ASPC Project

END CUSTOMER	:	**Arya Sasol Polymer Company**
CONTRACTOR	:	**DYPNF Co., Ltd.**
VENDOR NAME	:	**Airpack Netherlands BV**
EQUIPMENT DESCRIPTION	:	**Screw Compressor & Roots Blower Package**
PURCHASE ORDER NUMBER	:	**PO-PC2312-08**

Customer Document Number : 3944-VD-0171-DYP-RE-400-PRC-0012

Airpack Document Number : 23383-15

Document Title : NDE procedure

Review Code and Status			Contractor Initials/Signature	Date signed
	Code 1	**REJECTED** - Vendor to revise and Resubmit. Work cannot proceed		
	Code 2	Comments As Noted - Work May proceed, subject to compliance with and incorporation of comments		
	Code 3	No Comments - Work may proceed.		
	Code 4	Information only - Review not required.		

00	Issued for Approval	07-03-2025	SC	KP	JJ
Rev. No.	Description	Date	Prepared by	Checked by	Approved by

1. Purpose

Checking the performance and functioning of the package against the approved documents and specifications.

Separate test reports for each test will be generated; however, this FAT procedure covers only the procedure to be performed on all skids.

2. Reference documents

2.1. Vendor documents

Please find below the reference vendor documents that will be used during this FAT.

3944-VD-0171-DYP-RE-400-PID-0016	23383-03	P&ID
3944-VD-0171-DYP-RE-400-DWG-0020	23383-04	General Arrangement Drawing
3944-VD-0171-DYP-RE-400-DIA-0002	23383-05	Wiring Diagram
3944-VD-0171-DYP-RE-400-DWG-0003	23383-07	Panel lay-out
3944-VD-0171-DYP-RE-400-ITP-0120	23383-08	Inspection & Test Plan (ITP)
3944-VD-0171-DYP-RE-400-PRC-0081	23383-21	Control Philosophy
3944-VD-0171-DYP-RE-400-DIA-0082	23383-27	Cause and Effect chart

2.2. Manufacturing data book

The manufacturing data book will also be available for review during the FAT. The MDB will be checked according to the approved MDB index and ITP.

The client or client TPI will sign the relevant pages as well as all relevant points of the ITP.

3. Scope

9 Screw compressors and 2 root blowers, divided in the following way:
44C-40001A/B: Nitrogen screw compressors, discharge 6255 Nm3/h / 2.903 bar(a)
44C-80001A/B: Air screw compressors, discharge 4175 Nm3/h / 2.473 bar(a)
44C-80002A/B: Air root blowers, discharge 4257 Nm3/h / 1.983 bar(a)
44C-80004A/B: Air screw compressors, discharge 7185 Nm3/h / 3.213 bar(a)
44C-80005A/B/C: Air screw compressors, discharge 4095 Nm3/h / 2.423 bar(a)

4. HSE

Standard safety precautions have to be taken since we are working with pressurised air.

- Proper PPE has to be worn when working / testing the package
- All visitors for the FAT will be instructed before the FAT, about Airpack safety precautions, by Airpack Safety movie.
- All visitors will be asked to sign a disclaimer to be able to enter the hazardous area during the test.
- The test area is cordoned off to make sure non-authorized personnel does not enter this area.

5. FAT Kick off meeting

Before starting the FAT there will be a short kick off meeting, where Airpack will explain the safety rules and regulations as well as what activities and planning will be performed during the FAT.

Kick-Off Meeting (KOM) Agenda.

i. Introduction/Sign in (along with the name, role/designation)
ii. HSE Induction
iii. FAT organization, roles and responsibilities of the personnel involved.
iv. Briefing on duration and sequence of tests planned, timing etc.

Also proper PPE will be distributed as required.

6. Roles and responsibilities

The project manager is responsible for the complete FAT. The project manager will arrange the persons who are required for each part of the FAT.

A qualified AIRPACK Technician who is familiar with the operational parameters of the Package will perform all FAT tasks

6.1. Problem resolution

If there are any problems during the FAT, they will be rectified immediately if possible, if not possible they will be recorded in the FAT punch list and resolved before shipment /commissioning of the package.

Please find attachment 1: Punch list format.

7. Test Instruments

The following test instruments will be used during the FAT, all instruments will have a valid calibration certificate which will be supplied as part of the FAT test results for checking and signing.

- Paint thickness meter
- Sound level meter
- Ambient pressure / temperature meter
- Multi meter (voltage check)
- Etc.

8. Utilities

The utilities that are available during FAT are:
- Power: [voltage 6kV, 50Hz, 3ph / 400V, 50Hz, 3ph and/or 230V, 50Hz, 1ph]

9. Test procedure

Test may not be done in below order; it is subject to availability of personnel and equipment.

9.1. Mechanical checks

The Following will be tested / checked and recorded as part of the FAT:

Quality

1 Verify all equipment are installed in accordance with approved P&ID and GAD.
2 Visual inspection of the complete package for quality.
3 Verify piping, tubing location, orientation in accordance with approved GA Drawing.

P&ID review

1 Verify all components are installed as per the GA Drawing.
2 Check that all components are tagged according to the P&ID.
3 Check that the location is of the components is as per the GAD.

Dimensions

1 Dimensional check of the complete package for compliance to approved GA Drawing.
2 Verification and dimensional check of Tie-in Point, lifting points
3 Verification and dimensional check of foundation holes.

Painting

1 Check the overall paint for damages and overall quality.
2 Randomly check the thickness as per the approved paint procedure.
3 Check the paint color as per the paint procedure.

Control Panel

1 Check for any loose connection in the control panel
2 Verify all control panel BOM, GA, wiring, I/O etc., matches approved drawings.
3 Check the installation and type of cable glands
4 Check the installation of the cable trays
5 Check the cable type

Instruments

1 Check for any loose connection of cables or wires in the instruments
2 Check the installation of the instruments as per approved drawings
3 Check if all instruments are tagged
4 Check the quantity of the instruments

All checks are mentioned in attachment 2: Equipment checklist

9.2. Functional test control system

A functional test will be executed on local pushbutton stations.

The functional test will be performed as per attachment 3: Functional test results

Following items are functionally tested / checked:
- Power up checks
- grounding check (instruments will be earthed externally)
- I/O checks
- Alarms (10% random alarms are individually dry tested)
- Trips (10% random trips are individually dry tested)
- Check functionality of panel displays (HMI)
- Cause and effect test of the package
- Operation check (start, stop, etc.)

9.3. Performance test (two hours)

Test set-up for the package is as follows:
- The power from the package will come from internal power supply
- 6kV / 50Hz / 3ph and 230V / 50Hz / 1ph
- Power is ON
- One performance test will be done per type of compressor/blower

The following measurements will be taken during the performance test.

- Sound level at 1 metre distance from skid (max. 85 dB(A))
- Refer to Attachment 4 for an example of the performance test results sheet, which will be filled in during FAT.
- Data is extracted from all the transmitters to check the performance. Gauges can be checked during running and will not be listed in the performance test sheet.

All in house instruments required / used during the test will have recent calibration certificated, which will be attached to the FAT test report.

The FAT recordings can be found in attachment 4: Performance test results

9.4. Noise level measurement

Noise test will be done during the performance test. Measuring points will be defined by a distance of 1 metre from the package and measured round the package. Final measuring point will be the same as start measure point. This is for checking correct functioning of the noise level meter.

Noise level shall not exceed 85 dB(A) for complete package at 1 metre distance (with package test blow off muffler closed).

The measurement will be recorded in attachment 5: Noise test results.

	300 KT polyethylene project (ASPC)		
DATE: 07-03-2025	**DOC NO.:** 23383-14 ATTACHMENT 1 PUNCH LIST	**REV.** 00	**PAGE:** 1

	CAUSE:	DATE PUNCH LIST FILLED:	SIGNATURE:	SIGNATURE:	
	FAT	DD-MM-YYYY	T.B.D.	T.B.D.	

Item	Description	Point raised by	Action by	Completion before	Closed [date] [name]
001					
002					
003					
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038					
039					
040					

TEST DATE	SIGNATURE AIRPACK TEST ENGINEER	SIGNATURE CLIENT INSPECTOR	NOTES
DD-MM-YYYY	T.B.D.	T.B.D.	

INSPECTION	DOCUMENT	COMPLETED	REMARKS
Quality			
1. Installation of main equipment	GAD / PID		
2. Visual inspection of overall quality	GAD / PID		
3. piping, tubing location / orientation	GAD / PID		
P&ID review			
1. Component check	P&ID		
2. Tagging of all components	P&ID		
3. Component location	P&ID		
Dimensions			
1. Overal skid dimensions	GAD		
2. Tie-in point dimensions	GAD		
3. Foundation bolt holes	GAD		
Painting			
1. Overal Paint quality	Paint procedure		
2. Painf DFT measurement	Paint procedure		
3. Paint color	Paint procedure		
Control Panel			
1. Loose connections	Wiring diagram / Panel lay-out		
2. BOM	Wiring diagram / Panel lay-out		
3. Cable glands	Wiring diagram / Panel lay-out		
4. Cable trays	Wiring diagram / Panel lay-out		
5. Cable type	Wiring diagram / Panel lay-out		
Instruments			
1. Loose connections	Wiring diagram		
2. Installation	P&ID		
3. Tagging	P&ID		
4. quantity	P&ID		

Airpack Test Engineer	Client Inspector

INSPECTION	DOCUMENT	COMPLETED	REMARKS
Power up check	wiring diagram		
grounding check	wiring diagram		
I/O check	wiring diagram		
Alarm test of 10%	Control Philosophy		
Trip test of 10 %	Control Philosophy		
Cause and effect	Cause & effect chart		
Operational check	Control Philosophy		

Notes:

Performance Test Results - 44C-40001A

	00:00	00:15	00:30	00:45	01:00	01:15	01:30	01:45	02:00	UNIT	OPERATING VALUES
44PT-4001003 Compressor inlet pressure	START									Bar	
44TT-4001056 Compressor oil temperature										°C	
44PT-4001054 Compressor oil pressure										Bar	
44PT-4001011 Compressor discharge pressure										Bar	
44TT-4001057 Compressor discharge temperature										°C	
44TT-4001001 Compressor enclosure temperature										°C	

Running test starting time:		
Humidity:		R.H.%
Ambient temperature:		°C
Ambient pressure:		hPa

SIGNATURE;	
Airpack Test Engineer:	
Client inspector:	

NOTES;

Performance Test Results - 44C-80001A

	00:00	00:15	00:30	00:45	01:00	01:15	01:30	01:45	02:00	UNIT	OPERATING VALUES
44PDT-8001001A Compressor inlet filter diff. pressure	START									Bar	
44PT-8004001 Compressor inlet pressure										Bar	
44TT-8001056A Compressor oil temperature										°C	
44PT-8001054A Compressor oil pressure										Bar	
44PT-8004002 Compressor discharge pressure										Bar	
44TT-8004001 Compressor discharge temperature										°C	

Running test starting time:		
Humidity:		R.H.%
Ambient temperature:		°C
Ambient pressure:		hPa

SIGNATURE;	
Airpack Test Engineer:	
Client inspector:	

NOTES;

Performance Test Results - 44C-80002A

	00:00	00:15	00:30	00:45	01:00	01:15	01:30	01:45	02:00	UNIT	OPERATING VALUES
44PDT-8002001A Blower inlet filter diff. pressure	START									Bar	
44PT-8004005 Blower inlet pressure										Bar	
44PT-8004006 Blower discharge pressure										Bar	
44TT-8004005 Blower discharge temperature										°C	

Running test starting time:		
Humidity:		R.H.%
Ambient temperature:		°C
Ambient pressure:		hPa

SIGNATURE;	
Airpack Test Engineer:	
Client inspector:	

NOTES;

Performance Test Results - 44C-80004A

	00:00	00:15	00:30	00:45	01:00	01:15	01:30	01:45	02:00	UNIT	OPERATING VALUES
44PDT-8004001A Compressor inlet filter diff. pressure	START									Bar	
44PT-8004101 Compressor inlet pressure										Bar	
44TT-8004056A Compressor oil temperature										°C	
44PT-8004054A Compressor oil pressure										Bar	
44PT-8004102 Compressor discharge pressure										Bar	
44TT-8004101 Compressor discharge temperature										°C	

Running test starting time:		
Humidity:		R.H.%
Ambient temperature:		°C
Ambient pressure:		hPa

SIGNATURE;	
Airpack Test Engineer:	
Client inspector:	

NOTES;

Performance Test Results - 44C-80005A

	00:00	00:15	00:30	00:45	01:00	01:15	01:30	01:45	02:00	UNIT	OPERATING VALUES
44PDT-8005001A Compressor inlet filter diff. pressure	START									Bar	
44PT-8004107 Compressor inlet pressure										Bar	
44TT-8005056A Compressor oil temperature										°C	
44PT-8005054A Compressor oil pressure										Bar	
44PT-8004108 Compressor discharge pressure										Bar	
44TT-8004105 Compressor discharge temperature										°C	

Running test starting time:		
Humidity:		R.H.%
Ambient temperature:		°C
Ambient pressure:		hPa

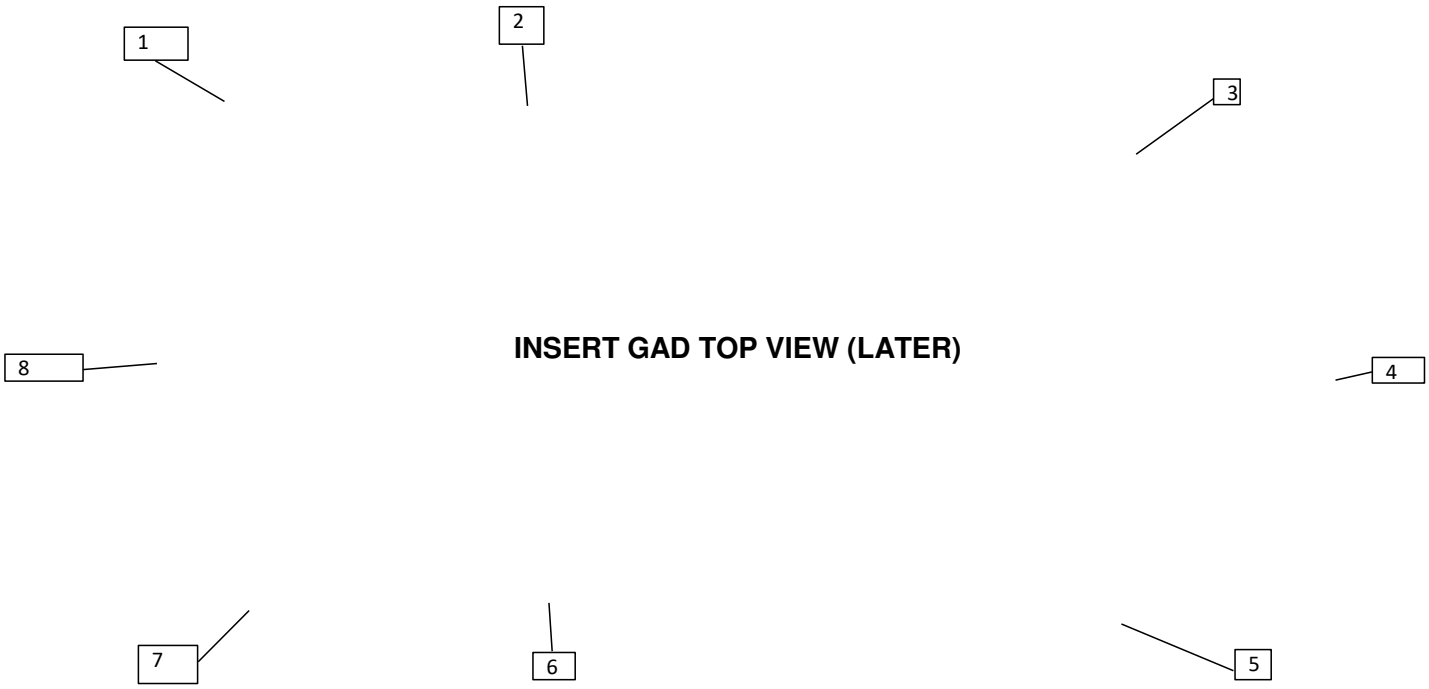
SIGNATURE;	
Airpack Test Engineer:	
Client inspector:	

NOTES;

Airpack	**300 KT polyethylene plant project (ASPC)**	DYPNF	
DATE: 07-03-2025	**DOC NO.:** 23383-14 ATTACHMENT 5 noise test	**REV.** 00	**PAGE:** 01 of 01

NOISE LEVEL

Supplier to Complete
Expected Noise Level Data



Noise test has been performed during performance test:

Procedure:
Measure point will be defined by a distance of 1 metre from the package and 1,5 metre above the ground level to measured round the package. Final measure points will be the same as start measure points. This is for checking correct functioning of the noise level meter. Noise shall not exceed 85 dB(A) for complete package. Noise meter calibration certificate is available during test

Points	Unit	Noise Estimated	Noise measured	Average of anti logs	Noise level (Logarithmic Avg)	Noise level (Arithmetic Avg)
P1	dB(A)	85		1	0	0
P2	dB(A)	84				
P3	dB(A)	83				
P4	dB(A)	83				
P5	dB(A)	83				
P6	dB(A)	84				
P7	dB(A)	85				
P8	dB(A)	85				

Surrounding Noise measured (dB(A)) : 75

Noise level (After correction(If required) as per 5.3 of ISO 2151):

Correction Factor		
Level increase due to	Value to be subtracted from measured	-2
5	2	
6 to 9	1	

Test Condition : Noise level test as per ISO 2151

Test Result:

-2

Tested By :

Date:

NOTE: