

BRL-K761
01-02-2012

Evaluation guideline

For a Kiwa Product Certificate for
Copper tubes provided with an external covering



Preface

This evaluation guideline has been accepted by the board of experts CWK of Kiwa, in which the parties concerned in the sector Drinkingwater appliances are being represented. This Board of Experts also supervises the certification activities and where necessary requires the evaluation guideline to be revised. All references to Board of Experts in this evaluation guideline pertain to the above mentioned Board of Experts.

This evaluation guideline will be used by Kiwa in conjunction with the Kiwa-Regulations for Product Certification. This regulation details the method employed by Kiwa for conducting the necessary investigations prior to issuing the product certificate and the method of external control.

This evaluation guideline is to be assessed by the Board of Experts at least every 5 years, but at the latests before 1 February 2017.

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The use of this evaluation guideline by third parties, for any purpose whatsoever, is only allowed after a written agreement is made with Kiwa to this end.

Validation

This evaluation guideline has been validated by Kiwa on 1 February 2012.

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1 Introduction

1.1 General

This evaluation guideline includes all relevant requirements which are adhered to by Kiwa as the basis for the issue and maintenance of a certificate for "Copper Tubes provided with an external covering", all this being on the basis of the Kiwa-Regulations for Product Certification.

This evaluation guideline replaces K760/5 dated 01-01-2005.

For the performance of its certification work, Kiwa is bound to the requirements as included in the clause 4.6 "conditions and procedures for granting, maintaining, extending, suspending and withdrawing certification" of EN45011.

1.2 Field of application / scope

The products are intended to be applied in

- sanitary installations (in buildings) for the transport of warm and cold drinking-water;
- hot water heating systems (temperature not exceeding 100 °C) including underfloor heating systems;
- domestic gas and liquid fuel distribution systems.

1.3 Acceptance of test reports provided by the supplier

When by the manufacturer reports from test Institutions or laboratories are produced in order to demonstrate that the product meets the requirements of this evaluation guideline, the institute or laboratory shall meet one of the applicable accreditation norms, being;

- NEN-EN-ISO/IEC 17025 for laboratories;
- NEN-EN-ISO/IEC 17020 for inspection bodies;
- NEN-EN 45011 for certification bodies certifying products;

This requirement is being considered to be fulfilled when a certificate of accreditation can be shown, either issued by the Board of Accreditation (RvA) or one of the institutions with which the RvA an agreement of mutual acceptance has been concluded.

The accreditation shall refer to the examination as required in this BRL. When no certificate of accreditation can be shown, Kiwa will verify whether the accreditation norm is fulfilled.

1.4 Quality declaration

The quality declarations to be issued by Kiwa are described as Kiwa product certificate.

A model of the certificate to be issued on the basis of this Evaluation Guideline has been included as an Annex.

2 Terms and definitions

In this evaluation guideline the following terms and definitions are applicable:

Evaluation Guideline: the agreements made within the Board of Experts on the subject of certification.

Board of Experts: The Board of Experts "CWK".

Supplier: the party that is responsible for ensuring that the products meet and continue to meet the requirements on which the certification is based.

IQC scheme: a description of the quality inspections carried out by the supplier as part of his quality system.

Product requirements: requirements made specific by means of measures or figures, focusing on (identifiable) characteristics of products and containing a limiting value to be achieved, which limiting value can be calculated or measured in an unequivocal manner.

Pre-certification tests: tests in order to ascertain that all the requirements recorded in the Evaluation Guideline are met.

Inspection tests: tests carried out after the certificate has been granted in order to ascertain whether the certified products continue to meet the requirements recorded in the Evaluation Guideline.

Remark

The test matrix contains a summary showing what tests Kiwa will carry out in the pre-certification stage and in the event of inspections as well as showing the frequency with which the inspection tests will be carried out.

Product certificate: a document, in which Kiwa declares that a product may, on delivery, be deemed to comply with the product specification recorded in the product certificate.

Tap water (origin NEN 1006:2002): water intended for drinking, cooking, food preparation or other domestic purposes.

3 Procedure for granting the quality declaration

3.1 Pre certification tests

The pre certification-tests to be performed are based on the (product) requirements as included in this evaluation guideline including the test methods and contain, depending on the nature of the product to be certified:

type testing to determine whether the products comply with the product and/or functional requirements,

Production Process Assessment

Assessment of the quality system and the IQC-scheme,

Assessment on the presence and functioning of the remaining procedure

3.2 Granting the quality declaration

After finishing the pre-certification tests the results are presented to the person deciding on granting of certificate. This person evaluates the results and decides whether the certificate can be granted or additional data and/or tests are necessary.

4 Requirements and test methods

4.1 General

This chapter deals with the requirements applicable to Copper tubes provided with an external covering. These requirements shall be used to verify the details of the product being certified and shall be included in the certificate..

4.2 Product requirements for Copper tubes

The requirements pertaining to copper tubes are detailed in BRL-K760 "Copper Tubes" (includes EN 1057:2004 or in BRL-K19005 "Internally tinned copper tubes for drinking water installations").

Note: In practice this means that certification of the copper tube by KIWA is required.

4.3 Product requirements for the external covering

4.3.1 Definition

These quality requirements relate to hard, halfhard, and soft copper tubes, with outer diameters varying between 10 to 76.1 mm, provided with an external covering which is meant for:

- protection of the surface of the copper tubes against corrosion;
- protection against the deposition of moisture and dirt;
- protection of the copper tubes against mechanical damage during transportation, installation and operation;
- improvement of the appearance, and
- as thermal insulation, when applicable.

4.3.2 Quality requirements

For initial acceptance the covering must meet the requirements as stipulated in section 2 and the additional requirements in sections 2, 3, 4, or 5 depending on the covering material concerned. Once certified, the covering is inspected twice a year according to the requirements in the table below. Routine testing may be done at the laboratory of the manufacturer providing the laboratory meets the requirements of NEN EN ISO 17025, or may be by done by Kiwa in case the required testing facilities are not available. In both cases the Kiwa inspector will pick the samples to be tested. In case the tests are not done by Kiwa, the inspector can request to witness one or several of the tests.

Routine inspection aspects and tests (2x/year)

PVC	PE	PUR foam
2.3.2.1	2.3.2.1	2.3.2.1
2.3.2.2	2.3.2.2	2.3.2.2
2.3.2.3	2.3.2.3	2.3.2.3
2.3.2.4	2.3.2.4	2.3.2.4
2.3.2.5	2.3.2.5	2.3.2.5
2.3.2.6	2.3.2.6	2.3.2.6
2.3.2.7 (optional)	2.3.2.7 (optional)	2.3.2.7 (optional)
2.3.3	2.3.4	2.3.4
2.3.4	4.2.1	5.2.1
3.2.1	4.2.2	
3.2.3	4.2.3	

4.3.3 Material

The covering shall be made out of a corrosion resistant material and shall be able to protect the copper tube sufficiently against moisture. The mechanical properties and the colour of the covering shall not be detrimentally influenced by sunlight and/or moisture.

In addition to the material requirements stipulated in this section, the material will comply with:

- Section 3 for coverings made out of plasticized PVC,
- Section 4 for coverings made out of Polyethylene, and
- Section 5 for coverings made out of Polyurethane foam surrounded by an external surface of non-plasticized PVC.

It should be noted that should the installation of these pipes require the use of plastic clamps, then the manufacturer should ensure that there is no negative interaction between the material of the clamps and that of the external covering.

4.3.4 Appearance

The covering shall on visual inspection be smooth, undamaged, and uniform in colour.

4.3.5 Fit

The covering shall on visual inspection fit sufficiently tightly on or around the copper tube.

4.3.6 Thickness

When examined visually the covering shall have an uniform thickness.

4.3.7 Vulnerability

When tested as detailed below, the covering shall exhibit no flaws or cracks. The covering is considered to fulfil the requirements if the result falls in zone A of figure 1.

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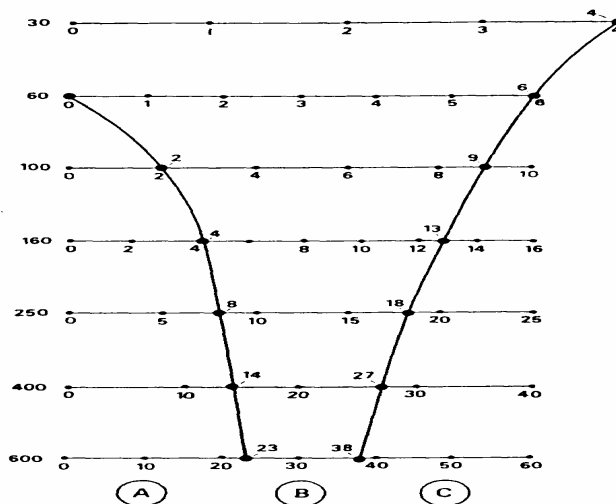


Figure 1 - Vulnerability

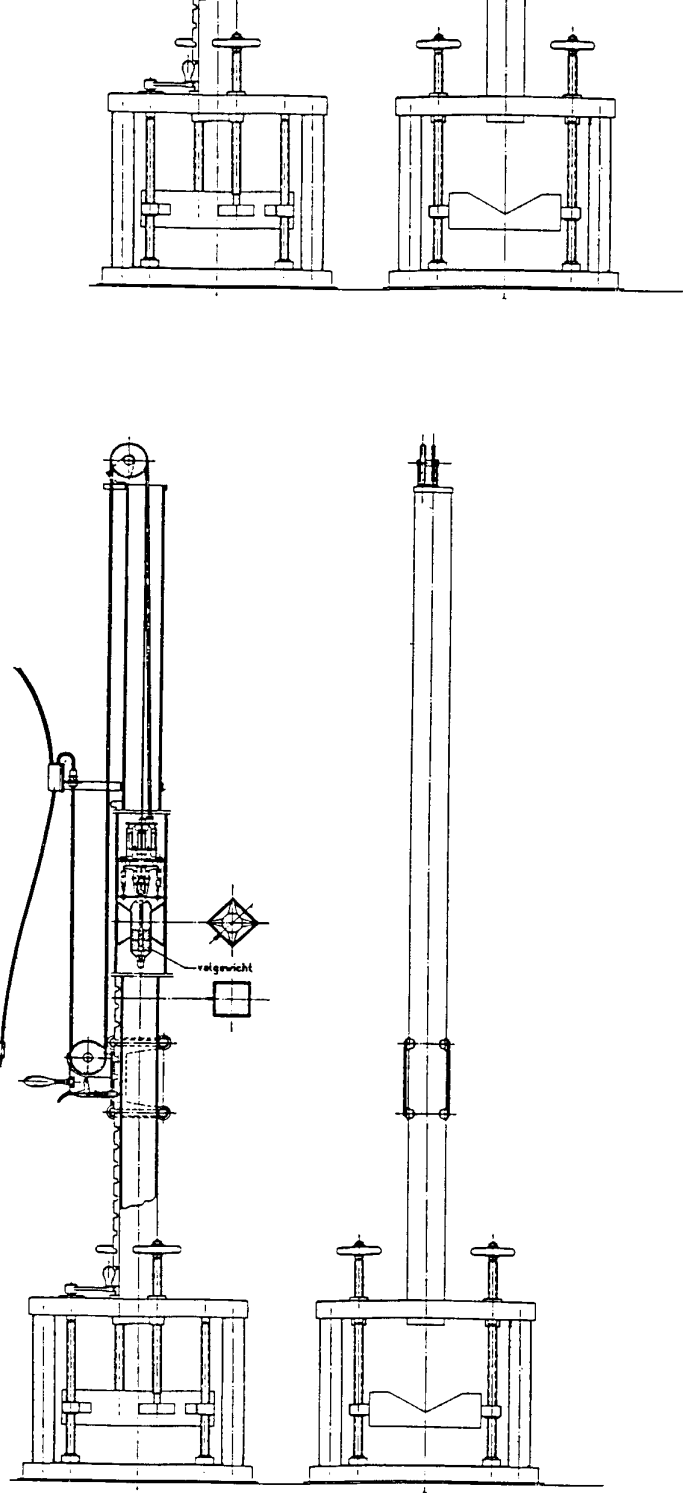


Figure 2 - Machine for testing the vulnerability

The samples for this test are cooled down to 0 ± 1 °C. If cooling is done with a mixture of water and ice, the cooling time is 30 minutes; if cooling is done with air the cooling time is 2 hours.

When testing, the sample is not allowed to stay out of the conditioning room for more than 10 seconds. For subsequent reconditioning the sample has to be stored for 10 minutes in the conditioning room. Place the sample in the machine and let the weight fall on the sample. The distance between two indentations must be at least 50 mm; the distance to the end of the tube must be at least 100 mm.

Evaluation of the damage is done visually.

4.3.8 | *Processability*

After testing with the appropriate tools and in accordance with the guidelines provided by the manufacturer it must be possible to both cut off the covering straight and flat and to easily remove the covering locally.

It should be noted that during assembling and installation special attention shall be paid in order to avoid the appearance of spaces allowing moisture to enter between the copper tube and the covering (as this can lead to corrosion). The manufacturer shall ensure that this information is incorporated in their assembly and installation instructions which will accompany the covered pipes.

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4.3.9 | *Thermal insulation (optional)*

When used to provide a thermal insulation of the pipe the covering shall have a maximum heat transmission factor of 250 cal/°C/hour when tested as detailed below.

Fill a covered copper tube with a length of 1 m, provided with rubber plugs at the ends, with water of 85 °C. Measure with a thermocouple of 0.4 m. the cooling curve of the tube. Calculate the heat transfer factor of the tube to the surrounding air with the following formula:

$$U = W (\ln \Delta T_1 - \ln \Delta T_2) / t$$

where:

U	= heat transfer factor, cal/(°C. hour) ;
W	= "water value" of tube with contents in cal/°C;
ΔT_1	= temperature difference with the environment after 30 minutes in °C;
ΔT_2	= temperature difference with the environment 60 minutes after ΔT_1 in °C;
t	= time in hours.

The water value is determined by adding the product of the copper-mass (g) in the sample and the specific heat of copper (0.092 cal/g/°C) to the product of the water-mass (g) and the specific heat of water (1 cal/g/°C).

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4.3.10 | *Marking*

The covering shall be permanently and legibly marked with the factory mark or trade name, the dimensions (diameter x wall thickness) and temper of the copper tube, the production date and the type of covering at distances not exceeding 1.0 m. For soft (annealed) tubes the temper symbol is not mandatory.

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4.3.11 | *Assembly and installation instructions*

The manufacturer shall provide assembly and installation instructions with each package and/or coil of covered pipes. These instructions shall cover at least the following aspects:

- provisions to be taken for soldering the pipes, and
- provisions to be taken to prevent ingress of moisture between the copper pipe and the covering.

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5 | ADDITIONAL REQUIREMENTS FOR PLASTICIZED PVC COVERINGS

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5.1 | Description

These quality requirements are additional requirements relating to coverings made from plasticized PVC.

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5.2 | Quality requirements

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5.2.1 | Ageing

The TFAB (tensile force at break) of the covering shall not change more than $\pm 20\%$ when tested as detailed below.

The change in TFAB is defined as the difference between the TFAB of the covering in the original condition and the TFAB after storage in an oven at $100\text{ °C} \pm 1\text{ °C}$ for 7 days, expressed as a %. The TFAB is determined with samples made by cutting the covering perpendicular to the length of the tube. No notches should be made in the longitudinal direction. The thus obtained tubular samples should be of sufficient length to enable a clamping length of 50 mm to be used. The TFAB for the original condition and the treated condition are determined as the mean values of 6 measurements made at a temperature of $23\text{ °C} \pm 2\text{ °C}$ with a drawing speed of 100 mm/min. All twelve samples when taken together shall form the original tube whereby the original and the exposed samples should be taken alternatively i.e. one conditioned, one original and so on.

5.2.2 | Loss of plasticizer

The loss of plasticizer when determined in accordance with ISO 176 shall not exceed 1%.

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5.2.3 | Cold bend test

It shall be possible to bend soft and halfhard covered copper tubes with an external diameter (of the copper tube) of up to 22 mm with a radius (measured at the centerline of the pipe) as specified in table A1, without appearance of significant defects and or discolorations of the covering.

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External diameter of the copper tube (mm)	Neutral axis bending radius (mm)
12	50
15	75
22	95

Table A1 - Cold bend radius

For the bending of the tubes special tools should be used, adjusted to the external diameter of the covered pipe. The bending operation shall not be carried out using an internal mandrel. The test piece shall be conditioned at $0\text{ °C} \pm 1\text{ °C}$ by either cooling in a mixture of water and ice for 30 minutes or in air at 0 °C for 2 hours. The test shall be performed within one minute of removal from the conditioning environment.

The evaluation for defects or discoloration is done visually.

It should be noted that copper tubes with a diameter above 22 mm are usually not cold bent. When using bigger pipes with an external covering it is recommended to use fittings.

6 ADDITIONAL REQUIREMENTS FOR POLYETHYLENE (PE) COVERINGS

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6.1 Description

These quality requirements are additional requirements relating to coverings made out of Polyethylene (PE).

6.2 Quality requirements

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6.2.1 *Melt-flow index after ageing*

When tested as detailed below, the melt index of the artificially aged test pieces shall not be less than 90% or higher than 25% of the value measured on the original material.

Obtain 6 testplates of at least 6 grams from the covering. Put 3 plates in an oven with circulating air at a temperature of $100\text{ °C} \pm 1\text{ °C}$ for periods of 250, 500 and 1000 hours. Determine the melt index of the aged and original test pieces in accordance with NEN 21133 (ISO R1133) procedure 4. If the melt index of the original plates is below 0.1 gr/10 min, it is advised to perform the testing in accordance with ISO R 1133 procedure 5.

6.2.2 *Elongation at break*

The elongation at break shall be at least 50% when tested as detailed below.

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To determine the elongation at break a tensile testing machine is required which can operate with a drawing speed of 50 mm/min at $23 \pm 2\text{ °C}$. Six tensile test samples are prepared in accordance with ISO 527, type 1, scale 1 : 2 from the covering with their length being parallel to the longitudinal axis of the copper tube and from locations evenly spread around the circumference of the pipe. The sides of the samples must be smooth. Each sample is marked with two stripes placed symmetrically around the middle of the sample with a distance of 25 mm between them. The samples shall be conditioned at a temperature of $23 \pm 2\text{ °C}$ for a period of 16 hours.

The elongation at break shall be the average of the six readings obtained.

6.2.3 *Cold bend test*

It shall be possible to bend soft and halfhard covered copper tubes with an external diameter (of the copper tube) of up to 22 mm with a radius (measured at the centerline of the pipe) as specified in table B1, without appearance of significant defects and or discolorations of the covering.

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External diameter of the copper tube (mm)	Bending radius (mm)
12	50
15	75
22	95

Table B1 - Cold bend radius

For the bending of the tubes special tools should be used, adjusted to the external diameter of the covered pipe. The bending operation shall not be carried out using an internal mandrel. The test piece shall be conditioned at $0\text{ °C} \pm 1\text{ °C}$ by either cooling in a mixture of water and ice for 30 minutes or in air

at 0 °C for 2 hours. The test shall be performed within one minute of removal from the conditioning environment.

The evaluation for defects or discoloration is done visually.

It should be noted that copper tubes with a diameter above 22 mm are usually not cold bent. When using bigger pipes with an external covering it is preferred to use fittings.

7 | ADDITIONAL REQUIREMENTS FOR COVERING MADE FROM HARD POLYURETHANE FOAM SURROUNDED BY AN OUTER COVER OF NON-PLASTICIZED PVC

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7.1 | Description

These quality requirements relate to coverings made from hard polyurethane foam (PU-foam), surrounded by a cover of non-plasticized PVC.

It should be noted that due to the stiffness of the covering it will be necessary to use special preformed pieces to make bends, etc.

7.2 | Quality requirements

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7.2.1 | *Dimensional stability of the PU-foam*

The external diameter of the foam layer shall not change by more than 1.5% when tested as detailed below.

Take a length of a piece of PU-foam covering (without the copper tube and without the outer PVC-cover) of approximately 100 mm. Determine the outer diameter with an accuracy of 0.1 mm as the mean value of two measurements made on the same section perpendicular to each other.

This testpiece is submitted 10 times to the following test cycle:

Store for 8 hours at -20 °C

Store for 16 hours at +20 -23 °C

Store for 8 hours at +70 °C

Store for 16 hours at +20 to 23°C

Hereafter the diameter is determined again as indicated above. Express the change of diameter as a percentage of the original diameter.

It should be noted that the above mentioned test for dimensional stability and the resistance against deformation at high temperatures as mentioned in the general requirements, are strongly determined by the composition of the PU-foam. It is easier to determine the dimensional stability and the resistance against deformation of the covering by using comparable test methods as detailed as followed:

a. Determination of the Nitrogen-content according to Kjeldahl.

If the values found for the Nitrogen-content do not differ by more than -5 % or +10 % from the values found on a previously approved material (in accordance with the requirements of this standard) then it can be assumed that the composition has remained constant provided the requirements of point b are fulfilled.

b. Determination of the compression strength.

This test is performed in accordance with ISO 844:2004. The compression strength shall not differ more than 10% from the value found on a sample previously approved in accordance with the requirements of this standard.


8 Marking

8.1 General

The products have to be marked with following indelible marks and indications:

- name or logo of the manufacturer,
- data or code indicating the date of production,
- type indication

8.2 Certification mark

After concluding a Kiwa certification agreement the certified products shall, beside the marks indicated in the respective standards, be indelible marked with the wordmark **KIWA**  on the body.

9 Requirements in respect of the quality system

This chapter contains the requirements which have to be met by the supplier's quality system.

9.1 Manager of the quality system

Within the supplier's organizational structure an employee must have been appointed who is in charge of managing the supplier's quality system.

9.2 Internal quality control/quality plan

The supplier shall have an internal quality control scheme (IQC scheme) which is applied by him.

The following must have been demonstrably recorded in this IQC scheme:

- what aspects are checked by the producer;
- according to what methods such inspections are carried out;
- how often these inspections are carried out;
- in what way the inspection results are recorded and kept.

This IQC scheme should at least be an equivalent derivative of the model IQC scheme included in the addendum.

9.3 Procedures and working instructions

The supplier shall be able to submit the following:

- procedures for:
 - dealing with products showing deviations;
 - corrective actions to be taken if non-conformities are found;
 - dealing with complaints about products and/or services delivered;
- the working instructions and inspection forms used.

10 Summary of tests and inspections

This chapter contains a summary of the following tests and inspections to be carried out in the event of certification:

- Pre-certification tests;
- Inspection test as to toxicological requirements and product requirements;
- Inspection of the quality system.

The frequency with which Kiwa will carry out inspection tests is also stated in the summary.

10.1 Test matrix

Description of requirement	Article BRL	Tests within the scope of		
		Pre-certification	Supervision by Kiwa after granting of certificate ¹⁾	frequency (no./year)
Material Toxicological requirements				
Design				
Functional requirements				
Marking				

¹⁾ In case of significant changes of the product or production process, compliance of the product to the performance requirements shall be determined

²⁾ Inspections as indicated are to be conducted by the inspector or by the manufacturer, whether or not in presence of the inspector.

10.2 Inspection of the quality system

The quality system will be checked by Kiwa on the basis of the IQC scheme.

The inspection contains at least those aspects mentioned in the Kiwa Regulations for Product certification.

11 Agreements on the implementation of certification

11.1 General

Beside the requirements included in these evaluation guidelines, also the general rules for certification as included in the Kiwa Regulations for Product Certification apply.

These rules are in particular

- The general rules for conducting the pre-certification tests, to be distinguished in:
 - the way suppliers are to be informed about an application is being handled,
 - how the test are conducted,
 - the decision to be taken as a result of the pre certification tests.
- The general directions for conducting inspections and the aspects to be audited,
- The measurements to be taken by Kiwa in case of Non Conformities,
- Measurements taken by Kiwa in case of improper Use of Certificates, Certification Marks, Pictograms and Logos,
- Terms for termination of the certificate,
- The possibility to lodge an appeal against decisions of measurements taken by Kiwa.

11.2 Certification staff

The staff involved in the certification may be sub-divided into:

- certification experts: they are in charge of carrying out the pre-certification tests and assessing the inspectors' reports;
- inspectors: they are in charge of carrying out external inspections at the supplier's works;
- decision-makers: they are in charge of taking decisions in connection with the pre-certification tests carried out, continuing the certification in connection with the inspections carried out and taking decisions on the need to take corrective actions.

11.2.1 Qualification requirements

The following qualification requirements have been set by the Board of Experts for the subject matter of this Evaluation Guideline:

EN45011	Certification Expert	Inspector	Decision maker
Education - general	<ul style="list-style-type: none"> • Technical higher-level professional education • Internal training certification and Kiwa policy • Training auditing 	<ul style="list-style-type: none"> • Intermediate-level professional education • Internal training certification and Kiwa policy • Training auditing 	<ul style="list-style-type: none"> • Higher level professional education • Internal training certification and Kiwa policy • Training auditing
Education - specific	<ul style="list-style-type: none"> • for BRL relevant technical education • specific studies and training (know-how and skills) 	<ul style="list-style-type: none"> • for BRL relevant technical education • specific studies and training (know-how and skills) 	<ul style="list-style-type: none"> • not applicable unless specific requirements have been specified by the BoE
Experience - general	<ul style="list-style-type: none"> • 1 year of relevant work experience with at least 4 pre certification tests of which one carried out independent under supervision. 	<ul style="list-style-type: none"> • 1 year of relevant work experience with at least 4 inspections of which one carried out independent under supervision 	<ul style="list-style-type: none"> • 4 year of relevant work experience with at least 1 year in certification

EN45011	Certification Expert	Inspector	Decision maker
Experience - specific	<ul style="list-style-type: none"> Detailed knowledge of the BRL and 4 certification tests carried out on the basis of the BRL or one related. 	<ul style="list-style-type: none"> Detailed knowledge of the BRL and 4 inspections carried out on the basis of the BRL or one related. 	<ul style="list-style-type: none"> general knowledge of the BRL

The level of education and the experience of the certification staff involved should be demonstrably recorded.

11.2.2 Qualification

The qualification of the Certification staff shall be demonstrated by means of assessing the education and experience to the requirements mentioned before. In case staff is to be qualified on the basis of deflecting criteria, written records shall be kept.

The authority to qualify staff is dedicated to:

- decision makers: qualification of certification experts and inspectors,
- Management of Kiwa: qualification of decision makers.

11.3 Report Pre certification tests

Kiwa records the results of the pre certification tests in a report. This report shall comply with the following requirements:

- completeness: the reports verdicts about all requirements included in the evaluation guideline,
- traceability: the findings on which the verdicts have been based shall be recorded traceable,
- basis for decision: the decision maker shall be able to base his decision on the findings included in the report.

11.4 Decision for granting the certificate

The decision for granting the certificate shall be made by a qualified decision maker which has not been involved in the pre certification tests. The decision shall be recorded traceable.

11.5 Lay out of quality declaration

The product certificate shall be conform the model included as an annex

11.6 Nature and frequency of external inspections

The certification body shall carry out Audits at the supplier at regular intervals to check whether the supplier complies with his obligations. About the frequency of inspections the Board of Experts decides.

At the time this Evaluation Guideline took effect, the frequency was set at number of **XXX** of inspection visits per year.

Inspections shall at least refer to:

- The suppliers IQC-scheme and the results obtained from inspections carried out by the supplier,
- The correct way of marking of certified products
- Complying with required procedures.

The results of each inspection shall be traceable recorded in a report.

11.7 Interpretation of requirements

The Board of Experts may record the interpretation of requirements of these evaluation guidelines in one separate interpretation document.

12 Titles of standards

ISO 844:2004	Rigid cellular plastics - Determination of compression properties	June 2004
BRL K 760-05	Evaluation guideline "copper tubes"	January 2005
BRL K 19005	Evaluation guideline "Internally tinned copper tubes for drinking water installations"	December 2001
EN 13349	Copper and copper alloys - Pre-insulated copper tubes with solid covering	August 2002
EN 17025	General requirements for the competence of testing and calibration laboratories	April 2000
EN 45004	General criteria for the operation of various types of bodies performing inspection	October 1996
EN 45011	General requirements for bodies operating product certification systems	March 1998
ISO 176	Determination of loss of plasticizers -- Activated carbon method	September 1999
ISO R1133	Plastics - Determination of melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics	August 2003
ISO 527	Plastics - Determination of tensile properties - Part 1: General principles	March 1996

I Model certificate

Certificate	Product certificate KXXXXXXX/OX	 Partner for progress
	Issued	
	Replaces	
	Page 1 of 2	
	Naam product	
	STATEMENT BY KIWA With this product certificate, issued in accordance with the Kiwa Regulations for Product Certification, Kiwa declares that legitimate confidence exists that the products supplied by	
	Name supplier	
	complying with the technical specifications as laid down in this product certificate and marked with the Kiwa®-mark in the manner as indicated in this product certificate, on delivery, may be relied upon to comply with Kiwa evaluation guideline BRL-K ^{xxxx} , dated 20xx-xx-xx.	
	 Bouke Meekma Kiwa	
	Publication of the certificate is allowed.	
	Advice: consult www.kiwa.nl in order to ensure that this certificate is still valid.	
	Supplier	
 Kiwa Nederland B.V. Sir W. Churchill-laan 273 Postbus 70 2280 AB RIJSWIJK The Netherlands Tel. +31 70 414 44 00 Fax +31 70 414 44 20 E-mail info@kiwa.nl www.kiwa.nl	<table border="1"><tr><td>Certification process consists of initial and regular inspection of:<ul style="list-style-type: none">• qualitysystem• product</td></tr></table>	Certification process consists of initial and regular inspection of: <ul style="list-style-type: none">• qualitysystem• product
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II Model IQC-scheme

Subjects	Aspects	Method	Frequency	Registration
Raw materials or materials supplied: <ul style="list-style-type: none"> • Recipe sheets • Incoming inspection raw materials 				
Production process, production equipment, material: <ul style="list-style-type: none"> • procedures • work instructions • equipment • release of product 				
Finished-products				
Measuring and testing equipment <ul style="list-style-type: none"> • measuring equipment • calibration 				
Logistics <ul style="list-style-type: none"> • internal transport • storage • preservation • packaging • identification or marking of semifinished and finished products 				