



ATG-PLT Rules

In litigation, the French version applies

1 Purpose and scope

These product Certification Rules of the ATG Mark shall apply in addition to the General ATG Certification Rules and define the specific conditions for the granting and maintenance of the ATG Mark for different product families:

- Stainless steel pliable corrugated tubing kits in buildings for gas with an operating pressure up to 0.5 bar (Pliable Linear Tube or “**PLT**” kits), in accordance with Specifications AFG CCH2007-01 of June 2007, made mandatory by the Decree of 15 July 1980, amended since 1 October 2007. This decree recognises the granting of the ATG Mark by CERTIGAZ as proof of conformity to the product specifications.

Specifications CCH2007-01 were revised in June 2014 by the BNG236 commission.

- Stainless steel pliable corrugated tubing kits in livestock buildings for gas with an operating pressure up to 2 bar (“**Livestock PLT**” kits), in accordance with Specifications AFG CCH2010-02 of March 2014, recommended by GROUPAMA in the guide to the rules of installation and use of gas heating for livestock.

For information, the Decree of 27 December 2013 deals with livestock installations classified for environmental protection.

- Stainless steel pliable corrugated tubing kits for gas with an operating pressure up to 2 bar, compliant with Standard XP E 29-826.

Ultimately, this standard should replace the two specifications mentioned above, CCH2007-01 and CCH2010-02. The transition period shall be 3 years from the publication of Standard XP E 29-826.

- Short hoses (**FC**) for the connection of piped gas distribution infrastructure within the scope of the amended Decree of 2 August 1977, in accordance with Specifications AFG CCH 2006-01 of December 2007, made obligatory by the Decree of 15 July 1980 amended since 1 January 2008. This decree recognises the granting of the ATG Mark by CERTIGAZ as proof of conformity to the product specifications.

Specifications CCH2006-01 were revised in March 2015 by the BNG236 commission.

Short hoses are classified into 3 families that correspond to the type of use:

- Penetration hoses (FCP)
- Metering hoses (FCC)
- Pressure reducing hoses (FCD)

These specifications are available on the AFG website, www.afgaz.fr under *Publications - Technical documentation - Other technical documents*.

2 Definitions

The definitions in paragraph 4 of the CCH 2006-01, CCH 2007-01 and CCH 2010-02 and paragraph 3 of Standard XP E 29-826 shall apply for their respective domains.

3 Marking

The Marking rules for products, their packaging and instructions are defined:

- in paragraph 8 of CCH2007-01 for PLT kits.

However, the comment "in the absence of inscription or marking on the pliable tubes or PLT fittings" of the second paragraph of chapter 8.2 of CCH2007-01 is not applicable.

- in paragraph 8 of CCH2010-02 for livestock PLT kits.
- in paragraph 7 of Standard XP E 29-826 for PLT kits up to 2 bar.
- paragraph 10 of CCH2006-01 for FCs.

In addition to these requirements, the tubes and fittings constituting PLT kits and short hoses shall bear the letters ATG or the ATG logo under the same conditions as other required markings.

The instructions and trade documents relating to the accessories certified by the ATG Mark may refer to the ATG Mark and bear the ATG logo in such a manner as to prevent any misinterpretation if accessories are not certified.

The instructions shall describe the implementation of protections (tape width, length of heat-shrinkable sheath, shrinkage temperature, minimum overlap percentage on the tube sheath and on the fitting, minimum overlap percentage at each pass of the tape, sleeve expiry date management if necessary, recommendations of application to prevent protection contamination, etc.).

4 Certification criteria

4.1 Obligations

No specific obligations other than those specified in the application form (Annex 1).

4.2 Applicable requirements

4.2.1 For PLT kits

PLT kits bearing the ATG Mark shall comply with the following specifications:

- Specifications AFG CCH 2007-01 mentioned in §1.
- Decisions taken following the BNG236 meetings in November 2012 and 2016 for the implementation of PLT kits.
- Supplement to CCH 2007-01 for the definition of products and the implementation of tests, mentioned in Annex 2.

4.2.2 For livestock PLT kits

Livestock PLT kits bearing the ATG Mark shall comply with the following specifications:

- Specifications AFG CCH 2010-02 mentioned in §1.
- Supplement to CCH 2010-02 for the definition of products and the implementation of tests, mentioned in Annex 3.

4.2.3 For PLT kits up to 2 bar

PLT kits bearing the ATG Mark shall comply with the following specifications:

- Standard XP E 29-826 mentioned in §1.
- Additional information in the test plans, mentioned in Annex 5.

4.2.4 For short hoses

Short hoses bearing the ATG Mark shall comply with the following specifications:

- Specifications AFG CCH 2006-01 mentioned in §1.
- Supplement to CCH 2006-01 for the implementation of tests, mentioned in Annex 2.

4.3 Quality management requirements

4.3.1 Quality management system

The minimum provisions in terms of quality assurance that the applicant/holder shall adopt and set up so that the products covered by the ATG-PLT Mark are produced and/or distributed at all times in accordance with

these certification guidelines are defined below.

By making use of the ATG Mark, the holder makes a commitment regarding the permanent quality of the certified products that it manufactures and/or supplies to its customers. In the context of the ATG-PLT Mark, the applicant/holder shall provide proof of the existence and effectiveness of its quality record.

The objective to be achieved by the applicant/holder is process control (as defined in Standard NF EN ISO 9000) and the maintained compliance of its products with the models initially accepted.

Achieving this objective requires that the applicant/holder should implement its own means whose performance is assessed during the admission visit and verified during follow-up visits. The quality requirements of this ATG-PLT Mark are defined below and are based on the requirements of NF EN ISO 9001 whose scope is limited to the field of application. The following table summarises these requirements based on the version of the standard.

Note that the 2008 version will not be applicable after October 2018.

Quality requirements	§ NF EN ISO 9001		Requirements*
	2008	2015	
Quality management system	4		
General requirements	4.1	4.1 - 4.2	Required for the product manufacturing processes.
Documentation requirements	4.2	4.4 – 7.5	Required
Management responsibility	5		
Management commitment	5.1	5.1 - 5.2	Required
Responsibility and authority	5.5.1	5.3	Required
Management representative	5.5.2		Required
Management review	5.6	9.3	Required
Resource management	6	7.1 to 7.4	Required
Product development	7		
Product development planning	7.1	8.1	Required
Customer-related processes	7.2	8.2	Required for customer complaint management
Purchasing	7.4	8.4	Required
Control of service production and preparation	7.5.1	8.5.1	Required
Identification and traceability	7.5.3	8.5.2	Required
Product preservation	7.5.5	8.5.4 - 8.5.5	Required
Control of monitoring and measuring equipment	7.6	7.1.5	Required
Measurements, analysis and improvement	8		
Product monitoring and measurement	8.2.4	8.6 - 9.1	Required
Control of non-conforming product	8.3	8.7 - 10.2	Required
Corrective action	8.5.2	10.2	Required

(*) These requirements also apply to subcontractors if any

4.3.2 In-process control plan

4.3.2.1 Raw materials

The characteristics of materials used in the manufacture of accessories shall be guaranteed by the manufacturer (raw material certificates or internal controls).

The traceability of batches of raw materials in relation to batches of finished products shall be ensured.

4.3.2.2 Dimensional characteristics

The manufacturer shall set up procedures to ensure that the allowable manufacturing tolerances for the accessories (pliable tubing, fittings, hoses, coatings and components) are in accordance with the declared values drawn from the initial type tests.

The definition and frequency of the necessary metrological verifications are left to the discretion of the manufacturer.

4.3.2.3 Minimum in-process tests, batch release and process monitoring

A batch of PLT pliable tubes or short hoses is a set of products with the same definitions having the same nominal diameter (DN) and marking, manufactured on the same machine without modification of the manufacturing parameters, from the same batch of raw materials. The batch shall be defined and identified by the manufacturer.

A batch of fittings, for the various PLT kits, is a set of fittings with identical dimensional characteristics, having the same nominal diameter and same marking, manufactured during the same production run from the same batch of raw materials. Production run means the period during which a defined and homogeneous quantity of the accessory is manufactured under uniform conditions. The batch shall be defined and identified by the manufacturer.

The characteristics and minimum frequencies of the tests shall be in accordance with the data in the tables in the respective annexes of the product families (Annexes 2 to 4).

For PLT kits or FCs, in the event of non-compliance of only one sample in the tested batch, another batch of samples consisting at least twice the original batch of samples, from same production batch, shall be retested; and if one of the new samples is found to be non-compliant, the production batch shall be rejected and analysis and corrective actions shall be carried out.

5 ATG certification process

5.1 Admission

5.1.1 Application file

The model application file is given in Annex 1.

5.1.2 Audits

The main manufacturing site is where batch release controls, packaging and provision of products are carried out. It is always audited during admission.

If it is different from the main manufacturing site, the manufacturing site of PLT or short hoses must be audited at the time of admission.

Other manufacturing sites of the components of products covered by the application for admission shall be audited only when the manufacturer cannot demonstrate that it has sufficient control over it (ISO 9001:2008 § 7.4 and § 8.2.4). They are referred to below as secondary manufacturing sites.

5.1.3 Tests

The admission tests and controls shall be:

- those defined in paragraphs 7 and 8 of the respective specifications, taking into account the details provided in Annexes 2 to 4 for ad hoc products,
- those defined in paragraphs 5 and 6 of Standard XP E 29-826 and Annex 5.

Where possible, they are carried out on products taken as samples by CERTIGAZ during audits specified in 5.1.2 or otherwise from retail shops or from the stocks of a reseller at the expense of the applicant.

Nevertheless, these tests may be performed on samples supplied by the applicant provided that it guarantees that they are representative of the type submitted for admission.

The test specimens shall be produced by the manufacturer or its representative and then shipped to the laboratory.

The tests shall be performed by CETIAT, which is an independent Mark laboratory, with the exception of the tests mentioned below which shall be carried out by other laboratories accredited according to ISO 17025:

- in paragraphs 6.13 Sheath ageing, 6.14 High temperature resistance and 6.15 Fire reaction in CCH 2007-01 and CCH 2010-02, for PLT and livestock PLT kits.
- in paragraphs 5.13 Sheath ageing, 5.14 High temperature resistance and 5.15 Fire reaction in Standard XP E 29-826 for PLT kits up to 2 bar.
- in paragraph 7.4 High temperature resistance of CCH2006-01, for FCs. Note that this high temperature resistance test is no longer requested in the March 2015 revision of CCH 2006-01.

Any report relating to tests other than those in the above paragraphs issued by a laboratory accredited according to ISO 17025 may be taken into account after analysis. In this case, a cross-check test shall be carried out by CETIAT.

For PLT kits, this cross-check test shall be identical to the admission tests but shall only be performed on two DN's (see Annex 2, 3 or 5 for ad hoc products):

- 1 DN from family X,
- 1 DN from families Y or Z,

Family	DN	Range cross-check CCH2007-01	Range cross-check CCH2010-02	Range cross-check XP E29-826
X	10	1 DN	1 DN	1 DN
	12			
	15			
Y	20	1 DN, the largest preferably	1 DN	1 DN, the largest preferably or from DN32/40/50
	25			
	32			
Z	40			
	50			

For short hoses, this cross-check test shall be identical to the monitoring tests for one DN of each hose type (see Annex 4).

Special cases:

For an application for the certification of livestock PLT kits whose characteristics are common to a range of PLT kits, the test plan may be reduced. It shall be defined by CERTIGAZ depending on the nature of the differences.

For an application for the certification of PLT kits up to 2 bar whose characteristics are identical to an already certified range of PLT kits, the test plan shall be reduced. It is defined in Annex 5.

For short hoses with a GrDF operating licence before 2012, admission tests shall be reduced to monitoring tests for one DN of each hose type.

When the application concerns a modification of the product or a range extension, the test plan may be reduced. It shall be defined by CERTIGAZ depending on the nature of the modification or extension.

CERTIGAZ may request CETIAT's laboratory to draw up a reduced test plan. In case of doubt, the Special Committee of the Mark may be called upon to give an opinion. If there is still any doubt, the initial tests shall be performed as a safety and precautionary measure.

5.2 Monitoring

5.2.1 Audit(s)

The monitoring audits shall be carried out under the same conditions as the admission audits provided for in 5.1.2.

The monitoring audits shall be performed:

- annually for the manufacturing and control of flexible hoses;
- every 2 years for the other activities covered in the admission audit.

5.2.2 Tests

The monitoring tests shall be carried out every year by CETIAT on products taken as samples by CERTIGAZ during audits specified in 5.2.1 or otherwise, if the tests allow it (tests on FC semi-finished products, for example), from retail shops or from the stocks of a reseller at the expense of the applicant. After the samples are taken, the products shall be sent to CETIAT at the expense of the applicant, within a maximum of one month.

For PLT kits, the monitoring tests shall be the same as the admission tests, but they shall be performed successively on only one DN from only one family X, Y or Z.

However, some types of tests shall not be performed as part of the monitoring, see Annex 2, 3 or 5 depending on the product.

Before the products taken as samples by CERTIGAZ are shipped, the manufacturer shall produce the test specimens for the laboratory. To respect the chronology of the field, for chemical resistance test specimens, the manufacturer shall bend the test specimens and then apply the protection(s) recommended in the instructions.

It shall also attach the instructions and some additional protective tape for repair.

For short hoses, the monitoring tests shall be the same as the admission tests, but they shall be performed successively on only one DN per type of FC (FCP, FCC and FCD).

However, some types of tests shall not be performed as part of the monitoring, see Annex 4.

Thus, irrespective of the product, all DNs shall be tested over several years at the rate of one DN per year. A rotation is set up so that all the DNs are monitored for as short a time as possible.

6 Approval

These ATG-PLT Certification rules:

- were approved on **10/11/2017** by the Managing Director of CERTIGAZ after consulting the ATG-PLT Special Committee and are applicable from that date;
- cancel any previous version;
- may be modified by the Managing Director of CERTIGAZ after consulting the ATG-PLT Special Committee.

Summary of changes

Revision no.	Date	Main changes made	Impact on the requirements of products already certified and/or transition period; integration/implementation on verification procedures.
Creation	15/04/2009	Creation of ATG-PLT Specific Rules	
Rev1	12/03/2013	<ul style="list-style-type: none"> - § 5.1.3 possibility of a reduced test plan in case of modification - § 5.2.2 details for the monitoring all DN's by annual rotation - Change of address of CERTIGAZ 	
Rev 2	25/07/2013	<ul style="list-style-type: none"> - The Rules govern PLT kits and short hoses based on their respective CCH specifications - For PLTs: <ul style="list-style-type: none"> - consideration of the decisions to amend the CCH of November 2012 for implementation - modification of frequencies and sampling for in-process control - details for the technical file and manifolds 	
Rev 3	25/03/2014	<ul style="list-style-type: none"> - Addition of § 5.5.4 in Annex 2, manifold details forgotten in Rev 2 - Presentation of the information in the technical file, Annex 1, Documents 2 and 3 	
Rev 4	23/01/2015	<ul style="list-style-type: none"> - Amendment only to the name of the ATG-PLT Mark, instead of ATG-PLT/FC, to rectify a discrepancy following the COFRAC audit concerning the filed title. However, the ATG-PLT rules apply to PLT kits and short hoses (FC). - Details on the deadline for sending samples (1 month maximum) to the laboratory and to inform CERTIGAZ (§ 5.2.2 and DOC1 of Annex 1) following the sampling for monitoring tests. 	
Rev 5	22/09/2015	<ul style="list-style-type: none"> - Consideration of the revisions of the specifications in relation to the amended Decree of 16 July 1980. - For short hoses, deletion of high temperature resistance, tensile strength and salt spray resistance tests. According to the CCH version. - Integration of a 3rd family of products: livestock PLT kits. - Rules restructured with an annex for each product family. - Details for the abandonment of a gas installation and the use of protective sleeves for PLT kits. Addition of prohibition note. - Modification of ammonia stress resistance specifications for PLT and livestock PLT kits. Details for chemical resistance tests (tube/fitting joints and sheath repair) for PLT and livestock PLT kits. - PLT or livestock PLT fittings for LPG, M20x150 or G3/4 installation. - Details on sampling for admission, cross-check or monitoring tests for short hoses. - Details for tees and manifolds of PLT kits. 	Transition phase until 31/12/2015; new requirements imposed from January 2016.
Rev 6	03/05/2016	<ul style="list-style-type: none"> - Integration of the 2 versions of ISO9001, 2008 and 2015 in §4.3.1 - In Annexes 2 and 3, details for end PLT fittings with the use of JSC fittings according to Standard NF E 29-536 mentioned in the normative references of CCH, GPL and "mixed" 	No impact on the requirements of already certified products – no need to set a transition period – no verification to be done
Rev 7	10/11/2017	<ul style="list-style-type: none"> - Addition of PLT 2 kits according to Standard XP E 29-826 with a 3-year transition period for the termination of CCH2007-01 and CCH2010-02 With the details in Annex 5 - Information for the preparation of test specimens: <ul style="list-style-type: none"> • Management of chemical resistance and ageing tests according to the various types of protection • Bending and affixing protections by the manufacturer 	<ul style="list-style-type: none"> - Reduced test plan for extension of a PLT 500 mbar range to a PLT up to 2 bar range - no verification by anteriority

ANNEX 1

CONSTITUTION OF THE APPLICATION FILE

- Model application letter for admission reproduced on the letterhead of the manufacturer and prepared in accordance with the attached model (Document no. 1)
- General information form (Document no. 2)
- Identification form of the product subject to admission (document no. 3a, 3b, 3c or 3d)
- Technical file:

PLT, PLT 2 or livestock PLT kits

- Dimensioned drawings of each tube (diameters, thickness and waves), fitting (in accordance with § 5.4 and 5.5 of CCH 2007-01 or CCH 2010-02 or § 4.4 and 4.5 of Standard XP E 29-826), accessory and seal;
- definition of markings and batches;
- certificate of conformity of the seal raw material according to NF EN 549 or NF EN 682;
- Instructions in accordance with § 8 and 9 of CCH 2007-01 or CCH 2010-02, or § 7 and 8 of Standard XP E 29-826 (instructions for jointing, installation, pressure drop, installation warning, etc.).

Short hoses

- dimensioned overall drawings, dimensioned drawings of each component (corrugated flexible metal duct, end piece or connection end) with the definition of raw materials;
- definition of the metal braid (size and material of the wires, number of wires, number of strands, angle and braid pitch);
- definition of the plastic sheath (FCC and FCD);
- definition of anti-corrosion coating (FCP);
- installation and installation instructions in accordance with § 11 of CCH 2006-01;
- the mode of protection and packaging in accordance with § 12 and 13 of CCH 2006-01.

DOCUMENT No. 1

ADMISSION APPLICATION FORM

(to be drawn up on the manufacturer's letterhead)

Letter addressed to:

Dear Sir
CERTIGAZ
8 rue de l'Hôtel de Ville
F – 92200 Neuilly sur Seine

Subject: **Application for admission to the ATG-PLT Mark**

Dear Sir,

I request permission to affix the ATG Mark on the products that I manufacture, in accordance with the corresponding specifications and the ATG-PLT Specific Certification Rules in force.

I declare that I have read the aforementioned texts and the ATG General Certification Rules.

I agree:

- to comply fully with the requirements of the Certification Rules, as well as with the decisions taken or to be taken, in execution of said requirements;
- to sell products bearing the ATG-PLT Mark only after taking all the precautions to ensure their compliance with standards and specifications;
- to reserve the Mark and the reference of the products submitted to the ATG-PLT Mark only to products conforming to those certified;
- to take all measures to protect the trademark submitted to the ATG-PLT Mark in order to have an exclusive right to this Mark under the industrial property legislation;
- to affix the Mark, unequivocally, on the certified products and only on them;
- to carry out the in-process controls required under the Rules of Certification of the Mark;
- to report without delay to CERTIGAZ any incident, any modification to the design, manufacturing method or organisation, and more generally, any fact likely to cause a variation from the conditions in which the Mark was granted;
- to facilitate the task of auditors mandated by CERTIGAZ within the framework of their missions;
- to provide any supporting documents required for the application of a penalty;
- to provide free of charge the products designated by CERTIGAZ for verifications and send them at my expense and under my responsibility to the laboratory designated by CERTIGAZ, within a period of one month and to inform CERTIGAZ thereof;

DOCUMENT No. 1

(to be drawn up on the manufacturer's letterhead)

- to pay the amount of the costs of examining the application laid down in the financial framework of the Mark, and to make any subsequent payments that may be claimed in accordance with the rules of the Mark;
- not to indicate on all the printed advertisements or catalogues, characteristics other than those which are confirmed by the tests and which will be communicated.

(2) I also authorise the company **(3)** represented by:

Mr/Mrs (*surname*)..... as (*capacity*)

to represent me on French territory for all issues relating to the use of the ATG-PLT Mark.

(2) I consequently request that the expenses that are to be borne by me be invoiced directly to the said representative. This agent will ensure immediate settlement of invoices upon receipt on my behalf as bound so to do in accepting to represent me.

I undertake to inform CERTIGAZ immediately of any appointment of a new agent replacing the above-mentioned agent.

Yours faithfully,

Date:

Stamp and signature of the representative (4)(5)

Date:

Stamp and signature of the manufacturer (4)(5)

Enclosures : General information form;
Product identification form;
Technical file.

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- (2)** Optional. This paragraph only concerns applicants located outside the European territory
 - (3)** The designation of the agent company shall include: corporate name, form of the company, registered office, trade register number
 - (4)** The signatures of the manufacturer and its representative in France must be preceded by the handwritten words "Approved for representation" and "Approved for acceptance of representation", respectively
 - (5)** Signature preceded by the handwritten words "Read and approved"

DOCUMENT No. 2

GENERAL INFORMATION FORM

(To be attached to the technical file)

• **Company name and address of the applicant/holder:**

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.....

Contact person: Telephone: Fax:

Email:

Information for billing (VAT no., SIRET):

• Where applicable, **name and address of the agent in Europe:**

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Contact person: Telephone: Fax:

Email:

Information for billing (VAT no., SIRET):

• **Company name(s) and address(es) of the tube manufacturing site(s):**

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Contact person: Telephone: Fax:

Email:

• **Company name and address of the packaging unit (if different):**

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Contact person: Telephone: Fax:

Email:

• **Company name and address of the fitting supplier (if different):**

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Contact person: Telephone: Fax:

Email:

DOCUMENT No. 3a
PRODUCT IDENTIFICATION FORM – PLT kits
 (To be attached to the technical file)

- **Trademark:**
- **Trade reference:** append a table that includes the characteristics (reference, DN, designation, fittings, etc.)
- **Material specifications** (standard designation and reference standard):
 - stainless steel corrugated flexible tubes:
 - fittings (stainless steel, copper alloy, cast iron according to § 5.2, 5.5.1 of CCH 2007-01):
 - end fittings
 - coupling fittings
 - tee
 - manifold
 - corrosion-resistant metal support:
 - yellow protective sheath (material and RAL colour according to § 5.10 of CCH 2007-01):
- **Characteristics of seals and/or sealants** (§ 5.6 of CCH 2007-01):
 - Supplier, nature, designation:
 - Hardness (seal) and temperature class:
 - Certification according to standard NF EN 549 or EN 682:
 - Other:
- **Marking** (according to § 8.2 of CCH 2007-01 and ATG-PLT Rules):
 - Tubes (PLT):
 - Fittings:
- **Resistance test pressure** (STP for § 6.6 of CCH 2007-01)
- **Use of a protective sleeve for fittings according to CCH 2007-01:**

	Heat-shrinkable sleeve (1)	Tape (1)
Material		
Supplier		
Description		
Dimensions		
Colour (RAL colour)		

(1) Delete if not used and the method of application must be described in the instructions

- **Tightening torque of the fittings by DN:**
- **To be completed with overall and detailed drawings**

DOCUMENT No. 3b**PRODUCT IDENTIFICATION FORM – Livestock PLT kits**

(To be attached to the technical file)

- **Trademark:**
- **Trade reference:** append a table that includes the characteristics (reference, DN, designation, fittings, etc.)
- **Material specifications** (standard designation and reference standard):
 - stainless steel corrugated flexible tubes:
 - fittings (stainless steel, copper alloy according to § 5.2, 5.5.1 of CCH 2010-02):
 - end fittings
 - coupling fittings
 - tee
 If these fittings are nickel plated, treatment thickness:
 - corrosion-resistant metal support:
 - yellow protective sheath (material and RAL colour according to § 5.10 of CCH 2010-02):
- **Characteristics of seals and/or sealants** (§ 5.6 of CCH 2010-02):
 - Supplier, nature, designation:
 - Hardness (seal) and temperature class:
 - Certification according to Standard NF EN 549 or EN 682:
 - Other:
- **Marking** (according to § 8.2 of CCH 2010-02 and ATG-PLT Rules):
 - Tubes (PLT):
 - Fittings:
- **Resistance test pressure** (STP for § 6.6 of CCH 2010-02)
- **Use of a protective sleeve according to CCH 2010-02 and ATG-PLT Rules:**

	Heat-shrinkable sleeve (1)	Tape (1)
Material		
Supplier		
Description		
Dimensions		
Colour (RAL colour)		

(1) Delete if not used and the method of application must be described in the instructions

- **Tightening torque of the fittings by DN:**
- **To be completed with overall and detailed drawings**

DOCUMENT No. 3c**PRODUCT IDENTIFICATION FORM – Short Hoses**

(To be attached to the technical file)

- **Trademark:**
- **Trade reference:** append a table that includes the characteristics (reference, DN, designation, hose type, FC end fittings, etc.)
- **Material specifications** (standard designation and reference standard):
 - Stainless steel corrugated flexible tubes, § 6.1 of CCH2006-01:
 - end piece, § 6.2 of the CCH 2006-01 (steel or copper tube, stainless steel tubular part, nut, flange).
- **Welding process:**
- **Marking** (according to § 10 of CCH2006-01 and ATG-PLT Rules):
- **Resistance test pressure** (PRM according to CCH2006-01):
- **Tightening torque of the fittings by DN** (types 3, sphero-conical joint for FCD and 4, flange joint for FCC):
- **Definition of the metal braid** (§ 6.3 of CCH2006-01 for the stainless steel grade, wire diameter, number of strands and wires per strand, braid angle and pitch for FCDs):
- **Definition of the plastic sheath** (according to CCH2006-01 for FCD and FCC):
- **Definition of the anticorrosion coating** (§ 6.4 of CCH2006-01 for FCP):
- **To be completed with overall and detailed drawings**

DOCUMENT No. 3d**PRODUCT IDENTIFICATION FORM – PLT 2 kits (Standard XP E 29-826)**

(To be attached to the technical file)

- **Trademark:**
- **Trade reference:** append a table that includes the characteristics (reference, DN, designation, fittings, etc.)
- **Material specifications** (standard designation and reference standard according to § 4 of Standard XP E 29-826):
 - stainless steel corrugated flexible tubes:
 - fittings (stainless steel, copper alloy, cast iron):
 - end fittings
 - coupling fittings
 - tee
 - manifold
 - corrosion-resistant metal support:
 - yellow/orange protective sheath (material and RAL colour):
- **Characteristics of seals and/or sealants** (§ 4.6 of Standard XP E 29-826):
 - Supplier, nature, designation:
 - Hardness (seal) and temperature class:
 - Certification according to Standard NF EN 549 or EN 682:
 - Other:
- **Marking** (according to § 7 of Standard XP E 29-826 and ATG-PLT Rules):
 - Tubes (PLT 2):
 - Fittings:
- **Resistance test pressure** (§ 5.6 of Standard XP E 29-826)
- **Use of a protective sleeve for fittings** (§ 3.6.2 of Standard XP E 29-826):

	Heat-shrinkable sleeve (1)	Tape (1)
Material		
Supplier		
Description		
Dimensions		
Colour (RAL colour)		

(2) Delete if not used and the method of application must be described in the instructions

- **Tightening torque of the fittings by DN:**
- **To be completed with overall and detailed drawings**

ANNEX 2

Supplement to CCH 2007-01, PLT kits

A- Details on § of CCH 2007-01

4.7 Protections (§ 4.7.1 and 4.7. added to the June 2014 revision of CCH2007-01)

4.7.1 Sheath: tubular outer sheath for the protection of the PLT tube.

4.7.2 Sleeve: tape or tube (adhesive, stretchable or shrinkable) added, if necessary, to protect the area between the PLT fitting and the PLT pliable tube sheath. This protection does not cover the entire fitting; it prevents the intrusion of foreign substances or matter between the tube and the sheath.

This sleeve is also used for repairing the sheath when it has been torn, cut or torn during the implementation or after.

5.4 Threads and end of PLT fittings

To be connected to existing copper or steel installations as appropriate, PLT end fittings may be:

- A JPC/JPG fitting, compliant with Standard NF E 29-532;
- A JSC fitting, compliant with Standard NF E 29-536;
- A conical male (R)/cylindrical female (Rp) fitting, compliant with Standard NF EN 10226-1;
- A solder fitting, compliant with Specifications ATG B 524-2;
- A fitting for LPG, female socket and swivel nut, M20x150 or G3/4 ISO228-1, compliant with the respective figures G.8 (type G.36) and G.6 (type G.28) of Standard NF EN 16129.

Note 1: Regardless of the fittings used, the MOP of PLT installations shall comply with CCH2007-01.

Note 2: "Mixed" fittings with an ATG-PLT end and an NF136 end (PE fitting), for example, may be included in a catalogue when they are made by a factory-soldered joint. In this case, each part shall be certified and marked according to the respective Mark but the "mixed" final fitting shall not be certified.

5.5.2 Stress corrosion

The test shall be carried out: (details added to the June 2014 revision of CCH2007-01 except pH and duration)

- for each DN on a type 2 PLT sample with reduced length (this configuration allows testing 2 end fittings and 2 fittings for the coupling in a single test);
- the sample shall be fitted with sleeves when they are specified in the manufacturer's installation instructions;
- according to the procedure of Annex 2 of Specifications SROB100-NF (120 hours and pH 13.1).

At the end of the test, the sample shall satisfy the leak test according to § 6.2 of CCH 2007-01 before and after application of the recommended tightening torque plus 10%. There shall be no cracks that could lead to rupture of the joint.

5.5.3 Dezincification (details added to the June 2014 revision of CCH2007-01)

In addition to CCH 2007-01, the corrosion behaviour of a copper alloy containing more than 10% zinc shall be evaluated in accordance with Standard NF EN ISO 6509, by the copper alloy supplier, for a grade B according to Standards NF EN 12164 or NF EN 12165.

5.5.4 Manifold and tee (details added to the June 2014 revision of CCH2007-01 except note 3)

In addition to § 4.5.4 of CCH 2007-01, a PLT manifold or tee shall be designed to:

- Connect directly to the branches of PLT tubes to limit joints;
- Connect the gas supply directly with a PLT tube;
- Have an end opposite to the gas supply, either plugged or with a direct connection with a PLT tube, in the case of a manifold;
- To be fixed in order to withstand the tightening forces of the various PLT fittings, in the case of a manifold.

Note 1: Depending on the manufacturing process, a leak test on the manifold or tee may be necessary.

Note 2: Two manifolds may be connected in series with a PLT tube.

Note 3: Based on these specifications, a tee is similar to a manifold but without attachment.

Note 4: use of standard plumbing manifold or tee with conical or cylindrical threaded fittings is not permitted. The PLT tube must be connected directly.

Note 5: One of the connections of a tee may be an end fitting for connecting another type of gas line.

6.4 Pliability

In initial type tests as in monitoring tests by the manufacturer or the third party organisation, it is recommended to continue this test beyond 12 cycles, either until failure or at least up to 36 cycles to ensure the tube exhibits the same performance level.

6.9 Impact resistance (details added to the June 2014 revision of CCH2007-01)

To perform this test, the sample shall be:

- Maintained by its end fittings without exerting traction;
- Guided so that it remains in the axis of percussion.

6.10 Resistance to penetration (details added to the June 2014 revision of CCH2007-01)

To perform this test, the sample shall be:

- on a flat and hard support (idem § 6.5, figure 4);
- guided so that it remains in the axis of percussion.

6.12 Chemical resistance

6.12.2.1 General

When the manufacturer prescribes the use of sleeves, the instructions shall describe the implementation of these sleeves.

6.12.2.2 Test method for resistance to household cleaning products

Bleaching agent is a sodium hypochlorite solution at 9% by volume. For monitoring tests by the manufacturer, the solution may be an industrial solution with a guaranteed concentration between 6 and 14%. The report shall mention the solution used.

6.17 Pressure drop

The test method for pressure drop verifications shall be in accordance with paragraph 6.17.3 with the following exceptions:

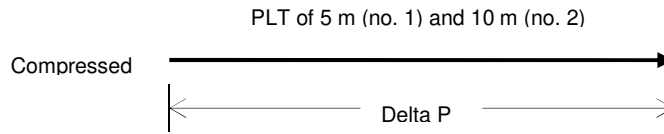
- If it is possible to choose between a tee and a manifold, in the submitted range, the tests shall be performed only with tees.
- Disregarding the last sentence of § e): "The pressure drops of all other PLT fittings shall be determined by adopting a similar method."

The manufacturer shall provide the pressure drop information for all PLT tubes and fittings (see § 8 of CCH2007-01).

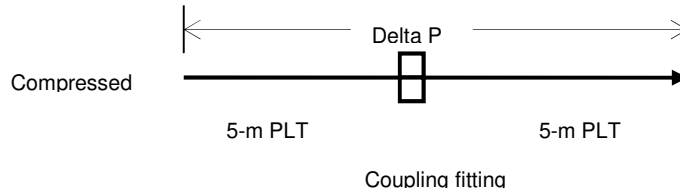
Sample type	DN to be tested	PLT length	Configuration
PLT kit type 1	All DN's	5 m	No. 1
PLT kit type 1	All DN's	10 m	No. 2
PLT kit type 2	X and Y and Z (1)	2x5 m	No. 3
PLT kit type 1 + 4 x 90° elbows	X and Y and Z (1)	10 m	No. 4
PLT kit type 1 + 1 tee or 1 manifold	X and Y and Z (1)	5 m x (2+y branch(es))	No. 5

(1) according to Table 2 of CCH 2007-01

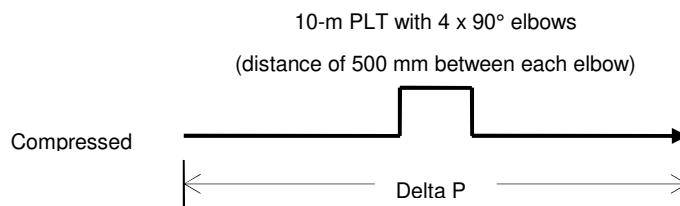
Configurations no. 1 and 2



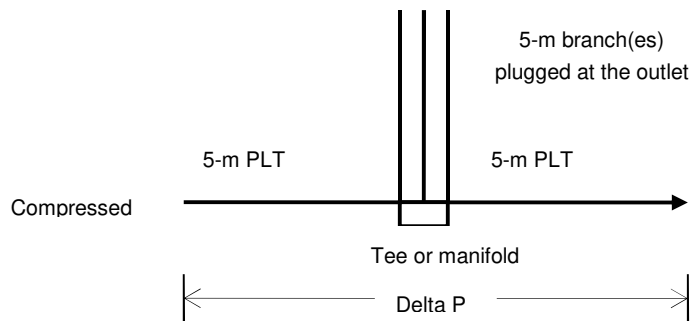
Configuration no. 3



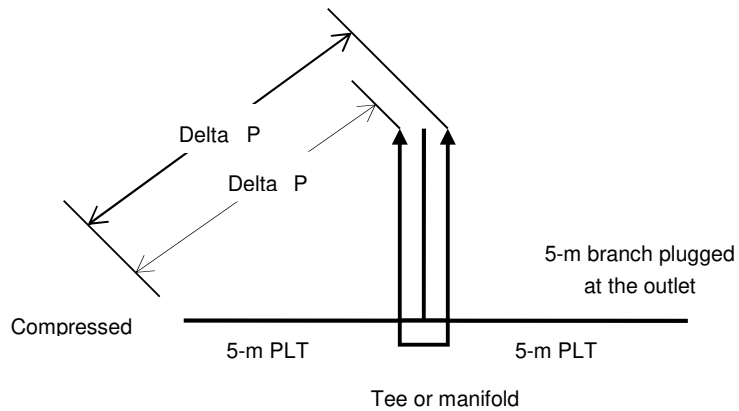
Configuration no. 4



Configuration no. 5 a



Configuration no. 5 b



7.3 Sampling

The sampling in Table 11 of CCH2007-01 is completed to take into account the additional information in these rules:

Characteristics	Admission	Cross-check (5)	Monitoring	§ of CCH 2007-01	Sample type	No. of samples
Dimensional	All DNs	2 DN X and (Y or Z)	1 DN	6.3	-	Tests in bold
Pliability + leaktightness (1)	All DNs	2 DN X and (Y or Z)	1 DN	6.4	1	2
Crush resistance + leaktightness + diameter	All DNs	2 DN X and (Y or Z)	1 DN	6.5	1	4
Stability under pressure + leaktightness + elongation	All DNs	2 DN X and (Y or Z)	1 DN	6.6	1	1
Wear resistance of the outer sheath + appearance	All DNs	2 DN X and (Y or Z)	1 DN	6.7	1	1
Structural resistance test + leaktightness + elongation	All DNs	2 DN X and (Y or Z)	1 DN	6.8	1	1
Impact resistance + leaktightness	X and Y and Z	2 DN X and (Y or Z)	1 DN	6.9	2	1
Penetration resistance + leaktightness	All DNs	2 DN X and (Y or Z)	1 DN	6.10	1	1
Tensile strength + leaktightness	All DNs	2 DN X and (Y or Z)	1 DN	6.11	1	1
Stress corrosion + torque + leaktightness + appearance	All DNs	2 DN X and (Y or Z)	1 DN	Annex 2	2 (shorter)	1
Dezincification	-	-	-	Annex 2	-	Supplier certificate
Chemical resistance + leaktightness	Y	Y	1 DN	6.12	2	2 per chemical agent (2)
	Y	Y	1 DN	6.12	1	1 per chemical agent (3)
Sheath ageing + leaktightness + appearance (4)	X and (Y or Z) (5)	-	-	6.13	2	2
Leaktightness in case of fire	X and Y and Z	-	-	6.14	2	2
Reaction to fire + classification	X and (Y or Z) (5)	-	-	6.15	According to Annexes A and B of CCH 2007-01	
Electrical conductivity	X and Y and Z	2 DN X and (Y or Z)	1 DN	6.16		2
Pressure drop + leaktightness	All DNs	-	-	6.17	1 and 2	See above

(1) With the recommendation laid down in § 6.4 of this annex.

(2) If the application for certification provides for 2 types of protection (tape or heat-shrinkable sheath):

- Admission or cross-check tests for chemical resistance shall be carried out on half with each type of protection (1 sample per chemical agent and per type of protection);
- Monitoring tests are performed by annual rotation of the type of protection.

- (3) To ensure the performance of repair tapes, during chemical tests, the sheath shall be damaged and then repaired as follows by the laboratory on a specimen at its disposal:
- a strip approximately 30 mm long and 2 mm wide is cut in the axis of the tube, on the central part of a type 1 test specimen.
 - the area is then protected by a protective tape according to the recommendations of the manufacturer, in the instructions for use.
 - the test specimen is then formed into a U-shape and tested like the other type 2 test specimens.
- (4) Half of the test specimens are equipped with protective sleeves if tapes and heat-shrinkable sleeves are recommended. At the end of the ageing test, these sleeves must remain in place to ensure their function.
- (5) Preferably, the largest DN is selected for the family pair Y or Z.

The tests concerning the families shall be carried out with the DNs indicated in Table 2 of CCH2007-01.

If they are not in the certification application, 1 DN from the family shall be tested.

9.5 Abandonment of existing tubing

The manufacturer shall describe the recommended plugging means in its instructions.

Plugging by simply clamping the tubes as well as welding and brazing is prohibited.

B- In-process monitoring plan, batch release and process monitoring

Characteristics	DN or family to be tested	Paragraph of CCH2007-01 specifying the corresponding test	Minimum number of samples per test	Minimum test frequency	Monitoring type
Leaktightness	All DNs	6.2.2	100%	100%	In-process
Visual appearance	All DNs		100%	100%	In-process
Dimensional	All DNs		Statistical	Sampling distributed / batch	Batch release
Pliability	All DNs	6.4 (1)	1	Each batch of tube	Batch release
Crush resistance	All DNs	6.5	1	1 per year	Process
Wear resistance of the outer sheath	X / Y / Z	6.7	1	4 per year	Process
Structural resistance test	All DNs/year	6.8	1	Every 5,000 m and at least 4 per year	Process
Impact resistance	All DNs	6.9	1	1 per year	Process
Tensile strength	All DNs/year	6.11	1	4 per year	Process
Chemical resistance (2)	X / Y / Z	6.12	1 / chemical agent	2 per year	Process

For the tests concerned by the X/Y/Z families, the tested DN is not systematically the one recommended by CCH2007-01. It is recommended to test each DN by rotation over several test runs.

(1) see also §6.4 of this annex.

(2) If 2 types of protection (tape or heat-shrinkable sheath) are certified, the process monitoring tests shall be performed by half-yearly rotation of the type of protection.

ANNEX 3

Supplement to CCH 2010-02, livestock PLT kits

A- Details on § of CCH 2010-02

4.7 Protections

4.7.1 Sheath: tubular outer sheath for the protection of the livestock PLT tube.

4.7.2 Sleeve: tape or tube (adhesive, stretchable or shrinkable) added, if necessary, to protect the area between the livestock PLT fitting and the livestock PLT pliable tube sheath. This protection does not cover the entire fitting; it prevents the intrusion of foreign substances or matter between the tube and the sheath.

This sleeve is also used for repairing the sheath when it has been torn, cut or torn during the implementation or after.

5.4 Threads and end of livestock PLT fittings

To be connected to existing copper or steel installations as appropriate, livestock PLT end fittings may be:

- A JPC/JPG fitting, compliant with Standard NF E 29-532;
- A JSC fitting, compliant with Standard NF E 29-536;
- A conical male (R)/cylindrical female (Rp) fitting, compliant with Standard NF EN 10226-1;
- A solder fitting, compliant with Specifications ATG B 524-2;
- A fitting for LPG, female socket and swivel nut, M20x150 or G3/4 ISO228-1, compliant with the respective figures G.8 (type G.36) and G.6 (type G28) of Standard NF EN 16129.

Note 1: Regardless of the fittings used, the MOP of PLT installations shall comply with CCH2010-02.

Note 2: "Mixed" fittings with an ATG-PLT end and an NF136 end (PE fitting), for example, may be included in a catalogue when they are made by a factory-soldered joint. In this case, each part shall be certified and marked according to the respective mark but the "mixed" final fitting shall not be certified.

5.5.2 Stress corrosion

The test shall be carried out:

- for each DN on a type 2 PLT sample with reduced length (this configuration allows testing 2 end fittings and 2 fittings for the coupling in a single test);
- the sample shall be fitted with sleeves when they are specified in the manufacturer's installation instructions;
- according to the procedure of Annex 2 of Specifications SROB100-NF (120 hours and pH 13.1);

At the end of the test, the sample shall satisfy the leak test according to § 6.2 of CCH 2010-02 before and after application of the recommended tightening torque plus 10%. There shall be no cracks that could lead to rupture of the joint.

Copper-alloy fittings that meet these specifications may not be nickel plated as required in § 5.5.1.

5.5.3 Dezincification

In addition to CCH 2010-02, the corrosion behaviour of a copper alloy containing more than 10% zinc shall be evaluated in accordance with Standard NF EN ISO 6509, by the copper alloy supplier, for a grade B according to Standards NF EN 12164 or NF EN 12165.

5.5.4 Tee

A PLT tee shall be designed to connect PLT tubes directly.

Note 1: Depending on the manufacturing process, a leak test may be necessary.

Note 2: One of the connections of a tee may be an end fitting for connecting another type of gas line.

Note 3: The use of standard plumbing tee with conical or cylindrical threaded fittings is not permitted.

6.4 Pliability

In initial type tests as in monitoring tests by the manufacturer or the third party organisation, it is recommended to continue this test beyond 12 cycles, either until failure or at least up to 36 cycles to ensure the tube exhibits the same performance level.

6.9 Impact resistance

To perform this test, the sample shall be:

- Maintained by its end fittings without exerting traction;
- Guided so that it remains in the axis of percussion.

6.10 Penetration resistance

To perform this test, the sample shall be:

- on a flat and hard support (idem § 6.5, figure 4);
- guided so that it remains in the axis of percussion.

6.12 Chemical resistance

6.12.2.1 General

When the manufacturer prescribes the use of sleeves, the instructions shall describe the implementation of these sleeves.

6.12.2.2 Test method for resistance to household cleaning products

Bleaching agent is a sodium hypochlorite solution at 9% by volume. For monitoring tests by the manufacturer, the solution may be an industrial solution with a guaranteed concentration between 6 and 14%. The report shall mention the solution used.

6.17 Pressure drop

The test method for pressure drop verifications shall be in accordance with paragraph 6.17.3 with the following exceptions:

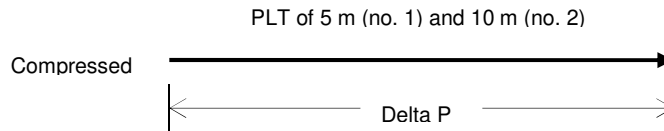
- The tests shall be carried out only with tees (no manifold for livestock PLT kits).
- For usual gas pressures of the 2nd and 3rd family for this type of installation.

The manufacturer shall provide the pressure drop information for all livestock PLT tubes and fittings (see § 8 of CCH2010-02).

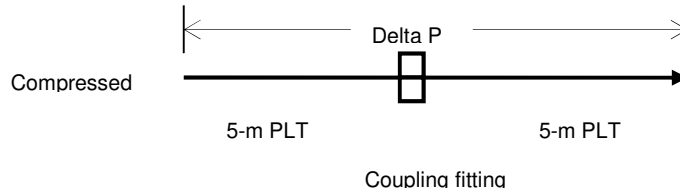
Sample type	DN to be tested	PLT length	Configuration
PLT kit type 1	All DNs	5 m	No. 1
PLT kit type 1	All DNs	10 m	No. 2
PLT kit type 2	X and Y (1)	2x5 m	No. 3
PLT kit type 1 + 4 x 90° elbows	X and Y (1)	10 m	No. 4
PLT kit type 1 + 1 tee	X and Y (1)	5 m x (2+y branch(es))	No. 5

(1) according to Table 2 of CCH 2010-02

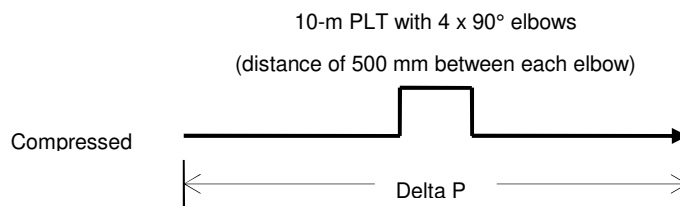
Configurations no. 1 and 2



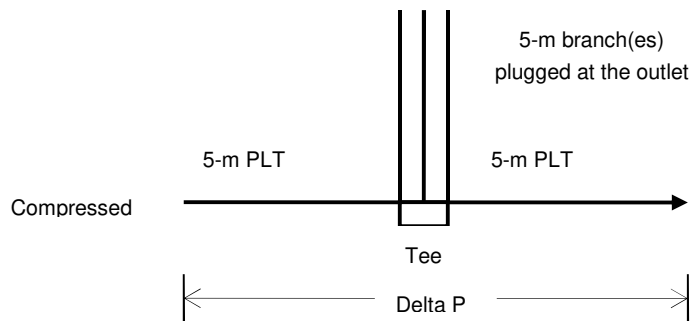
Configuration no. 3



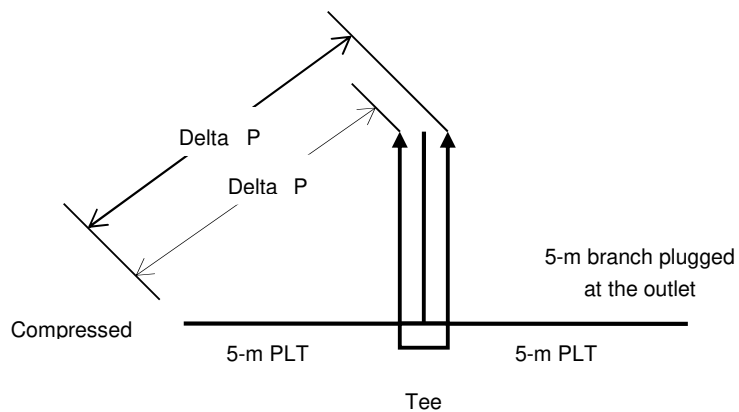
Configuration no. 4



Configuration no. 5 a



Configuration no. 5 b



7.3 Sampling

The sampling in Table 11 of CCH2010-02 is completed to take into account the additional information in these rules:

Characteristics	Admission	Cross-check	Monitoring	§ of CCH 2010-02	Sample type	No. of samples
Dimensional	All DNs	2 DN (X and Y)	1 DN	6.3	-	Tests in bold
Pliability + leaktightness (1)	All DNs	2 DN (X and Y)	1 DN	6.4	1	2
Crush resistance + leaktightness + diameter	All DNs	2 DN (X and Y)	1 DN	6.5	1	4
Stability under pressure + leaktightness + elongation	All DNs	2 DN (X and Y)	1 DN	6.6	1	1
Wear resistance of the outer sheath + appearance	All DNs	2 DN (X and Y)	1 DN	6.7	1	1
Structural resistance test + leaktightness + elongation	All DNs	2 DN (X and Y)	1 DN	6.8	1	1
Impact resistance + leaktightness	X and Y	2 DN (X and Y)	1 DN	6.9	2	1
Penetration resistance + leaktightness	All DNs	2 DN (X and Y)	1 DN	6.10	1	1
Tensile strength + leaktightness	All DNs	2 DN (X and Y)	1 DN	6.11	1	1
Stress corrosion + torque + leaktightness + appearance	All DNs	2 DN (X and Y)	1 DN	Annex 2	2 (shorter)	1
Dezincification	-	-	-	Annex 2	-	Supplier certificate
Chemical resistance + leaktightness	Y	Y	1 DN	6.12	2	2 per chemical agent (2)
	Y	Y	1 DN	6.12	1	1 per chemical agent (3)
Sheath ageing + leaktightness + appearance (4)	X and Y	-	-	6.13	2	2
Leaktightness in case of fire	X and Y	-	-	6.14	2	2
Reaction to fire + classification	X and Y	-	-	6.15	According to Annexes A and B of CCH 2010-02	
Electrical conductivity	X and Y	2 DN (X and Y)	1 DN	6.16		2
Pressure drop + leaktightness	All DNs	-	-	6.17	1 and 2	See above

- (1) *With the recommendation laid down in § 6.4 of this annex.*
- (2) *If the application for certification provides for 2 types of protection (tape or heat-shrinkable sheath):*
- *Admission or cross-check tests for chemical resistance shall be carried out on half with each type of protection (1 sample per chemical agent and per type of protection);*
 - *Monitoring tests are performed by annual rotation of the type of protection.*
- (3) *To ensure the performance of repair tapes, during chemical tests, the sheath shall be damaged and then repaired as follows by the laboratory on a specimen at its disposal:*
- *a strip approximately 30 mm long and 2 mm wide is cut in the axis of the tube, on the central part of a type 1 test specimen.*
 - *the area is then protected by a protective tape according to the recommendations of the manufacturer, in the instructions for use.*

- the test specimen is then formed into a U-shape and tested like the other type 2 test specimens.

- (4) Half of the test specimens are equipped with protective sleeves if tapes and heat-shrinkable sleeves are recommended. At the end of the ageing test, these sleeves must remain in place to ensure their function.

The tests concerning the families are carried out with the DNs indicated in Table 2 of CCH2010-02. If they are not in the certification application, 1 DN from the family shall be tested.

9.5 Abandonment of existing tubing

The manufacturer shall describe the recommended plugging means in its instructions.

Plugging by simply clamping the tubes as well as welding and brazing is prohibited.

B- In-process monitoring plan, batch release and process monitoring

Characteristics	DN or family to be tested	Paragraph of CCH2010-02 specifying the corresponding test	Minimum number of samples per test	Minimum test frequency	Monitoring type
Leaktightness	All DNs	6.2.2	100%	100%	In-process
Visual appearance	All DNs		100%	100%	In-process
Dimensional	All DNs		Statistic	Sampling distributed / batch	Batch release
Pliability	All DNs	6.4 (1)	1	Each batch of tube	Batch release
Crush resistance	All DNs	6.5	1	1 per year	Process
Wear resistance of the outer sheath	X / Y	6.7	1	4 per year	process
Structural resistance test	All DNs/year	6.8	1	Every 5,000 m and at least 4 per year	Process
Impact resistance	All DNs	6.9	1	1 per year	Process
Tensile strength	All DNs/year	6.11	1	4 per year	Process
Chemical resistance (2)	X / Y	6.12	1 / chemical agent	2 per year	Process

For the tests concerned by the X/Y families, the tested DN is not systematically the one recommended by CCH2010-02. It is recommended to test each DN by rotation over several test runs.

(3) see also §6.4 of this annex.

(4) If 2 types of protection (tape or heat-shrinkable sheath) are certified, the process monitoring tests shall be performed by half-yearly rotation of the type of protection.

ANNEX 4
Supplement to CCH 2006-01, Short hoses

A- Details on § of CCH 2006-01**7.3 Leaktightness** (correction made partly to the March 2015 revision of CCH2006-01)**7.3.1 Test method**

See 5.2 of Standard NF EN ISO 10380.

7.3.2 Parameters

The test pressure shall be equal to the PRM.

7.3.3 Requirement

- In helium sniff testing: the leakage rate shall be less than 10^{-4} mbar.l/s at PRM.
- In air under water: no bubble with air at PRM, for a satisfactory duration in accordance with Standard NF EN ISO 10380 in which a 2-min observation time is required after making sure there is no disturbance due to bubbles on the tube surface during a stabilisation time
- By flow meter: leakage rate of 10 cm³/h maximum with air at PRM.

B- Test plan and sampling by test type

The sampling for each test, carried out by a third party, is defined in the table below according to:

- Specifications of §7 of CCH 2006-01 and these rules;
- The tests type (admission, cross-check or annual monitoring);

Test type	PMS/PRM	Admission			Cross-check			Monitoring		
		0.5/1	0.5/1	5/7	0.5/1	0.5/1	5/7	0.5/1	0.5/1	5/7
Sampling by test	§ of CCH 2006-01	FCP	FCC	FCD	FCP	FCC	FCD	FCP	FCC	FCD
Dimensional a)	Miscellaneous + DT	2/DN	2/DN	2/DN	2 for 1 DN	2 for 1 DN	2 for 1 DN	1 DN	1 DN	1 DN
Rated flow rate, 20 mbar a)	7.2	2/DN	no	no	2 for 1 DN	no	no	1 DN	no	no
Leaktightness, PRM a)	7.3	2/DN	2/DN	2/DN	2 for 1 DN	2 for 1 DN	2 for 1 DN	1 DN	1 DN	1 DN
Burst, 4xPRM	7.4.1	3/DN	3/DN	3/DN	3 for 1 DN	3 for 1 DN	3 for 1 DN	1 DN	1 DN	1 DN
Elongation, PRM	7.4.2	3/DN	no	3/DN	3 for 1 DN	no	3 for 1 DN	1 DN	no	1 DN
Bending, PRM	7.4.3 (3)	3/DN	no	3/DN	3 for 1 DN	no	3 for 1 DN	1 DN	no	1 DN
Cyclic fatigue, PRM	7.4.4 (3)	3/DN	no	3/DN	3 for 1 DN	no	3 for 1 DN	no	no	no
Impact resistance, PRM	7.4.5	3 DN25	3/DN	3 DN15	3 for 1 DN	3 for 1 DN	3 for 1 DN	no	no	no
Compression/extension, PRM	Table 5 + Annex B (3)	no	1 DN100	no	no	1 for 1 DN	no	no	no	no
Min. no. of samples		15/DN	9/DN	15/DN	15	7	15	3	2	3

(a) The samples can be used for destructive testing

(3) see § D for the special testing conditions

C- In-process monitoring plan, batch release and process monitoring

In accordance with Standard NF EN ISO 10380 and with CCH 2006-01, the corrugated flexible metal tube manufacturer or the assembler shall regularly monitor certain characteristics to ensure compliance with the declared values obtained in the initial type tests.

In-process

Characteristics	DN and hose type to be tested	Paragraph of CCH2006-01 specifying the corresponding test	Minimum number of samples per test	Minimum test frequency	Monitoring type
Leaktightness	All DN's of each type	§ 9	100%	100%	In-process
Visual appearance			100%	100%	In-process
Dimensional (according to CCH2006-01 and critical dimensions)			Statistical 1/batch min	Sampling distributed over the batch	Batch release
Weld appearance		§ 9	2% min from the batch	Sampling distributed over the batch	Batch release
Appearance of the hose before preparation, after cleaning and after application of the coating	All DN's for FCP	§9, Table 12	100%	100%	In-process
°C and RH before application of the coating		§9, Table 12	2/station	Measurement distributed over the batch	In-process
Electrical non-porosity of the coating		§9, Table 12	Statistic	Sampling distributed over the batch	Batch release (a)
Tearing of the coating		§9, Table 12	1%	Sampling distributed over the coating batch	In-process
Flexibility of the coating		§9, Table 12	1%	Sampling distributed over the coating batch	In-process

(a) When the coating is applied with a mechanised process that is controlled compared to a completely manual application (in the field for example), electrical non-porosity may be monitored periodically as defined by the manufacturer and not during batch release.

During periodic monitoring

Characteristics	DN and hose type to be tested	Paragraph of CCH2006-01 specifying the corresponding test	Minimum number of samples per test	Minimum test frequency	Monitoring type
Burst	All DN's of each type	§ 7.4.1 (1)	3	Max. every 3 years	Process
Elongation	All DN's for FCP and FCD	§ 7.4.2 (2)	3	Max. every 3 years	Process
Bending		§ 7.4.3 (3)	3	Max. every 3 years	Process
Cyclic fatigue		§ 7.4.4 (3)	3	Max. every 5 years	Process
Mechanical strength	All DN's for FCC	Annex 2 of CCH (3)	3	Max. every 5 years	Process

(1) (2) (3) see § D for the special testing conditions

D- Special testing conditions

(1) For the burst tests performed by the manufacturer, it is not necessary to make the 20 steps to reach the test pressure; only the following 5 steps are required (3PRM - 3.25PRM - 3.5PRM - 3.75PRM - 4PRM). In the event of a dispute, CCH2006-01 shall apply.

(2) For the elongation tests performed by the manufacturer, the pressure holding time of 1 hour may be decreased; but in the event of dispute, CCH2006-01 shall apply.

(3) For bending, cyclic fatigue and mechanical strength tests:

In order to monitor the change in the tubing performance level, it is recommended to conduct tests beyond the acceptance thresholds set out in CCH2006-01:

- either until failure;
- or at least with a coefficient:
 - o 3 times the threshold required for bending, that is, 30 cycles;
 - o 1.3 times the respective required thresholds for cyclic fatigue and mechanical strength (i.e. 13,000 cycles for cyclic fatigue and 1,300 cycles for mechanical strength).

Note: points (1) and (2) were taken into account in the March 2015 version of CCH 2006-01.

ANNEX 5**Supplement to Standard XP E 29-826, PLT kits up to 2 bar****A- Details on the § of Standard XP E 29-826****3.6.2 Sleeve**

This sleeve is also used for repairing the sheath when it has been torn, cut or torn during the implementation or after.

4.4 Threads and end of PLT fittings

“Mixed” fittings with an ATG-PLT end and an NF136 end (PE fitting), for example, may be included in a catalogue when they are made by a factory-soldered joint. In this case, each part shall be certified and marked according to the respective Mark but the “mixed” final fitting shall not be certified.

4.5.3 Manifold and tee

Note 1: Depending on the manufacturing process, a leak test on the manifold or tee may be necessary.

Note 2: Two manifolds may be connected in series with a PLT tube.

Note 3: A tee is similar to a manifold but without attachment.

Note 4: use of standard plumbing manifold or tee with conical or cylindrical threaded fittings is not permitted. The PLT tube must be connected directly.

Note 5: One of the connections of a tee may be an end fitting for connecting another type of gas line.

5.4 Pliability

In initial type tests as in monitoring tests by the manufacturer or the third party organisation, it is recommended to continue this test beyond 12 cycles, either until failure or at least up to 36 cycles to ensure the tube exhibits the same performance level.

5.12 Chemical resistance**5.12.2.2 Test method for resistance to household cleaning products**

Bleaching agent is a sodium hypochlorite solution at 9% by volume. For monitoring tests by the manufacturer, the solution may be an industrial solution with a guaranteed concentration between 6 and 14%. The report shall mention the solution used.

6.3 Sampling and compliance criteria

Table 11 is completed to take into account the information specified in these rules:

Characteristics	Admission	Cross-check (5)	DN addition	Monitoring	§ standard	Sample type	No. of samples	Compliance criteria
Dimensional	All DNs	2 DN X and (Y or Z)	DN	1 DN	5.3	-	Tests in bold	Dimensions
Pliability (1)	All DNs	2 DN X and (Y or Z)	DN	1 DN	5.4	1	2	Leaktightness
Crush resistance	All DNs	2 DN X and (Y or Z)	DN	1 DN	5.5	1	4	Leaktightness and max. deformation
Stability under pressure	All DNs	2 DN X and (Y or Z)	DN	1 DN	5.6	1	1	Leaktightness and elongation
Wear resistance of the outer sheath	All DNs	2 DN X and (Y or Z)	DN	1 DN	193	1	1	No full perforation
Structural resistance	All DNs	2 DN X and (Y or Z)	DN	1 DN	5.8	1	1	Leaktightness
Impact resistance	X and Y and Z	2 DN X and (Y or Z)	DN	1 DN	5.9	2	1	Leaktightness
Penetration resistance	All DNs	2 DN X and (Y or Z)	DN	1 DN	5.10	1	1	Leaktightness
Tensile strength	All DNs	2 DN X and (Y or Z)	DN	1 DN	5.11	1	1	Leaktightness
Stress corrosion	All DNs	2 DN X and (Y or Z)	DN	1 DN	5.18	2 shorter	1	Leaktightness and no rupture
Dezincification	-	-	-	-	4.5.2	-	Supplier certificate	
Chemical resistance	Y	Y	DN	1 DN	5.12	2	2 per chemical agent (2)	Leaktightness and no sign of damage
	Y	Y	DN	1 DN	5.12	1	1 / chemical agent (3)	
Sheath ageing	X and (Y or Z) (4) (5)	-	-	-	5.13	2	2	Leaktightness and no sign of damage
Leaktightness in case of fire	X and Y and Z	-	-	-	5.14	2	2	Permissible leakage rate
Reaction to fire	X and (Y or Z) (5)	-	-	-	5.15	According to Annexes A and B		Euroclass rating
Electrical conductivity	X and Y and Z	2 DN X and (Y or Z)	DN	1 DN	6.16	2	2	Electrical resistance
Pressure drop	All DNs	-	DN	-	6.17	Tables 9 and 10		Declaration of pressure drops

- (1) *With the recommendation laid down in § 5.4 of this annex.*
- (2) *If the application for certification provides for 2 types of protection (tape or heat-shrinkable sheath):*
 - Admission or cross-check tests for chemical resistance shall be carried out on half with each type of protection (1 sample per chemical agent and per type of protection);
 - Monitoring tests are performed by annual rotation of the type of protection.
- (3) *To ensure the performance of repair tapes, during chemical tests, the sheath shall be damaged and then repaired as follows by the laboratory on a specimen at its disposal:*
 - a strip approximately 30 mm long and 2 mm wide is cut in the axis of the tube, on the central part of a type 1 test specimen.
 - the area is then protected by a protective tape according to the recommendations of the manufacturer, in the instructions for use.
 - the test specimen is then formed into a U-shape, if necessary, and tested like the other type 2 test specimens.
- (4) *Half of the test specimens are equipped with protective sleeves if tapes and heat-shrinkable sleeves are recommended. At the end of the ageing test, these sleeves must remain in place to ensure their function. At the end of the ageing test, these sleeves must remain in place to ensure their function.*
- (5) *Preferably, the largest DN is selected for the family pair Y or Z or among DN32/40/50.*

In the case of an extension of a PLT 500 mbar range to a PLT range up to 2 bar, the admission tests are reduced as follows:

- For a new DN with the operating pressure of 2 bar, the relevant tests by DN shall be performed according to the table above, DN addition column.
- For identical DNs with the operating pressure of 2 bar, only the pliability test shall be performed for each DN concerned, according to the table above.

B- In-process monitoring plan, batch release and process monitoring

Characteristics	DN or family to be tested	§ standard specifying the corresponding test	Minimum number of samples per test	Minimum test frequency	Monitoring type
Leaktightness	All DNs	5.2.2	100%	100%	In-process
Visual appearance	All DNs		100%	100%	In-process
Dimensional	All DNs	Compliance with the technical file	Statistic	Sampling distributed / batch	Batch release
Pliability (1)	All DNs	5.4	1	Each batch of tube	Batch release
Crush resistance	All DNs	5.5	1	1 per year	Process
Wear resistance of the outer sheath	X / Y / Z	5.7	1	4 per year	Process
Structural resistance test	All DNs/year	5.8	1	Every 5,000 m and at least 4 per year	Process
Impact resistance	All DNs	5.9	1	1 per year	Process
Tensile strength	All DNs/year	5.11	1	4 per year	Process
Chemical resistance (2)	X / Y / Z	5.12	1 / chemical agent	2 per year	Process

(1) With the recommendation laid down in § 5.4 of this annex.

(2) If 2 types of protection (tape or heat-shrinkable sheath) are certified, the process monitoring tests shall be performed by half-yearly rotation of the type of protection.

For the tests concerned by the X/Y families, the tested DN is not systematically the one recommended by Table 2. It is recommended to test each DN by rotation over several test runs.