Amber Grid

AB „Amber Grid“
Savanorių pr. 28, LT-03116
Vilnius

No.	Pipe	Basic Quantity, m	Extra quantity, m	Total quantity, m
1	Steel pipe **d711x11,0 mm; L485ME;** with HDPE coating coating thickness 4 mm; design temperature t=(-20+50)°C	17 165	125	17 290
2	Steel pipe **d711x11,0 mm; L415ME**; with HDPE coating coating thickness 4 mm; design temperature t=(-20+50)°C	13 520	50	13 570
3	Steel pipe **d711x12,5 mm; L415ME**; with HDPE coating coating thickness 5 mm; design temperature t=(-20+50)°C	1 920	1 080	3 000
4	Steel pipe **d711x8,8 mm; L415ME;** with HDPE coating coating thickness 4 mm; design temperature t=(-20+50)°C	9090	40	9 130
5	Steel pipe **d711x8,0 mm; L415ME;** with HDPE coating coating thickness 4 mm; design temperature t=(-20+50)°C	124 193	107	124 300
6	Steel pipe **d508x8,0 mm; L415ME;** with HDPE coating coating thickness 3,5 mm; design temperature t=(-20+50)°C	303	20	323
7	Steel pipe **d711x11,0 mm; L485ME**; bare; design temperature t=(-20+50)°C	24	-	24
8	Steel pipe **d711x8,0 mm; L415ME;** bare; design temperature t=(-20+50)°C	24	-	24
	Total	166 239	1 422	167 661

Rev. No.	Date	Description
0	2016-03-15	For tender

Certificate No. 9824

ARDYNAS
Gedimino g. 47,
LT- 44242 Kaunas
Tel. (8 37) 323209
Faks. (8 37) 337257
El. p. ardynas@ardynas.lt

PM	A. Mincė	
DPM	E. Lepeška	
DGS	R. Bankauskas	
PPM	A. Keserauskienė	

Title of overall project

Construction of Gas Interconnection Poland – Lithuania in Territory of Lithuania Republic

Project title

Pipe procurement documentation

Document name	Rev.
Bill of quantities of steel pipes	0

EN

Builder and Client

Amber Grid

Document number	Page	Pages
2015-08-00-KRDD-D.PP-BOQ	1	1

Amber Grid	AB „Amber Grid“ Savanorių pr. 28, LT-03116 Vilnius

0	2016-04-15	For tender
Rev. No.	Date	Description

Certificate No.	ARDYNAS Gedimino g. 47, LT- 44242 Kaunas Tel. (8 37) 323209 Faks. (8 37) 337257 El. p. ardynas@ardynas.lt			Title of overall project **Construction of Gas Interconnection Poland – Lithuania in Territory of Lithuania Republic**
9824	PM	A. Mincė		Project title **Pipe procurement documentation**
	DPM	E. Lepeška		
26502	DGS	R. Bankauskas		
4248	PPM	A. Keserauskienė		Document name **Technical requirements for steel pipes d711mm and d508 mm** — Rev. 0
EN	Builder and Client Amber Grid			Document number **2015-08-00-KRDD-D.PP-TS.1-1** — Page 1 — Pages 14

TABLE OF CONTENTS

1 GENERAL

1.1 Scope

This specification covers the design, material, manufacturing, testing, inspection, packing and acceptance requirements of welded steel pipes for gas transmission lines. Pipe will be used for construction of gas interconnection Poland - Lithuania.

Pipe shall be suitable for the onshore transportation of non-sour natural gas. Natural gas composition - sweet gas to LST EN ISO 13686.

The pipes shall be field weldable using the manual shielded material arc method of welding, with commercially available electrodes and standard field welding techniques to produce welds acceptable for service conditions.

Pipe shall be suitable for making cold bends using bending machine. Minimum bend radius is 40 times of nominal pipe diameter (40 x DN).

1.2 Definitions

Purchaser:	AB „Amber Grid"
Supplier:	Pipe Supplier as direct Contractor of the Purchaser
Manufacturer:	Pipe Manufacturer (potentially the same as Supplier)

The Terms and Definitions of LST EN ISO 3183 shall apply.

1.3 Normative References

This specification supplements the requirements of and shall be read in conjunction with LST EN ISO 3183:2012 "Petroleum and natural gas industries - Steel pipe for pipeline transportation systems".

Any specification or standard referred to shall be of the latest edition.

When any code/standard refers to a standard that is still in preparation (pr EN), the Supplier/Manufacturer shall suggest a corresponding standard at the time of order.

Pipe Manufacturer shall have documented Quality management system EN ISO 9001 or equivalent management system and Environmental management system EN ISO 14001 or equivalent environmental management system.

1.4 Units of Measurement

Pipe data, drawings and maintenance dimensions shall be in the International System (SI) of measurement with exception:

- Acceptable unit for pressure: "bar".
- Acceptable unit for diameter: mm.

1.5 Roles and Responsibilities

Supplier/Manufacturer (further in text Supplier) shall be fully responsible for compliance with all applicable requirements of EN ISO 3183, the applicable reference standards and the supplementary requirements of this specification.

Purchaser have right to make any investigation necessary in order to be assured of compliance by the Supplier and to reject any material that does not comply.

Purchaser shall be responsible for defining the applicable code and project requirements.

Supplier shall submit steel pipe Manufacturing Procedure Specification (MPS)'s for the approval. The Supplier shall receive the Purchaser's written approval of MPS prior to starting pipe production. MPS form will be supplied for the Supplier.

In the case of new manufactures or mills, or products unfamiliar to the Purchaser, procedure qualification tests will be required and witnessed by the Purchaser. The Purchaser, may, at his discretion, accept the results of previously authoritative tests or production experience. The Purchaser reserves the right to require re-qualification in the case of the change in the Manufacturing procedure or in the Manufacturing Procedure Specification.

2 AMENDMENTS / SUPPLEMENTS TO EN ISO 3183

The following modifications to EN ISO 3183 shall be applicable. The numbering of sub-sections 1 - 14 corresponds to the section numbering of EN ISO 3183. Paragraphs or parts of paragraphs contained in EN ISO 3183 which remain unaffected by the requirements of this Specification, shall remain fully applicable.

2.1 Scope (Section 1 of EN ISO 3183)

Applicable.

2.2 Conformity (Section 2 of EN ISO 3183)

Applicable.

No deviation from the requirements stated in this specification shall be permitted unless prior written approval has been obtained from Purchaser.

2.3 Normative References (Section 3 of EN ISO 3183)

Applicable, add:

EN ISO standards or EN standards shall be preferred to API and ASTM standards.

2.4 Terms and Definitions (Section 4 of EN ISO 3183)

Applicable, add:

Purchaser defined in 4.49 shall be as per section 1.2 of this Specification.

2.5 Symbols and Abbreviated Terms (Section 5 of EN ISO 3183)

Applicable.

2.6 Pipe Grade, Steel Grade and Delivery Condition (Section 6 of EN ISO 3183)

Applicable, add:

Additional provisions of Annex M shall be observed as applicable.

2.7 Information to be Supplied by the Purchaser (Section 7 of EN ISO 3183)

Applicable, add:

2.7.1 General Information (7.1)

a) The quantity (total length of supplied pipe) shall be as given in the Bill of Quantities (BOQ).

b) All pipe shall be supplied to specification level 2 - PSL2.

c) The pipe shall be welded pipe SAWH, SAWL, COWH, COWL or HFW in M delivery condition. Coil and plate used for the manufacture of welded pipe shall be rolled from continuously cast slabs or pressure cast slabs.

d) The pipe shall fully comply with EN ISO 3183:2012 and this specification.

e) Pipe steel –as referred in Purchase document "Bill of quantities of steel pipes". (BOQ)

f) Pipe wall thickness: as referred in Purchase document "Bill of quantities of steel pipes".(BOQ)

g) Coated pipes d711x8,0 mm shall be delivered in approximate length of (15,5±0,5) m. Other pipes, including different wall thickness pipes, shall be delivered in approximate length of (13±0,5) m. Maximum 5% of total quantity may be accepted in shorter length. In any case no pipe length shall be less than 10 m.

h) The following annexes of EN ISO 3183 shall apply to this order:

Annex B, Annex C, Annex D, Annex E, Annex G, Annex J, Annex L and Annex M.

i) (additional to EN ISO 3183) The pipes shall not have internal coating.

2.7.2 Additional Information

2.7.2.1 Items that are subject to mandatory agreement, if applicable:

Not applicable.

2.7.2.2 Items that apply as prescribed, unless otherwise agreed:

4) The chemical composition limits for the coil shall comply with Table M.1, EN ISO 3183. mass fraction of molybdenum (Mo) shall be ≤ 0,10%.

9) The end faces of pipe shall be bevelled for welding. The angle of bevel, measured from a line drawn perpendicular to the axis of the pipe, shall be 30° with a tolerance of +5° and the width of the root face of bevel shall be1,6 mm with the tolerance of ±0,8 mm.

10) The Charpy test shall carried out in accordance with standard EN ISO 148-1 and required striker radius is 2 mm (M.7.4.2).

11) The choice of a suitable physical or chemical analytical method for the product analysis is left at the discretion of the Seller. Relevant existing EN or EN ISO standards shall be preferred.

12) Pipe diameter measurements shall be made by circumferential tape.

14) Repair welding after cold expansion is not acceptable. The repairs of the weld is not permitted after hydrostatic pressure test.

2.7.2.3 Items that apply if agreed:

1) Pipe shall be made from thermomechanical rolled coil; pipe forming - cold forming process.

4) Double seam weld pipes are not acceptable.

6) SAWH shall be not supplied with strip/plate end welds (skelp end welds).

7) Jointers are not permitted.

8) The test temperature for Charpy testing of the pipe body, weld seam and heat affected zone shall be -20°C.

9) For pipe body, the minimum average (set of three test pieces) absorbed energy shall be in accordance with EN ISO 3183 table G.2. Single values of the absorbed energy shall be at minimum 75% of the minimum specified mean value.

   If no transverse test pieces can be obtained, longitudinal test pieces shall be tested. The required absorbed energy shall be 50% higher than the specified energy for transverse test pieces.

10) For pipe weld and heat affected zone (HAZ) the minimum average (set of three test pieces) absorbed energy value, based upon full-size test pieces specimens, shall be 40 J.

11) Pipe with wall thickness more than or equal to 8,0 mm shall be drop weight tear tested. The average shear fracture area shall be at least 85%.

12) Drop weight tear tests shall be carried out at temperature of -20°C.

16) For a distance of at least 150 from each pipe end, the outside bead shall be removed by grinding or machining such that it does not extend above the adjacent pipe surface by more than 0,5 mm. The transition shall be smooth with a taper of no more than 7°. The grinding shall not reduce the wall thickness below minimum permissible wall thickness of the pipe and shall match the profile of the pipe. Machining of external bead other than at pipe ends is not allowed.

17) The Seller shall supply weldability data for the type and grade of steel and pipe concerned. The Purchaser will be seeking conclusive proof that pipe of the highest specified carbon equivalent (IIW and Pcm) can be welded using the intended manual shielded metal arc method of welding. If the Purchaser is unable to accept the data provided as proof of weldability he will specify a weldability test program to be instigated by the manufacturer before the start of line pipe production. The welding procedures for weldability testing shall be supplied by the Purchaser.

20) Inspection Certificate 3.1 in accordance with EN 10204 shall be issued for starting material and for the pipe.

27) The minimum permissible wall thickness shall be used for determining the required test pressures (M.7.4.3).

29) For pipe d711 mm the use of internal diameter measurement to determine diameter

tolerances and out of roundness shall apply.

32) The Purchaser may specify additional markings. Example of marking shall be sent for Purchaser's agreement prior to manufacturing.

33) Location of markings shall be within 100 mm of the pipe ends and at least 25 mm from pipe weld.

34) Pipe shall be marked by low-stress die- stamping. Stamping shall be done with rounded or blunt dies.

40) The pipe shall be coated externally in accordance with the Purchase Order and in compliance with document Technical requirements for coating 2015-08-00-KRDD-D.PP-TS.2-1

41) Lining is not required.

42) Annex B applies to this order.

43) The weld seam of SAW pipe shall be ultrasonically tested as specified. Strip/plate end welds shall be cut out.

46) Ultrasonic inspection shall be done acc. EN ISO 3183 E 3.2.3 using compressions and shear wave techniques, shall be applied to a full 25 mm circumferential segment at each pipe end to ensure this area is free of laminar and planar imperfections and micro cracks.

50) For COW pipe seams, any continuous indication greater than 25 mm in length, regardless of the indication height, provided that it is greater than the background noise, shall be re-inspected by radiographic method in accordance with Clause E.4 of EN ISO 3183:2013.

51) For EW, SAWH or COW pipe ultrasonic inspection, as specified, shall be used to test the pipe body for laminar imperfections in accordance with Clause E.8 of EN ISO 3183:2013.

52) Ultrasonic testing shall be used to verify that the 15 mm wide zone along each side of the pipe weld is free of laminar imperfections greater than those permitted in accordance with Clause E.9 of EN ISO 3183:2013.

54) Annex G shall be applied. Add:

The minimum average absorbed energy value in the set of three full size specimens for each test shall be determined.

55) The pipe line is not in sour service. Annex H does not apply.

57) The pipeline is on land and Annex J does not apply unless specified otherwise in this specification.

58) Annex M applies to the order.

59) The pipe shall be hardness tested to Annex J requirements. Hardness test shall be performed for pipe body, weld and HAZ of welded pipe. Hardness shall not exceed 270 HV10 for steel L415ME and 300 HV10 for steel L485ME. Hardness reported in any other unit must be equivalent to 270 HV10/300 HV10 and the method of conversation shall be outlined.

61) Hydraulic test pressure to LST EN ISO 3183, test duration – 10 seconds.

61) Each end shall be protected with a cap that will protect the pipe's internal surface and allow for pipe lifting. Protection device and material shall be approved by Buyer.

2.8 Manufacturing (Section 8 of EN ISO 3183)

Applicable, add:

- The supplying steel and rolling mill(s) shall have documented Quality management system EN ISO 9001 or equivalent management system and Environmental management system EN ISO 14001 or equivalent environmental management system.
- Pipe manufacturer shall operate standard EN ISO 3834-2 Quality requirements for fusion welding of metallic materials - Part 2: Comprehensive quality requirements.

2.9 Acceptance Criteria (Section 9 of EN ISO 3183)

Applicable, add:

- The chemical analysis and carbon equivalent of the plate and coil shall comply with Table M.1. In addition the carbon equivalent based on CE (Pcm) shall not exceed 0,21% and C content shall not exceed 0,10%.
- The sulphur and phosphorus mass fraction shall not be greater than 0,035%.
- Molybdenum content shall be less than or equal to 0,10%.

9.11) Dimensions, Mass and Tolerances

Applicable, add:

- Tolerance on wall thickness shall be in accordance with table M.4 EN ISO 3183.
- Diameter tolerances of pipe d711 apply for the inside diameter D and shall fulfill requirements as follows:
  a) Pipe body diameter tolerance is ±0,25% D, but not more than ±3 mm; pipe end tolerance is ±1,2 mm.
  b) Pipe body out-off roundness tolerance shall be acc. to table M.3; pipe d711 ends out-off roundness tolerance max. 0,5%x D is required.
- Diameter and out-off roundness tolerances of pipe d508 mm shall be in accordance with table M.3 EN ISO3183.
- Check of wall thickness of pipe d711 mm with UT equipment shall be carried out on each pipe at 3 circumferential locations equally spaced along the pipe length: a minimum of 4 measurements (equally spaced) shall be taken around the circumference.

9.12) Finishing of Pipe End

Applicable.

9.12-5) Plain Ends

Applicable, also refer to 2.7.2.2 (9) of this specification.

9.13) Tolerances for Weld Seam

Applicable Clause M.6 of EN ISO 3183, Add:

The outside weld bead shall be removed in accordance with 2.7.2.3 (16) of this specification.

2.10 Inspection (Section 10 of EN ISO 3183)

Applicable, add:

10.2 Specific Inspection

Each pipe shall be fully visually inspected over the entire external and internal surface.

Para 10.2.4.2, Add:

No rupture in the weld or fusion line shall be acceptable for cross weld tensile test.

Additionally to tests provided in table 18 and table M.7 hardness test shall be done according to annex J.

2.11 Marking (Section 11 of ISO 3183)

Applicable, add:

Pipe marking shall include information as per EXAMPLE 1, section 11, EN ISO 3183.

Pipe marking shall include an identification number that permits the correlation of the product unit with the related inspection certificate (M.8 requirement).

Product specification level designation PSL2 shall be followed by letter "E".

2.12 Coatings and Thread Protectors (Section 12 of EN ISO 3183)

Applicable 12.1.

2.13 Retention of Records (Section 13 of EN ISO 3183)

Applicable.

2.14 Pipe Loading (Section 14 of EN ISO 3183)

Applicable, add:

- The pipes can be dispatched only after a Release Certificate has been issued.
- Mill Certificates shall be supplied at the time of dispatch of the pipes.
- The full production report as above shall be transmitted to the Purchaser without delay after completion of pipe production. The latest date of submission of this report shall be agreed at the bid stage.

2.15 Annex A Specification for Welded Jointers

Not applicable.

2.16 Annex B Manufacturing Procedure Qualification for PSL 2 Pipe

Applicable, add:

- Qualification shall be in accordance with clause B.3 and B.4. The frequency of testing shall be as specified in table M.7.2 ISO 3183 but this shall include at least two pipes from two casts of each wall thickness pipe grade, diameter, or source of steel plate or coil. In addition to the mechanical tests specified Charpy tests shall be taken from the weld line, weld line +2 mm and weld line +5 mm positions. For information, additional Charpy tests shall be carried out at stepped reductions in temperature, to establish the transition temperature for the steel.

Manufacturer shall provide for Purchasers approval:

a. Manufacturing procedure specification (as per B.3);
b. Inspection and test plan (as per B.4);
c. Procedure qualification tests (as per B.5.1 and B.5.3); Manufacturer may offer prequalification data from previous production;
d. Charpy test method (Clause D.2.3 ISO 3183). Test temperature shall be -20°C.
e. Product analysis method (as per 10.2.4.1);
f. Method for diameter measurement (as per 10.2.8.1);
g. Standard practice for non-destructive inspection (as per E.2).

All tests summarized in Table 18 and Table M.7 of EN ISO 3183 shall be mandatory as applicable for the manufacturing process.

2.17 Annex C Treatment of Surface Imperfections and Defects

Applicable, add:

Weld repairs within 200 mm of the pipe ends and the repair of pipes with cracks are not permitted.

Modify para C.4.6: After weld repair, the total area of the repair shall be both ultrasonically and radiographically inspected in accordance to Annex E.

Add: Maximum number of repairs in one section is three (3). A section is intended as 6 m of pipe length.

2.18 Annex D Repair Welding Procedure

Applicable.

Cracks shall not be repaired.

2.19 Annex E Non-destructive Inspection for Other than Sour Service or Offshore

Applicable, add:

- Non-destructive Inspection shall be conducted by Level 2 or Level 3 personnel.
- AUT calibration shall demonstrate coverage of the entire weld volume plus a minimum of 5mm each side of the weld.

2.20 Annex F Requirements for Couplings (PSL 1 only)

Not Applicable.

2.21 Annex G PSL 2 Pipe with Resistance to Ductile Fracture Propagation

Applicable.

As specified in p.2.7.2.3 (8) and (9) of this specification.

2.22 Annex H PSL 2 Pipe Ordered for Sour Service

Not Applicable.

2.23 Annex I Pipe Ordered As "Through the Flowline" (TFL) Pipe

Not Applicable.

2.24 Annex J PSL 2 Pipe Ordered for Offshore Service

Applicable only when specifically indicated in this specification.

2.25 Annex K Non-destructive Inspection for Pipe Ordered for Sour Service and/or Offshore Service

Not Applicable.

2.26 Annex L Steel Designations

Applicable.

2.27 Annex M PSL 2 pipes ordered for European natural gas transmission pipelines

Applicable.

2.28 Annex N

Not Applicable.

2.29 Annex O

Not Applicable.

2.30 Annex P

Not Applicable.

3 DOCUMENTATION AND CERTIFICATION

3.1 General

The Seller shall prepare all reports in accordance with the Purchase Order and the following requirements.

3.2 Quality Control Documents

The Seller shall prepare the following technical documents and submit these to the Purchaser for review/approval prior to the start of fabrication.

3.2.1 Manufacturing Procedure Specification (MPS)

The MPS shall address, as a minimum, the following:

- Manufacturing operations;
- Inspection and testing operations;
- Non-destructive examination;
- Interrelation of the above operations;
- Characteristics being checked;
- Number of applicable reference procedures;
- Acceptance criteria, and;
- Notes and comments.

Manufacturing Procedure Specification shall be comprehensive and concise. MPS acceptable form will be provided to the Winner of Pipe Supply Tender.

3.2.2 Quality Control Procedures

The following quality control procedures shall be addressed

- Non-destructive examination;
- Visual/ dimensional checking;

- Mechanical testing;
- Hydrostatic testing;
- Marking, and;
- Coating and preservation.

3.2.3 Document Review

The Purchase shall have access to all quality related documents produced for this Purchase Order. The Seller shall promptly address any queries raised by the Buyer related to specific documents and shall immediately rectify identified discrepancies.

3.3 Required documents on the end of pipes fabrication

Inspection document of type LST EN 10204 - 3.1 is required. Document shall be provided in English and Lithuanian.

Four copies of each, inclusive of one original, for all documents and certificates are required.

3.4 Pipe loading and storage instruction

Manufacture shall provide pipe transportation loading and storage in piles instruction.

Instruction shall be provided in English and Lithuanian.

Amber Grid	AB „Amber Grid“ Savanorių pr. 28, LT-03116 Vilnius

O	2016-04-15	For tender
Rev. No.	Date	Description

Certificate No.	ARDYNAS Gedimino g. 47, LT- 44242 Kaunas Tel. (8 37) 323209 Faks. (8 37) 337257 El. p. ardynas@ardynas.lt			Title of overall project **Construction of Gas Interconnection Poland – Lithuania in Territory of Lithuania Republic**
9824	PM	Arvydas Mincė		Project title **Pipe procurement documentation**
	DPM	Egidijus Lepeška		
26502	DGS	Ramūnas Bankauskas		Document name **Technical requirements for steel pipes d711mm and d508 mm coating** — Rev. 0
4248	PPM	Aušra Keserauskienė		
EN	Builder and Client Amber Grid			Document number **2015-08-00-KRDD-D.PP-TS.2-1** — Page 1 — Pages 6

CONTENT

1 GENERAL

1.1 Scope

This specification covers the design, material, manufacturing, testing, inspection and acceptance requirements for 3 layer PE-coating of gas transmission pipes.

1.2 Definitions

Purchaser: AB „Amber Grid"

Supplier: Pipe Supplier as direct Contractor of the Purchaser

Manufacturer: Pipe Manufacturer (potentially the same as Supplier)

The Terms and Definitions of EN ISO 21809-1:2011 shall apply.

1.3 Normative References

This specification supplements the requirements of and shall be read in conjunction with EN ISO 21809-1:2011 "Petroleum and natural gas industries – External coatings for buried or submerged pipelines used in pipeline transportation systems -- Part 1: Polyolefin coatings (3-layer PE and 3-layer PP)". Paragraphs or parts of paragraphs contained in EN ISO 21809-1 which remain unaffected by the requirements of this Specification, shall remain fully applicable.

Any specification or standard referred to shall be of the latest edition.

When any code/standard refers to a standard that is still in preparation (prEN), the Supplier /Manufacturer shall suggest a corresponding standard at the time of order.

Manufacturer shall have documented Quality management system EN ISO 9001 or equivalent management system and Environmental management system EN ISO 14001 or equivalent environmental management system.

1.4 Units of Measurement

Units of measurement as per International System (SI) shall apply.

1.5 Roles and Responsibilities

Supplier/Manufacturer (Supplier further in the text) shall be fully responsible for compliance with all applicable requirements of EN ISO 21809-1, the applicable reference standards and the supplementary requirements of this specification.

Purchaser shall be responsible for defining the applicable codes and project requirements.

2 COATING SPECIFICATION

2.1 General Information (6.1 of EN ISO 21809-1)

2.1.1 Pipe Specification

For pipe specification refer to 2015-08-00-KRDD-D.PP-TS.1-1 based on standard EN ISO 3183.

Main parameters of the pipes to be ordered are specified in BOQ.

2.1.2 Coating Class (7.2, 7.3 of EN ISO 21809-1)

The coating system shall be a 3-layer extruded high density bi-modal polyethylene system (HDPE) fully suitable for the design temperatures and other service conditions in accordance with coating class B3.

For pipe d508 mm minimum required coating thickness shall be 3,5 mm; for pipe d711 mm minimum required coating thickness shall be 4mm, except pipe d711x12,5 mm.

Pipe d711x12,5 mm used for HDD technology shall have HDPE coating of thickness of 5 mm.

2.1.3 Cut back configuration (10.3 of EN ISO 21809-1)

The cut back length shall be minimum 150 mm. The PE shall be beveled to an angle not exceeding 30° measured in direction of pipe axis. The cut back shall be measured from the root face of the pipe to the beginning of the coating bevel. The FBE layer shall extend 15 mm +/- 5 mm beyond the toe of the PE bevel.

2.1.4 Inspection and testing (11 of EN ISO 21809-1)

Inspection and testing shall be carried out in accordance with clause 11 requirements.

Supplementary requirement: coating resistivity shall be not less than 10^8 Ω m^2. Coating resistivity shall be determined in accordance with DIN 30670 clause 5.3.7 Other equivalent test method may be used if agreed by Purchaser. The equivalent test method results shall consist of recording coating resistivity in Ω m^2.

Coating resistivity test report shall be included in PQT.

2.1.5 Marking (13 of EN ISO 21809-1)

2.1.5.1 Additionally to all markings required by EN ISO 21809-1 the coated pipes the following markings shall be placed on the coating:

- the pipe diameter and wall thickness in mm;
- pipe type;
- steel grade;
- an identification number for correlation of pipe with the related inspection document.

Marking shall be applied on the outside surface starting at 450 mm from one end of the pipe. Marking shall be carried out using a stencil painting method to ensure legible and indelible identification.

2.1.5.2 Additionally pipes shall be marked:

a) pipe d711x8,8 mm; L415ME shall have one (1) red ring-form belt on the both pipe ends;

b) pipe d711x11,0 mm; L415ME shall have two (2) red ring-form belts on the both pipe ends;
c) pipe d508x8,0 mm; L415ME shall have one (1) red ring-form belt on the both pipe ends;
d) pipe d711x11,0 mm; L485ME shall have one (1) blue ring-form belt on the both pipe ends;

Ring-form belt shall be permanently painted/glued on coated pipe. Width of belt≈150 mm, belt distance from pipe ends ≈1,0 meter.

2.1.5.3 Width of belt≈150 mm, belt location ≈1,0 meter from pipe ends. The belt shall be permanently painted/glued on coated pipe.

2.1.5.4 Pipe d711x8,0 mm shall have no additionally marking.

2.1.5.5 Each pipe shall have Bar code labels. Four (4) labels shall be attached on pipe coating. Label location will be specified during CMS (Coating Procedure Specification) agreement.

2.1.6 Certificate of Compliance (15 of EN ISO 21809-1)

The Inspection Certificate 3.1 in accordance with EN 10204 shall be issued. Additional Information (6.2 of EN ISO 21809-1).

2.1.7 Coating System Qualification

Seller shall provide the application procedure specification (APS) for Purchaser's approval. The APS shall be verified by a procedure qualification trial PQT in accordance with Annex L of EN ISO 21809-1. PQT shall include coating resistivity test report as per Clause 2.1.4.

2.1.8 Manufacturing and Quality Control

Seller shall provide an Inspection and Testing Plan (ITP) for Purchaser's approval.
Daily quality control data shall be recorded in accordance with Annex L.3.3 of EN ISO 21809-1 requirements.

2.1.9 Storage and Handling

Seller shall provide storage and handling instruction for transport and intermediate storage under construction site conditions.

Instruction shall include temperature limits related to the time for storage under construction site conditions without impairment of the coating.

2.1.10 Documentation and schedule for supply of documentation

The Seller shall prepare all reports in accordance with the Purchase Order requirements.

3 COATING REPAIRS

3.1 The Purchaser permits repairs of external or internal coating at the plant of the coating manufacturer or at the place of delivery upon qualification of damages by authorized representatives of the Purchaser; all repairs must be appropriately documented.

3.2 The pipes on which any unauthorized actions related to a repair of external insulation in places other than the mentioned, shall not be accepted by the ordering party.

3.3 The manufacturer of the external coating shall develop and deliver to the Purchaser for

acceptance the ***"Instructions for repair of damages to external of steel pipes"*** Repair materials shall be appropriate for the applied factory coating. The document must include description of damages and repair technologies, covering at least the below information.

3.4 External coating damages are all damages even not causing a break in the coating during holiday test, or damages in which the first layer of coating is not broken through, and the second layer may not be seen during visual inspection and also all damages causing a break in the coating during holiday test, or damages in which the first layer of coating is broken through, and the second layer may not be seen during visual inspection.

3.5 Any damages of this type shall be classified by the Purchaser's inspector. (or accepting company inspector accepting the pipes on behalf of orderer).

3.6 The r Purchase allows for repairs of damaged coating on surfaces constituting no more than 5% of pipe quantity in a batch delivered to the place of repair.

3.7 The area of a single, repaired damage must not be larger than 10 cm2, and the number of repaired damages on a single pipe - no more than 3.

3.8 If the number or size of defects on the pipe as well as a number of pipes with damaged surface exceeds said limits, the entire external coating shall be removed from the pipe and applied anew according to this specification, in a plant certified for quality management regarding performing external coatings on steel pipes.

3.9 The surface after repair shall be of uniform color, it shall cover the pipe continuously, not have any corrugations, blow holes and defects lowering quality, and feature at least minimum thickness in accordance with the order.

3.10 Upon repairing the defect, repeated porosity test as well as external coating thickness examinations are required.

3.11 A repair protocol will be drawn up and signed by the Supplier and Purchase inspector (or accepting company inspector accepting the pipes on behalf of Purchase).