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شرکت ملی گاز ایران  
مدیریت پژوهش و فناوری  
امور تدوین استانداردها

# IGS

مشخصات فنی خرید

نوار پوشش سرد خارجی برای خطوط لوله فلزی مدفون

Cold-Applied Outer-Layer Tape for Buried Steel linePipes



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شرکت ملی گاز ایران



دفتر مدیرعامل

## ابلاغ مصوبه هیأت مدیره

مدیر محترم پژوهش و فناوری

باسلام،

به استحضار می‌رساند در جلسه ۱۹۸۵ مورخ ۱۴۰۱/۰۸/۰۱ هیأت مدیره، نامه شماره گ/۰۰۰/۹/۱۰۷۸۶۸ مورخ ۱۴۰۱/۰۷/۲۰ آن مدیریت درمورد تصویب نهایی مقررات فنی شرکت ملی گاز ایران به شرح زیر مطرح و مورد تصویب قرار گرفت.

۱- دستورالعمل نوار پلاستیکی خود ممزوج سه لا برای سرجوش ها و بازسازی خطوط لوله فلزی

IGS-C-TP-014-2(0)

۲- مشخصات فنی خرید نوار پوشش سرد خارجی برای خطوط لوله فلزی مدفون

IGS-M-TP-025(1)

سید محمد پیشوایی  
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رونوشت: مدیرعامل محترم شرکت ملی گاز ایران و رئیس هیأت مدیره

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رئیس محترم حسابرسی داخلی

رئیس محترم امور مجامع

## Foreword

This standard specification is intended to be mainly used by N.I.G.C. and contractors, and has been prepared base on interpretation of recognized standards and technical documents, as well as knowledge, backgrounds and experiences in gas industries at national and international levels.

Iranian Gas Specification (IGS) are prepared, reviewed and amended by technical standard committees within NIGC standardization division of research and technology management and submitted to "the standards council of NIGC" for approval.

IGSs are subjected to revision, amendment or withdrawal, if required, and thus the latest edition of IGS shall be checked / inquired by NIGC'S users.

This standard must not be modified or altered by NIGC employees or its contractors. Any deviation or conflicts between this specification and other applicable standards, codes, procedure or well-known manufacturer's specifications must be resolved in writing by the user or its representative through Manager, Engineering Department or standardization division of NIGC.

The technical standard committee welcomes comments and feedbacks from concerned or interested corporate and individuals about this standard, and may revise this document accordingly based on the received feedbacks.

## General Definitions

Throughout this standard the following definitions, where applicable, should be followed:

- 1- "STANDARDIZATION DIV." is organized to deal with all aspects of industry standards in NIGC. Therefore, all enquiries for clarification or amendments are requested to be directed to mentioned division.
- 2- "COMPANY": refers to National Iranian Gas Company (NIGC).
- 3- "SUPPLIER": refers to a firm who will supply the service, equipment or material to IGS specification whether as the prime producer or manufacturer or a trading firm.
- 4- "SHALL ": is used where a provision is mandatory.
- 5- "SHOULD": is used where a provision is advised only.
- 6- "MAY": is used where a provision is completely discretionary.

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## 1. SCOPE

This standard specification covers the minimum requirements for cold applied outer – layer tape to be applied as mechanical protection over the inner – layer tape systems to the exterior of all diameters of buried steel linepipes for long – term protection and prevention of underground corrosion when the maximum continuous operating temperature is 50 °C.

## 2. REFERENCES

Throughout this standard specification the following standards and codes are referred to, the edition of them, that are in effect at the time of issues of this standard specification shall, to the extent specified herein form part of this standard specification. The applicability of changes in codes and standards that occur after the date of standard, shall be mutually agreed upon by the purchaser and manufacturer and /or applicator.

### 2.1 Normative References

**ASTM D 149 (2004)** "Test method for dielectric breakdown voltage and dielectric strength of solid electrical insulating materials at commercial power frequencies"

**ASTM D 1000 (2008)** "Standard test method for pressure – sensitive adhesive – coated tapes used for electrical and electronic applications"

**ASTM D 4218 (2008)** "Standard test method for determination of carbon black content in polyethylene compounds by the muffle – furnace technique"

**ASME B 31.8 (2018)** "Gas transmission and distribution piping systems"

**EN 12068 (1999)** "Cathodic protection – External organic coatings for the corrosion protection of buried or immersed steel pipeline used in conjunction with Cathodic protection Tapes and shrinkable materials"

**ISO 9001 (2015)** "Quality system – Model for quality assurance in design, development, production, installation and servicing"

### 2.2 Informative References

**ANSI/AWWA C214 (2007)** "Standard for tape coating systems for the exterior of steel water pipelines"

**EN 10204 (2004)** Metallic Products-Types of Inspection Documents

## 3. DEFINITION

### Batch

The batch shall consist of an indefinite number of rolls, offered for acceptance, of materials manufactured by a single plant run through the same processing equipment with no change in ingredient materials.

### Coating System

The complete number and types of coats applied to a substrate in a predetermined order. (when used in a broader sense, surface preparation, pretreatments, dry film thickness, and manner of application are included.)

### Maximum continuous operating temperature

Maximum continuous operating temperature of the medium transported through the buried or immersed coated pipeline

## 4. REQUIREMENTS

### 4.1 Description

The outer – layer tape shall be a two – layer tape consisting of a polyethylene backing layer with a butyl adhesive layer.

The primary functions of the outer – layer tape shall be to provide mechanical and outdoor weathering protection to the tape system, and secondarily, to contribute to the overall corrosion protection properties of the system. The outer- layer tape backing shall be compounded so that it will be resistant to outdoor weathering and ultraviolet – light.

The manufacturer shall certify that the backing material is polyethylene only, containing not less than 3.0 percent nor more than 7.0 percent, by weight, of non–polyethylene material consisting of pigments, antioxidants, and stabilizers.

The manufacturer shall certify that the elastomer content of the adhesive layer is not less than 20 percent by weight.

The outer – layer tape shall be made from materials that provide high electrical resistivity, low moisture absorption and permeability, and resistance to corrosive environments.

### 4.2 Properties

**4.2.1** The plastic backing shall be smooth and uniform, free from visible faults such as fish eyes, slits, folds, break, uneven or frayed edges and other defects that could affect appearance or serviceability.

**4.2.2** The adhesive layer shall be smooth and uniform and as free from lumps and bare spots as the best commercial practice will permit. There shall be no adhesive transfer when the tape is unwound from the roll.

**4.2.3** The outer – layer tape shall be sufficiently pliable for normal application operations and shall be suitable for hand apply and wrapping machine applications, and no significant wrinkles or blisters shall be developed during application even under sunlight.

**4.2.4** The outer – layer tape shall be compatible with the Inner – layer tape.

**4.2.5** The outer – layer tape shall comply with the requirements of Table 2, and when applied over the Inner – layer tape, shall provide an effective bond to the Inner – layer tape.

**4.2.6** The color of polyethylene backing shall be white.

**4.2.7** The tape shall be supplied in rolls wound on polyethylene hollow cores pipe. Hollow cores shall have a typical inside diameter according to Table 1

**4.2.8** Unless otherwise specified, the outer – layer tape shall be supplied in the following dimensions:

**Table 1- Roll size**

LENGTH(m)	WIDTH(mm)	Hollow Core(mm)
10	50	38
20	100	75
30	150 For hand applied machine	75

**Table 2: Physical Properties of Outer – Layer Tape**

ITEM	PROPERTY	UNIT	QUALIFICATION TEST	BATCH CERTIFICATE TEST	REQUIREMENT	TEST METHOD
1	Width deviation	mm	*	*	±5	see 4.3.1
2	Total thickness, min Backing min Adhesive min	µm	*	*	500 300 200	ASTM D 1000
3	Tensile strength , min	N/mm width	*	*	7	ASTM D 1000
4	Elongation , min	%	*	*	400	ASTM D 1000
5	Adhesion to backing, min	N/mm width	*	*	0.5	ASTM D 1000
6	Dielectric strength , min	V/mm	*	*	22000	ASTM D 149
7	Non-polyethylene material	% by weight	*	-	min 3.0 max 7.0	ASTM D 4218 (see 4.3.3)
8	Water absorption, 23°C , max	% by weight	*	*	0.1	ASTM D 570

### **4.3 Tape Tests**

#### **4.3.1 Width deviation**

A specimen of outer – layer tape at least 1m long shall be removed from each of three randomly selected rolls. The width of the specimen shall be measured at several points along the length of the sample to the nearest 1.0 mm using a standard steel scale. The width deviation shall not exceed the limits stated in Table 2.

#### **4.3.2 Non–polyethylene material content**

The outer – layer tape shall be tested for non-polyethylene content in accordance with ASTM D 4218. Sections 9.11, 9.12, and 9.13 of ASTM D 4218 need not be performed in this test method to obtain accurate results. The adhesive layer must not be present on the tape backing when performing the ASTM D 4218 test. The preferred method of adhesive removal shall be defined by tape manufacturer. The tests should be performed only on samples taken from tape supplied by the tape manufacturer. Five samples shall be tested and the results averaged. An average value outside the limits given in Table 2 shall constitute failure to meet this requirement.

**4.3.3** The tape manufacturer/supplier shall provide the purchaser with certified test reports on each order of tape supplied.

## **5. DOCUMENTATION**

The manufacturer / supplier shall provide sufficient information to identify the outer – layer tape and shall supply as a minimum the technical information of the product as follows:

- ISO 9001: 2015 "Certification" for "Design, Manufacturing and Quality control" of tape coating system for "pipeline corrosion protection" issued by an internationally recognized body.
- "Certificate" and "type approval test report" obtained from an independent laboratory or institute for the coating system (primer, inner layer tape, outer layer tape) for maximum continuous operating temperature up to 50°C (stress class C – 50).
- Manufacturing product data sheets, technical catalogue, technical specification and application procedure.

## **6.PACKAGING**

The tapes purchased according to this standard specification shall be rolled on a polyethylene hollow cores pipe with internal diameter according to Table 1 and packaged in suitable and approved containers so that during stocking and transport, full quality of performance is retained. Each roll of tape shall be individually put in a plastic bag. Rolls of tape shall be packed in quantities not to exceed the weight limitations of the container specification. Type and dimensions of packages shall be chosen to suit transport in containers and suitably palletized and packed with plastic cover.

## **7. MARKING**

### **7.1 Marking of Rolls**

Each roll shall be legibly marked with the following information:

- Name and trademark of the manufacturer
- Product designation



- Length of the roll
- Width of the roll

Each container shall be legibly marked with the following information:

Storage in closed and dry place, shall be marked with a red "double roof" symbol.

- Name and trademark of the manufacturer
- Product designation (Type and trade name of tape)
- Batch No.
- Quantity (number of rolls in container)
- Roll sizes
- Order No.
- IGS No.
- Date of manufacture
- Manufacturer's name and address
- Maximum temperature resistance

## 8. STORAGE LIFE & CONDITION

The tape shall meet the requirements of clause 4 after storage for 24 months of delivery date, in a tightly covered container at temperatures between -10 to +35 °C or according to manufacturer storage condition. The primer shall show no thickening, curdling, skinning, gelling, or hard caking after storage for 24 months, at normal condition, from date of delivery in a full, tightly covered container.

## 9. QUALITY ASSURANCE

The manufacturer shall operate an effective documented quality system based on the relevant part of the ISO 9001:2015 and maintain records identifying the product, date of manufacture, batch numbers and all results of inspection and testing.

## 10. INSPECTION AND TESTING

### 10.1 INSPECTION FOR QUALIFICATION

- Inspection operations shall be carried out as per Table 1 & 2 by the applicator. The results of inspection shall be recorded by the applicator and made available to the purchaser's inspector
- The purchaser's appointed inspector shall have free access to the workshops, storage yards and laboratory of the coating applicator. Inspector shall have the right and opportunity to witness any quality control tests and/or to perform such tests himself. The applicator shall furnish the purchaser's inspector with all tools and equipment necessary for inspection at the application site.
- Purchaser's inspector shall have free access at all times to all work related to the coating application process, with the right to inspect work and materials. All such work and materials shall be subject to approval by inspector. Failure of inspector to identify or reject defective work or materials shall not be construed as acceptance of such work or materials.

### 10.2 INSPECTION FOR BATCH CERTIFICATE

To guarantee the quality of the products to be delivered, the inspection is carried out at the manufacturer's site prior to shipment.

Based on the results of material tests during the inspection and on the provided quality control data (process control, in-house and external tests) an inspection report shall be

filled-out and signed by the inspector according to inspection type 3.1 of standard EN 10204. This inspection and Testing Procedure regulates the steps that be performed during the inspection process. The Inspector's works and duties consist of the following activities, but not limited to:

### **1. Checking of Documents**

- a. Checking the raw material quality control test results and Certificates for all items and verifying the results versus the manufacturer's data sheets.
- b. Checking the manufacturer's daily production quality control test reports showing the amounts of produced material & results of the relevant tests and verify the results versus the manufacturer's data sheets.
- c. Check the calibration certificates of the testing and inspection instruments.
- d. Check the test report for all items (long terms and short terms) of qualification properties according to related standard IGS, not exceeding two years from issuance date.

### **2. Visual inspection of the produced goods:**

- a. Visual inspection of the marking and packaging (number and weight of container, batch number of components, etc.) according to this standard and purchase order.
- b. Crosscheck of purchase order quantities with stock

### **3. Selection of samples for material tests**

- a. Selection of three rolls per each batch of all material to prepare samples from coating system running for each item according to related test methods.
- b. If the results of one or more tests carried out on samples are found not to conform to this standard specification, the test(s) failed shall be repeated on at least three new samples collected by the NIGC's inspector(s). In case, any of the new samples fail to conform with this standard specification, all materials represented by such samples shall be considered rejected.

### **4. Batch certificate tests:**

All test shall be carried out according to table 1 of this standards.

### **5. Inspection report:**

Inspection report shall be including of the following items, but not limited to:

- List of inspection materials, quantities and batch numbers
- Report of document check (according to section 1)
- Report of visual inspection (according to section 2), plus photos of activities
- Description of sample selection and preparation of specimens, plus photos of activities
- Report of calibration certificates of the testing and inspection instruments
- Date of presence in factory, preparation of specimens and start test
- Tests report include of tests result and graphs (if that to exist)
- Third party inspection agency approves

Notes: All in-house tests shall be performed in witness of inspector.

For Non-Iranian manufacturers tests of one produced batch exemplary for the whole shipment, to be carried out by an internationally well-known independent laboratory and all of documents shall be accepted by inspector.

For Iranian manufacturers the tests shall be carried out at a third-party laboratory that approved by Technical & Industrial Research Laboratories of NIGC.

Details of all inspection and testing shall be fully documented by the manufacturer and certified by inspector.

The results of all mentioned tests shall be checked and complied by criteria which are remarked in related standard.

In the case of any failure to comply with any of the NIGC's requirements mentioned in related standard IGS, new samples according to above mentioned table shall be selected by inspector and all of required tests shall be carried out accordingly. If any failure occurred again, it shall be effect of rejection for each batch presented.

At least one photo of inspector next to the goods is required. The photos of the all parts (include of storage, batch number of drum, preparation of test specimens, test instruments and etc.), plus the image of the inspector's photo attached to the certificate on the inspection report (via CD/DVD) is required.

Third party inspector shall issue release note to supplier and purchaser (two copies) after enquiry items acceptance

Third party inspection agency shall issue inspection certificate after release note has been issued.

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**ANNEX A**  
**Data Sheet for Cold Applied Outer Layer Tape**

<b>Manufacturer's name and address</b>	
<b>Product</b>	
<b>Product designation</b>	

ITEM	PROPERTY	UNIT	ACTUAL and REPRODUCIBLE DATA	TEST METHOD	REMARK
1	Width deviation				
2	Total thickness				
3	Tensile strength				
4	Elongation				
5	Adhesion to backing and inner layer tape				
6	Dielectric strength				
7	Non-polyethylene material				
8	Application temperature				
9	Service temperature				
10	Water absorption, 23°C				
11	Storage condition Max.temp. Min. temp.	°C		-	
12	Storage life at storage temp.	Month.		-	

**NOTES:**

1. This data sheet shall be filled, signed, and stamped by manufacturer.
2. Any deviation from this standard specification shall clearly be specified by manufacturer.

<b>DEVIATION(S)</b>

AUTHORIZED SIGNATURE;

COMPANY'S STAMP :

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## 1. SCOPE

This standard specification covers the minimum requirements for cold applied outer – layer tape to be applied as mechanical protection over the inner – layer tape systems to the exterior of all diameters of buried steel linepipes for long – term protection and prevention of underground corrosion when the maximum continuous operating temperature is 50 °C.

## 2. REFERENCES

Throughout this standard specification the following standards and codes are referred to, the edition of them, that are in effect at the time of issues of this standard specification shall, to the extent specified herein form part of this standard specification. The applicability of changes in codes and standards that occur after the date of standard, shall be mutually agreed upon by the purchaser and manufacturer and /or applicator.

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**EN 10204 (2004)** Metallic Products-Types of Inspection Documents

## 3. DEFINITION

### Batch

The batch shall consist of an indefinite number of rolls, offered for acceptance, of materials manufactured by a single plant run through the same processing equipment with no change in ingredient materials.

### Coating System

The complete number and types of coats applied to a substrate in a predetermined order. (when used in a broader sense, surface preparation, pretreatments, dry film thickness, and manner of application are included.)

### Maximum continuous operating temperature

Maximum continuous operating temperature of the medium transported through the buried or immersed coated pipeline

## 4. REQUIREMENTS

### 4.1 Description

The outer – layer tape shall be a two – layer tape consisting of a polyethylene backing layer with a butyl adhesive layer.

The primary functions of the outer – layer tape shall be to provide mechanical and outdoor weathering protection to the tape system, and secondarily, to contribute to the overall corrosion protection properties of the system. The outer- layer tape backing shall be compounded so that it will be resistant to outdoor weathering and ultraviolet – light.

The manufacturer shall certify that the backing material is polyethylene only, containing not less than 3.0 percent nor more than 7.0 percent, by weight, of non–polyethylene material consisting of pigments, antioxidants, and stabilizers.

The manufacturer shall certify that the elastomer content of the adhesive layer is not less than 20 percent by weight.

The outer – layer tape shall be made from materials that provide high electrical resistivity, low moisture absorption and permeability, and resistance to corrosive environments.

### 4.2 Properties

**4.2.1** The plastic backing shall be smooth and uniform, free from visible faults such as fish eyes, slits, folds, break, uneven or frayed edges and other defects that could affect appearance or serviceability.

**4.2.2** The adhesive layer shall be smooth and uniform and as free from lumps and bare spots as the best commercial practice will permit. There shall be no adhesive transfer when the tape is unwound from the roll.

**4.2.3** The outer – layer tape shall be sufficiently pliable for normal application operations and shall be suitable for hand apply and wrapping machine applications, and no significant wrinkles or blisters shall be developed during application even under sunlight.

**4.2.4** The outer – layer tape shall be compatible with the Inner – layer tape.

**4.2.5** The outer – layer tape shall comply with the requirements of Table 2, and when applied over the Inner – layer tape, shall provide an effective bond to the Inner – layer tape.

**4.2.6** The color of polyethylene backing shall be white.

**4.2.7** The tape shall be supplied in rolls wound on polyethylene hollow cores pipe. Hollow cores shall have a typical inside diameter according to Table 1

**4.2.8** Unless otherwise specified, the outer – layer tape shall be supplied in the following dimensions:



**Table 1- Roll size**

LENGTH(m)	WIDTH(mm)	Hollow Core(mm)
10	50	38
20	100	75
30	150 For hand applied machine	75

**Table 2: Physical Properties of Outer – Layer Tape**

ITEM	PROPERTY	UNIT	QUALIFICATION TEST	BATCH CERTIFICATE TEST	REQUIREMENT	TEST METHOD
1	Width deviation	mm	*	*	±5	see 4.3.1
2	Total thickness, min Backing min Adhesive min	µm	*	*	500 300 200	ASTM D 1000
3	Tensile strength , min	N/mm width	*	*	7	ASTM D 1000
4	Elongation , min	%	*	*	400	ASTM D 1000
5	Adhesion to backing, min	N/mm width	*	*	0.5	ASTM D 1000
6	Dielectric strength , min	V/mm	*	*	22000	ASTM D 149
7	Non-polyethylene material	% by weight	*	-	min 3.0 max 7.0	ASTM D 4218 (see 4.3.3)
8	Water absorption, 23°C , max	% by weight	*	*	0.1	ASTM D 570

## 4.3 Tape Tests

### 4.3.1 Width deviation

A specimen of outer – layer tape at least 1m long shall be removed from each of three randomly selected rolls. The width of the specimen shall be measured at several points along the length of the sample to the nearest 1.0 mm using a standard steel scale. The width deviation shall not exceed the limits stated in Table 2.

### 4.3.2 Non–polyethylene material content

The outer – layer tape shall be tested for non-polyethylene content in accordance with ASTM D 4218. Sections 9.11, 9.12, and 9.13 of ASTM D 4218 need not be performed in this test method to obtain accurate results. The adhesive layer must not be present on the tape backing when performing the ASTM D 4218 test. The preferred method of adhesive removal shall be defined by tape manufacturer. The tests should be performed only on samples taken from tape supplied by the tape manufacturer. Five samples shall be tested and the results averaged. An average value outside the limits given in Table 2 shall constitute failure to meet this requirement.

**4.3.3** The tape manufacturer/supplier shall provide the purchaser with certified test reports on each order of tape supplied.

## 5. DOCUMENTATION

The manufacturer / supplier shall provide sufficient information to identify the outer – layer tape and shall supply as a minimum the technical information of the product as follows:

- ISO 9001: 2015 "Certification" for "Design, Manufacturing and Quality control" of tape coating system for "pipeline corrosion protection" issued by an internationally recognized body.
- "Certificate" and "type approval test report" obtained from an independent laboratory or institute for the coating system (primer, inner layer tape, outer layer tape) for maximum continuous operating temperature up to 50°C (stress class C – 50).
- Manufacturing product data sheets, technical catalogue, technical specification and application procedure.

## 6.PACKAGING

The tapes purchased according to this standard specification shall be rolled on a polyethylene hollow cores pipe with internal diameter according to Table 1 and packaged in suitable and approved containers so that during stocking and transport, full quality of performance is retained. Each roll of tape shall be individually put in a plastic bag. Rolls of tape shall be packed in quantities not to exceed the weight limitations of the container specification. Type and dimensions of packages shall be chosen to suit transport in containers and suitably palletized and packed with plastic cover.

## 7. MARKING

### 7.1 Marking of Rolls

Each roll shall be legibly marked with the following information:

- Name and trademark of the manufacturer
- Product designation

- Length of the roll
- Width of the roll

Each container shall be legibly marked with the following information:

Storage in closed and dry place, shall be marked with a red "double roof" symbol.

- Name and trademark of the manufacturer
- Product designation (Type and trade name of tape)
- Batch No.
- Quantity (number of rolls in container)
- Roll sizes
- Order No.
- IGS No.
- Date of manufacture
- Manufacturer's name and address
- Maximum temperature resistance

## 8. STORAGE LIFE & CONDITION

The tape shall meet the requirements of clause 4 after storage for 24 months of delivery date, in a tightly covered container at temperatures between -10 to +35 oC or according to manufacturer storage condition. The primer shall show no thickening, curdling, skinning, gelling, or hard caking after storage for 24 months, at normal condition, from date of delivery in a full, tightly covered container.

## 9. QUALITY ASSURANCE

The manufacturer shall operate an effective documented quality system based on the relevant part of the ISO 9001:2015 and maintain records identifying the product, date of manufacture, batch numbers and all results of inspection and testing.

## 10. INSPECTION AND TESTING

### 10.1 INSPECTION FOR QUALIFICATION

- Inspection operations shall be carried out as per Table 1 & 2 by the applicator. The results of inspection shall be recorded by the applicator and made available to the purchaser's inspector
- The purchaser's appointed inspector shall have free access to the workshops, storage yards and laboratory of the coating applicator. Inspector shall have the right and opportunity to witness any quality control tests and/or to perform such tests himself. The applicator shall furnish the purchaser's inspector with all tools and equipment necessary for inspection at the application site.
- Purchaser's inspector shall have free access at all times to all work related to the coating application process, with the right to inspect work and materials. All such work and materials shall be subject to approval by inspector. Failure of inspector to identify or reject defective work or materials shall not be construed as acceptance of such work or materials.

### 10.2 INSPECTION FOR BATCH CERTIFICATE

To guarantee the quality of the products to be delivered, the inspection is carried out at the manufacturer's site prior to shipment.

Based on the results of material tests during the inspection and on the provided quality control data (process control, in-house and external tests) an inspection report shall be

filled-out and signed by the inspector according to inspection type 3.1 of standard EN 10204. This inspection and Testing Procedure regulates the steps that be performed during the inspection process. The Inspector's works and duties consist of the following activities, but not limited to:

### **1. Checking of Documents**

- a. Checking the raw material quality control test results and Certificates for all items and verifying the results versus the manufacturer's data sheets.
- b. Checking the manufacturer's daily production quality control test reports showing the amounts of produced material & results of the relevant tests and verify the results versus the manufacturer's data sheets.
- c. Check the calibration certificates of the testing and inspection instruments.
- d. Check the test report for all items (long terms and short terms) of qualification properties according to related standard IGS, not exceeding two years from issuance date.

### **2. Visual inspection of the produced goods:**

- a. Visual inspection of the marking and packaging (number and weight of container, batch number of components, etc.) according to this standard and purchase order.
- b. Crosscheck of purchase order quantities with stock

### **3. Selection of samples for material tests**

- a. Selection of three rolls per each batch of all material to prepare samples from coating system running for each item according to related test methods.
- b. If the results of one or more tests carried out on samples are found not to conform to this standard specification, the test(s) failed shall be repeated on at least three new samples collected by the NIGC's inspector(s). In case, any of the new samples fail to conform with this standard specification, all materials represented by such samples shall be considered rejected.

### **4. Batch certificate tests:**

All test shall be carried out according to table 1 of this standards.

### **5. Inspection report:**

Inspection report shall be including of the following items, but not limited to:

- List of inspection materials, quantities and batch numbers
- Report of document check (according to section 1)
- Report of visual inspection (according to section 2), plus photos of activities
- Description of sample selection and preparation of specimens, plus photos of activities
- Report of calibration certificates of the testing and inspection instruments
- Date of presence in factory, preparation of specimens and start test
- Tests report include of tests result and graphs (if that to exist)
- Third party inspection agency approves

Notes: All in-house tests shall be performed in witness of inspector.

For Non-Iranian manufacturers tests of one produced batch exemplary for the whole shipment, to be carried out by an internationally well-known independent laboratory and all of documents shall be accepted by inspector.

For Iranian manufacturers the tests shall be carried out at a third-party laboratory that approved by Technical & Industrial Research Laboratories of NIGC.

Details of all inspection and testing shall be fully documented by the manufacturer and certified by inspector.

The results of all mentioned tests shall be checked and complied by criteria which are remarked in related standard.

In the case of any failure to comply with any of the NIGC's requirements mentioned in related standard IGS, new samples according to above mentioned table shall be selected by inspector and all of required tests shall be carried out accordingly. If any failure occurred again, it shall be effect of rejection for each batch presented.

At least one photo of inspector next to the goods is required. The photos of the all parts (include of storage, batch number of drum, preparation of test specimens, test instruments and etc.), plus the image of the inspector's photo attached to the certificate on the inspection report (via CD/DVD) is required.

Third party inspector shall issue release note to supplier and purchaser (two copies) after enquiry items acceptance

Third party inspection agency shall issue inspection certificate after release note has been issued.

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**ANNEX A**  
**Data Sheet for Cold Applied Outer Layer Tape**

<b>Manufacturer's name and address</b>	
<b>Product</b>	
<b>Product designation</b>	

<b>ITEM</b>	<b>PROPERTY</b>	<b>UNIT</b>	<b>ACTUAL and REPRODUCIBLE DATA</b>	<b>TEST METHOD</b>	<b>REMARK</b>
1	Width deviation				
2	Total thickness				
3	Tensile strength				
4	Elongation				
5	Adhesion to backing and inner layer tape				
6	Dielectric strength				
7	Non-polyethylene material				
8	Application temperature				
9	Service temperature				
10	Water absorption, 23°C				
11	Storage condition Max.temp. Min. temp.	°C		-	
12	Storage life at storage temp.	Month.		-	

**NOTES:**

1. This data sheet shall be filled, signed, and stamped by manufacturer.
2. Any deviation from this standard specification shall clearly be specified by manufacturer.

<b>DEVIATION(S)</b>

AUTHORIZED SIGNATURE;

COMPANY'S STAMP :