

# Test Report



Laboratório de Ensaios

INTERFACE testing lab

Rua Capitães de Abril nº39, 1º Dto  
Colina do Sol  
2650-351 Amadora - Portugal

Phone: 21 476 77 70

Fax: 21 474 81 54

Site: www.interface.pt

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**Report Number:** 376AR17 **Report Date:** 14-11-2017

## Equipment Tested: **CLEANROOM**

**Room:** Production Room  
**Room Conditions:** Resting  
**Number of people:** 1  
**Room Area (m<sup>2</sup>):** 10.4

## Customer Identification:

**Institute** IlhaPlast - Soc. Transformadora de Plásticos  
**Department:** Direction  
**Contact Person:** Eng<sup>o</sup> Jorge Jesus  
**E-mail Address:** ilhaplast@ilhaplast.com  
**Installation Address:** Zona Industrial de Vagos, Lote 87, 3840-385 Vagos, Portugal

## Equipments used in the tests:

Test Equipments	Serial Number
Air Particle Counter	040501036
Thermoanemometer	54100241
Luximeter	110301261
Micromanometer	113573
Photometer	16137
Aerosol Generator	16038
Sound Level Meter + Calibrator	00341519/50441100
Termohygrometer	160109124
<b>Others:</b> Supports, tapes leaflets, tape and smoke ampoules	

## Applicable Standards:

<b>ISO 14644-1:2015</b>	Cleanrooms and associated controlled environments
<b>ISO 14698:2003</b>	Cleanrooms - Biocontamination control
<b>IEST- RP-CC006.3:2004</b>	Testing Cleanrooms
	Equipment calibration na Validation Procedures
	HEPA and ULPA Filter Leak Tests

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**Testing date:** 19-10-2017



**Responsible for the Technical Tests**  
João Fonseca

**Technical and Quality Director**  
Elsa Rodrigues

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## Air velocity report test

<b>Test Code</b>	<b>Expected report</b>
SLZOQ.02 IEST-RP-CC006.3	IEST-RP-CC006.3- Uniform flow measurement
Total insuflation area with HEPA filters (m <sup>2</sup> ):	<b>1.44</b>
Number of tests:	<b>6</b>
Medium of velocity* in insuflation by HEPA filters (m/s):	<b>0.50</b>
Number renovations of the air in the cleanroom by hour:	<b>90.93</b>

**\*Speed above 1,0 m/s is outside the scope of accreditation.**

## Test of the Pressure difference

<b>Test code</b>	<b>Expected report</b>
SLZOQ.03 IEST-RP-CC006.3	There is not a defined value by the norm, this value is defined by the customer.

	<b>Result (Pa)</b>
Pressure inside the room compared with exterior pressure:	-
Pressure in the antechamber compared with exterior pressure:	<b>4,2</b>
Pressure in the room compared with room :	<b>4</b>

## Filtration System Integrity Test - Leak Test

<b>Test Code</b>	<b>Expected report</b>
SLZOQ.04 IEST-RP-CC006.3	IEST-RP-CC006.3-The aerosol penetration can not exceed 0,01% at any point of the filter
<b>Method</b>	<b>Result</b>
IEST-RP-CC006.3	HEPA filter test <b>OK</b>

## Lighting intensity test

<b>Test Code</b>	<b>Expected report</b>
SLZOQ.05 IEST-RP-CC006.3	There is no defined value by the norm, this value is defined by the customer specifications. Procedure by the normative IEST-RP-CC006.3
	<b>Result</b>
Light medium intensity (lux):	<b>706</b>

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## Noise Level Test

**Test Code** SLZOQ.06 **Expected report** There is no defined value by the norm, this value is defined by the customer specifications.  
**Method** IEST-RP-CC006.3 Procedure by the normative: IEST-RP-CC006.3

**Maximum Value** obtained by the Frequency Tested:

	<b>Result</b>
63 Hz	<b>46.7</b>
125 Hz	<b>48.4</b>
250 Hz	<b>59.7</b>
500 Hz	<b>63.4</b>
1K	<b>63.8</b>
2K	<b>65.1</b>
4K	<b>59.2</b>
8K	<b>51.4</b>

NC Value of the room (dB(A)): **< 70**

## Humidity and Temperature Test

**Test code** SLZOQ.07 **Expected Report** There is no defined value by the norm, this value is defined by the customer specifications.  
**Method** IEST-RP-CC006.3 Procedure by the normative: IEST-RP-CC006.3

**Measuring sites:** Same as the particle counts.

	<b>Result</b>
Medium value of the temperature obtained in the room (°C):	<b>22.2</b>
Maximum value (°C):	22.5
Minimum value (°C):	22.0
Number of measurements:	6
Medium value of the humidity obtained in the room(%):	<b>55.1</b>
Maximum value (°C):	56.2
Minimum value (°C):	54.1
Number of measurements:	6

## Flow Direction Test

**Test Code** SLZOQ.07 **Expected report** IEST-RP-CC006.3 Insuflation - Perpendicular air with velocity enough to reach the work area. Air extration must follow the flow direction. In the working area the air must circulate from top to bottom and with considerable speed.  
**Method** IEST-RP-CC006.3

	<b>Results</b>
Air direction in the insuflation area:	<b>OK</b>
Air direction the extraction area:	<b>OK</b>
Air direction in the working zone:	<b>OK</b>

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Approved by: Dra. Elsa Rodrigues

Date: 24/10/2016

EN/76/R11

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# Test Report

Report Number: 376AR17 Report Date: 14-11-2017

## Room classification - Particle Counting

Test code SLZOQ.01 Expected report ISO 14644-1:2015 normative (see attached table)



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ISO Classe Number	Maximum concentration of particles (Particles per cubic meter of air)					
	0.1 µm	0.2 µm	0.3 µm	0.5 µm	1 µm	5.0 µm
ISO 1	10	---	---	---	---	---
ISO 2	100	24	10	---	---	---
ISO 3	1.000	237	102	35	---	---
ISO 4	10.000	2.370	1.020	352	83	---
ISO 5	100.000	23.700	10.200	3.520	832	---
ISO 6	1.000.000	237.000	102.000	35.200	8.320	293
ISO 7	---	---	---	352.000	83.200	2.930
ISO 8	---	---	---	3.520.000	832.000	29.300
ISO 9	---	---	---	35.200.000	8.320.000	293.000

Number of Particle Counting proceeded: 28 l/min  
Sample flow: 28 l/min

### Medium values of the countings (particles/m<sup>3</sup>):

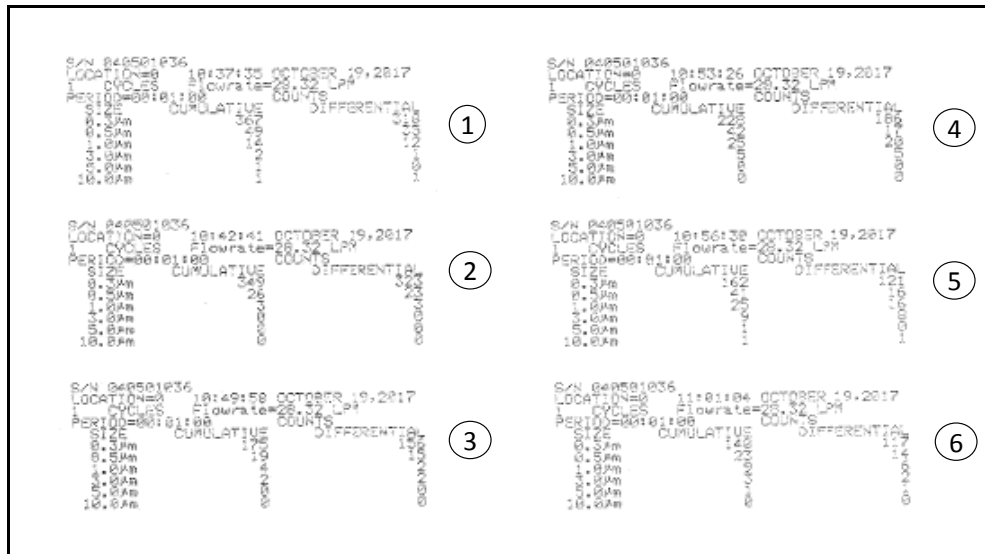
0,3 µm 8357      0,5 µm 1176      1,0 µm 470      5,0 µm 18

### Trust Limit at 95%:

0,3 µm 9514      0,5 µm 1320      1,0 µm 586      5,0 µm 18

Note: When the number of counting points is greater than 9 the value of trust limit at 95% is equal to the medium value of the counting (particles / m<sup>3</sup>) because the factor UCL (t) is equal to zero.

### Particle Count Bead Printed



Legend - ○ Particle counting points made according to the attached plan.

ISO classification of the room : ISO 6

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## Corrective Actions

Check the differential pressure meter of the production and contiguous rooms.

## Conclusions

The differential pressure meter in the personnel room is always measuring 6.2 Pa. The equipment measuring from the personnel room to the outside is also very slow.

The Clean Room tested has an ISO 6 rating, so it can be used while a lower rating is not required.

**Note:** The corrective actions, observations and conclusions presented are not supported by the accredited evaluation criterium.

**NA:** Not applicable

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# Test Report

Report Number: 00-01-1900

Report Date:

00-01-1900



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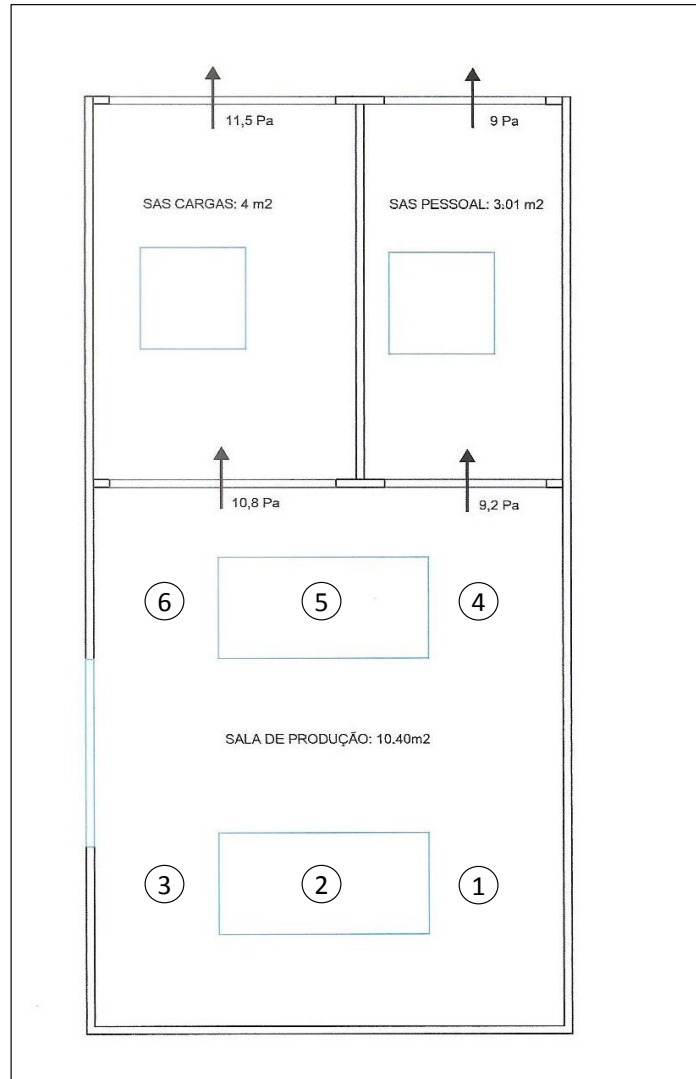
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## Attachment: Room plant tested



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Legend - ○ Places where the particle counts were made.



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