

# SHANGHAI EMPEROR OF CLEANING INTERNATIONAL TRADE CO., LTD **LETTER REPORT**

**SCOPE OF WORK**

In-Duct Ozone Testing of the In-duct Air Cleaner Model ECH-KJX-Z

**REPORT NUMBER**

104626851CRT-002

**ISSUE DATE**

10-MAY-2021

**[REVISED DATE]**

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## LETTER REPORT

May 10<sup>th</sup>, 2021

Intertek Report No. 104626851CRT-002

Intertek Project No. G104626851

Mr. Wang Wei

SHANGHAI EMPEROR OF CLEANING INTERNATIONAL TRADE CO., LTD

6 Building No.138 Boxeu Road Jiading Area

Shanghai City

China

Phone: NA

Email: [alkingsleyusa@gmail.com](mailto:alkingsleyusa@gmail.com)

**Subject:** In-Duct Ozone Testing of the In-duct Air Cleaner Model ECH-KJX-Z

Dear Mr. Wang Wei,

This letter report represents the results of our evaluation of the above referenced product(s) to the requirements contained in the following standards:

*CSA C22.2 No. 187:20, Electrostatic air cleaners, Section 7.6*

Samples provided to Intertek by SHANGHAI EMPEROR OF CLEANING INTERNATIONAL TRADE CO., LTD were sent to Blue Heaven Technologies LLC. Blue Heaven Technologies LLC employees conducted their protocol for testing to Section 7.6 of CSA C22.2 No. 187:20, Electrostatic air cleaners. The reports from Blue Heaven Technologies LLC have been appended to this letter report.

Issuance of this letter report completes the testing covered by Intertek Project No. G104626851. If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact your dedicated Intertek Project Manager.

Completed by: Jacob Langenbacher

Title: Engineer

Signature:



Date 5/10/2021

Please note: this Letter Report does not represent authorization for the use of any Intertek certification marks.

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2820 S. English Station Road - Louisville, KY 40299  
Phone: (502) 357-0132

TEST NO. 21-237-1A

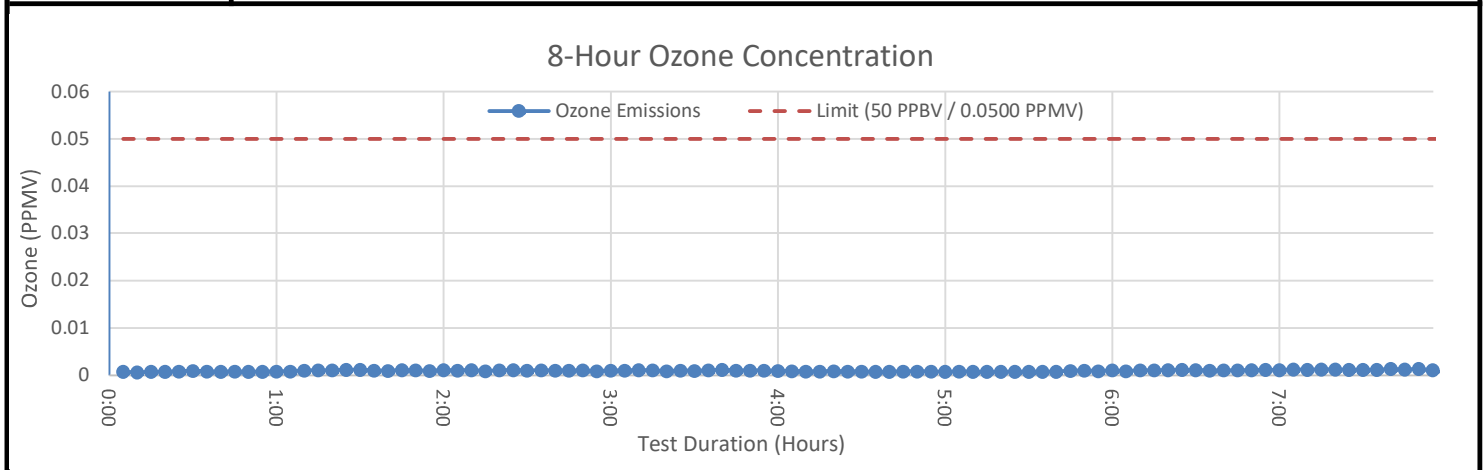
## Test Report - Ozone Emissions - Low Flow Rate

CSA Group - C22.2 No.187-20 - Section 7.5

Electrostatic In Duct Type Air Cleaners for Residential Use

page 1 of 2

<b>Test Unit Description</b>	Customer: <u>Intertek</u>	NOTES: Unit is an in-duct Electrostatic Air Sterilizer meant for operation	
	Manufacturer: <u>ECH</u>	inside HVAC ductwork.	
	Model No.: <u>ECH-KJX-Z</u>	Run in Start: <u>4/23/2021 8:16</u>	Run in End: <u>4/23/2021 8:36</u>
	Serial Number: <u>CRT2103121452-001</u>	<u>30 Minutes</u>	
	<u>The unit was tested at two flow rates. Low: 375 CFM and High: 3150 CFM. This report details performance at low flow.</u>		
	<u>The unit dimensions are 20" Wide X 25" Tall X 4" Deep. 110 VAC power required</u>		
<b>8-Hour Ozone Emissions Test Results</b>	Test Date: <u>4/23/2021</u>	Start Time: <u>4/23/2021 8:43</u>	End Time: <u>4/23/2021 16:43</u>
	Average 8-Hr Background Concentration: <u>0.00073 PPM</u>	<u>Maximum Allowed</u>	<u>PASS / FAIL</u>
	Average 8-Hr Downstream Concentration: <u>0.00167 PPM</u>		
	<b>Average 8 Hour Time Weighted Average (TWA) Ozone Concentration:</b>	<b>0.000935 PPM</b>	<b>0.0500 PPM</b>
	<b>Maximum Ozone Reading over 8-Hour Testing:</b>	<b>0.001267 PPM</b>	<b>0.0500 PPM</b> <b>PASS</b>



	Model	Serial Number	Range
Upstream Ozone Analyzer:	2B Technologies Model: 205	2332DB	0.0000 - 0.1500 PPMV
Downstream Ozone Analyzer:	2B Technologies Model: 206	2331DB	0.0000 - 0.1500 PPMV
Temperature:	Dwyer RHP-2D11-LCD	M96797-E23W-A	-40 - 140 °F
Humidity:	Dwyer RHP-2D11-LCD	M96797-E23W-A	0 - 100% RH
Data Recorder:	Yokogawa DX112-3-2/M1	12VB31078	NA
Watt Transducer:	Ohio Semitronics, Inc. AGH-002E	20100694	0-1000 Watts

<b>Test Conditions</b>	Unit was tested in a complete ASHRAE 52.2 Test Duct. Flow Rate was maintained at 375 CFM over the 8-hour test period. Test unit was mounted in-line with a 24" X 24" duct in the correct orientation and sealed to be leak-free.	
	Average Test Flow Rate: <u>376.15 CFM</u>	
	Average Test Temperature: <u>70.55 Deg F</u>	Average Test Rel. Humidity: <u>44.46 %</u>

<b>Requester Information</b>	Test Requestor: <u>Jacob Langenbacher</u>	Phone: <u>607-758-6446</u>
	Company Name: <u>Intertek</u>	Email: <u><a href="mailto:jacob.langenbacher@intertek.com">jacob.langenbacher@intertek.com</a></u>
<b>Test Operator Information</b>	Company Address: <u>3933 US Route 11; Cortland, NY 13045</u>	Date Requested: <u>4/20/2021</u>
	Test Performed by: <u>Glen Toloczko CAFS</u>	Reviewed by: <u>ES</u> Completion Date: <u>5/5/2021</u>

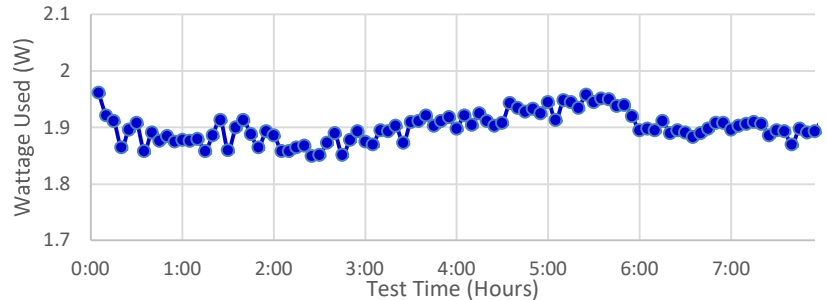
## Test Report - Ozone Emissions - Low Flow Rate

CSA Group - C22.2 No.187-20 - Section 7.5

### Device Energy Usage

Average Input Wattage **1.900 W**

Input Voltage **115 V**



### Photos

Front View



Rear View



Unit Label

### Requester Information

Test Requestor: Jacob Langenbacher

Phone: 607-758-6446

Company Name: Intertek

Email: jacob.langenbacher@intertek.com

Company Address: 3933 US Route 11; Cortland, NY 13045

Date Requested: 4/20/2021

### Test Operator Information

Test Performed by: Glen Toloczko CAFS

Completion Date: 5/5/2021



2820 S. English Station Road - Louisville, KY 40299  
Phone: (502) 357-0132

TEST NO. 21-237-1B

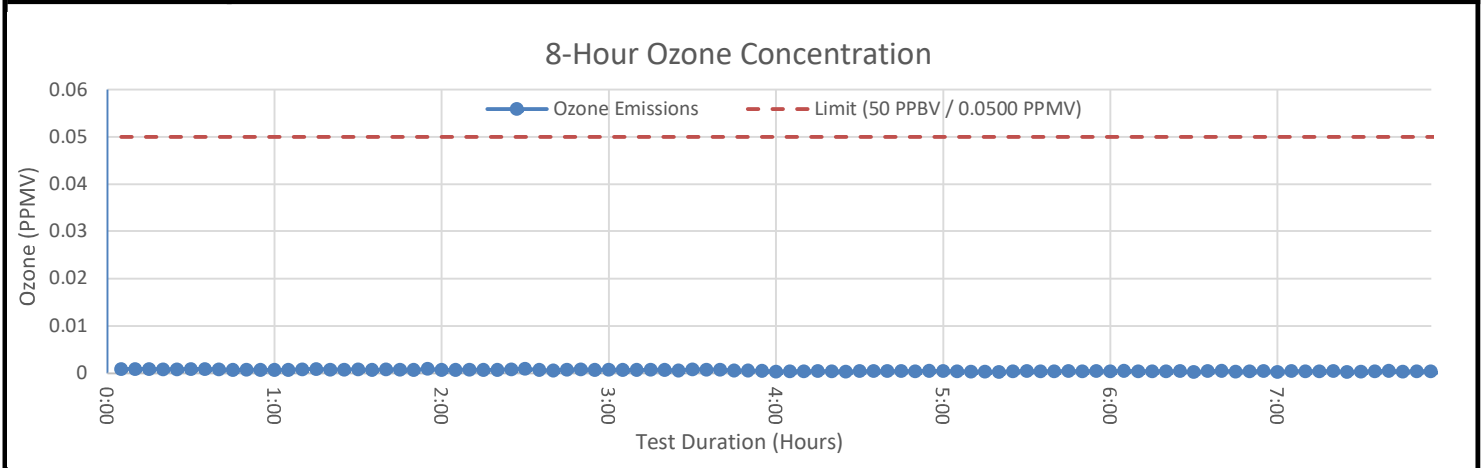
## Test Report - Ozone Emissions - High Flow Rate

CSA Group - C22.2 No.187-20 - Section 7.5

Electrostatic In Duct Type Air Cleaners for Residential Use

page 1 of 2

<b>Test Unit Description</b>	Customer: <u>Intertek</u>	NOTES: Unit is an in-duct Electrostatic Air Sterilizer meant for operation	
	Manufacturer: <u>ECH</u>	inside HVAC ductwork.	
	Model No.: <u>ECH-KJX-Z</u>	Run in Start: <u>4/23/2021 8:16</u>	Run in End: <u>4/23/2021 8:36</u>
	Serial Number: <u>CRT2103121452-001</u>	<u>30 Minutes</u>	
	<u>The unit was tested at two flow rates. Low: 375 CFM and High: 3150 CFM. This report details performance at high flow.</u>		
	<u>The unit dimensions are 20" Wide X 25" Tall X 4" Deep. 110 VAC power required</u>		
<b>8-Hour Ozone Emissions Test Results</b>	Test Date: <u>4/23/2021</u>	Start Time: <u>4/23/2021 17:33</u>	End Time: <u>4/24/2021 1:33</u>
	Average 8-Hr Background Concentration: <u>0.00241 PPM</u>	<u>Maximum Allowed</u>	<u>PASS / FAIL</u>
	Average 8-Hr Downstream Concentration: <u>0.00301 PPM</u>		
	<b>Average 8 Hour Time Weighted Average (TWA) Ozone Concentration:</b>	<b>0.000598 PPM</b>	<b>0.0500 PPM</b>
	<b>Maximum Ozone Reading over 8-Hour Testing:</b>	<b>0.000950 PPM</b>	<b>0.0500 PPM</b> <b>PASS</b>



	Model	Serial Number	Range
Upstream Ozone Analyzer:	2B Technologies Model: 205	2332DB	0.0000 - 0.1500 PPMV
Downstream Ozone Analyzer:	2B Technologies Model: 206	2331DB	0.0000 - 0.1500 PPMV
Temperature:	Dwyer RHP-2D11-LCD	M96797-E23W-A	-40 - 140 °F
Humidity:	Dwyer RHP-2D11-LCD	M96797-E23W-A	0 - 100% RH
Data Recorder:	Yokogawa DX112-3-2/M1	12VB31078	NA
Watt Transducer:	Ohio Semitronics, Inc. AGH-002E	20100694	0-1000 Watts

<b>Test Conditions</b>	Unit was tested in a complete ASHRAE 52.2 Test Duct. Flow Rate was maintained at 3150 CFM over the 8-hour test period. Test unit was mounted in-line with a 24" X 24" duct in the correct orientation and sealed to be leak-free.	
	Average Test Flow Rate:	<u>3,153.37 CFM</u>
	Average Test Temperature:	<u>72.12 Deg F</u> Average Test Rel. Humidity: <u>49.56 %</u>

<b>Requester Information</b>	Test Requestor: <u>Jacob Langenbacher</u>	Phone: <u>607-758-6446</u>
	Company Name: <u>Intertek</u>	Email: <u><a href="mailto:jacob.langenbacher@intertek.com">jacob.langenbacher@intertek.com</a></u>
	Company Address: <u>3933 US Route 11; Cortland, NY 13045</u>	Date Requested: <u>4/20/2021</u>
<b>Test Operator Information</b>	Test Performed by: <u>Glen Toloczko CAFS</u>	Reviewed by: <u>ES</u> Completion Date: <u>5/5/2021</u>



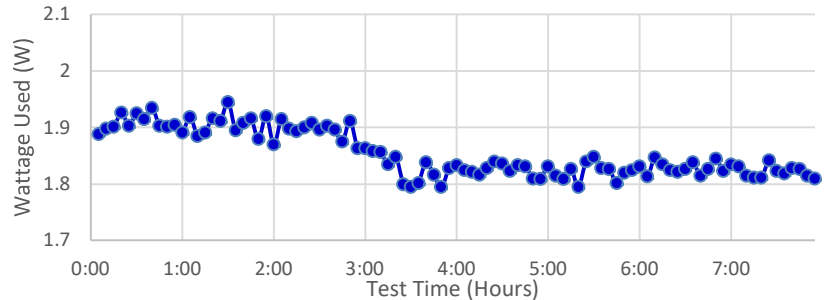
### Test Report - Ozone Emissions - Low Flow Rate

CSA Group - C22.2 No.187-20 - Section 7.5

**Device Energy Usage**

Average Input Wattage **1.854 W**

Input Voltage **115 V**



**Photos**

**Front View**



**Rear View**



**Unit Label**

**Requester Information**

Test Requestor: Jacob Langenbacher

Phone: 607-758-6446

Company Name: Intertek

Email: jacob.langenbacher@intertek.com

Company Address: 3933 US Route 11; Cortland, NY 13045

Date Requested: 4/20/2021

**Test Operator Information**

Test Performed by: Glen Toloczko CAFS

Completion Date: 5/5/2021



2820 S. English Station Road - Louisville, KY 40299  
Phone: (502) 357-0132

TEST NO. 21-237-2A

## Test Report - Ozone Emissions - Low Flow Rate

CSA Group - C22.2 No.187-20 - Section 7.5

Electrostatic In Duct Type Air Cleaners for Residential Use

page 1 of 2

<p><b>Test Unit Description</b></p>	<p>Customer: <u>Intertek</u>      NOTES: Unit is an in-duct Electrostatic Air Sterilizer meant for operation inside HVAC ductwork.</p> <p>Manufacturer: <u>ECH</u></p> <p>Model No.: <u>ECH-KJX-Z</u>      Run in Start: <u>4/26/2021 14:48</u>      Run in End: <u>4/26/2021 15:18</u></p> <p>Serial Number: <u>CRT2103121452-002</u>      30 Minutes</p> <p><u>The unit was tested at two flow rates. Low: 211 CFM and High: 375 CFM. This report details performance at low flow.</u></p> <p><u>The unit dimensions are 10" Wide X 10" Tall X 4" Deep. 110 VAC power required</u></p>																												
<p><b>8-Hour Ozone Emissions Test Results</b></p>	<p>Test Date: <u>4/27/2021</u>      Start Time: <u>4/27/2021 12:20</u>      End Time: <u>4/27/2021 20:20</u></p> <p>Average 8-Hr Background Concentration: <u>0.00070 PPM</u>      <u>Maximum Allowed</u>      <u>PASS / FAIL</u></p> <p>Average 8-Hr Downstream Concentration: <u>0.00184 PPM</u></p> <p><b>Average 8 Hour Time Weighted Average (TWA) Ozone Concentration:</b>      <b>0.001138 PPM</b>      <b>0.0500 PPM</b>      <b>PASS</b></p> <p><b>Maximum Ozone Reading over 8-Hour Testing:</b>      <b>0.001320 PPM</b>      <b>0.0500 PPM</b>      <b>PASS</b></p>																												
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<p><b>Test Equipment Information</b></p>	<table border="1"> <thead> <tr> <th></th> <th>Model</th> <th>Serial Number</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>Upstream Ozone Analyzer:</td> <td>2B Technologies Model: 205</td> <td>2332DB</td> <td>0.0000 - 0.1500 PPMV</td> </tr> <tr> <td>Downstream Ozone Analyzer:</td> <td>2B Technologies Model: 206</td> <td>2331DB</td> <td>0.0000 - 0.1500 PPMV</td> </tr> <tr> <td>Temperature:</td> <td>Dwyer RHP-2D11-LCD</td> <td>M96797-E23W-A</td> <td>-40 - 140 °F</td> </tr> <tr> <td>Humidity:</td> <td>Dwyer RHP-2D11-LCD</td> <td>M96797-E23W-A</td> <td>0 - 100% RH</td> </tr> <tr> <td>Data Recorder:</td> <td>Yokogawa DX112-3-2/M1</td> <td>12VB31078</td> <td>NA</td> </tr> <tr> <td>Watt Transducer:</td> <td>Ohio Semitronics, Inc. AGH-002E</td> <td>20100694</td> <td>0-1000 Watts</td> </tr> </tbody> </table>		Model	Serial Number	Range	Upstream Ozone Analyzer:	2B Technologies Model: 205	2332DB	0.0000 - 0.1500 PPMV	Downstream Ozone Analyzer:	2B Technologies Model: 206	2331DB	0.0000 - 0.1500 PPMV	Temperature:	Dwyer RHP-2D11-LCD	M96797-E23W-A	-40 - 140 °F	Humidity:	Dwyer RHP-2D11-LCD	M96797-E23W-A	0 - 100% RH	Data Recorder:	Yokogawa DX112-3-2/M1	12VB31078	NA	Watt Transducer:	Ohio Semitronics, Inc. AGH-002E	20100694	0-1000 Watts
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<p><b>Test Conditions</b></p>	<p>Unit was tested in a complete ASHRAE 52.2 Test Duct. Flow Rate was maintained at 211 CFM over the 8-hour test period. Test unit was mounted on the center of a plate and installed in-line with a 24" X 24" duct in the correct orientation and sealed to be leak-free. All test air was flowed through the device.</p> <p>Average Test Flow Rate: <u>209.44 CFM</u></p> <p>Average Test Temperature: <u>72.51 Deg F</u>      Average Test Rel. Humidity: <u>52.49 %</u></p>																												
<p><b>Requester Information</b></p>	<p>Test Requestor: <u>Jacob Langenbacher</u>      Phone: <u>607-758-6446</u></p> <p>Company Name: <u>Intertek</u>      Email: <u><a href="mailto:jacob.langenbacher@intertek.com">jacob.langenbacher@intertek.com</a></u></p> <p>Company Address: <u>3933 US Route 11; Cortland, NY 13045</u>      Date Requested: <u>4/20/2021</u></p>																												
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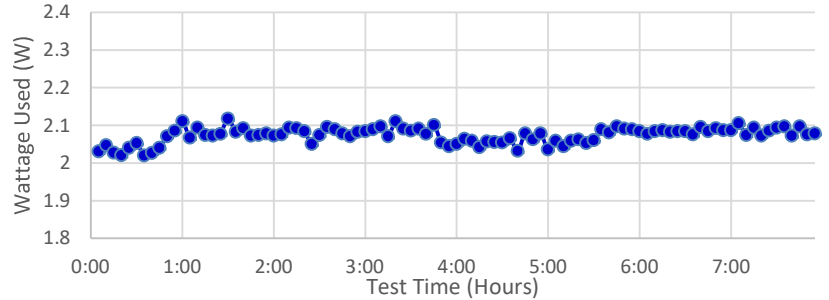
### Test Report - Ozone Emissions - Low Flow Rate

CSA Group - C22.2 No.187-20 - Section 7.5

**Device Energy Useage**

Average Input Wattage **2.075 W**

Input Voltage **115 V**

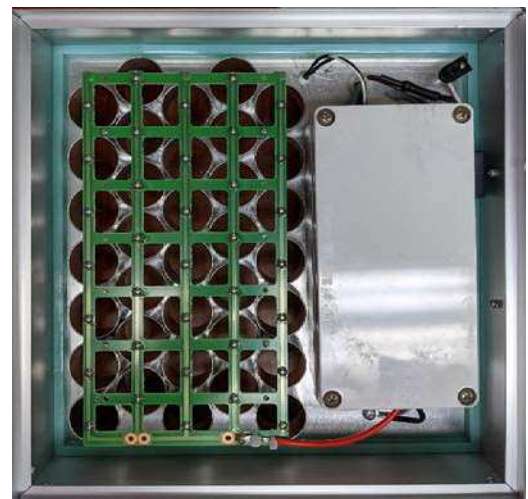


**Photos**

**Front View**



**Rear View**



**Unit Label**

**Requester Information**

Test Requestor: Jacob Langenbacher Phone: 607-758-6446  
 Company Name: Intertek Email: jacob.langenbacher@intertek.com  
 Company Address: 3933 US Route 11; Cortland, NY 13045 Date Requested: 4/20/2021

**Test Operator Information**

Test Performed by: Glen Toloczko CAFS Completion Date: 5/5/2021





2820 S. English Station Road - Louisville, KY 40299  
Phone: (502) 357-0132

TEST NO. 21-237-2B

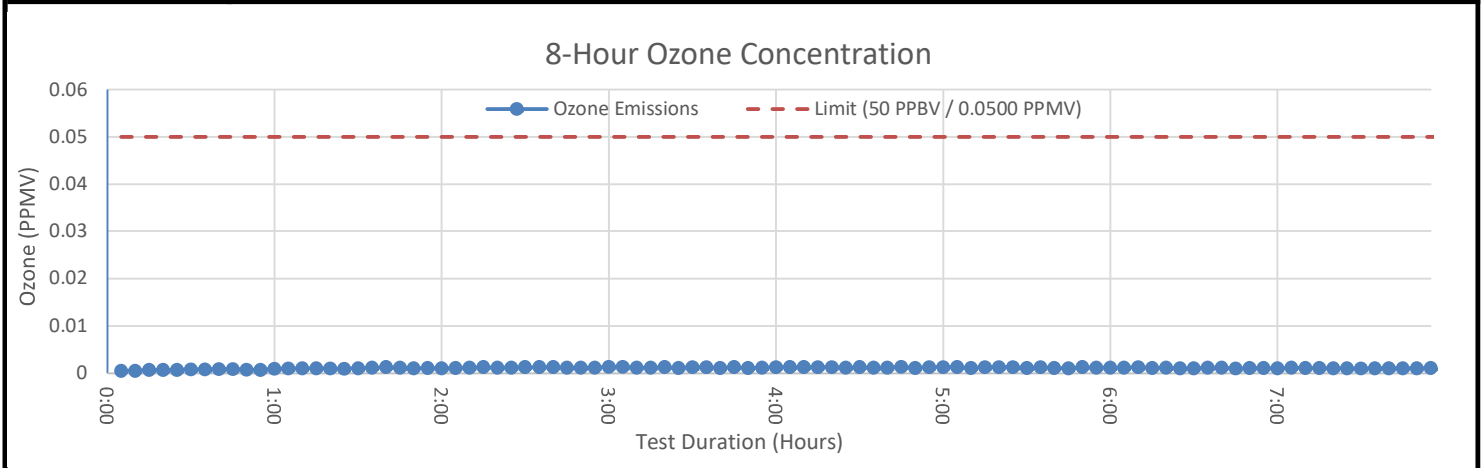
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page 1 of 2

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	Model No.: <u>ECH-KJX-Z</u>	30 Minutes	
	Serial Number: <u>CRT2103121452-002</u>		
	<u>The unit was tested at two flow rates. Low: 211 CFM and High: 375 CFM. This report details performance at high flow. The unit dimensions are 10" Wide X 10" Tall X 4" Deep. 110 VAC power required</u>		
<b>8-Hour Ozone Emissions Test Results</b>	Test Date: <u>4/26/2021</u>	Start Time: <u>4/26/2021 14:52</u>	End Time: <u>4/26/2021 22:52</u>
	Average 8-Hr Background Concentration: <u>0.00077 PPM</u>	<u>Maximum Allowed</u>	<u>PASS / FAIL</u>
	Average 8-Hr Downstream Concentration: <u>0.00191 PPM</u>		
	<b>Average 8 Hour Time Weighted Average (TWA) Ozone Concentration:</b> <u>0.001139 PPM</u>	<b>0.0500 PPM</b>	<b>PASS</b>
	<b>Maximum Ozone Reading over 8-Hour Testing:</b> <u>0.001370 PPM</u>	<b>0.0500 PPM</b>	<b>PASS</b>



	Model	Serial Number	Range
Upstream Ozone Analyzer:	2B Technologies Model: 205	2332DB	0.0000 - 0.1500 PPMV
Downstream Ozone Analyzer:	2B Technologies Model: 206	2331DB	0.0000 - 0.1500 PPMV
Temperature:	Dwyer RHP-2D11-LCD	M96797-E23W-A	-40 - 140 °F
Humidity:	Dwyer RHP-2D11-LCD	M96797-E23W-A	0 - 100% RH
Data Recorder:	Yokogawa DX112-3-2/M1	12VB31078	NA
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<b>Test Conditions</b>	Unit was tested in a complete ASHRAE 52.2 Test Duct. Flow Rate was maintained at 375 CFM over the 8-hour test period. Test unit was mounted on the center of a plate and installed in-line with a 24" X 24" duct in the correct orientation and sealed to be leak-free. All test air was flowed through the device.
	Average Test Flow Rate: <u>372.52 CFM</u>
	Average Test Temperature: <u>73.50 Deg F</u> Average Test Rel. Humidity: <u>41.32 %</u>

<b>Requester Information</b>	Test Requestor: <u>Jacob Langenbacher</u>	Phone: <u>607-758-6446</u>
	Company Name: <u>Intertek</u>	Email: <u><a href="mailto:jacob.langenbacher@intertek.com">jacob.langenbacher@intertek.com</a></u>
	Company Address: <u>3933 US Route 11; Cortland, NY 13045</u>	Date Requested: <u>4/20/2021</u>
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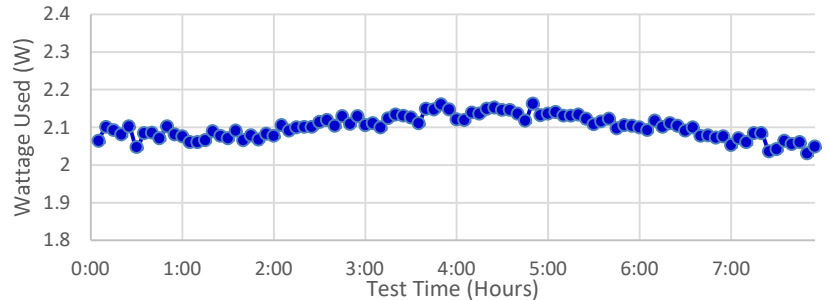
### Test Report - Ozone Emissions - Low Flow Rate

CSA Group - C22.2 No.187-20 - Section 7.5

**Device Energy Useage**

Average Input Wattage **2.101 W**

Input Voltage **115 V**



**Photos**

**Front View**



**Rear View**



**Unit Label**

**Requester Information**

Test Requestor: Jacob Langenbacher Phone: 607-758-6446  
 Company Name: Intertek Email: jacob.langenbacher@intertek.com  
 Company Address: 3933 US Route 11; Cortland, NY 13045 Date Requested: 4/20/2021

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Test Performed by: Glen Toloczko CAFS Completion Date: 5/5/2021