective EN (or EN ISO) unless the testing foreseen in the original specification better reflects the state of the art than the corresponding EN (EN ISO). Examples of such standards are:

EN 10002-1	Tensile testing at room temperature
EN 10002-5	Tensile testing at elevated temperatures
EN 10045-1	Charpy impact test
EN ISO 3651-2	Intergranular corrosion resistance

Depending on product form and type of material, the sampling and frequency of testing shall as a minimum be based on the analogous European standard (EN). E.g.: EN 10028-1 and -7 for flat products, EN 10213-1 for castings, and EN 10222-1 for forgings.

## **10. Certification and marking**

The EAM shall indicate that the certificate issued by the material manufacturer shall guarantee that the delivered material complies with the specification of the EAM. A simple reference to 3.1.B, 3.1.C or 3.2 is inadequate as the 1991 version of EN 10204 does not require the material manufacturer to affirm the compliance of the delivery with the specification as part of such certificates.

For materials to be used for main pressure bearing parts of equipment in categories II, III & IV a certificate of specific product control will always be required. See WGP Guideline 7/5 and 7/20. The draft EAM should not be more restrictive.

The inspection certificate and physical marking shall include the EAM number. The only exception is a case, where the EAM does not have any additional technical requirements to the original standard and provided the latter is still publicly available. (See WGP Guideline 7/9)

## **11. Information for further processing**

General information regarding weldability, forming, heat treatment requirements, cutting, etc. shall be given in the EAM text, where relevant. The level of detail should be similar to the relevant harmonized EN . The group and sub-group of the material according to the weldability and NDT classification (as given for example in EN 13445-2:2002) should be specified where appropriate. For new materials, sufficient additional details shall be given.

## **12. Copyright and public availability**

The Notified Body is responsible for ensuring that there is no infringement of copyright relating to the EAM and that the descriptive text and accompanying list of technical data is made publicly available in a non-discriminatory way and at a reasonable price. The latter can be achieved for example by publishing the text on a web site or providing an address where the text can be obtained. The Notified Body also warrants the unrestricted use by public administrations and other Notified Bodies in the context of the PED. This allows for the required public availability of the EAM specification. The requirements in this paragraph shall be documented in the EAM text.