

## Test report from ZYYX Labs AB

### 1. Acoustic noise tests for ZYYX Pro II 3D printing system

Performed 2021-02-12 – 2021-02-15 by Tomas Bengtsson

#### 1.1. Measuring site

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#### 1.2. Purpose of test

To verify that the ZYYX Pro II system as designed fulfils the acoustic noise given in the accompanying documents.

#### 1.3. Test objects

1. ZYYX Pro II system, s/n: ZP2-2103001
2. Sound level meter, Smart Sensor AS824 s/n: 03359367
3. Backup sound level meter, s/n: DX3D3KDMN737

#### 1.4. Test configurations

1. Off (background)
2. On, idle
3. On, printing

#### 1.5. Test set-up and procedure

For all tests:

- The EUT was operated according to the manual in a typical office environment.
- The temperature: approx. 22 °C, humidity: approx. 90 %, barometric pressure 100.9 kPa
- Each test had a duration of 2 minutes.
- The sound level meter was placed 1 m from the printer, which is a typical minimum distance when used at the user's desk.

## 1.6. Performance requirements

The acoustic noise level for the 2 minute test duration was recorded and the mean value documented.

## 1.7. Test results

1. EUT off (background):	29.5 dB(A)
2A. EUT on, idle:	31.7 dB(A)
2B. EUT on, chamber heating:	33.9 dB(A)
3A. EUT on, printing, front:	38.2 dB(A)
3B. EUT on, printing, side:	36.8 dB(A)
3A. EUT on, printing, back:	37.6 dB(A)

## 1.8. Test analysis

The noise level of the ZYYX Pro II printer is well suited for office use, below typical office noise levels.

See reference table below.

Levels (dB)	Source	Subjective Response
<b>Safe Range*</b>		
0	No sound	Hearing threshold
10	Rustle of leaf	Faint
20	Buzzing Insect	
30	Quiet Whisper	
40	Quiet Office	
50	Window Air Conditioner	Moderate
60	Conversation	
70	Freight train	
80	Computer print room	
<b>Risk Range*</b>		
90	Heavy vehicle	Limit of exposure for 8 hrs
100	Subway station	
110	Rock drill	
<b>Harmful Range*</b>		
120	Propeller plane	Pain threshold
130	Riveting hammer	Feeling threshold
140	Jet engine at 30m	Danger

\* for average populations

Table from CANADA SAFETY COUNCIL, <https://canadasafetycouncil.org/workplace-safety/office-noise-and-acoustics>

## Document history

Issue	Date	Done by	Change
A	2021-03-12	TB	First issue of document.