TUBASYS: Documents Inspection Applicable to the pipe

The different types of inspection documents that are defined considering the order specifications must be provided to the buyer to make installment of the plumbing regardless of any manufacturing process.

DEFINITIONS:

- Nonspecific Inspection: Inspected by the manufacturer, according with their own standards to check whether the products resulting from same production process correctly answer order specifications. The inspection has to be performed necessarily on the products delivered.

- Specific Inspection: Inspected before delivery, on products will deliver or inspection units disposed for delivery to check that products comply with the order specifications.

DOCUMENTS BASED ON INSPECTION AND TESTING BY PERSONNEL APPROVED BY THE MANUFACTURER, WHICH MAY BE INVOLVED IN MANUFACTURING PROCESS:

- Witnessing of conformity in accordance with the order "2.1": Document by which the manufacturer testifies that the products supplied conform to the order specifications, not to mention the results of the tests.

  Witnessing in accordance with the order "2.1" is a document established based on the results of a nonspecific inspection.

- Witnessing inspection "2.2": Document whereby the manufacturer testifies that the products supplied are in conformity with the specifications of order and provides the results of tests conducted based on a nonspecific inspection.

- Witnessing inspection "2.3": Document whereby the manufacturer testifies that the products supplied are in conformity with the specifications of order and provides the results of tests conducted based on a specific inspection.

  Witnessing specific inspection "2.3" is used only in the event that the manufacturer does not have a qualified inspection service, hierarchically independent of production services.

  If the manufacturer has an authorized inspection service, hierarchically independent of production services, he must provide a certificate "3.1.B" instead of the document "2.3".

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DOCUMENTS BASED ON INSPECTION AND TESTS PERFORMED OR SUPERVISED BY AUTHORIZED STAFF, HIERARCHALLY INDEPENDENT OF PRODUCTION PROCESS FOR SPECIFIC INSPECTIONS:

- Certificate of Inspection: Document based on the inspection and testing performed in accordance with the technical specifications of the order or in the regulations or technical rules that apply. Testing shall be done on supplied products or products of an inspection unit, which form part of the supplied products. The inspection unit should be defined in the product standard, the official regulations, in applicable technical rules or the order.

  As cases are distinguished:

  1. Inspection certificate "3.1.A": Document issued and validated by an inspector appointed by government regulations, and conforming to these and the corresponding technical rules.
  2. Inspection certificate "3.1.B": Document issued by a factory department independent of the manufacturing process and validated by an authorized representative of staff independent of production services
  3. Inspection certificate "3.1.C": Document issued and validated by an authorized representative of the buyer according to order specifications.

- Inspection report: In case of special agreement, certificate of inspection is jointly signed by the authorized representative of the manufacturer and by the Buyer's authorized representative, such certificate is called "inspection certificate 3.2".

DOCUMENTS TO BE PROVIDED BY A PROCESSOR OR AN INTERMEDIARY

When a processor or a broker is supplying a product, it shall supply the buyer, without modification, the manufacturer's documentation as described in the previous sections. This documentation must be accompanied by a Proper identification of the products, in order to ensure traceability between product and documentation. If the processor or intermediary has changed the state or dimensions, whatever the manner in which this is done, should provide a supplementary document pursuant to the new individual conditions. This is also applicable for any particular requirements contained in the order and that are not defined in the documentation.

VALIDATING DOCUMENTS

The inspection documents shall be signed or sealed properly by the person or persons responsible for the validation of these. However, if the certificates are produced by a word processing system, you can replace the signature by indicating the name and function of the responsible for validating the document.

TUBASYS, SL always provides the client a certificate 3.1.B upon pipe supply.

A summary of the inspection certificates is listed in the chart shown on the next page.

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Standard conventional designation	Document	Type of inspection	Contents of the document	Conditions of contents	Document validated by
2.1	Witnessing of conformity in accordance with the order	Non specific	No test results are collected	According to the specifications of the order and, where appropriate, with the official regulations and technical regulations that apply.	The manufacturer
2.2	Witnessing inspection	Non specific	The results of tests conducted are included, based on a specific inspection		
2.3	Witnessing of scientific inspection	Specific	The results of tests conducted are included, based on a non- specific inspection		
3.1 A	Inspection certificate 3.1A			According to official government regulations or technical regulations applicable.	The inspector designated by the official regulations
3.1 B	Inspection certificate 3.1B			According to the specifications of the order and, where appropriate, with the official regulations and technical regulations that apply.	The authorized representative of the manufacturer hierarchically independent of production services.
3.1 C	Inspection certificate 3.1C			In accordance with the order specifications	The authorized representative of the purchaser
3.2	Inspection protocol 3.2			In accordance with the order specifications	The authorized representative of the manufacturer hierarchically independent of production services and an authorized representative of the purchaser.

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The compliance of the requirements for the pipe, in the case of a specific inspection, should be checked according to the following tests:

- Tensile test: This test is performed in accordance with UNE-EN 10002-1, and must determine the following:
  - The tensile strength (Rm).
  - Yield strength (ReH) or, if no elastic regime, the strength of the test for which the proportional extension is the 0.2% of the extensometer gauge length (Rp 0.2) or the strength test for which the total length is 0.5% of the extensometer gauge length (Rt 0.5).
  - The percentage elongation after fracture (A) with a length of initial calibration $L_0 = 5{,}65\sqrt{S_0}$. If a non-proportional test piece is used, the value of the proportional elongation obtained must be converted into a value for a length of initial calibration $L_0 = 5{,}65\sqrt{S_0}$ using conversion tables contained in the standard EN ISO 2566-1.

- Bend test: This test shall be made on black tubes outside diameters (de) between 17.2 mm and 60.3 mm (included) and must be performed in accordance with UNE EN 10232, with an bending angle of 90°.

  Welded tubes must be bent with seam on the outside of the curve. The tubes should have no cracks noticeable with the naked eye.

d_e	17.2	21.3	26.9	33.7	42.4	48.3	60.3
Bending radius	50	65	85	100	150	170	220

Dimensions in mm

- Crushing test: This test shall be made on black tubes with outer diameter (de) greater than 60.3 mm and must be performed according to the standard EN 10233.

  Welded pipes should be crushed with the seam placed alternately at 0° or 90° (at 12 o'clock or 3 o'clock position) to the crushing direction. The pipe section must be crushed in a press until the distance between plates, measured under load, reaches 75% of original exterior diameter of the tube. The tube should have no cracks or visible defects noticeable with the naked eye. Until the distance between the plates, measured under load, reaches 60% of the original outside diameter, any cracks or visible defects noticeable with the naked eye, except in the seam, must not occur. A slight premature fault at the edges should not be considered as a cause for rejection.

- Leak test. A leak test of all tube should be performed before threading, where applicable.

  The test can be performed using a hydrostatic pressure test at a minimum of 50 bar for at least 5s or by an electromagnetic test according to the European Standard EN 10246-1

  Dimensional inspection, the specified dimensions should be verified.

  Visual inspection, the tubes should be visually inspected to ensure compliance with the conditions of surface appearance.

MARKING OF THE PIPE

The tubes should be marked with suitable and durable methods with at least the following information:

- The trademark of the manufacturer.
- The symbol indicating the series, H or F, or the type L1 or L2.
- The symbol S, seamless or welded W to indicate the tube manufacturing process.

The marking must appear at least once and less than 1m from one end of each tube.

At the discretion of the manufacturer, the marking of the series or type can be replaced by a color coded as follows:

- Heavy (H): red
- Medium (M): Blue
- Light (L, L1 and L2): green, white and brown, respectively.

The bands of color-coding should have a width of 50 mm.

In turn, each package of tube must be labeled containing at least the following information:

- The trademark or manufacturer's name.
- The number of manufacturing standard.
- The symbol S or W to indicate the tube manufacturing process.
- The specified outside diameter (de)
- The number, type or specified wall thickness.

All pipes supplied by TUBASYS, SL are marked with their respective casting numbers to verify your inspection certificate corresponds to a determined tube.