



الاتحاد لصناعة الانابيب المحدودة
Union Pipe Industry K.S.A

Quality Control



IPT				
S. No	Equipment	Model No.	Standard	Type of Test
01	Carbon black tester	1398	ISO 6964, ASTM D 1603	Statutory standards prescribe the verification of carbon black content of polyolefin plastics
02	MFR-MVR tester	1709	ISO 1133, ASTM D 1238	combines the determination of the melt flow rate (MFR) and melt volume rate (MVR) of thermoplastic materials into one test procedure under specified temperature and load conditions.
03	Hydrostatic Pressure tester	1720	ISO 1167, ASTM D 1598, ASTM D 1599	Determining the strength of thermoplastic pipes.
04	Quix end closures	1735-1736	ISO 1167, ASTM D 1598, ASTM D 1599	Determining the strength of thermoplastic pipes to constant hydrostatic internal pressure at a constant ambient temperature
05	Unit for determination of density	H3002	ISO 1183 , ASTM D 792	Determine the density of plastics according to the buoyancy method
06	Burst tester	M1718	ASTM D 1599	
07	Water baths	M1759-0358		
08	End closure	V1280		
09	Forced Air Drying Oven	SLW 400	ISO 2505	used to condition samples according to the dimensional change of pipes and as a drying oven (e.g for determining the degree of cross linking, water Absorption, etc.).
10	Oxidation Induction Time Tester		ISO 11357-6, ASTM D 3895	To determine Oxidation Induction Time (Isothermal OIT) and Oxidation Induction Temperature (Dynamic OIT)



QC Equipment and Instruments

11	Universal Testing machine with Extended frame for Ring Stiffness		ISO 6259, ASTM D 638, DVS 2203-2, DVS 2203-5)	used for performing tension, pressure or bending tests
12	Marking Gauge	1291	ISO 2505	To determine the change in length as a result of warm storage, the marking gauge can be used to mark exact parallel circles on the outer surface of pipe segments
13	Contour Cutter			To prepare Specimen for Tensile & Elongation test PROPERTIES
14	Circumference Pi-Tape		ISO 3126	To measure the Outside Diameter of Pipe
15	Vernier Calipers	Mitutoyo	ISO 3126	To measure the Wall Thickness of the Pipe







شركة صناعات البولي إيثيلين عالي الكثافة
صناعة أنابيب البولي إيثيلين عالي الكثافة
Union Pipes Industry KSA

INSPECTION TEST PLAN- HDPE PIPES

UNION PIPES INDUSTRY
KAEC - KSA

Integrated Management System
Responsibility Documentation

S.No.	Description	Frequency	Test Method	Acceptance Criteria	Responsibility
A					
RAW MATERIAL					
1	Density	Once per Raw material Batch	ISO 1183	0.940 gm/cc --0.965 gm/cc	QA/QC Engineer
2	Melt Flow Rate	Once per Raw material Batch	ISO 1133	<0.3 gms/10 min @190/5.0 Kgs < 0.2gms/10 min @190/2.16 Kgs	QA/QC Engineer
3	Thermal stability	Once per Raw material Batch	ISO10837	> 20 Min.	QA/QC Engineer
B					
ON LINE INSPECTION					
1	Out side diameter	Every hour/Pipe	ISO3126	ISO 4427/DIN 8074	Extruder Operator/ Lab Technician
2	Wall Thickness	Every hour/Pipe	ISO3126	ISO 4427/DIN 8074	Extruder Operator/ Lab Technician
3	Length	Every hour/Pipe	ISO 4427	6/12 Mtr. Or As agreed	Extruder Operator/ Lab Technician
4	Ovality	Every hour/Pipe	ISO3126	ISO 4427/DIN 8074	Extruder Operator/ Lab Technician
5	Marking	Every hour/Pipe	ISO 4427	ISO 4427/DIN 8074	Extruder Operator/ Lab Technician
6	Visual Inspection	Every hour/Pipe	ISO 4427	ISO 4427/DIN 8074	Extruder Operator/ Lab Technician
7	End finishing	Every hour/Pipe	ISO 4427	ISO 4427/DIN 8074	Extruder Operator/ Lab Technician
C					
PIPE SAMPLING TESTS					
1	Heat Reversion Test	Three samples per run	ISO 2505	</= 3%	QA/QC Engineer
2	Hydrostatic Pressure Test @20 deg. 100 Hrs.	3 samples/ year per extruder, rotating sizes	ISO 1167	ISO 4427/DIN 8074	QA/QC Engineer
3	Hydrostatic Pressure Test @80 deg. 165 Hrs.	3 samples/ year per extruder, rotating sizes	ISO 1167	ISO 4427/DIN 8074	QA/QC Engineer
4	Hydrostatic Pressure Test @80 deg. 1000Hrs.	3 samples/ year per extruder, rotating sizes	ISO 1167	ISO 4427/DIN 8074	QA/QC Engineer
5	Tensile Strength Test	Every run/batch	ISO 6259	>18 Mpa	QA/QC Engineer
Form: ITP-01 Rev - 01	Prepared by : QA/QC Engineer <i>[Signature]</i>	Reviewed by : QA/QC Engineer <i>[Signature]</i>	Approved by : General Manager <i>[Signature]</i> Dr. Zeid		

 KAEC - KSA		INSPECTION TEST PLAN-LDPE PIPES				UNION PIPES INDUSTRY	
						KAEC - KSA	
Description		Frequency	Test Method	Acceptance Criteria	Integrated Management System Documentation		
A							
RAW MATERIAL							
1	Density	Once per Raw material Batch	ISO 1183	0.920 gm/cc --0.930gm/cc	QA/QC Engineer		
2	Melt Flow Rate	Once per Raw material Batch	ISO 1133	0.2 to 0.9 gms/10 min @190/2.16 Kgs	QA/QC Engineer		
B							
ON LINE INSPECTION							
1	Out side diameter	Every hour/Pipe/Coil	ISO 3126	Customer specs	Extruder Operator/ Lab Technician		
2	Wall Thickness	Every hour/Pipe/Coil	ISO 3126	Customer specs	Extruder Operator/ Lab Technician		
3	Length	Every hour/Pipe/Coil	ISO 3126	Customer specs	Extruder Operator/ Lab Technician		
4	Ovality	Every hour/Pipe/Coil	ISO 3126	</= 3%	Extruder Operator/ Lab Technician		
5	Marking	Every hour/Pipe/Coil	ISO 4427	Customer specs	Extruder Operator/ Lab Technician		
6	Visual Inspection	Every hour/Pipe/Coil	ISO 4427	ISO 4427	Extruder Operator/ Lab Technician		
7	End finishing	Every hour/Pipe/Coil	ISO 4427	ISO 4427	Extruder Operator/ Lab Technician		
C							
PIPE SAMPLING TESTS							
1	Heat Reversion Test	Three samples per run	ISO 2505	</= 3%	QA/QC Engineer		
2	Hydrostatic Pressure Test	One sample per batch per run	ISO 1167	ISO 4427	QA/QC Engineer		
3	Tensile Strength Test	Every run/batch	ISO 6259	> 11 Mpa	QA/QC Engineer		
Form : ITP-02		Prepared by : QA/QC Engineer	Reviewed by : QA/QC Engineer	Approved by : General Manager			
Rev - 01							



UNION PIPES INDUSTRY - 14070030000000000000
UNION PIPES INDUSTRY - KSA

INSPECTION TEST PLAN-MDPE PIPES

UNION PIPES INDUSTRY KAEC - KSA		Integrated Management System Documentation	
S.No.	Description	Frequency	Acceptance Criteria
A			
RAW MATERIAL			
1	Density(Compounded)	Once per Raw material Batch	0.940 gm/cc --0.955gm/cc
2	Melt Flow Rate	Once per Raw material Batch	<0.18 gms/10 min @190/2.16 Kgs
3	Thermal Stability	Once per Raw material Batch	>20 min
B			
ON LINE INSPECTION			
1	Out side diameter	Every hour/Pipe/Coil	Customer specs
2	Wall Thickness	Every hour/Pipe/Coil	Customer specs
3	Length	Every hour/Pipe/Coil	Customer specs
4	Ovality	Every hour/Pipe/Coil	</= 3%
5	Marking	Every hour/Pipe/Coil	Customer specs
6	Visual Inspection	Every hour/Pipe/Coil	ISO 4427
7	End finishing	Every hour/Pipe/Coil	ISO 4427
C			
PIPE SAMPLING TESTS			
1	Heat Reversion Test	Three samples per run	</= 3%
2	Hydrostatic Pressure Test @20 deg. 100 Hrs.	3 samples/ year per extruder,rotating sizes	ISO 4427/DIN 8074
3	Hydrostatic Pressure Test @80 deg. 165 Hrs.	3 samples/ year per extruder,rotating sizes	ISO 4427/DIN 8074
4	Hydrostatic Pressure Test @80 deg. 1000Hrs.	3 samples/ year per extruder,rotating sizes	ISO 4427/DIN 8074
5	Tensile Strength Test	Every run/batch	>15 Mpa

Form:ITP-03
Rev - 01

Prepared by :QA/QC Engineer

Reviewed by : QA/QC Engineer

Approved by : General Manager

[Handwritten signatures and initials]



Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 02-04-2018
Required Test : Appearance & Color – SASO ISO 4427-2

TEST RESULTS

Sr. No	Appearance Test Result	Color
1	Smooth & Clean internal & external surface observed during inspection and free from scoring and other surface defects	Black with Blue Strips

Test conditions: - Temperature=23°C, RH=48%

Requirement: -

1. For Appearance internal and external surface must clean, smooth and free from scoring, cavities and other surface defects
2. For Color must be Black or Blue whereas Blue or black Pipes with Blue stripes are intended for drinking purpose only.
3. For above ground installation, all blue components or components with non-black layers must be protected from direct UV Light.

Note:

AHSL certifies that the above test was carried out in accordance with **SASO ISO 4427-2** standard.

Tested by:

Hasan Shawkat
 Polymer Engineer
 AHSL Polymer Department



Verified by:

SAYYED ASJAD HUSSAIN
 Dept. Head - Specialist division
 AHSL Polymer Department

Test Method Variation: None

This report relates only to the sample tested and shall only be reproduced in full with the written approval of AHSL testing laboratory.

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 02-04-2018
Required Test : Dimensions – SASO ISO 4427-2

TEST RESULTS

S. No	Outer Diameter (mm)	Thickness (mm)	Ovality (%)
01	63.27	4.06	0.31
02	63.30	3.89	
03	63.40	3.90	
04	63.40	3.83	
05	63.20	4.05	
Average	63.31	3.94	

S. No	Test Parameters	Values
01	Minimum Requirement for outside diameter, mm	63.0
	Maximum Requirement for outside diameter, mm	63.4
02	Minimum Requirement for wall thickness, mm	3.8
	Maximum Requirement for wall thickness, mm	4.3
04	Test Atmospheric conditions	Temperature=22.2°C, RH=50%
Note:	Maximum & Minimum requirement are in accordance with SASO ISO 4427-2 standard	

Note:

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

Tested by



Hasan Shawkat
 Polymer Engineer
 AHSL Polymer Department



Verified by:



SAYYED ASJAD HUSSAIN
 Dept. Head - Specialist division
 AHSL Polymer Department

Test Method Variation: None

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AL HOTY STANGER LTD. CO.

INDEPENDENT LABORATORIES & MATERIALS TESTING

P.O. Box 3072 - Al-Hofuf - 51622 - TEL: (013) 558 1000 / 808 4517 / 525 7517 / 524 7510 / 828 5217 Fax: (013) 558 1466

Jubail P.O. Box 482 - Tel: (013) 341-6791 Fax: (013) 341-0542 - Hofuf P.O. Box 2732 - Tel: (013) 588-3211 Fax: (013) 587-1420 - Riyadh P.O. Box 7354 - Tel: (011) 473-4232 Fax: (011) 479-2066

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 02-04-2018
Required Test : Density – ASTM D792/ISO 1183

TEST RESULTS

Sample No		1	2	3
Weight of Sample in Air	g	1.8277	1.8001	1.6927
Weight of Sample in Water	g	0.1794	0.1728	0.1620
Specific gravity	---	1.108	1.106	1.105
Density = (Sp.gr X density of liquid)	g/cm ³	0.953	0.951	0.950
Average	g/cm ³	0.951		

(Density of liquid – 0.86g/cm³)**Note:**

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

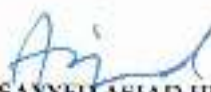
Tested by:



Husan Shawkat
 Polymer Engineer
 AHSL Polymer Department



Verified by:



SAYED ASJAD HUSSAIN
 Dept. Head - Specialist division
 AHSL Polymer Department

Test Method Variation: None

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AL HOTY STANGER LTD.CO.

INDEPENDENT LABORATORIES & MATERIALS TESTING

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 Jubail P.O. Box 0126 - Tel: (013) 660-1324 Fax: (013) 664-8345 - Yanbu P.O. Box 90919 - Tel: (013) 551-4466 Fax: (013) 551-4466

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 02-04-2018
Required Test : Melt Mass Flow Rate – ISO 1133 (SASO ISO 4427-2)

TEST RESULTS

For HDPE PIPE – 63X3.8 SDR17 PN10 PE100

Test Property	1	2	3	Average
Melt Mass Flow Rate, g/10min	0.230	0.230	0.231	0.230

For HDPE RAW MATERIAL

Test Property	1	2	3	Average
Melt Mass Flow Rate, g/10min	0.260	0.262	0.268	0.263

S. No	Test Parameters	Values
01	Test Temperature, °C	190
02	Specimen weight, kg	5
03	Method used	Mass Measurement method
04	Conditioning procedure	Sample conditioned at 21°C for 24 hours
05	Requirement, %	±20

Note:

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

Tested by

Hasan Shawkat
Polymer Engineer
AHSL Polymer Department



Verified by:

SAYYED ASJAD HUSSAIN
Dept. Head - Specialist division
AHSL Polymer Department

Test Method Variation: None

This report relates only to the sample tested and shall only be reclassified in full with the written approval of AHSL testing laboratories.

AL HOTY STANGER LTD.CO.

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AL HOTY - STANGER**TEST REPORT**

Date: April 02, 2018

Ref.No: 15/2455

Report No: PM18T129

UNION PIPE INDUSTRY**KING ABDULLAH ECONOMIC CITY - KSA**

Page: 1 of 1

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 02-04-2018
Required Test : Tensile Strength – ISO 6259-1, 3 (SASO ISO 4427-2)

TEST RESULTS

Test Property		Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Average
Tensile Strength at yield	MPa	25.26	23.98	26.40	23.62	23.88	24.62

Test Parameters:-

S. No	Test Parameters	Values
01	Type of Test Specimen	Type 2
02	Specimen size (widthxthickness) (mm)	6x3.8
03	Rate of separation (mm/min)	50
04	Method of preparation of sample	Punched from the pipe
05	Test Atmospheric conditions	Temperature=22.2°C, Relative Humidity=50%
06	Standard Deviation	1.36

Note:

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

Tested by

Hasan Shawkat
 Polymer Engineer
 AHSL Polymer Department



Verified by:

SAYYED ASJAD HUSSAIN
 Dept. Head - Specialist division
 AHSL Polymer Department

Test Method Variation: None

This report relates only to the sample tested and shall only be reproduced in full with the written approval of AHSL testing laboratory.

AL HOTY STANGER LTD.CO.**INDEPENDENT LABORATORIES & MATERIALS TESTING**

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Jeddah P.O. Box 5125 - Tel: (011) 890-1324 Fax: (011) 885-8717 - Yach - P.O. Box 33312 - Tel: (011) 550-0000 Fax: (011) 550-1474

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
 Company : UNION PIPE INDUSTRY
 Sample Delivered by : Client
 Testing date : 02-04-2018
 Required Test : Elongation at break – ISO 6259-1, 3 (SASO ISO 4427-2)

TEST RESULTS

Test Property		Reading 1	Reading 2	Reading 3	Reading 4	Reading 5	Average
Elongation at break	%	547.69	531.02	578.63	519.92	531.71	541.79

Test Parameters:-

S. No	Test Parameters	Values
01	Type of Test Specimen	Type 2
02	Specimen size (widthxthickness) (mm)	6x3.8
03	Rate of separation (mm/min)	50
04	Method of preparation of sample	Cut from the pipe
05	Test Atmospheric conditions	Temperature=22.2°C, Relative Humidity=50%
06	Standard Deviation	22.96
07	Requirement as per ISO 4427-2 %	≥350

Note:

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

Tested by



Hasan Shawkat
Polymer Engineer
AHSL Polymer Department



Verified by:



SAYYED ASJAD HUSSAIN
Dept. Head - Specialist division
AHSL Polymer Department

Test Method Variation: None

This report relates only to the sample tested and shall only be reproduced in full with the written approval of AHSL as per laboratory

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 02-04-2018
Required Test : Longitudinal Reversion – ISO 2505-1 (SASO ISO 4427-2)

TEST RESULTS

Sample No	Initial length (<i>l₀</i>) (mm)	Final length (<i>l</i>) (mm)	Change in length (ΔL) (%)
01	100.00	98.99	1.03
02	100.00	98.97	1.04
03	100.00	99.01	1.00
Average	100.00	98.99	1.02

(*l₀* - distance between the gauge marks before heat treatment), (*l* - distance between the gauge marks after heat treatment)

Test Parameters:-

S. No	Test Parameters	Values
01	Test Method	Method B – Determination using Air Oven
02	Test Duration, minutes	120
03	Test Temperature, °C	110
04	Pipes Length, mm.	200
05	(<i>l₀</i>) for Each pipe is 100mm	$\Delta L = l - l_0 / l_0$
06	Requirement, %	≤3

Note:

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

Tested by



Hasan Shawkat
Polymer Engineer
AHSL Polymer Department



Verified by:



SAYYED ASJAD HUSSAIN
Depr. Head - Specialist division
AHSL Polymer Department

Test Method Variation: None

This report relates only to the sample tested and shall only be reproduced in full with the written approval of AHSL testing laboratory.

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 02-04-2018
Required Test : Oxidation Induction Time – ISO 11357-6 (ISO 4427-2)

TEST RESULTS

Test Property	1	2	3	Average
Oxidation Induction Time minutes	37	37	37	37

S. No	Test Parameters	Values
01	Test Temperature, °C	200
02	Specimen weight, mg	10
03	Nitrogen gas flow, ml/min	50
04	Measurement technique	Offset method
05	Result Range, %	≥20

Note:

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

Tested by



Hasun Shawkat
Polymer Engineer
AHSL Polymer Department



Verified by:



SAYYED ASJAD HUSSAIN
Dept: Head - Specialist division
AHSL Polymer Department

Test Method Variation: None

This report relates only to the sample tested and shall only be reissued in full with the written approval of AHSL source laboratory.

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 02-04-2018
Test Required : Carbon black content – ISO 6964

TEST RESULT

Sample No	1	2	
Mass of the boat (W_1)	g	32.7489	32.3912
Mass of the sample (W_2)	g	33.7490	33.3915
Mass of residue + boat (W_3)	g	32.7699	32.4132
Carbon black content	%	2.1	2.2
Average CBC	%	2.15	
Requirement	%	2-2.5	

Test Parameters:

S. No	Test Parameters	Values
01	Nitrogen Flow, L/min.	1.8
02	Furnace Temperature, °C.	600
03	Carbon black content	$(W_3 - W_1) / (W_2 - W_1) \times 100$

Note:

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

Prepared by



Hasan Shawkat
 Polymer Engineer
 AHSL Polymer Department



Witnessed & Verified by:



SAYYED ASJAD HUSSAIN
 Dept: Head - Specialist division
 AHSL Polymer Department

Test Method Variation: None

This witness report relates only to the sample tested and shall only be reproduced in full with the written approval of AHSL testing laboratory.

AL HOTY STANGER LTD.CO.

INDEPENDENT LABORATORIES & MATERIALS TESTING

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 Jeddah P.O. Box 0126 - Tel: (012) 885-1934 Fax: (012) 885-6329 - Yanbu' P.O. Box 37017 - Tel: (044) 999-2400 Fax: (011) 479-2058

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 31/04/2018 to 03/04/2018
Required Test : Hydrostatic Strength Test – ISO 1167-1,2 (SASO ISO 4427-2)

Sample description:

SDR	Length (m)	Outer Diameter (mm)	Thickness (mm)
17	1	63.0	3.8

Test Parameters:

Stress (MPa)	Test Temperature (°C)	Test Time (hours)	Type of Test
12.4	20.0	100	Water-in-water

TEST RESULT

S. No	Test Property	Test Method	Result
01	Pressure Test	ISO 1167-1,2	Pass

Remark: - Sample does not show any failure during the test period.

Note:

AHSL certifies that the above test was carried out in accordance with SASO ISO 4427-2 standard.

Prepared by:

Hasan Shawkat
Polymer Engineer
AHSL Polymer Department



Witnessed & Verified by:

SAYYED ASJAD HUSSAIN
Dept. Head - Specialist division
AHSL Polymer Department

Test Method Variation: None

This witness report relates only to the sample tested and shall only be reproduced in full with the written approval of AHSL testing laboratory.

Sample Description : HDPE PIPE – 63X3.8 SDR17 PN10 PE100
Company : UNION PIPE INDUSTRY
Sample Delivered by : Client
Testing date : 31/04/2018 to 03/04/2018
Required Test : Hydrostatic Strength Test – ISO 1167-1,2 (SASO ISO 4427-2)





الاتحاد لصناعة الانابيب المحدودة

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Clients Approvals