

# DOCKET

10-RADB-1

DATE JUL 22 2010

RECD. JUL 22 2010

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## STATE OF CALIFORNIA

### ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

11 In the matter of,

12 Informal Proceeding to Decertify Appliances  
Turbo Air, Inc., Commercial Refrigerators,  
13 Model Numbers TSR-23SD and TUR-28SD

Docket No.: 10-RADB-01

**TURBO AIR, INC.'S  
REQUEST TO (1) MAINTAIN THE  
TSR-23SD IN THE APPLIANCE  
DATABASE AND (2) MAINTAIN THE  
TUR-28SD IN THE DATABASE OR,  
ALTERNATIVELY, REMAND THE  
TUR-28SD TO THE EFFICIENCY  
COMMITTEE**

18 Since 1997, TurboAir has manufactured and distributed quality refrigeration products in  
19 California. One of TurboAir's core principles is to produce environmentally responsible products.

20 On June 22, 2010 the Efficiency Committee of the State Energy Resources Conservation  
21 and Development Commission Energy Resources (the "Efficiency Committee") recommended  
22 that the California Energy Commission remove two Turbo Air Commercial Refrigerators, Model  
23 Nos. TSR-23SD and TUR-28SD, from the Appliance Database.<sup>1</sup>

24 Decertifying these models would cause great hardship to TurboAir and would harm  
25

26 <sup>1</sup> The Efficiency Committee also recommended that any removal be without prejudice to Turbo  
27 Air's ability to create new model numbers if necessary, and to be able to resubmit the refrigerators  
28 with new model numbers for inclusion in the Appliance Database.

1 California and California consumers. The disputed refrigeration models already fully comply with  
2 the California energy efficiency standards set forth in Table A-9 of Title 20 of the California Code  
3 of Regulations section 1605.3(a)(5). Decertifying these models – effectively forcing TurboAir to  
4 have them recertified with new model numbers – would cause confusion among California  
5 customers and deprive them of choice, for no environmental benefit.

6 If these models are decertified, it will cause Turbo Air *substantial* harm. TurboAir has  
7 developed substantial business goodwill in these particular model numbers, and has focused its  
8 product marketing efforts on the model numbers. Customers want to purchase a TSR-23SD, not a  
9 refrigerator with identical characteristics that goes by a different name.

10 A change in model number would be so detrimental for TurboAir's business that it may  
11 require TurboAir to scale back its operations. TurboAir is committed to a California presence – it  
12 currently employs 65 people in California, and is planning on creating an additional 150 jobs in  
13 Southern California. However, if it is unable to market the TSR 23SD or the TUR 28SD as such,  
14 business realities may force TurboAir to scale back its operations there.

15 TurboAir has submitted a Proposed Order to this Committee, Exhibit A. TurboAir  
16 requests that, pursuant to its authority under 20 Cal. Code Regs., § 1236, this Commission:

17 (1) Maintain the TSR-23SD in the Appliance Database, as is.

18 The Appliance Database shows accurate efficiency levels for TSR-23SD that comply with  
19 section 1605.3(a)(5).

20 The first test that the Efficiency Committee had conducted for TSR-23SD should be  
21 discarded because it was the result of a fluke manufacturing mistake: on the assembly line, that  
22 particular unit was inserted into an incorrect type of cabinet, which caused the aberrant result. The  
23 second test result prepared on a different TSR-23SD unit, housed in the proper cabinet, showed  
24 that TSR-23SD meets the efficiency criteria shown in the Appliance Database. Forcing TurboAir  
25 to recertify it under a different model number would serve no useful purpose and would be  
26 unnecessarily punitive. An innocent manufacturing mistake produced a one-time fluke result.

27 (2) Maintain the TUR-28SD in the Appliance Database, as is.

28 Again, the differing test results for TUR-28SD were the result of an innocent error. In

2008, TurboAir changed the condenser motor and fan blades. It calculated the expected energy consumption change that would be caused by these new parts, which was insignificant. However, the change actually did cause significant increase in the energy consumption of the unit, as a whole. TurboAir has since engineered a design solution (a new control board) that makes the unit compliant with the efficiency standard.

TurboAir voluntarily intends to retrofit the approximately 135 TUR-28SD units sold in California, which would mean that all TUR-28SD units in California would be physically identical and in compliance with section 1605.3(a)(5). TurboAir requests that the Commission maintain the TUR-28SD in the Appliance Database, as is, because after the retrofit, every TUR-28SD in California will (1) comply with the energy consumption standard in section 1605.3(a)(5) and (2) contain the same parts, design specifications, and all other features affecting energy consumption.

(3) In the alternative, remand the TUR-28SD back to the Efficiency Committee.

In the alternative, TurboAir requests that the Commission remand the TUR-28SD to the Efficiency Committee to consider the determinations that TurboAir is requesting.

(4) Allow TurboAir to bear the cost of any additional testing that may be required.

After the innocent mistakes were corrected, TurboAir previously offered to the Efficiency Committee to pay the cost of additional independent lab tests to confirm, as may be appropriate, TurboAir's internal, CEC-certified laboratory results. TurboAir believes that its internal, CEC-certified results more than suffice. However, TurboAir again offers to pay the cost of any additional tests that the Commission or the Efficiency Committee may determine are warranted.

**BOTH TURBOAIR UNITS COMPLY WITH THE CALIFORNIA  
EFFICIENCY STANDARDS**

**A. The TSR-23SD.**

The sole reason that this unit was found out of compliance is because of a fluke manufacturing occurrence: the unit tested was inadvertently built with a freezer cabinet rather than a refrigerator cabinet. Units with the correct cabinet perform well within the California standard.

BR Labs, the independent lab used here, purchased a first unit for testing from a local supplier. Unbeknownst to TurboAir, the unit sent to BR Labs was built with the wrong cabinet

1 This mistake caused the unit's energy consumption to increase dramatically, above the California  
2 standard. TurboAir did not discover the issue until approximately February 2010, after the unit  
3 was returned from BR Labs in and inspected.

4 BR Labs purchased a second unit for a second test. The second unit sent had the proper  
5 cabinet, and tested in compliance with the standard.

6 The test results reported to the Efficiency Committee reflect the erroneous cabinet. That is,  
7 the TSR-23SD with the correct cabinet consumed 40% less energy than the TSR-23SD with the  
8 incorrect cabinet. The TSR-23SD with the correct cabinet consumed far less energy than the  
9 maximum allowable standard under section 1605.3(a)(5).

10 **B. The TUR-28SD.**

11 In February 2008, TurboAir changed the condenser motor and the fan blades in the TUR-  
12 28SD. This change increased the energy consumption of the units, and increased consumption  
13 over the regulatory limit.

14 At the time of the design change, TurboAir's staff made an inadvertent error by failing to  
15 accurately calculate the TUR-28SD's energy consumption. That is, they calculated the  
16 consumption difference between the old and the new parts, and believed that the difference was  
17 insignificant, and would not materially alter the TUR-28SD's energy consumption as a whole.  
18 They failed, however, to realize that the new parts would, in fact, cause other parts of the  
19 refrigerator to perform differently, thereby increasing the consumption of the unit over the  
20 California standard. At the hearing before the Efficiency Committee, TurboAir acknowledged that  
21 it failed to appropriately test and report.

22 Because of the testing done at the direction of the Efficiency Committee, TurboAir  
23 developed a simple fix to the increased energy consumption – inserting a new control board. With  
24 the fix in place, TurboAir retested the TUR-28SD in its internal, CEC-certified lab. Based on that  
25 testing, the TUR-28SD's consumption is 1.693/1.217 kWh per day (below the regulatory  
26 maximum), rather than the 3.612/3.465 reported to the Efficiency Committee. Those revised test  
27 results, from April and July 2010, are attached here as Exhibits B and C.

28

1           C.     New Model Numbers for the TSR-23SD and the TUR-28SD Are Not  
2                 Necessary.

3           Appliance model numbers are governed by the following provision: "Any unit of any  
4 appliance . . . may be sold or offered for sale in California only if: . . . (3) the unit has the same  
5 components, design characteristics, and all other features that affect energy or water consumption  
6 or energy or water efficiency, as applicable, as the units that were tested under sections 1603 and  
7 1604 and for which information was submitted under section 1606 . . . " (20 Cal. Code Regs., §  
8 1608.) Thus, if a unit has different components, design characteristics, or features than the unit for  
9 which the CEC has energy consumption data, then the unit should bear a different model number.

10                   1.     **TSR-23SD**

11           With regard to the TSR-23SD, there is no need for any change, redesign or remarking – the  
12 noncompliant test results were the product of a TSR-23SD unit with an improper cabinet. Had BR  
13 Labs tested two TSR-23SD units with proper parts, the final, mean results would have been well  
14 under the regulatory maximum. Because the TSR-23SD's original "components, design  
15 characteristics, and all other features" are in compliance with the efficiency regulations, there is no  
16 need for a new model number.

17           A new model number would actually cause confusion for consumers and Commission  
18 staff. That is, if the TSR-23SD is decertified, and TurboAir is forced to recertify with a new  
19 model number, the "new" unit will be physically identical to the many TSR-23SD units already in  
20 use. So the Commission would, effectively, create a situation where a single appliance would  
21 have two different model numbers.

22                   2.     **TUR-28SD**

23           With regard to the TUR-28SD, TurboAir believes that a new model number is  
24 unnecessary. Keeping the current model number would comply with section 1608 and satisfy the  
25 regulatory need to have one model number correspond with one appliance.

26           With this Commission's blessing, TurboAir will retrofit each of the 135 noncompliant units  
27 sold in California with the new control board. Going forward, TurboAir would sell only energy-  
28 compliant TUR-28SD units with the new control board in place. Thus, every TUR-28SD unit in

1 California would have the same "components, design characteristics, and all other features," and  
2 all TUR-28SD's would be in compliance with the energy consumption regulations.

3 This solution would remove any need for a change of model number, and would avoid the  
4 great hardship to TurboAir described below. Each TUR-28SD in California would have the same  
5 "components, design characteristics and all other features," including the new control board. That  
6 TUR-28SD unit – including the new control board – will be the unit that will be tested in accord  
7 with sections 1603 and 1604, and the testing will be reported pursuant to section 1606.

8 If the Commission deems it necessary, the TUR-28SD may also be remanded to the  
9 Efficiency Committee.

10 **D. Decertification and Modification of Model Numbers Would Cause Great**  
11 **Harm to TurboAir.**

12 It goes without saying that TurboAir's California business depends on its compliance with  
13 the CEC standards and the CEC certification. To decertify these appliances now – even though  
14 TurboAir's testing shows that they are both in compliance – would harm TurboAir's ability to do  
15 business in California, without any appreciable benefit to consumers or to the environment.

16 TurboAir would be forced to seek recertification for these units. Although this might  
17 superficially appear to be a relatively easy process, in truth, it is costly and complicated, at least to  
18 the extent that recertification necessitated a change of model number.

19 **1. TurboAir will lose the business goodwill and marketing efforts that**  
20 **have been focused on these models.**

21 These units have been widely available in California for many years, and customers in  
22 search of a commercial refrigeration unit know them by their particular model numbers. If these  
23 popular model numbers are discontinued, TurboAir must then convince consumers that the  
24 subsequent models have equal performance.

25 Just as Ford has invested in and developed their business around the Explorer or the F-150,  
26 TurboAir has invested in and developed their business around the TSR-23SD and the TUR-28SD.  
27 So, for example, if Ford were to change the name of the "F-150" to the "G-150," consumers would  
28 not recognize the model, consumers would continue to ask for the F-150 by name, and Ford would

1 be forced to spend a great deal of time and expense to attempt to rebuild their corporate  
2 recognition and goodwill around the "G-150." The TSR-23SD and the TUR-28SD are similarly  
3 positioned for TurboAir. Consumers ask for those products by model number, they recognize the  
4 model numbers, and TurboAir will be harmed if they are forced to change the model numbers.

5 **2. TurboAir will be forced to reprint and re-distribute its product catalog.**

6 For TurboAir, a new model number will mean more than simply printing new labels –  
7 TurboAir has to notify its retailers, reprint catalogs, and mail catalogs to its nationwide network of  
8 distributors and retailers. TurboAir estimates that this process will cost approximately \$100,000.

9 **3. A new model number will trigger other recertifications.**

10 If a new model number is required in California, TurboAir will be forced to seek new  
11 certification by Underwriters Laboratories (UL) as well as new NSF certification. At this time,  
12 TurboAir has not been able to calculate the cost of such re-certification, but believes that it will be  
13 significant.

14 **4. TurboAir will be forced to reevaluate the scope of its California**  
15 **operations.**

16 Finally, these units are very commercially important to TurboAir's California operations.  
17 To the extent that TurboAir is unable to market these units in California, TurboAir will need to  
18 evaluate its business realities, and how an inability to sell these units in California might affect the  
19 scope of its business in California. That is, TurboAir has approximately 60 employees in Carson,  
20 California, and has been in the process of planning to open another facility in Ontario, California,  
21 which would employ an additional 150 people. Those additional employees would be primarily  
22 assembly-line workers, sheet metal workers, welders, and other laborers. All of TurboAir's  
23 employees receive competitive compensation and full medical benefits.

24 TurboAir is committed to a presence in California. Nevertheless, to the extent that its  
25 California operations become unsustainable, TurboAir will be obligated to consider the scale of its  
26 presence here.

1           E.       **Conclusion: The Commission Has the Power to Protect the Environment,**  
2                    **California Consumers, the California Economy, and TurboAir.**

3           These two refrigeration units comply with the maximum daily energy consumption  
4 standard in kilowatt hours (kWh) for such appliances, set forth in section 1605.3(a)(5), table A-9.  
5 The best choice for California consumers, the environment and TurboAir would be for this  
6 Commission to (1) maintain the TSR-23SD in the database, and (2) maintain the TUR-28SD in the  
7 database, or alternatively, remand it back to the Efficiency Committee. Should any further testing  
8 by required by this Commission or by the Efficiency Committee, TurboAir is willing to bear the  
9 cost of such testing.

10           Ultimately, maintaining these units' certification will (1) help compliant units be available  
11 for sale in the California markets, (2) advance the cause of energy conservation and regulatory  
12 compliance, (3) prevent TurboAir from having to bear significant expenses for no appreciable  
13 environmental benefit, and (4) preserve TurboAir's plans to expand their California operations to  
14 hire an additional 150 employees.

15  
16 DATED: July 22, 2010

Respectfully submitted,

COBLENTZ, PATCH, DUFFY & BASS LLP

17  
18  
19 By: 

20 Charmaine Yu  
21 Attorneys for TURBO AIR, INC.  
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27  
28



# Exhibit A

# STATE OF CALIFORNIA

## Energy Resources Conservation And Development Commission

In the matter of,

Informal Proceeding to Decertify Appliances  
Turbo Air, Inc., Commercial Refrigerators,  
Model Numbers TSR-23SD and TUR-28SD

**Docket No.:** 10-RADB-01

**Order No.:**

**[PROPOSED] ORDER**

July 28, 2010

### DECISION AND ORDER OF THE CALIFORNIA ENERGY COMMISSION

On July 28, 2010, the California Energy Commission<sup>1</sup> held a public hearing, as part of its regularly scheduled business meeting, to consider the Proposed Decision, dated June 22, 2010, of the Commission's Efficiency Committee in the above-captioned matter. To the extent reasonably possible, such consideration is required within 21 days of the filing of the Proposed Decision. (20 Cal. Code Regs., section 1236).<sup>2</sup> The July 28 Business Meeting was the first available to consider this matter after the Committee made its recommendation.

The Efficiency Committee prepared a Proposed Decision following an Informal Proceeding<sup>3</sup> held on April 29, 2010, recommending the removal of Turbo Air Inc. commercial refrigerator models numbered TSR 23-SD and TUR-28SD from the Energy Commission's database of certified appliances (hereafter referred to as the "Appliance Database."). Commissioner Anthony Eggert is the Presiding Member of the Efficiency Committee, and Commissioner Jeffrey D. Byron is the Associate Member of the Committee.

The Commission has now reviewed and considered the June 22, 2010 Order of the Efficiency Committee, the written submission of TurboAir, dated July 22, 2010, and comments received at the public hearing, and incorporates them herein. The Commission **DECLINES** to adopt the Proposed Decision of the Efficiency Committee at this time, and finds and orders as follows:

1. TurboAir commercial refrigeration unit TSR-23SD shall remain in the appliance database, as is. The unit in the database meets the maximum daily energy consumption standard in kilowatt hours (kWH) for such appliances manufactured between January 1, 2007, and January 1, 2010, found in Section 1605.3, subdivision (a)(5), Table A-9.
2. TurboAir commercial refrigeration unit TUR-28SD shall remain in the appliance

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<sup>1</sup> Also known as the State Energy Resources Conservation and Development Commission. See Pub. Resources Code, § 25200.

<sup>2</sup> Unless otherwise noted, all subsequent regulatory citations are to Title 20 of the Cal. Code Regs.

<sup>3</sup> The hearing was held pursuant to Government Code, sections 11445.10 – 11445.60, and § 1608, subd. (e)(2)(C).

database. The unit in the database meets the maximum daily energy consumption standard in kilowatt hours (kWH) for such appliances manufactured between January 1, 2007, and January 1, 2010, found in Section 1605.3, subdivision (a)(5), Table A-9.

At its own expense, TurboAir shall undertake diligent and reasonable efforts to identify and offer to retrofit to applicable energy efficiency standards any and all TUR-28SD units that were previously sold to California customers. In the future, no TurboAir TUR-28SD units shall be sold in California without the retrofit.

IT IS SO ORDERED

Date: July 28, 2010

STATE ENERGY RESOURCES  
CONSERVATION AND  
DEVELOPMENT COMMISSION

---

KAREN DOUGLAS, J.D.  
Chairman

---

JAMES D. BOYD  
Vice Chair

---

JEFFREY D. BYRON  
Commissioner

---

ROBERT WEISENMILLER, Ph.D  
Commissioner

---

ANTHONY EGGERT  
Commissioner

## Exhibit B

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## TEST REPORT OF TURBO AIR COMMERCIAL REFRIGERATOR, AUTOMATIC DEFROST

MODEL NO. : TUR-28SD  
SERIAL NO. : U200505001

April - 2010

TEST PROCEDURE : Volume measured using ANSI/AHAM HRF-1-2004.  
Energy Consumption measured using 10CFR431.64 (2009)  
[ANSI/ARI Standard 1200-2006, Performance Rating of  
Commercial Refrigerated Display Merchandisers and Storage  
Cabinets, Section 4.4 (referring to ANSI/ASHRAE Standard  
72-2005, Method of Testing Commercial Refrigerators and  
Freezers)].

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I. BACKGROUND

Turbo air China :

- a) would like to participate in Appliance Efficiency Program and there submits an application with a related test report.
- b) tests the TURBO AIR TUR-28SD commercial refrigerator in accordance with 10CFR Section 431. Part 64 (2009). [ANSI/ARI Standard 1200-2006, Section 4 which refers to ANSI/ASHRAE 72-2005, Method of Testing Commercial Refrigerators and Freezers (and establish its compliance with mean daily energy consumption requirements of the California Appliance Efficiency Regulations)].

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## II. APPLIANCE DATA

### 1. Appliance nameplate data included the following :

Appliance	: Commercial Refrigerator, Automatic Defrost
Brand Name	: TURBO AIR
Manufacturing Site	: CHINA
Serial No.	: U200505001
Size, H×W×D, inch	: 37×28×31
Electrical	: 115V, 1Phase, 60Hz, 6.6Amps.
Refrigerant	: R-134a, 10.2oz
Design Pressures	: High Side = 312psig Low Side = 140psig
Listing	: ETL, 3091403, Conforms to UL STD.471 Certified to CSA STD. C22.2 No. 120 NSF®
Manufacturer Claim	: Insulation is CFC free
Door(s)	: (1) solid door, Hinged Type
Date of Manufacture	: April 2010
Markings	: DO NOT CLEAN LABEL WITH SOLVENT Compressor Made in Korea Components Made in Korea Assembled /Made in China

- The tested commercial refrigerator met the marking requirements of Section 1607(b) of the California Appliance Efficiency Regulations



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### III. TEST METHOD

A self-contained TURBO AIR Commercial Refrigerator, Model TUR-28SD, Serial Number: U200505001 was tested in accordance with ANSI/AHAM HRF-1-2004, and 10CFR Section 431. Part 64 (2009) [ANSI/ARI Standard 1200-2006, Section 4.4-ANSI/ASHRAE Standard 72-2005]. The ANSI/ASHRAE Standard 72-2005 specifies that the anti-condensate controllers should be allowed to control if they are an integral part of the refrigerator. For the purposes of the ANSI/ASHRAE Standard, the TUR-28SD falls under the category of medium temperature refrigerator. The 24-hour test can be repeated for any desired number of test levels (refrigerator thermostat settings) to determine the performance of the refrigerator at different points of operation.. In this case, TUR-28SD was tested at the thermostat temperature setting of Normal.

Test Conditions : Door Opening every 10 minutes for 8 hours

Total = 48 openings

Ambient Temperature : 75.2  $\pm$  1.8°F (24.0  $\pm$  1.0°C) dry bulb

64.4  $\pm$  1.8°F (18.0  $\pm$  1.0°C) wet bulb

Note : No condensate was observed on the doors during the test

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#### IV. TEST DATA

- a) Measured Volume : 7.0 ft<sup>3</sup>
- b) Thermostat Setting : Normal
- c) Refrigerant : R-134a
- d) Equipment : Refrigerator
  
- TEST Package :
  - Average Temp. / Integrated Average Temperature (IAT), °F = 37.04
  - Coldest Test Package Average (CTPA), °F = 35.65
  - Warmest Test Package Average, °F = 38.25
- Maximum of Warmest Test Sample, °F = 39.02
- Temperatures :
  - Test Start, °F = 37.04
  - Test End, °F = 37.58
- Energy Input During Refrigerating Time, kWh/day = 1.687
- Total Energy Input, kWh/day = 1.693
- Percent Compressor Running Time = 24.38
- Ambient Temperatures :
 

		<u>6" Above Ref.</u>	<u>Middle of Ref</u>
Dry Bulb, °F	:	75.4	75.3
Wet Bulb, °F	:	65.6	63.5
- Number of Door Openings = 48

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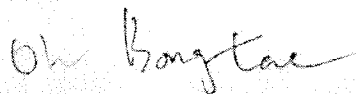
HQ: 1250 Victoria St. Carson, CA 90746 / TEL: 310-800-1000, FAX: 310-800-1077

V. SUMMARY OF TEST RESULTS

- Appliance : Self-contained Commercial Refrigerator,  
Automatic Defrost
- Manufacturer : TURBO AIR, INC
- Size, H × W × D, in. : 37 × 28 × 31
- Model No. : TUR-28SD
- Serial No. : U200505001
- Style : Undercounter
- Door : (1) Solid Door, Hinged Type
- Incandescent Wattage (Tublar) : —
- CFC Free : Refrigerant / Compressor Insulation  
(manufacturer claimed)
- Thermostat Setting : NORMAL
- Measured Volume : 7 ft<sup>3</sup>
- Integrated Average Temp., °F : 37.04 °F
- Mean Daily Energy Consumption : 1.693 kWh
- CEC Allowed Mean Daily Energy  
Consumption :  $0.1 \times 7 + 2.04 \approx 2.74$  kWh
- Federally Regulated : YES

CONCLUSIONS : PASS

Respectfully Submitted,



**OH Bong-tae**

Technical Manager



**Date**

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VI. EQUIPMENT USED

1. Yokogawa Data Acquisition Unit DA100 to record :
  - a) Time
  - b) Refrigerator and/or Freezer Temperatures
  - c) Ambient Temperatures
  - d) Cycles completed
2. Yokogawa Digital Power Meter WT210 to record :
  - a) wattage
  - b) Voltage
  - c) Current
3. Type 'K' thermocouples
4. Test Packages(1000g) for freezing-tests in conformity with ISO/DIN/British Standard Institution
  - Components of 1000g
    - a) 230g of oxyethylmethilcellulose
    - b) 764.2g of water
    - c) 5.0g of sodium chloride
    - d) 0.8g of 4-chloro-m-cresol

[note] Instruments are calibrated once a year.

# Exhibit C

FACTORY : West of Zhushan Road, No 297, North of Haibin 7 Road, Jiaonan Coastal Industrial Park, Qindao, China

TEL : +86-532-8513-5768, FAX : +86-532-8513-5769

HQ : 1250 Victoria St. Carson, CA 90746 / TEL : 310-900-1000, FAX : 310-900-1077

## **TEST REPORT OF TURBO AIR COMMERCIAL REFRIGERATOR, AUTOMATIC DEFROST**

MODEL NO. : TUR-28SD  
SERIAL NO. : U200507002

**July - 2010**

TEST PROCEDURE : Volume measured using ANSI/AHAM HRF-1-2004.  
Energy Consumption measured using 10CFR431.64 (2009)  
[ANSI/ARI Standard 1200-2006, Performance Rating of  
Commercial Refrigerated Display Merchandisers and Storage  
Cabinets, Section 4.4 (referring to ANSI/ASHRAE Standard  
72-2005, Method of Testing Commercial Refrigerators and  
Freezers)].

PREPARED FOR : TURBO AIR, INC.  
1250 VICTORIA STREET  
CARSON, CA 90746

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PREPARED BY : Turbo air China  
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□. BACKGROUND

- a) Turbo air china tests the TURBO AIR TUR-28SD commercial Freezer in accordance with 10CFR Section 431. Part 64 (2009). [ANSI/ARI Standard 1200-2006, Section 4 which refers to ANSI/ASHRAE 72-2005, Method of Testing Commercial Refrigerators and Freezers (and establish its compliance with mean daily energy consumption requirements of the California Appliance Efficiency Regulations)].
- b) This model test also covers for model MUR-28, CUR-28, TWR-28SD
- c) Test date : 2010-7-14



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□. APPLIANCE DATA

1. Appliance nameplate data included the following :

Appliance	: Commercial Refrigerator, Automatic Defrost
Brand Name	: TURBO AIR
Manufacturing Site	: CHINA
Serial No.	: U200507002
Size, HxWxD, inch	: 37x28x31
Electrical	: 115V, 1Phase, 60Hz, 5.5Amps.
Refrigerant	: R-134A, 6.34 oz
Design Pressures	: High Side = 312psig Low Side = 140psig
Listing	: ETL, 3091403, Conforms to UL STD.471 Certified to CSA STD. C22.2 No. 120 NSF®
Manufacturer Claim	: Insulation is CFC free
Door(s)	: one (1) solid door, Hinged Type
Date of Manufacture	: July 2010
Markings	: DO NOT CLEAN LABEL WITH SOLVENT

- The tested commercial refrigerator met the marking requirements of Section 1607(b) of the California Appliance Efficiency Regulations

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□. TEST METHOD

A self-contained TURBO AIR Commercial Refrigerator, Model TUR-28SD, Serial Number: U200507002 was tested in accordance with ANSI/AHAM HRF-1-2004, and 10CFR Section 431. Part 64 (2009) [ANSI/ARI Standard 1200-2006, Section 4.4-ANSI/ASHRAE Standard 72-2005]. The ANSI/ASHRAE Standard 72-2005 specifies that the anti-condensate controllers should be allowed to control if they are an integral part of the refrigerator. For the purposes of the ANSI/ASHRAE Standard, the TUR-28SD falls under the category of medium temperature refrigerator. The 24-hour test can be repeated for any desired number of test levels (refrigerator thermostat settings) to determine the performance of the refrigerator at different points of operation. In this case, TUR-28SD was tested at the thermostat temperature setting of COOL

Test Conditions : Door Opening every 10 minutes for 8 hours  
Total = 48 openings

Ambient Temperature :  $75.2 \pm 1.8^{\circ}\text{F}$  ( $24.0 \pm 1.0^{\circ}\text{C}$ ) dry bulb  
 $64.4 \pm 1.8^{\circ}\text{F}$  ( $18.0 \pm 1.0^{\circ}\text{C}$ ) wet bulb

Note : No condensate was observed on the doors during the test

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□. TEST DATA

- a) Measured Volume : 7.15 ft<sup>3</sup>
- b) Thermostat Setting : COOL
- c) Refrigerant : R-134A
- d) Equipment : Refrigerator
  
- TEST Package :
  - Average Temp. / Integrated Average Temperature (IAT), □ = 37.98
  - Coldest Test Package Average (CTPA), □ = 37.23
  - Warmest Test Package Average, □ = 39.11
  
- Maximum of Warmest Test Sample, □ = 40.64
  
- Temperatures :
  - Test Start, □ = 36.23
  - Test End, □ = 38.09
  
- Energy Input During Refrigerating Time, kWh/day = 1.097
  
- Total Energy Input, kWh/day = 1.217
  
- Percent Compressor Running Time □ 24.91
  
- Ambient Temperatures :

	<u>6" Above Ref.</u>	<u>Middle of Ref</u>
Dry Bulb, □ :	75.29	75.26
Wet Bulb, □ :	65.5	64.1
  
- Number of Door Openings = 48

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□. SUMMARY OF TEST RESULTS

- Appliance : Self-contained Commercial Refrigerator,  
Automatic Defrost
- Manufacturer : TURBO AIR, INC
- Size, H × W × D, in. : 37×28×31 (W/O casters)
- Model No. : TUR-28SD
- Serial No. : U200507002
- Style : Undercounter
- Door : (1) Solid Door, Hinged Type
- Incandescent Wattage (Tublar) : NO
- CFC Free : Refrigerant / Compressor Insulation  
(manufacturer claimed)
- Thermostat Setting : COOL
- Measured Volume : 7.15 ft<sup>3</sup>
- Integrated Avenge Temp., □ : 37.98 □
- Mean Daily Energy Consumption : 1.217 kWh
- CEC Allowed Mean Daily Energy Consumption :  $0.1 \times 7.15 + 2.04$  □ 2.755 kWh
- Federally Regulated : YES

CONCLUSIONS : PASS

Respectfully Submitted,

Report prepared by

Kim Bong Yong

**Kim Bong-yong**

Date : 7/16/2010

Technical Manager

Report reviewed by

Oh Bong-tae

**OH Bong-tae**

Date : 7/20/2010

Technical Director

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□. EQUIPMENT USED

1. Yokogawa Data Acquisition Unit DA100 to record :

- a) Time
- b) Refrigerator and/or Freezer Temperatures
- c) Ambient Temperatures
- d) Cycles completed
- e) Calibration Date : 2/1/2010  
Due Date : 2/1/2011

2. Yokogawa Digital Power Meter WT210 to record :

- a) wattage
- b) Voltage
- c) Current
- d) Calibration Date : 1/8/2010  
Due Date : 1/7/2011

3. Type 'K' thermocouples

- a) Calibration Date : 2/1/2010  
Due Date : 2/1/2011

4. Thermocouples put in the plastic container filled with 6% salt water  
Dummy loads- water filled plastic containers

[note] Instruments are calibrated once a year.

**PROOF OF SERVICE**

**STATE OF CALIFORNIA, COUNTY OF SAN FRANCISCO**

At the time of service, I was over 18 years of age and **not a party to this action**. I am employed in the County of San Francisco, State of California. My business address is One Ferry Building, Suite 200, San Francisco, California 94111-4213.

On July 22, 2010, I served true copies of the following document(s) described as

**TURBO AIR, INC.'S REQUEST TO (1) MAINTAIN THE TSR-23SD IN THE APPLIANCE DATABASE AND (2) MAINTAIN THE TUR-28SD IN THE DATABASE, OR, ALTERNATIVELY, REMAND THE TUR-28SD TO THE EFFICIENCY COMMITTEE**

on the interested parties in this action as follows:

Media and Public Communication Office  
California Energy Commission  
1516 Ninth Street, MS-29  
Sacramento, CA 95814  
Tel: (916) 654-4989  
Email: mediaoffice@energy.state.ca.us

Docket Unit  
California Energy Commission  
1516 Ninth Street, MS-4  
Sacramento, CA 95814  
Tel: (916) 654-5076  
Email: docket@energy.state.ca.us

Harriet Kallemeyn  
Energy Commission Secretariat  
Media and Public Communication Office  
California Energy Commission  
1516 Ninth Street, MS-29  
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Email: Hkalleme@energy.state.ca.us

Public Adviser  
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**BY FEDERAL EXPRESS ONLY**

Karen Douglas, J.D.  
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California Energy Commission  
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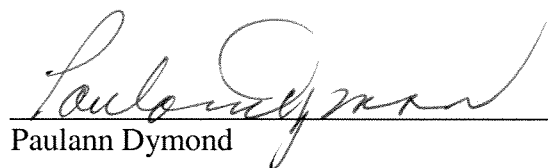
Anthony Eggert  
California Energy Commission  
1516 Ninth Street, MS-31  
Sacramento, CA 95814  
Tel: (916) 654-4930

1 **BY FEDEX:** I enclosed said document(s) in an envelope or package provided by FedEx and  
2 addressed to the persons at the addresses listed in the Service List. I placed the envelope or  
3 package for collection and overnight delivery at an office or a regularly utilized drop box of FedEx  
4 or delivered such document(s) to a courier or driver authorized by FedEx to receive documents.

5 **BY E-MAIL OR ELECTRONIC TRANSMISSION:** I caused a copy of the document(s) to be  
6 sent from e-mail address pdymond@cpdb.com to the persons at the e-mail addresses listed in the  
7 Service List. I did not receive, within a reasonable time after the transmission, any electronic  
8 message or other indication that the transmission was unsuccessful.

9 I declare under penalty of perjury under the laws of the State of California that the  
10 foregoing is true and correct.

11 Executed on July 22, 2010, at San Francisco, California.

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Paulann Dymond