

Title: **Conformance Testing and Certification**

Subject: **BACnet Handbook**

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BACnet Interest Group Europe defines a certification/listing scheme for products conforming to the BACnet<sup>®</sup> protocol standard. This handbook describes this scheme, the certification/listing process and the process to qualify testlabs.

Key Words: BACnet, Certification, Testing, Conformance, interoperability

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## Revision History

The revision history may be placed on the cover page if enough space.

It's recommended to mark revised lines at the outside border ('Tools : Revisions : Options').

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D	15-Jan-2004	René Quirighetti Added chapter 2,2 "Granting the BTL mark. In this chapter we distinguish between issuing a certificate and granting the BTL mark Added chapter 5.1 to refer to checklist and testplans where the conformance test shall be based.on made some other minor adaptations.
C	30-May-2003	Frank Bitter, reviewed and reworked clause 3 "certification process"
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A	19-Oct-2000	René Quirighetti, 4092 Worked in the review results from Sep 15 <sup>th</sup> 2000

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# 1. Introduction

## 1.1 Purpose of the document

This document describes the certification/listing scheme defined by BACnet Interest Group Europe in close cooperation with BACnet International to certify products compliant to the BACnet<sup>®</sup> protocol standard. It is the binding guidebook for all parties involved in the certification/listing process in Europe.

## 1.2 Scope of validity

This document governs all aspects of the process to obtain a BACnet<sup>®</sup> certificate of conformance, issued by BACnet Interest Group Europe e.V in cooperation with BACnet International. It provides guidance for all parties, persons or legal entities involved in the certification/listing process and it defines the structure of and the rules for the authorities issuing the certificates. This handbook shall complement rather than contradict the BACnet<sup>®</sup> Standard, its annexes or ASHRAE 135.1P. If this handbook ever should contradict one of the mentioned standards, the standard always precedes.

The intend of this handbook is to define the process between the different parties, namely the Testlab, BIG-Office and BIG-Executive board (in its role as the listing body) or the Certification Department (that role to be assigned to an accredited body) rather than to infringe with the internal process of these bodies..

## 1.3 Term of validity, Field of application

The handbook describes the process and the rules for the parties involved in the certification/listing process in accordance with the relevant standards listed below. The most recent version of this handbook is available from BACnet Interest Group Europe office and is published on the BACnet Interest Group Europe internet page.

## 1.4 Intended Audience

This handbook should be used by all parties involved in the BACnet<sup>®</sup> certification/listing process

## 1.5 Document Structure

Besides this introductory chapter, the handbook consists of the four chapters (2..5):

### **Chapter 2: Certification/listing scheme and certification/listing**

- Scope of BACnet<sup>®</sup> certification/listing
- Involved parties, their rights and duties

### **Chapter 3: Certification/listing process**

- Process to gain a certificate
- Process to retain a certificate
- Process to withdraw a certificate
- Process management special issues

### **Chapter 4: Qualifying- and accreditation process for test laboratories**

- Requirements for testlabs to become qualified:
- Qualification process
- Accreditation process
- Rights and duties of a testlab against BIG and against the customer

### **Chapter 5: Forms and proforma**

## 1.6 Related Documents

### 1.6.1 Referenced Documents

[ASHRAE/ANSI 135-2001]	BACnet <sup>®</sup> : A Data Communication Protocol for Building Automation and Control Networks. This standard has now been published as an International and European standard ISO EN 16484-5
[ASHRAE 135.1P]	Methods of Test for Conformance to BACnet <sup>®</sup> <i>ASHRAE standard and intended to become EN ISO 16484-6</i>
ISO/IEC 9646-1	<i>Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 1: General Concepts.</i>
ISO/IEC 9646-2	<i>Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 2: Abstract Test Suite Specification.</i>

## 1.7 Glossary of New Terms, Abbreviations

<b>Applicant</b>	The company applying for certification/listing
<b>BIG-EU</b>	Short for Bacnet Interest Group Europe
<b>BIBB</b>	BACnet <sup>®</sup> Interoperability Building Block (see BACnet <sup>®</sup> Standard Vxxx ( <i>to be defined</i> ))
<b>BACnet International</b>	BACnet Manufacturer's Association: will encourage the successful use of BACnet <sup>®</sup> in building automation and control systems through interoperability testing, educational programs, and promotional activities
<b>BTL</b>	BACnet <sup>®</sup> Test Lab: BTL has been founded by BACnet International to provide facilities for BACnet <sup>®</sup> conformance testing.
<b>BTL-mark</b>	The logo awarded to devices that have passed a set of tests required to be performed based on the functionality of the device and the tests defined in the test plans
<b>Certification mark</b>	A trademark, issued from BIG and manifesting that the product is certified/listed by BIG to conform to the BACnet <sup>®</sup> standard
<b>Contractor</b>	A company, that develops and manufactures a product by order and for account of a third company
<b>Derived product</b>	An end product which is derived from a platform or base-product or by modification from an other end product
<b>Device Profile</b>	A list of BIBBs a device type has to implement to claim conformance to the respective profile
<b>End product</b>	A marketable product, in contrast to a platform or a base-product which is not directly marketable
<b>Licensee</b>	In this document "Licensee" is used in short for a company who signed the BIG certification/listing-mark licence agreement.
<b>Manufacturer</b>	A company, that has developed the product or that has let develop it by a contractor, but that owns all rights on the product.
<b>OEM</b>	Original Equipment Manufacturer. A manufacturer, who lets develop a

product by a third company and who markets the product as a part of its own products or systems.

- Owner** short for "the owner of a BIG certification/listing mark"
- SSPC-135** Standing Standard Program Committee 135: The ASHRAE committee maintaining the BACnet<sup>®</sup> standard.
- Vendor** A company that markets a product. The vendor may or may not be the manufacturer
- Applicant's List** A list, where the applications for certification/listing are listed together with their registration number
- Product Database** A database, where certified BACnet<sup>®</sup> products are listed, including the main specifications

## 2. Certification/listing Scheme and Certification/listing Body

### 2.1 Scope of BACnet certification/listing

An important field of application for BACnet<sup>®</sup> is the integration of system components from different providers into one Building Automation system at the customer's premises. These so called multivendor systems are advantageous for the customer, the scope of functionality can be broadened and the dependency from one vendor may be reduced. However the customer has to trust in the interoperability of the products within his system.

To support the proliferation of the BACnet<sup>®</sup> protocol in the market is the main goal of the BACnet interest Group Europe. Therefore the association sustains a certification/listing scheme. The purpose of this certification/listing scheme is to

- Achieve a defined degree of interoperability between BACnet<sup>®</sup> products of different vendors
- Increase the market success of the BACnet<sup>®</sup> protocol on Building Automation
- Establish a BACnet<sup>®</sup> certification/listing mark as a token for compliance to the BACnet<sup>®</sup> protocol

While interoperability is the ultimate goal, a certificate is issued on the base of a conformance test. Conformance tests are made on a per product type base while conclusive interoperability tests have to be based on installed systems. Therefore to achieve at reasonable cost best probability that different implementations of a BACnet<sup>®</sup> protocol are able to interwork it is in common use to test the conformance of an implementation to the protocol standard. (see also ISO/IEC 9646-1 clause 5.8)

Successful interworking of two or more systems is more likely to be achieved if they all conform to the same profiles than if they do not. For this reason the BACnet<sup>®</sup> standard defines profiles (BIBBs and device profiles). Conformance to the profiles is also an element of the BACnet<sup>®</sup> certification/listing.

### 2.2 Granting the BTL mark

#### 2.2.1 General terms of usage of the BTL<sup>®</sup> mark

The BTL<sup>®</sup> mark has been registered by BACnet International with the trademark register in the United States of America and by BACnet Interest Group e.V. in the countries of the European Community. The usage of the BTL<sup>®</sup> mark is governed by these rules:

Products that have been successfully tested by a BACnet Testing Laboratory are eligible to display the BTL logo if the requirements of chapter [2.2.2](#) are fulfilled, under the following guidelines:

##### ACCEPTABLE USAGE

1. The Mark printed in black and used as a label or a hangtag on the product. (See example below).
2. The Mark may be used in an ad. It must appear in black and white. If the advertisement is in color and is a bleed ad, that is no white margins, the BTL Mark should be reversed so that it appears in white.
3. The Mark may appear in a trade show display but only in black and white.
4. The Mark can only be used on the individual product which was tested and not on a whole line of similar products or as part of a corporate logo.



#### UNACCEPTABLE USAGE

1. The BTL Mark may never appear in color anywhere
2. The BTL Mark may not be used in a way that would indicate that an entire line of products has been tested and met the BTL's requirements.
3. The usage is limited only to the individual product(s) that have been tested and met the BTL / BIG-EU criteria.
4. The BTL Mark may not be used without the specific product that is BTL listed and/or listed or certified by BIG-EU. That is, it cannot be used with a company name that would indicate that the company complies with BACnet testing.
5. The BACnet International/BTL logos may not be used in a manner that would imply your company is a branch office, agent, or a direct division of the BACnet International or BIG-EU.
6. The BACnet International/BTL logos may not be used in a manner that would disparage the BACnet International or BIG-EU or its members.

### 2.2.2 Special considerations using the BTL® mark on products

The BTL® mark may be displayed on a product, if the product has been tested by a testlab accredited by BACnet International or BIG-EU

AND

if it passed the tests according to checklists and testplans jointly approved by bma-btl-wg and BIG-EU / WG-T (called "the expert group" for short)

AND

got listed acc. to BTL rules

OR

got certified acc.to BIG-EU certification/listing rules

**Remark:** while listing is possible for whatever profile has been tested for (Device Profile or list of BIBBs), a certificate may only be issued by legal reasons, to confirm the full compliance of a product's BACnet interface to the standard. As long as the testlabs are not yet ready to test all the implemented BIBBs, the European Certifier (BIG-EU) will list products as a base to grant the BTL® mark.

## 2.3 Involved parties, their rights and duties

### 2.3.1 Overview

This are the bodies involved in the BACnet® testing and certification/listing procedure:

#### Certification/listing body

The Certifier (to issue certificates)

The Certifier (to list products and to grant the BTL® mark)

#### Related BIG committee or group

BACnet Interest Group Europe, represented by WSPCert

BACnet Interest Group Europe, represented by the executive committee and BACnet International represented by the BTL manager

**Certification/listing body**

**Related BIG committee or group**

The applicant

A member or non-member company of BIG-EU or BACnet International.

The BIG Certification/listing steering bodies

- The expert group
- Certification Management Committee

BACnet International's BACnet Test Lab Working Group and BIG WG-Technique EU: five voting representatives from BIG WG-Technique and one consulting representative from the BIG –EU accredited test lab (At BACnet International this role is split between the BTL manager (first level ruling on technical issues) and the Executive Director of BACnet International (first level of appeal)).

• Certification Board  
Certification Department

The BIG Advisory Board  
A company or person appointed by BIG executive committee and conforming to EN 45011.  
In case of listing instead of certification the BIG-EU executive board is acting in this role.

Independent Test Lab

An accredited testlab, first, second or third party, but independent acc. to EN 45001

Table 2–1: BIG Certification body and its relationship to BIG standing committees

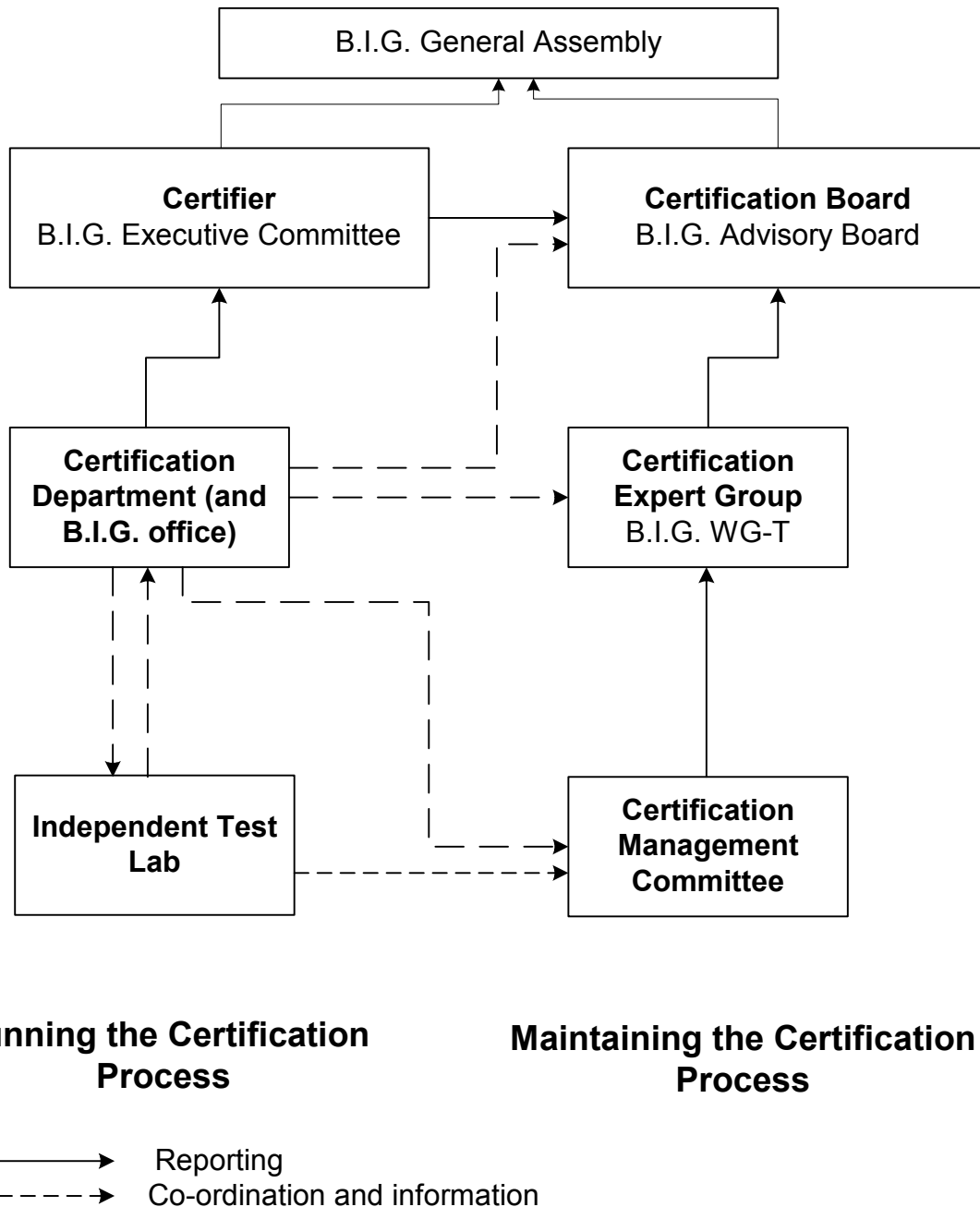


Figure 2–1: BIG Certification Body

### 2.3.2 The involved parties, their rights and duties

This is a short description of the position of the different parties in the process and of their general rights and duties. More specific description of the tasks of each of the entities in the process is given in the process descriptions, see [3. Certification/listing Process](#). Some of these bodies correspond to BIG standing bodies (see also [2.3.1](#)). The information- and reporting relationships defined here are only valid for these certification/listing tasks. The reporting scheme defined in the association rules is not touched.

### **2.3.2.1 The applicant**

The applicant may be a BIG member, a BACnet International member or a non-member. Non-members are required to sign a licence agreement to use the BTL® mark.

### **2.3.2.2 The Certifier**

The BACnet Interest Group Europe, represented by the executive board is the certification/listing and registration body. The certification department may act on behalf of the executive committee in day to day work. The certifier / lister certifies or lists a product based on the technical judgment of the test lab. The certifier / lister judges on formal issues (e.g. Completeness of the tests, correctness of test report, entitlement of the applicant to request for listing / certification...). In a most rare case when the certification management committee is called for arbitration between the test lab and applicants position and when it is not able to reach a solution commonly applicable to all involved parties, the certifier / lister will have to take into account besides the decision of the test lab also the position of the committee.

### **2.3.2.3 The BIG Certification steering bodies**

The three bodies grouped under this title are responsible to set-up and maintain the certification/listing scheme, to guarantee quality of the process and independence of the acting bodies.

#### **The expert group**

The Expert group 'Certification' and its task forces, responsible for the drafting, extension and maintenance of the BIG Certification/listing procedure for products including test specifications and test tools. The group consists of the BIG WG-Technique. The group reports to the Certification Board

Note 1: Test Specification is defined by SSPC-135. The task of the BIG expert group is to bring European requirements into the SSPC 135 body maintaining the testspecs.

Note 2: Test tools are as far as possible in common with those of the BACnet International's BTL. The BIG expert group shall co-operate with BTL in the definition and maintenance of the tools.

Note 3: All Harmonisation and interpretation which is influencing ASHRAE 135.1P or the BACnet® Standard shall be proposed to the responsible SSPC 135 working groups. Testing issues may be handled locally or together with the BACnet International-BTL working group.

#### **Certification Management Committee**

The BIG Certification Management Committee shall consist of five voting representatives from BIG WG-Technique and one consulting representative from the BIG –EU accredited test labs. The BIG-EU. Executive Committee appoints the the members on recommendation of BIG-EU. WG-T for a two years' term.

These three tasks have been assigned to the committee:

1. It's responsible for harmonization / interpretation of test procedures and / or interpretation of the BACnet standard on an ad hoc base for issues outside the scope of the test lab's tasks. These interpretations shall remain valid for all future testing until BTL-WG or SSPC135 decide on that matter.
2. It acts as a first level of appeal if the test lab and the applicant do not reach consensus on issues in the test report. The committee shall act as a board of arbitration; its aim shall be to reach an acceptable solution for all involved parties without to infringe rules and regulations of the accredited test lab. In the rare case that no solution acceptable to all parties could be reached, the committee communicates its own, deviating position to the certifier / listing body.
3. It acts as a technical expert team for the board in cases when the board needs a second opinion about the recommendation for listing

In case of items two and three above, three out of the five members of the committee shall act. The acting members shall not be involved in the issue to act upon nor shall they be related to the applicant.

### **Certification Board**

The BIG Certification Board is responsible for the surveillance of the Certification/listing process and the compliance of the BIG Certification Department to EN45011. The Certification Board also acts as the ultimate body of appeal. The certification board consists of the BIG Advisory Board.

#### **2.3.2.4 Certification Department**

The Function of a Certification Department may reside within the BIG or be delegated to a company providing this kind of service. In both cases the operation of this department is run in accordance with the requirements of EN 45011 (General criteria for bodies operating product certification systems)

The Certification Department shall carry-out or arrange for the assessment of test labs acc. to the rules defined in chapter 0. During assessment of the operation of testing laboratories, the BIG certification department together with its designated experts takes into account the requirements of EN45002 (General requirements for the assessment of testing laboratories) and 45003 (General criteria for laboratory accreditation bodies, identical to ISO/IEC Guide 58-1993).

#### **2.3.2.5 Independent Test Lab**

The BIG accredited testlab shall have the necessary impartiality, independence and integrity in accordance with the requirements of ISO/IEC 17025 clause 4. The process interactions of the testlab are defined in more detail in the underneath chapters 3. and 0 of this handbook. The test lab executes its tasks in accordance with the rules imposed to an accredited test lab. Most notably it decides on conformance of a product against the standards, the decision based on tests according to the ratified test plans.

#### **2.3.2.6 Confidentiality**

One of the consequences of applying this European standard is the full neutrality and integrity guaranteed by the BIG certification/listing Schemes. Any expert to whom BIG takes recourse in the framework of the operation of the BIG Certification/listing Scheme (e.g. members of the Certification Board) is obliged to sign a confidentiality agreement.

### 3. Certification/listing Process

The process to gain a certificate is the main part of the overall certification/listing process. The process to retain the certificate and the process to withdraw a certificate define subprocesses residing in the boxes "Re.certification/listing process" and "withdrawal of a certificate" respectively of Figure 3–1: BACnet® Certification Process: Overview. To understand all details of the process the description of the proformas and their use in chapter 5. Lists, Testplans, Forms and Proforma is important.

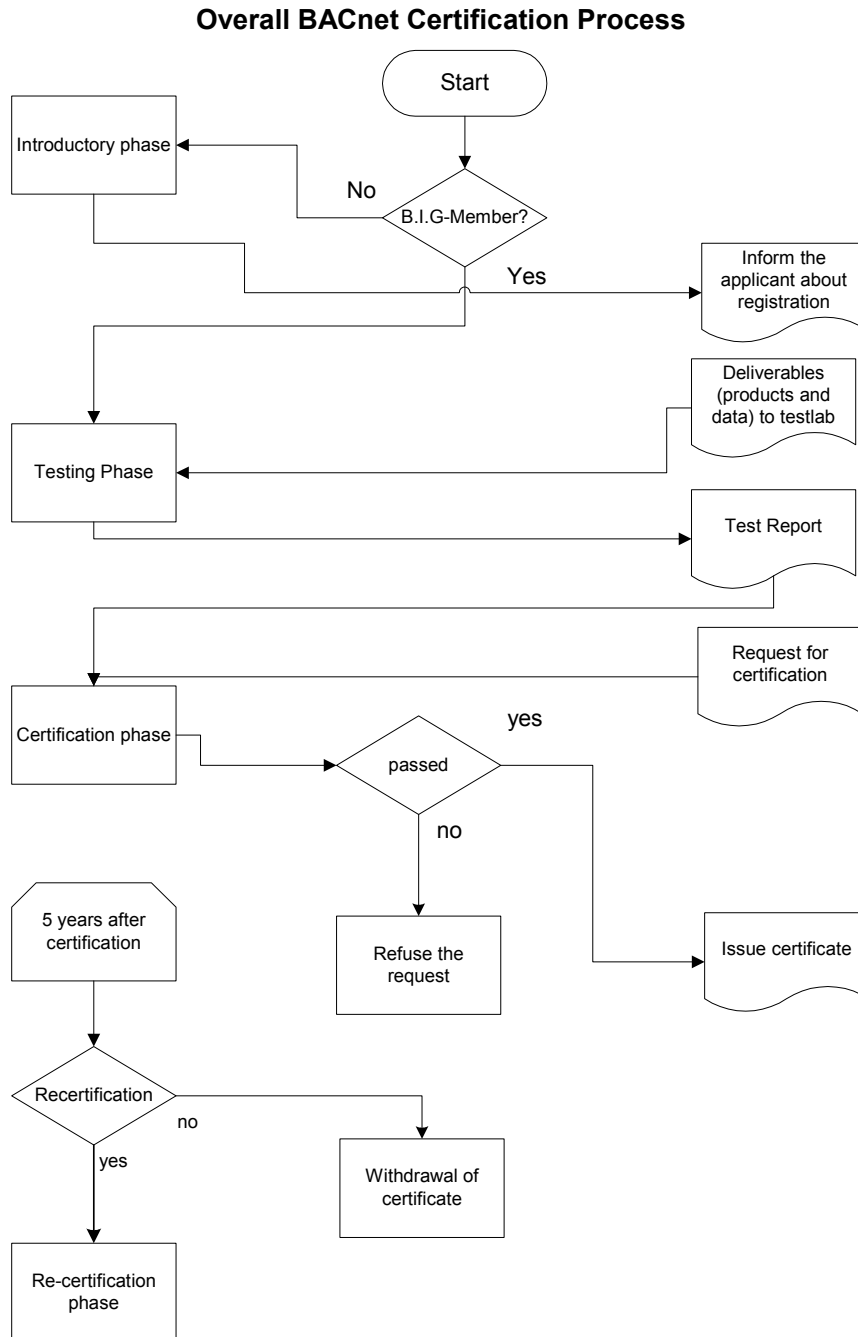


Figure 3–1: BACnet® Certification Process: Overview

### 3.1 Process to gain a certificate/listing

The certification/listing process for not yet certified/listed products consists of 3 phases.

- Introductory and registration phase: Identification of product, manufacturer and contractor
- Testing phase: Submitting the products and the necessary proforma to a BIG accredited testlab, carrying out the test, providing a test protocol.
- Certification/listing phase: The applicant presents the testprotocol and other necessary documents to the BIG certification department and receives, after thorough inspection of the documents, the certificate. In case of non-fulfillment of the requirements, the product is withdrawn from the applicant's list.

#### 3.1.1 Introductory and registration phase

Prior to submit a product to a testlab for conformance testing, the applicant may address BIG to get advice or information on the process as well as a list of accredited testlabs. This step may be especially useful if the requester intends to apply for a shortened process, e.g. with a "derived product".

If the company applying for certification/listing (the applicant) is not a BIG member, it shall enquire BIG office about the conditions for a BIG certification/listing-mark licence agreement. BIG office will document the requester with the necessary information:

- BIG certification/listing-mark licence agreement text. The agreement governs the use of the BIG certification/listing mark on registred and / or certified/listed BACnet<sup>®</sup> products.
- BIG certification/listing-mark licence agreement request form

If the applicant is a BIG member, the membership entitles it to use the BIG certification/listing-mark under the conditions defined in the "Guide to use the BIG certification/listing-mark". This applicant may skip the introductory phase.

An applicant has to be either the manufacturer, a vendor or an OEM. The vendor can only apply for certification/listing, if he can show a written assurance from the manufacturer, that he will provide the necessary information and support needed for the testing and certification/listing process.

A contractor can't apply by its own for certification/listing. But he can act on behalf of the manufacturer or OEM. He has to furnish a document of authorization from the manufacturer or OEM. The certificate will be issued to the name of the manufacturer or OEM and the manufacturer or OEM has to either be BIG member or sign a BIG certification/listing-mark licence agreement.

The product certified/listed may either be a pure SW-product, that runs on standard HW, e.g. a PC or it may be a device with embedded BACnet<sup>®</sup> SW (usually called Firmware). In both cases, the product provides communication- as well as application functionality, it is to be used as an "end product"

In addition, two special cases have to be considered: A BACnet<sup>®</sup> communication stack, to be integrated into products and systems to provide BACnet<sup>®</sup> communication capabilities and a platform-product from which different end products may be derived. Clause 3.7 Process management special issues defines the rules for the certification/listing of products using already certified/listed communication stacks or already certified/listed platforms.

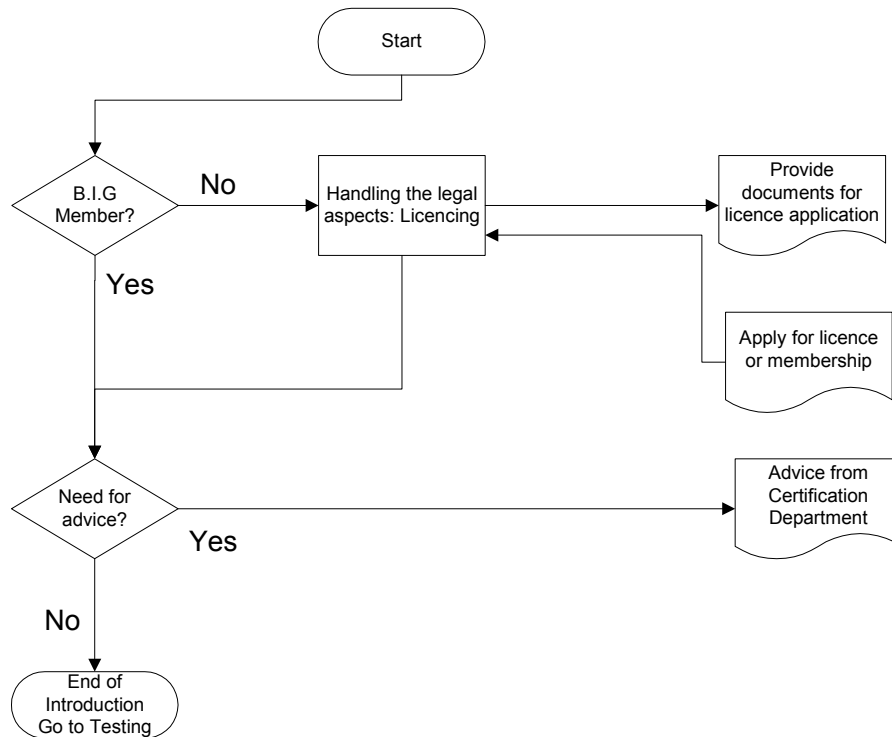


Figure 3–2: BACnet® Certification/Listing Process: Introductory- and Registration Phase

### 3.1.2 Testing phase

The applicant shall make a contract for the test of his BACnet® product directly with a BIG accredited testlab. A list of accredited testlabs is available from the BIG certification department. The applicant shall deliver to the testlab at least:

- One piece of the product to be tested for conformance to BACnet®
- A completely filled PICS form. The PICS form is defined in the BACnet® standard ASHRAE/ANSI 135 Annex A (or in the respective addenda). The PICS shall include all implemented objects and services, the standard and the proprietary ones. It also shall include all implemented properties, the mandatory as well as the (implemented) optional ones.
- A complete electronic PICS (EPICS) acc. to ASHRAE 135.1P including again all implemented mandatory- and optional items and including the additional information requested by ASHRAE 135.1P<sup>1</sup>.
- The product has to include a test application. This application shall be the real application in a non-programmable product and it shall be a specific test application allowing to test all items listed in the PICS in case of a programmable product. If the unit under test is not a device but a BACnet® communication stack only, the applicant has to provide an environment where the SW can run and a test-MMI to manipulate the BACnet® stack's API
- If necessary, simulators to activate the device under test's physical Interfaces shall be provided by the applicant
- The testlab may ask for additional information or for support for the set-up of the product in the test-environment.

The test procedure will be carried out in 4 phases: application, test preparation, testing and reporting of the results:

<sup>1</sup> This additional information is often called PIXIT (Protocol Extra Information for Testing)

- Application:** The Applicant shall deliver the BACnet Protocol Implementation conformance statement (PICS) as well as the EPICS file of the BACnet product to the testlab. The EPICS file will be the basis of the tests. The testlab develops a testplan and submit a quotation including expected starting time and time duration.
- Test preparation:** When the testlab is commissioned to test in a first step the consistency of the EPICS file is tested according to ASHRAE 135.1P clause 5. If the EPICS file is not conform to the definition in ASHRAE 135.1P the testlab informs the applicant about the failures and asks for a reworked version of the EPICS file. The applicant will be charged extra for every additional consistency test. If the consistency of the EPICS file is ascertained the testlab develops a detailed testplan and generates the product-specific test scripts. The lab informs the applicant about the time schedule and if the applicant would like to attend the test the schedule will be arranged with the applicant. The applicant shall deliver the product and the test-environment to the testlab.
- Initial testing:** The testlab shall carry out the tests according the ASHRAE 135.1P. All relevant tests of the kinds listed (object support, application service initiation, application service execution, network layer, logical link layer protocol, special functionality, BACnet<sup>®</sup> IP functionality) shall be carried out. The data link protocol shall only be explicitly tested, if it is one of the two BACnet<sup>®</sup> specific data-link protocols, i.e. MS/TP or PTP. Other link layer protocols shall be tested "by use".
- Reporting the results:** The testlab shall hand over the test report to the applicant. This report shall contain all information required by ISO/IEC 17025 and the information defined in ASHRAE 135.1P clause 15 "Reporting of Testresults". The testlab shall store a copy of the test report and of the EPICS and of all other information needed to assess the test procedure or to repeat the test.

All the information the testlab gets in connection with the contract are confidential and may only be communicated to the applicant.

The first certification/listing of a product requires an initial test as described above with all relevant tests of ASHRAE 135.1P. If a product shall be re-certified/listed a shortend test program may be sufficient. Four types of tests may be performed:

- Initial test:** shall be performed when a BACnet product is certified/listed the first time. All relevant tests of ASHRAE 135.1P have to be performed.
- Repeat test:** shall be performed when a BACnet product shall be re-certified/listed after the expiry of the validity of the certificate when no BACnet relevant parts of the product were changed. These tests were random tests which will check if the product is still conform to the standard and cover 30% of the extent of the initial tests. The testlab decides about the tests which shall be done.
- Additional test:** shall be performed when BACnet parts of the product were changed. The changed functionality of the product will be tested. The testlab decides the extent of the tests in consultation with the applicant.

Retest: shall be performed when substantial BACnet relevant parts of the product were changed. The test procedure is identical to the initial test. All relevant tests of ASHRAE 135.1P shall be performed. The testlab decides when retesting is required in consultation with the applicant.

Reports of repeat tests and additional tests are always related to a report of an initial test or a retest and the certificate is only issued in combination with these tests.

### 3.1.3 Certification/listing phase

Guidelines for the procedure to be followed by the test lab and the different BIG-EU bodies to grant the listing and logo:

- The procedure shall be supervised by BIG-EU office, i.e. the office shall receive and forward all documents from and to the involved bodies so they can keep track on the process and remind the parties if a process step is not finished in due time.
- The BIG-EU board is the listing body, i.e. the board decides about listings.
- To support the board members the test lab shall provide a recommendation on whether the listing should be granted and if necessary under which constraints. This recommendation shall be accompanied by reasoning, if it recommends to issue the listing under constraints or to deny the listing. The board is however free to follow these arguments or not.
- If the board needs a second opinion, it asks the certification management committee for its expert opinion.
- If the applicant contests the test lab's conclusions in the test report, he may appeal to the certification management committee. The committee's opinion is then forwarded to the executive board together with the test lab's recommendation.

This process steps shall be followed to provide a BACnet listing:

1. The test report shall be forwarded by the test lab to the customer
2. The customer decides whether he will apply for a listing
3. The application for a listing: shall be forwarded from the customer to the BIG-EU office
4. BIG-EU office: Informs the test lab about the application
5. The test lab sends its recommendation (and if appropriate the listing form) to the office
6. BIG-EU office sends these documents to the executive board
7. The executive board decides and communicates the decision to the BIG-EU office
8. BIG-EU office informs the customer and publishes the listing information on the website if the listing has been granted by the executive board.

The office takes track on these steps and reminds a party if a step doesn't get finished in due time. The board will provide rules for the timeframe.

Guidelines for the procedure to be followed by the test lab, the certification body and the different BIG-EU bodies to grant a certificate:

[This process will be defined by the time when certification can be offered]

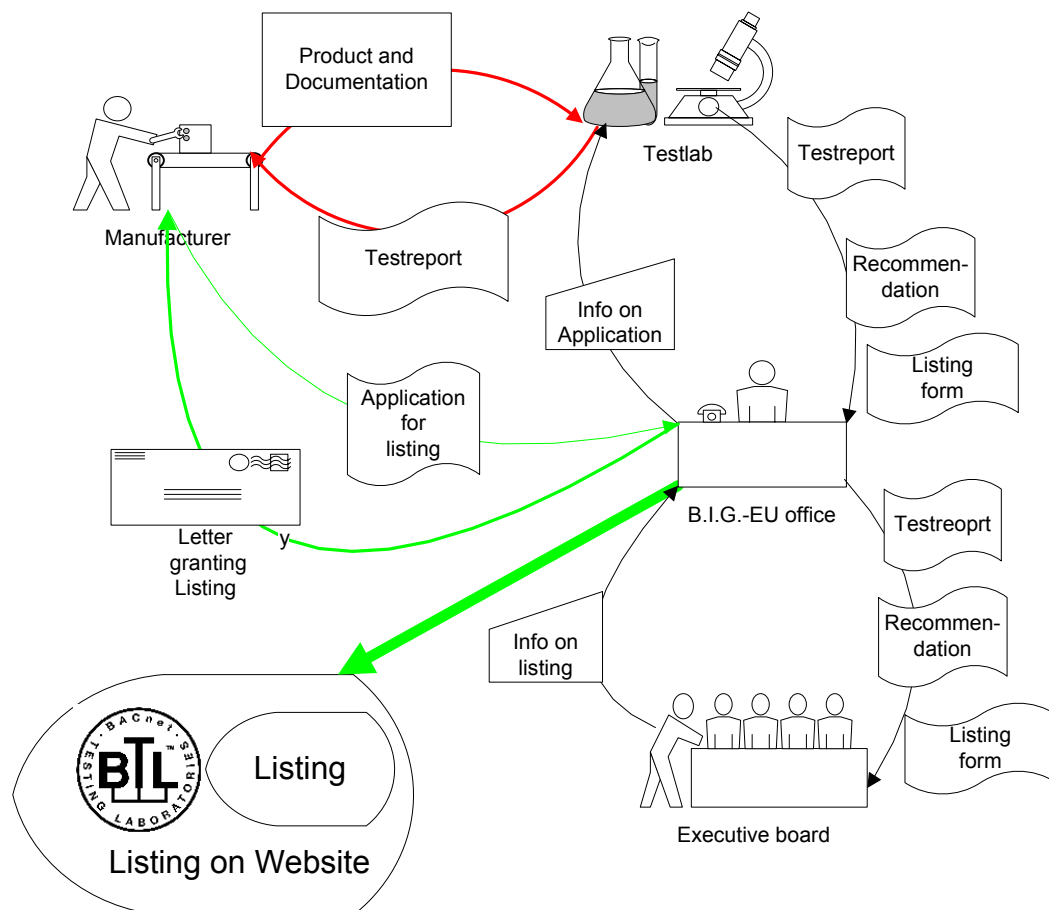


Figure 3–3: BACnet<sup>®</sup> Listing Process: Testing- and Listing Phase

### 3.2 Validity of the certificate

The BACnet certificate is valid 5 years. After this period, re-certification/listing with a repeat test is required to prolong the validity of the certificate.

### 3.3 Maintenance of the certificate/listing

To keep the certificate throughout the validity period an annual certification/listing fee has to be paid to the certification department. This fee covers the costs to maintain and observe the certification/listing and to run the product database with all relevant data of the certified/listed product. Additionally, non-BIG-members have to pay a certification/listing mark licence fee to the BIG. This fee includes the publication of the product in the product database on the internet.

### 3.4 Process to retain a certificate/listing

Re-certification/listing is required:

- If the validity period of the BIG certificate expires
- If communication-relevant parts of the SW of a BIG certified/listed product changed
- If communication-relevant parts of the HW of a BIG certified/listed product changed
- If the BACnet standard changes (see clause 3.7.2 “Transition to new BACnet protocol versions/releases” of this handbook)

### 3.5 Re-certification/listing process

The BIG certification department informs the applicant in writing (letter or e-mail) at least three months before the expiry date of the certificate. The user of the certification/listing mark then decides whether or not to extend the validity of the certificate with another validity period (see clause 3.2 of this handbook). If the user of the certification/listing mark does not submit an application for re-certification/listing of a given product, the BIG certification/listing-mark shall be removed under the conditions stipulated by the BIG trademark license agreement.

If any of the reasons mentioned above (clause 3.4) for re-certification/listing apply, the user of the certification/listing mark shall inform the BIG certification department and ask for a re-certification/listing. A new 6 month period starts and the product is marked in the BIG product database as "under re-assessment" The applicant shall submit the necessary documents to allow the BIG accredited testlab to define the necessary testsuites for re-testing (necessary form and checklist see clause 5. Lists, Testplans, Forms and Proforma).

When the communication relevant parts of the product were not changed a repeat test shall be performed. If communication relevant parts of the product were changed additional tests or retesting may be performed. The testlab decides in consultation with the applicant. The testlab shall forward the test report to the BIG certification department.

When the test results were positively assessed by the testlab, BIG will prolong the BACnet<sup>®</sup> certificate.

The validity of the certificate is prolonged for another period (see clause 3.2), if

- a repeat test is performed after the validity period has expired
- a retest is performed (complete conformance tests, identical to initial tests).

If additional tests were performed due to changes of the communication relevant parts of the BACnet product the validity of the certificate remains as before the re-certification/listing process.

When the test results were negatively assessed, BIG will oblige the applicant to withdraw the BIG certification/listing mark from the product and from all related documents.

Everybody is entitled to request for testing or re-testing of a BACnet<sup>®</sup> product at a BIG accredited testlab by his own expenses. On justified suspicion that the product doesn't meet the requirements of the standard anymore the BIG certification department is entitled to ask for a re-testing of certified/listed BACnet<sup>®</sup> products (additional or repeat tests).

However, the parties entitled to apply for certification/listing are entirely listed in clause 3.1.1 Introductory and registration phase .

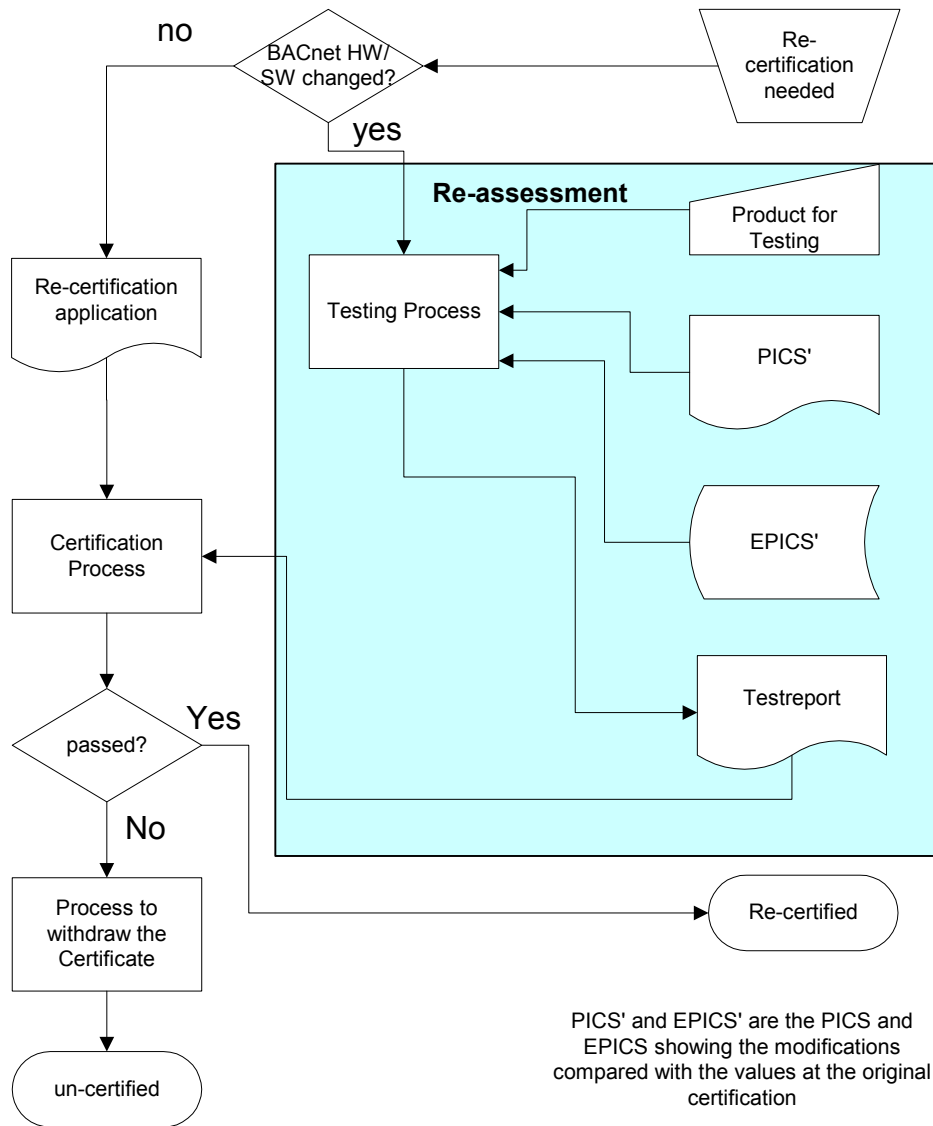


Figure 3–4: BACnet<sup>®</sup> Certification/Listing process: Re-certification/Listing and Re-assessment phase

### 3.6 Process to withdraw a certificate/Listing

This process can be initiated by different players:

- The user of the certification/Listing mark, if he decides that he no longer will maintain using the certification/Listing mark.
- The BIG certification department, if the required time period for re-testing expired, the test result was negative or the user of the mark doesn't pay the annual certification/Listing fee.
- The BIG certification board as the result of an action taken in response to an appeal or a complaint.

If the user of the BACnet<sup>®</sup> certification/Listing mark decides to withdraw it by his own will, he informs the BIG certification department by means of the form "Request to withdraw the BACnet<sup>®</sup> certificate". The BIG certification department will then respond by withdrawing the product from the BACnet<sup>®</sup> certified/Listing product database and by confirming this action to the user with the form "Decision to withdraw the BIG certification/Listing mark"

If the BIG certification department withdraws the certification/listing mark according to one of the reasons the department is explicitly authorized to do so, it communicates its decision to the user of the certification/listing mark with the form "Decision to withdraw the BIGcertification/listing mark". The user of the certification/listing mark can appeal against this decision to the BIG certification board.

If the BIG certification board decides to withdraw the right to use the BIG certification/listing mark as a decision resulting from an appeal or a complaint, it communicates its decision to the applicant / owner with the form "Decision to withdraw the BIGcertification/listing mark". There is no appeal against decisions of the certification board.

## **3.7 Process management special issues**

### **3.7.1 BACnet Standard extension approval**

The process to propose and approve extensions to the BACnet<sup>®</sup> standard is owned by ASHRAE SSPC 135. This is the only organisation entitled to extend the standard. Request for extensions / modifications of the BACnet<sup>®</sup> standard, which are raised in the context of BACnet<sup>®</sup> testing in Europe shall be brought via the Certification Expert Group into SSPC135 as a proposal.

### **3.7.2 Transition to new BACnet protocol versions / releases**

The transitional period between two versions / revisions of the BACnet<sup>®</sup> standard is one year. During this year, certificates based on both editions of the standard are valid. Six months after the transition to the new standard conformance test may equally be made against the old or the new version / revision of the standard. Certificates based on conformity tests on the previous standard will be valid only to the end of the transitional period.

Generally, tests of products shall always be carried out on the basis of the last valid edition of the standard.

After the transitional period all certificates based on a previous version of the standard will be invalid if the user of the certificate has not applied for re-certification/listing in this period. The user of the certificate has to apply at a BIG accredited testlab for a conformity test to the new standard. The testlab will review the product data whether the conformity of the product is affected by the changes of the standard. When the testlab attests the applicant that the product is still conform to the standard the certificate will be issued for the new standard. The date of expiry of the validity of the certificate will be the same as before the transcription of the certificate.

When the changes in the standard affect the conformity of the certified/listed BACnet product the testlab has to decide whether additional tests or retesting is required in consultation with the user of the certificate. In the case of additional tests the date of expiry of the validity of the certificate will be the same as before the transcription of the certificate. When the product is retested the certificate is valid for a whole new period (see clause 3.2).

### **3.7.3 Certification/listing of products using already certified/listed communication stacks**

If an already certified/listed protocol stack is used in a BACnet<sup>®</sup> product, the product has nevertheless to be tested. The test however may become reduced to the part of the functionality not covered by the protocol stack software. The testlab will decide the level of testing needed in consultation with the applicant.

### **3.7.4 Certification/listing of a derived product**

"Derived" is called a product, which either is based on an already certified/listed product or which is based on a certified/listed platform. A platform is a base for a family of end-product but by itself no marketable product.

For a derived product, a request for certification/listing is always needed. The testlab will decide, based on the documents received from the applicant, whether a retest, an additional test or no testing is required in consultation with the applicant..

### **3.7.5 Process to handle appeals, complaints and disputes**

Appeals against decisions of any BIG bodies are handled by the BIG certification board. The board decides finally

Appeals against test procedures or test results from a BIG accredited testlab are handled and decided upon by the certification management committee. Against these decisions an appeal can be made to the certification board. This board decides finally. Contract disputes between a testlab and an applicant are not in the responsibility of BIG

Complaints from third parties against the use of the BIG conformance mark on a specific product are handled by the BIG certification board. The board may take any measures necessary to establish whether the complaint is justified. The board may refuse the complaint or it may take any measures needed to re-establish conformance to the BIG rules. The board decides finally.

### **3.7.6 Actions to take against unauthorized use of a certificate**

To be defined.

## **4. Qualifying- and Accreditation Process for Test Laboratories**

To be defined.

## 5. Lists, Testplans, Forms and Proforma

### 5.1 Checklists and Testplans

BACnet International-BTL-WG developed, in cooperation with BIG-EU, a set of checklists and testplans for testing of conformance to BACnet. While the BACnet standard 135 defines communication protocol and objects, BACnet teststandard 135.1 defines the testprocedures. Checklist and testplans however determine which of the tests have to be applied to test which BIBB and give additional hints. In more detail:

#### 5.1.1 BTL/IUT Functionality Checklist

The BTL Functionality Checklist serves as the guide for the pre-tester and BTL / BIG-EU testlab - tester for determining what tests will be applied to the IUT. As the name suggests, it presents lists of BACnet capabilities. For each capability supported by the IUT, the box in the 'Support' column is checked.

A copy of the BTL Functionality Checklist named the IUT Functionality Checklist should be completed for use by the pre-tester in pretesting. It must be received by the BTL / BIG-EU testlab before testing on the IUT can begin

#### 5.1.2 BTL Test Plan

The BTL Test Plan is a worksheet that provides information about each of the actual tests performed by the pre-tester and the BTL / BIG-EU testlab tester.

Each entry in the Option column of the BTL Functionality Checklist corresponds to the title of a section in the BTL Test Plan. Each section in the BTL Test Plan identifies where the test is to be found (by ASHRAE 135.1 clause number, by BTL-Specified Tests clause number, or by reference to some other document). The section conveys other information about the test, such as whether a script (see the Script Library, below) exists for the test or if it is performed manually, conditions under which the test may be skipped, configuration, and so on.

There is also space for the pre-tester to make notes to himself, if necessary, on how to configure the IUT for the test. These could be used as the basis for the IUT Special Test Instructions form; the BTL Test Plan itself is not submitted to the BTL.

#### 5.1.3 Script Library

The Script Library contains a set of scripts that can be executed by VTS to automate many of the tests. These scripts are ASCII text files that define the content and order of BACnet messages that are to be sent and expected to be received by VTS.

Which of the scripts are to be used in testing is determined by the items checked in the BTL Functionality Checklist; the sections of the BTL Test Plan referenced by the checked items list the script(s), if any, that are to be used in the indicated test. Usually the scripts to be used need to be edited to provide IUT-specific information. A customization section will be provided at the beginning of the scripts for this purpose.

Remark: For some tests, scripts are not yet available in the initial test rounds. For these tests manual testing is applied.

### **5.1.4 Presentation of multiple revisions of a product and / or derived products on BIG-EU listing site**

We distinguish between derived products and new SW-/FW-revisions of an existing product.

- Derived products provide different functionality than the product they are based upon. They may contain different SW-/FW-parts than the base product. If they contain modifications in BACnet relevant parts they have to undergo conformance test acc.to chapters 3.7.3 / 3.7.4
- New revisions of an existing and already listed product provide the functionality of the former revision (maybe with some enhancements), use the same product name and type designation and are exchangeable with a device of a former revision.

The further discussion deal with the listing on the BIG-EU website. The testing- and listing process are covered in chapter 3.

#### **5.1.4.1 Listing of derived products**

- Derived products shall be listed in one common entry field in the overview page of the "European Product List for Proven BACnet Conformity". In the "Details Listing" page, i.e. in the "BACnet Testing Labs Product Listing" form that shows-up clicking on the BTL mark in the overview page, each derived product shall be itemized in the second table (i.e. the table with the columns Product Name, Model Number, Firmware Revision).

#### **5.1.4.2 Listing of a new revision of an already listed product**

- On the overview-page "European Product List for Proven BACnet Conformity" only the latest revision of the SW/FW shall be listed.
- If this "BACnet Testing Labs Product Listing" form contains multiple revisions of a product, then in the overview page a new button "Former Revisions" shall make the reader aware that additional revisions may be listed. By clicking on this button a list of the former listed revisions of this product pops-up.
- The PICS forms of former revisions shall remain on the website and shall be accessible by clicking on the respective entry of the above pop-up list.

## **5.2 List of all forms related to BIG certification/listing**

- BIG certification/listing-mark licence agreement text. The agreement governs the use of the
- BTL. certification/listing mark on registered and / or certified/listed BACnet<sup>®</sup> products.
- BIG certification/listing-mark licence agreement form
- Guide to use the BIG certification/listing-mark
- Application form for BACnet<sup>®</sup> certification/listing
- PICS, PIXIT and Profile-ICS proforma: Included in the BACnet<sup>®</sup> PICS form and in the EPICS forms, see ANSI/ASHRAE 135 and Addenda and ASHRAE 135.1P
- BACnet<sup>®</sup> re-certification/listing checklist and forms
- BACnet<sup>®</sup> re-assessment checklist and forms
- Request to withdraw the BACnet<sup>®</sup> certificate
- Decision to withdraw the BIGcertification/listing mark

## **Annex A: Testlabs and Certification Departments appointed by BIG-EU**

Currently these entities have been appointed by BIG-EU to the role of Testlab and Certification Department. (This list will be amended when additional entities will be appointed):

- **Independent Testlab:** WSPLab, Kapuzinerweg 7, D-70374 Stuttgart
- **Certification Department:** WSPCert, Kapuzinerweg 7, D-70374 Stuttgart (to become active as soon as the conditions for formal certification will be given).