



**Dit pdf bestand bevat alle beschikbare talen van het opgevraagde document.**

**Ce fichier pdf reprend toutes langues disponibles du document demandé.**

**This pdf file contains all available languages of the requested document.**

**Dieses PDF-Dokument enthält alle vorhandenen Sprachen des angefragten Dokumentes.**



**REGULATORY NOTE**  
FOR  
**VERIFICATIONS, CALIBRATIONS AND CHECKS**  
ON PRODUCTION AND CHECKING EQUIPMENT  
FOR THE CERTIFICATION OF ELASTOMERIC PRODUCTS

*Version 1.0 of 2018-03-30*

**COPRO** vzw Impartial Institute for the Inspection of Construction Products

Z.1 Researchpark  
Kranenberg 190  
1731 Zellik

tel. +32 (2) 468 00 95  
fax +32 (2) 469 10 19  
info@copro.eu

**www.copro.eu**  
VAT no. BE  
0424.377.275

KBC20 4264 0798 0156

## TABLE OF CONTENTS

|       |   |    |
|-------|---|----|
| 1     | INTRODUCTION.....   | 4  |
| 1.1   | TERMINOLOGY AND REFERENCES.....   | 4  |
| 1.1.1 | Definitions.....  | 4  |
| 1.1.2 | Abbreviations.....  | 5  |
| 1.1.3 | References.....   | 5  |
| 1.2   | AVAILABILITY OF THE REGULATORY NOTE.....                                  | 6  |
| 1.3   | STATUS OF THIS REGULATORY NOTE.....                                       | 7  |
| 1.3.1 | Version of this Regulatory Note.....                                      | 7  |
| 1.3.2 | Approval of this Regulatory Note.....                                     | 7  |
| 1.3.3 | Confirmation of this Regulatory Note.....                                 | 7  |
| 1.4   | HIERARCHY OF RULES AND REFERENCE DOCUMENTS.....                           | 7  |
| 1.5   | QUESTIONS AND COMMENTS.....   | 7  |
| 2     | POSITION OF THIS REGULATORY NOTE.....                                     | 8  |
| 2.1   | SCOPE.....  | 8  |
| 2.1.1 | Subject of executive certification.....                                   | 8  |
| 2.1.2 | Reference documents.....  | 8  |
| 3     | IDENTIFICATION AND REGISTRATIONS.....                                     | 9  |
| 3.1   | IDENTIFICATION OF INSTRUMENTS.....  | 9  |
| 3.1.1 | Identification.....   | 9  |
| 3.1.2 | Exceptions.....   | 9  |
| 3.1.3 | Additional information.....   | 9  |
| 3.2   | REGISTRATIONS.....  | 9  |
| 3.2.1 | Calibration and checking reports.....                                     | 9  |
| 3.2.2 | Retention of registrations.....   | 10 |
| 3.2.3 | Overview of instruments for calibration and checks.....                   | 11 |
| 4     | VERIFICATION AND REFERENCE INSTRUMENTS.....                               | 12 |
| 4.1   | EXECUTIVES.....   | 12 |
| 4.1.1 | Acknowledged or accredited executives.....                                | 12 |
| 4.1.2 | Other executives.....   | 12 |
| 4.2   | WEIGHING SYSTEMS.....   | 12 |
| 4.3   | REFERENCE INSTRUMENTS, VERIFICATION STANDARD AND CALIBRATION WEIGHTS..... | 13 |
| 4.3.1 | Instruments.....  | 13 |
| 4.3.2 | Method and frequency.....   | 13 |
| 4.3.3 | Accuracy.....   | 14 |
| 4.3.4 | Registration and certificate.....   | 14 |
| 4.3.5 | Use.....  | 14 |
| 4.3.6 | Identification and storage.....   | 14 |

|             |   |    |
|-------------|---|----|
| 5           | CALIBRATION AND CHECKS .....                                    | 15 |
| 5.1         | EXECUTIVES AND SUPERVISION .....                                | 15 |
| 5.1.1       | Calibrations and checks by an external institution.....         | 15 |
| 5.1.2       | Calibration and checks by the manufacturer .....                | 15 |
| 5.2         | GENERAL CALIBRATION RULES.....                                  | 16 |
| 5.2.1       | Method .....  | 16 |
| 5.2.2       | Frequency.....  | 16 |
| 5.2.3       | Accuracy.....   | 17 |
| 5.2.4       | Measures for sub-standard calibration and checking results..... | 18 |
| 5.3         | INSTRUMENTS.....  | 18 |
| 5.3.1       | Overview of calibrations and checks.....                        | 18 |
| APPENDIX A: | FORMULATING OVERVIEWS.....                                      | 19 |
| APPENDIX B: | OVERVIEW OF REFERENCE INSTRUMENTS.....                          | 20 |
| APPENDIX C: | OVERVIEW OF VERIFICATION FOR WEIGHING SYSTEMS.....              | 21 |
| APPENDIX D: | OVERVIEW OF CALIBRATIONS AND CHECKS.....                        | 22 |

# 1 INTRODUCTION

*This chapter offers information about a few specific rules concerning this Regulatory Note.*

## 1.1 TERMINOLOGY AND REFERENCES

*This article provides definitions for a few of the specific terms used in this Regulatory Note, which will be followed by an explanation for abbreviations used in the Regulatory Note as well as an overview of references.*

### 1.1.1 Definitions

|             |  |
|-------------|--|
| Accuracy    | <p>The accuracy of an instrument is determined by how much it deviates from the result.</p> <p>The accuracy of an instrument cannot exceed the legibility of the instrument.</p>   |
| Calibration | <p>A set of actions which, in specified circumstances, establish the relationship between the values indicated by an instrument, or the values given by a measuring instrument or reference material, and the corresponding known values of a magnitude achieved by gauge blocks.</p> <p>When an instrument is being prepared for use after calibration, the term 'adjustment' is principally used. However, for ease of reading in this Regulatory Note, we always use the term "calibrate", even when an instrument is being configured after calibration.</p> <p>Whenever a graduation mark is added which corresponds to the correct setting, during adjustment of an instrument, we also use the term 'calibrate' in the context of this Regulatory Note.</p> |
| Check       | <p>As part of checks carried out on production and checking equipment, as addressed in this Regulatory Note, the term 'check' involves inspecting whether the instrument complies with requirements stipulated for the instrument in question, without it having to be verified or calibrated. It will be clearly mentioned whether the check relates to raw materials, production or products.</p>  |
| Device      | <p>See: Instrument.</p>  |
| Instrument  | <p>Part or all of a production or checking device. In this case, the terms 'equipment' or 'device' will also be used.</p>  |

|                      |   |
|----------------------|---|
| Legibility           | The extent to which results can be read from an instrument, e.g. via the scale on a thermometer or numbers after the decimal point on weighing scales. There can be confusion about the accuracy of such readings.<br><br>The legibility of an instrument must be equal to or better than the accuracy stipulated for a particular check. |
| Manufacturer         | The party responsible for manufacturing the product. It will be clearly stated when reference is being made to the manufacturer of an instrument.   |
| Measuring error      | Any potential difference between the result of the measurement and the actual value of the parameter which is being measured.   |
| Reference instrument | Instrument which is suitable for, and is exclusively used for, calibrating or checking production or checking equipment. For example, a reference thermometer.  |
| Tolerance            | The maximum permitted measurement error.  |
| Verification         | A set of actions performed by a legally authorized entity with the purpose of establishing and confirming that the instrument fully complies with the terms of the verification regulation.   |

---

### 1.1.2 Abbreviations

|       |  |
|-------|--|
| BELAC | <u>B</u> elgian <u>A</u> ccreditation System           |
| EA    | <u>E</u> uropean Cooperation for <u>A</u> ccreditation |

---

### 1.1.3 References

|                  |   |
|------------------|---|
| CRC 01 BENOR     | General Certification regulations for the certification of products in the construction sector under the BENOR mark.  |
| EN ISO 376       | Metallic materials – Calibrating force-measurement instruments used to verify uniaxial testing equipment  |
| EN ISO 3650      | Geometrical product specifications (GPS) – Length standards – Gauge blocks  |
| EN ISO 7500-1    | Metallic materials – Verification of uniaxial testing machines – Part 1: Tension/compression testing machines -- Verification and calibration of the force-measurement system |
| EN ISO 18898     | Rubber - Calibration and verification of hardness testers   |
| ISO 18899        | Rubber – Guide to the calibration of test equipment   |
| EN ISO/IEC 17025 | General requirements for the competence of testing and calibration laboratories   |
| ISO 5893         | Rubber and plastics test equipment - Tensile, flexural and compression types (constant rate of traverse) - Specification  |
| ISO 11095        | 'Linear calibration using reference materials'  |

|            |   |
|------------|---|
| ISO 3417   | Rubber - Measurement of vulcanization characteristics with the oscillating disc curemeter   |
| ISO 3302-1 | Rubber - Tolerances for products - Part 1: Dimensional tolerances   |
| ISO 48     | Rubber, vulcanized or thermoplastic - Determination of hardness (hardness between 10 IRHD and 100 IRHD)                           |
| ISO 37     | Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties   |
| ISO 815-1  | Rubber, vulcanized or thermoplastic - Determination of compression set – Part 1: At ambient or elevated temperatures              |
| ISO 188    | Rubber, vulcanized or thermoplastic - Accelerated ageing and heat resistance tests  |
| ISO 9691   | Rubber - Recommendations for the workmanship of pipe joint rings - Description and classification of imperfections                |
| ISO 815-2  | Rubber, vulcanized or thermoplastic - Determination of compression set – Part 2: At low temperatures                              |
| ISO 1817   | Rubber, vulcanized or thermoplastic - Determination of the effect of liquids  |
| ISO 1431-1 | Rubber, vulcanized or thermoplastic - Resistance to ozone cracking - Part 1: Static and dynamic strain testing                    |
| ISO 3384-1 | Rubber, vulcanized or thermoplastic - Determination of stress relaxation in compression - Part 1: Testing at constant temperature |
| ISO 3387   | Rubber - Determination of crystallization effects by hardness measurements  |
| ISO 4649   | Rubber, vulcanized or thermoplastic - Determination of abrasion resistance using a rotating cylindrical drum device               |
| ISO 34-2   | Rubber, vulcanized or thermoplastic - Determination of tear strength - Part 2: Small (Delft) test pieces                          |

With regard to reference documents mentioned in this Regulatory Note, the most recent version is always applicable along with any possible errata, addenda and amendments.

All EN norms mentioned in this Regulatory Note are always subject to the corresponding Belgian publication NBN EN.

*Note: The certifying body may permit use of a non-Belgian publication, whenever its contents are identical to those of the Belgian publication.*

## 1.2 AVAILABILITY OF THE REGULATORY NOTE

*This article describes how this Regulatory Note will be made available.*

The most recent version of this Regulatory Note is available free of charge on the website of the certifying body.

A paper version of this Regulatory Note may be ordered from the certifying body. The certifying body is authorized to charge costs for supplying this version.

It is not permitted to make changes to the original version of the Regulatory Note approved by the advisory council and the Board of Directors at vzw BENOR.

### **1.3 STATUS OF THIS REGULATORY NOTE**

*This article gives details concerning the version, approval and confirmation of this Regulatory Note.*

#### **1.3.1 Version of this Regulatory Note**

This Regulatory Note is version 1.0.

#### **1.3.2 Approval of this Regulatory Note**

This Regulatory Note was approved by the Sectorial Commission Elastomers on 2018-03-30.

#### **1.3.3 Confirmation of this Regulatory Note**

This Regulatory Note was confirmed by the Board of Directors at COPRO on 2018-05-02.

This Regulatory Note was submitted to the association BENOR on 2018-05-02.

### **1.4 HIERARCHY OF RULES AND REFERENCE DOCUMENTS**

*See CRC 01 BENOR.*

### **1.5 QUESTIONS AND COMMENTS**

Questions and comments relating to this Regulatory Note should be directed to the certifying body.



## 2 POSITION OF THIS REGULATORY NOTE

### 2.1 SCOPE

*This article describes the scope of this Regulatory Note.*

#### 2.1.1 Subject of executive certification

- 2.1.1.1 This Regulatory Note supplements the rules identified in the application regulations TRA 32 for Elastomeric products.
- 2.1.1.2 During the certification of elastomeric products, all checks, calibrations and verifications of production equipment, materials and monitoring equipment, whether performing checks for type testings or self-monitoring, must be carried out in accordance with this Regulatory Note.

#### 2.1.2 Reference documents

- 2.1.2.1 The applicable regulations are:
- |        |   |
|--------|---|
| TRA 32 | Application regulations for the product certification of elastomeric products under the BENOR mark. |
|--------|---|
- 2.1.2.2 The applicable norms are:
- EN ISO 7500-1 Metallic materials - Calibration and verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Calibration and verification of the force-measuring system (ISO 7500-1:2015)
  - EN ISO 18898 Rubber - Calibration and verification of hardness testers
  - ISO 18899 Rubber – Guide to the calibration of test equipment
- 2.1.2.3 The applicable specifications are:
- Not applicable.
- 2.1.2.4 The applicable Technical Requirements are:
- Not applicable.
- 2.1.2.5 Other applicable reference documents are:
- Not applicable.

## 3 IDENTIFICATION AND REGISTRATIONS

*This chapter explains the rules concerning the identification of production and checking equipment as well as registrations, certificates, calibration reports, checking reports and potential overviews.*

### 3.1 IDENTIFICATION OF INSTRUMENTS

*This article describes the rules concerning the identification of production and checking equipment.*

#### 3.1.1 Identification

Each instrument must have its own visible unique identification mark. If present, the serial number of the instrument in question must be used.

#### 3.1.2 Exceptions

For certain instruments, the manufacturer may not be required to place identification on the instrument itself.

#### 3.1.3 Additional information

If an instrument has not been calibrated or checked, has a limited range or only has limited use, this must be clearly indicated on the instrument in question.

## 3.2 REGISTRATIONS

*This article explains the rules concerning registrations like certificates, calibration reports, checking reports and possible overviews.*

### 3.2.1 Calibration and checking reports

3.2.1.1 In principle, each report must be compiled by the party responsible for the calibration or check.

If the manufacturer makes a report for calibrations or checks carried out by the supplier of the instrument, then such a report must be authenticated (name, signature and company stamp) by the supplier.

If the manufacturer is personally responsible for performing the check, he must draft the report and submit it voluntarily to the certifying body for inspection.

3.2.1.2 All calibration or checking reports must at least mention the following details:

| Details in calibration or checking report   | Performed by |          |              |
|---|--------------|----------|--------------|
|   | manufacturer | supplier | organization |
| - the unique reference of the report (report serial number);  | -            | x        | x            |
| - details of the organization responsible for performing the calibration or check;  | -            | x        | x            |
| - the name of the manufacturer;   | x            | x        | x            |
| - the date and location where the calibration or check was carried out;   | x            | x        | x            |
| - identification: description of the instrument, serial number, location; if the instrument does not have a serial number, the manufacturer must personally assign a unique identification number to the instrument;                                      | x            | x        | x            |
| - the method implemented for the calibration or check, with a link to the applicable reference document (norm, testing method, et cetera); if the calibration or check is carried out by the manufacturer, it can also be included in his technical file; | x            | x        | x            |
| - the temperature at which the calibration or check was carried out;  | x            | x        | x            |
| - a link reference to any implemented reference instruments, verification standards or calibration weights;   | x            | x        | x            |
| - the unique code of certificates for any used reference instruments, verification standards or calibration weights;  | -            | x        | x            |
| - the complete traceability process to meet the national standard;  | -            | x        | -            |
| - details and results accompanying the check or calibration;  | x            | x        | x            |
| - any possible corrective measures taken in the event that the result was found to be insufficient;   | x            | x        | x            |
| - the statement of conformity, referring to the requirements (with a summary of various reference documents used to test the instrument); this could be added at a later date by the manufacturer;  | x            | x        | x            |
| - possible reference to the insufficient measurement range;   | x            | x        | x            |
| - the validity period of the calibration or checking report; this can also be added by the manufacturer, as long as requirements in this Regulatory Note are respected;   | x            | -        | -            |
| - the name and signature of the person responsible for the check or calibration.  | x            | x        | x            |

### 3.2.2 Retention of registrations

For each verification, calibration or check, the certificate, calibration report or checking report (respectively) must be retained in the equipment register or in the register for checking equipment.

---

### 3.2.3 Overview of instruments for calibration and checks

3.2.3.1 The manufacturer must draft an overview list featuring all production and checking instruments used for the production and weighing of the elastomeric products and all checking instruments used when inspecting the elastomeric products.

For each instrument, at least the following must be mentioned:

- the name of the instrument, where appropriate clarified by a description;
- the identification;
- a reference to the applicable calibration or checking method included in the technical file;
- the frequency of calibration or checking;
- the date of the previous calibration or check;
- the date when the calibration or check will be carried out this year;
- the accuracy required in accordance with the applicable reference documents;
- the realized accuracy during the most recent calibration or check.

The layout of the overview list is given in Appendix A.

3.2.3.2 A separate overview list must be provided for instruments that are verified and those that are calibrated or checked.

A separate overview list must be provided for instruments used in the production process and for instruments used in the laboratory.

## 4 VERIFICATION AND REFERENCE INSTRUMENTS

*This chapter describes the rules concerning the verification of instruments, as well as the use of reference instruments, test blocks and calibration weights.*

### 4.1 EXECUTIVES

*This article describes who is authorized to carry out the verification.*

#### 4.1.1 Acknowledged or accredited executives

4.1.1.1 Verification must be carried out by an institution which has either:

- been recognized to do so by the Belgian Metrological Service or by a National Metrological Institute that is part of the International Convention of Metrological Institutes;
- been accredited by BELAC or another member of EA.

4.1.1.2 The institution must be independent from the manufacturer.

#### 4.1.2 Other executives

In the absence of an institution which complies with article 4.1.1, verification can be carried out by an institution that has been approved by the certifying body to verify the instruments in question.

### 4.2 WEIGHING SYSTEMS

*This article is not applicable for elastomeric products.*

## **4.3 REFERENCE INSTRUMENTS, VERIFICATION STANDARD AND CALIBRATION WEIGHTS**

*This article describes rules concerning the use of reference instruments, test blocks and calibration weights.*

### **4.3.1 Instruments**

A non-exhaustive list of calibrated or verified reference instruments, test blocks and calibration weights has been included in Appendix B.

### **4.3.2 Method and frequency**

4.3.2.1 Verification and calibration must be carried out in accordance with requirements in reference documents and the schedule mentioned in the technical file.

4.3.2.2 Each reference instrument must be re-verified or re-calibrated once its accuracy has been modified, or once it has been configured, used incorrectly, repaired, revised or disassembled.

4.3.2.3 Reference thermometers must be calibrated or verified prior to use.

Glass thermometers must be calibrated once every five years. The freezing point or any other reference temperature must be checked six months after commissioning. This must then be repeated on an annual basis, in addition to the five-yearly calibration.

Thermocouples and platinum resistance reference thermometers must be calibrated annually.

4.3.2.4 Calibration weights must be verified prior to use. Calibration weights in class E1, E2, F1, F2 and M1, which are used in conformity with EN 932-5 must then be verified every two years. If they are used in accordance with another norm, they must then be verified every five years.

4.3.2.5 Calibration weights must initially be verified prior to use and then every five years.

Callipers used as a reference instrument must be verified at the outset and then be verified every five years. Calibration must take place in accordance with ISO 11095.

4.3.2.6 Reference instruments that are used to calibrate pressure or force must be calibrated at the outset and then every two years. Calibration must take place in accordance with EN ISO 376.

---

### 4.3.3 Accuracy

- 4.3.3.1 The reference instrument used for a calibration or check must have an accuracy higher or equal to half of the accuracy required for the to-be-calibrated or checked instrument.

*Example: if a thermometer is required for the check, which has an accuracy of 1 °C, ⇒ tolerance for calibration = 1 °C ⇒ the accuracy of the reference thermometer used during calibration must be 0.5 °C.*

Reference instruments used to calibrate pressure or force must have an accuracy higher or equal to a tenth of the accuracy required for the to-be-calibrated or checked instrument.

- 4.3.3.2 Calibration weights must have an accuracy higher or equal to the resolution of the to-be-calibrated scales.
- 4.3.3.3 Calibration weights must comply with EN ISO 3650.

---

### 4.3.4 Registration and certificate

- 4.3.4.1 Calibration weights must always be supplied along with a valid certificate in accordance with class F1, F2, M1, E1 or E2. The certificate must demonstrate a level of traceability which conforms to the national standard.
- 4.3.4.2 Calibration weights and reference instruments must always be supplied along with a valid certificate, which demonstrates traceability in line with the national standard.
- 4.3.4.3 The details and results for each verification must be shown on an overview list, in accordance with Appendix A.

---

### 4.3.5 Use

Reference instruments, test blocks and calibration weights must only be used to calibrate or check production and checking equipment and not to perform checks on raw materials, production, elastomeric products, et cetera.

Exceptions include callipers, micrometres, slide rules, tape measures, tachometers, chronometers and scales that are used to calibrate or check instruments.

---

### 4.3.6 Identification and storage

Reference instruments, test blocks and calibration weights must be identified as such. They must be stored in suitable and safe conditions, and be clearly separated from other equipment.

## 5 CALIBRATION AND CHECKS

*This article describes the rules which apply to the calibrating and checking of instruments.*

### 5.1 EXECUTIVES AND SUPERVISION

*This article describes who is authorized to perform calibrations and checks.*

#### 5.1.1 Calibrations and checks by an external institution

5.1.1.1 Calibrations and checks can be carried out by either:

- an appropriately accredited institution in accordance with EN ISO/IEC 17025 by BELAC (BELAC-CAL) or another member of EA (calibration and checks carried out under accreditation); in absence thereof, calibration and checks must be carried out by an institution which has been approved by the certifying body to calibrate or check the instruments in question;
- the producer/manufacturer of the instruments.

5.1.1.2 The institution must be independent from the manufacturer.

5.1.1.3 Calibrations and checks carried out by external institutions that do not comply with article 5.1.1.1 will be deemed to have been carried out by the manufacturer.

5.1.1.4 If there are doubts concerning a calibration or check carried out by an external institution, the certifying body is authorized to request the calibration or check to be carried out again in its presence.

#### 5.1.2 Calibration and checks by the manufacturer

5.1.2.1 Calibrations and checks can also be carried out by the manufacturer.

5.1.2.2 Depending on the level of supervision, the certifying body may request to be present in this case. This supervision is determined by the appropriate level:

| Level of supervision | Supervision   | Degree of influence on accuracy of instrument   |
|----------------------|---|---|
| 1                    | Calibrations and checks are carried out by the manufacturer, in the presence of the certifying body                   | Considerable influence on the results of checks OR considerable influence when evaluating the conformity of the product |
| 2                    | Calibrations and checks are carried out by the manufacturer, every three years in the presence of the certifying body | Neither level 1 nor level 3   |
| 3                    | Calibrations and checks are carried out by the manufacturer, randomly in the presence of the certifying body          | Limited influence on the results of checks AND limited influence when evaluating the conformity of the product          |



- 5.1.2.3 If there are any doubts concerning a calibration or check carried out by the manufacturer, the certifying body is authorized to request calibration or checks to be carried out again in its presence.
- 5.1.2.4 Initial checks and calibrations are a special case. In this case, supervision must be interpreted as follows: The manufacturer must perform the check and/or calibration (without supervision) before the instrument is commissioned. The certifying body will then request the check and/or calibration to be carried out again in its presence, subject to the prescribed level of supervision.

## 5.2 GENERAL CALIBRATION RULES

*This article describes the general rules for the methods, frequency, accuracy and measures used when calibrating or checking instruments. Please refer to the following article for the specific rules per instrument.*

### 5.2.1 Method

- 5.2.1.1 All calibrations or checks must be carried out in accordance with the schedule in the quality control handbook, and in accordance with the calibration procedure mentioned in the quality control handbook for the instrument in question.
- 5.2.1.2 Should the manufacturer want to deviate from the method stipulated in this Regulatory Note, the presented proposal must be approved by the certifying body and incorporated into his/her quality control plan.
- 5.2.1.3 All instruments and reference instruments, calibration weights and test blocks must be allowed to reach operating temperature for at least two hours in the space where the calibration or check will be carried out.

### 5.2.2 Frequency

- 5.2.2.1 The frequencies mentioned in article 5.3 and Appendix D are the minimum frequencies that must be respected.
- 5.2.2.2 The frequencies mentioned in article 5.3 and Appendix D must be interpreted as follows:
- 1 / year: the calibration or check must be carried out within three months of the previous calibration;  
if this period is going to be exceeded, this must be done in consultation with the certifying body;  
the validity of the new calibration period may never exceed 365 days from date of expiry of the previous calibration period.
- 1 / month: the calibration or check must be carried out within a month pursuant to the previous calibration or check.

- 5.2.2.3 In addition to the frequencies mentioned in article 5.3 and Appendix D, instruments must also be calibrated and checked:
- prior to commissioning;
  - when two consecutive calibrations or checks indicate that interim accuracy cannot be safeguarded; such an increase in frequency will be determined by the use of the instrument and an evaluation of calibration and checking details;
  - after a change has been made to its accuracy, or a modification, improper use, repair, revision or disassembly; in the event normal frequency has already been complied with, and the instrument appeared to be in compliance during the previous calibration or check, then this may take place without the certifying body being present.

---

### 5.2.3 Accuracy

- 5.2.3.1 The tolerances mentioned in article 5.3 and Appendix D are the minimum tolerances that must be respected.
- 5.2.3.2 If a reference document requires stricter accuracy for an instrument than the tolerances required in accordance with article 5.3 and Appendix D, then a check must be carried out to see whether the instrument complies with this additional requirement.
- 5.2.3.3 If an instrument is used for several purposes in accordance with various reference documents, the assessment must take place in accordance with each reference document. The strictest accuracy norm will be retained when different accuracies are required for an instrument in different applicable reference documents. Similarly, the strictest legibility norm must also be retained. The various reference documents must, in accordance with article 3.2.1.2, be mentioned in the calibration or checking report.

*Example: Various testing methods involve the use of a water bath. This water bath must first be checked to ensure it complies with all testing methods, in terms of volume, dimensions, structure, water circulation, legibility of the thermometer, et cetera. The strictest tolerance in the various testing methods must then be used to calibrate the water bath. All applicable testing methods must be summarized in the report.*

---

## **5.2.4 Measures for sub-standard calibration and checking results**

- 5.2.4.1 If the results of a calibration or check are sub-standard, the manufacturer must take appropriate measures to resolve the shortcomings.

Whenever possible, an adjustment should be made to the instrument. Under this Regulatory Note, this adjustment is taken to be part of the calibration.

It may be necessary to call upon the supplier of the instrument, or an appropriately accredited institution, to resolve shortcomings with the instrument.

- 5.2.4.2 If the calibration or check shows that an instrument is not suitable for part of the measurement range, this instrument can continue to be used so long as the appropriate part of the measurement range (minimum and maximum) is mentioned in the calibration or checking report (see art. 3.2.1.2) and on the instrument (see art. 3.1.3).

- 5.2.4.3 If there are doubts concerning whether an instrument works properly, calibrations or checks performed by the manufacturer or the certifying body may be increased in frequency.

---

## **5.3 INSTRUMENTS**

*This article describes the specific rules for calibrations and checks per instrument. Please refer to the previous article for general rules concerning methods, frequencies, accuracy and measures.*

---

### **5.3.1 Overview of calibrations and checks**

- 5.3.1.1 A non-exhaustive overview of required calibrations and checks has been provided in Appendix D.

The following articles provides additional rules concerning calibrations and checks for certain instruments.

- 5.3.1.2 When using an instrument which is not covered in the following articles or in Appendix D, then the method, frequency, tolerances, level of supervision and registrations for calibration and checks must be determined via the applicable reference document, registered in consultation with the certifying body and included in the technical file.

## APPENDIX A: FORMULATING OVERVIEWS

*This appendix shows how an overview can be created for all intended and already implemented verifications, calibrations and checks.*

| Instrument                | Identification              | Method                    | Frequency | Previous calibration | Calibration this year | Accuracy   | Achieved accur. |
|---------------------------|-----------------------------|---------------------------|-----------|----------------------|-----------------------|------------|-----------------|
| Scales Tetler-Moledo 5000 | LAB-BAL-1<br>sn/354678-76-9 | Q-handbook<br>PROC-CAL-20 | 1 / year  | 21/05/2011           | 18/05/2012            | +/- 0.02 % | + 0.01 %        |
| Scales Cern FT-8100       | LAB-BAL-2<br>sn/567-TG-789  | Q-handbook<br>PROC-CAL-20 | 1 / year  | 21/05/2011           | 18/05/2012            | +/- 0.02 % | 0.00 %          |
| ...                       | ...                         | ...                       | ...       | ...                  | ...                   | ...        | ...             |
| Thermometer Testoster 300 | LAB-TH-1<br>sn/5967-PG      | Q-handbook<br>PROC-CAL-35 | 1 / year  | 05/09/2011           |                       | +/- 1 °C   |                 |
| Thermometer Testoster 60  | LAB-TH-2<br>sn/1948-PW      | Q-handbook<br>PROC-CAL-36 | 1 / year  | 21/05/2011           | 18/05/2012            | +/- 0.1 °C | 0.1 °C          |
| ...                       | ...                         | ...                       | ...       | ...                  | ...                   | ...        | ...             |
| ...                       | ...                         | ...                       | ...       | ...                  | ...                   | ...        | ...             |

## APPENDIX B: OVERVIEW OF REFERENCE INSTRUMENTS

*This appendix provides a non-exhaustive overview of calibrations for reference instruments and gauging for test blocks and calibration weights.*

| Instrument  | Frequency                                     | Method                          | Requirements   | Registration                    |
|---|---|---------------------------------|----------------|---------------------------------|
| Calibration weights                                   | initially +<br>1 / 5 year +<br>see art. 4.3.2 | EN ISO 3650 +<br>see art. 4.3.2 | see art. 4.3.3 | certificate +<br>see art. 4.3.4 |
| Callipers   | initially +<br>1 / 5 year +<br>see art. 4.3.2 | ISO 11095 +<br>see art. 4.3.2   | see art. 4.3.3 | certificate +<br>see art. 4.3.4 |
| Calibration weights                                   | initially +<br>1 / 2 year +<br>see art. 4.3.2 | see art. 4.3.2                  | see art. 4.3.3 | certificate +<br>see art. 4.3.4 |
| Glass thermometers                                    | see art. 4.3.2                                | see art. 4.3.2                  | see art. 4.3.3 | certificate +<br>see art. 4.3.4 |
| Thermocouples and platinum<br>resistance thermometers | initially +<br>1 / year +<br>see art. 4.3.2   | see art. 4.3.2                  | see art. 4.3.3 | certificate +<br>see art. 4.3.4 |
| Reference instruments for force<br>or pressure        | initially +<br>1 / 2 year +<br>see art. 4.3.2 | EN ISO 376 +<br>see art. 4.3.2  | see art. 4.3.3 | certificate +<br>see art. 4.3.4 |
| Reference sieves                                      | initially +<br>see art. 4.3.2                 | see art. 4.3.2                  | see art. 4.3.3 | certificate +<br>see art. 4.3.4 |
| Other reference instruments                           | see art. 4.3.2                                | see art. 4.3.2                  | see art. 4.3.3 | certificate +<br>see art. 4.3.4 |

## APPENDIX C: OVERVIEW OF VERIFICATION FOR WEIGHING SYSTEMS

*This appendix is not applicable for elastomeric products.*

## APPENDIX D: OVERVIEW OF CALIBRATIONS AND CHECKS

This appendix provides a non-exhaustive overview of calibrations and checks for instruments.

| Instrument   | Level of monitoring in accordance with art. 5.1.2 | Frequency                            | Method and checking points                               | Requirements  |
|--|---|--------------------------------------|--|---|
| Callipers  | 3   | 1 / year                             | ISO 18899  | ISO 3302-1 art 3.2  |
| Tape measure   | 3   | initially                            | check for accuracy                                       | ISO 3302-1 art 3.2  |
|  | 3   | before every use                     | checking for legibility and damage                       | ISO 3302-1 art 3.2  |
| Micrometre dial gauge/<br>Thickness gauge  | 3   | ISO 18899                            | ISO 18899  | ISO 3302-1 art 3.2,<br>ISO 23529,<br>ISO 815-1 Annex B,<br>ISO 815-2 Annex A,<br>ISO 34-2 |
| Other dimensional measurement instruments (like micrometre, depth gauge, indicator, optical measurement instruments) | 3   | 1 / year                             | ISO 18899  | ISO 3302-1 art 3.2  |
| Hardness tester  | 3   | 1 / year                             | calibration in accordance with ISO 18898                 | ISO 48 and ISO 18898  |
| Universal testing machine:<br>- force measurement cell<br>- extensometer   | 3   | 1 / year                             | verification of parameters ISO 5893/ISO 18899 (ISO 34-2) | class 1 according to EN ISO 7500-1, class 1 according to ISO 34-2                         |
|  | 3   | 1 / year                             | verification of parameters ISO 5893                      | class D according to ISO 5893   |
| - Rate of traverse   | 3   |                                      | ISO 18899  | 500 ± 50 mm/min   |
| - Die for cutting Delft test pieces  | 3   | Annex B ISO 34-2                     | ISO 18899  | ISO 34-2  |
| Compression device and counterforce measuring device/compression-testing machine                                     | 3   | Annex C of ISO 3384-1                | idem   | idem  |
| Compression assembly (Compression plates, steel spacer(s), clamping device)  | 3   | ISO 815-1 Annex B, ISO 815-2 Annex A | idem   | idem  |
| Oven   | 3   | ISO 815-1 Annex B, ISO 188 Annex D   | idem   | idem  |
| Low temperature cabinet  | 3   | ISO 815-2 Annex A                    | idem   | idem  |
| Joint testing apparatus  | 3   | 1 / year                             | -  | Annex C of EN 681-1   |
| Ozone cracking testing equipment   | 3   | ISO 1431-1 Annex B                   | idem   | idem  |
| Hygrometer   | 3   | ISO 1431-1 Annex B                   | ISO 18899  | ISO 18899   |

| Instrument   | Level of monitoring in accordance with art. 5.1.2 | Frequency        | Method and checking points | Requirements                       |
|--|---|------------------|----------------------------|------------------------------------|
| Crystallization effects equipment                        | 3   | ISO 3387 Annex A | idem                       | idem                               |
| Compression jig  | 3   | -                | -                          | EN 681-1 Annex B                   |
| Abrasion machine, abrasive sheet and hollow drill        | 3   | ISO 4649 Annex C | ISO 18899                  | ISO 4649, Annex A, B, C            |
| Total immersion apparatus                                | 3   | ISO 1817 Annex B | ISO 18899                  | ISO 1817 Annex B                   |
| Apparatus for testing one surface only                   | 3   | ISO 1817 Annex B | -                          | ISO 1817 Annex B                   |
| Test liquid  | 3   | ISO 1817 Annex B | -                          | ISO 1817 Annex B                   |
| Materials<br>distilled water<br>lintless blotting medium | 3   | ISO 1817 Annex B | -                          | ISO 1817 Annex B                   |
| Autoclave  | 3   | -                | -                          | EN 681-1 Annex B                   |
| Thermometer  | 3   | ISO 18899        | idem                       | idem                               |
| Timing device  | 3   | ISO 18899        | ISO 18899 art 23.1         | +/- 1 s                            |
| Travelling microscope                                    | 3   | -                | -                          | ISO 34-2                           |
| Balance  | 3   | ISO 4649 Annex C | ISO 18899                  | ISO 4649 Annex C, ISO 1817 Annex B |
| Other instruments  | art. 5.3.1.2                                      | art. 5.3.1.2     | art. 5.3.1.2               | art. 5.3.1.2                       |