



## ETL Test Results on Cold-Plus®

Intertek ETL (Edison Testing Lab)\* conducted testing on Cold-Plus® in a brand-new\*\* 3-ton split unit. The test protocol was to determine the EER rating with and without the Cold-Plus treatment. The following were the test protocols:

- Test took place in a sealed chamber
- Input temperatures were regulated to the same degrees
- Outlet temperatures were regulated by exhausting cooled air to the outside
- Cold-Plus was added 3 oz, 1 oz, 1 oz, 1 oz at a time for a total of 6 oz
- Unit was not allowed to cycle off
- Test runs were for 30 minutes and there were 26 runs
- Standards used were ARI 210/240

Test results (see next page) showed:

- A decrease in starting amperage spike
- A 3% reduction of operating amps
- A 3.3% increase in EER
- Increase in Coolant Flow Rate (>2.5%)
- Increase in C1 Refrigerant of 3.9%
- A 3-4 degree reduction in evaporator coil temperature

The tests showed that the addition of Cold-Plus to a new unit has very beneficial results. In addition, because the unit will cool the room faster you will also get significant reductions in running time and therefore reductions in KWH usage.

The unit should last longer because the operating time per day is decreased.

The testing protocols prevented complete evaluation of the treatment by not allowing the unit to cycle as it would in normal usage and the way the treatment was installed. Our recommendation is for a 50-hour run-in period after installation of Cold-Plus. Our own tests have shown that the addition of Cold-Plus in stages will decrease the effectiveness of the treatment.

Cold-Plus Chief Engineer

A handwritten signature in black ink, appearing to read "W. H. E. Smith", is written below the text "Cold-Plus Chief Engineer".

## ETL Test Report on Cold-Plus Treatment of New Unit

### Baseline

**Unit:** 3.0 Ton Split  
**Date:** 4/6/2007  
**Time:** 04:50:00 PM-->05:20:00  
**Standards used:** ARI 210/240  
**Test Personnel:** J. Coffman  
**Model Number:** N/A  
**Serial Number :** N/A  
**Refridge/Charge :** Charge ??? Factory R-22  
**Expansion Device :** TXV Fixed  
**Barometer** 29.00" Hg  
**Voltage:** 230 Volt 60 Hz  
**Test Condition :** Run # 1 A Test 80/67-95  
**Airflow:** 1200 SCFM  
**Note:** No Blower

### Last Run

**Unit:** 3.0 Ton Split  
**Date:** 4/12/2007  
**Time:** 06:40:00 AM-->07:10:00  
**Standards used:** ARI 210/240  
**Test Personnel:** W.Allen  
**Model Number:** N/A  
**Serial Number :** N/A  
**Refridge/Charge :** Charge ??? Factory R-22  
**Expansion Device :** TXV Fixed  
**Barometer** 28.80" Hg  
**Voltage:** 230 Volt 60 Hz  
**Test Condition :** Run # 25 Test 80/68 --  
**Airflow:** 1200 SCFM  
**Note:** Added 6 oz Cold-Plus™ Refrigerant Modifier



New unit without cycling allowed  
 Runs are 30 minutes in a test chamber.  
 Output is exhausted outside test chamber.

Locations	Average	Units
Indoor Dry Bulb	80	Deg F
Indoor Wet Bulb	66.99	Deg F
Discharge Dry Bulb	62.8	Deg F
Discharge Wet Bulb	58.29	Deg F
Outdoor Dry Bulb	94.99	Deg F
Outdoor Wet Bulb	65.53	Deg F
Discharge @ Comp	186.7	Deg F
Lvg O.D. Psig 1	243.72	PSIG
Saturation Temp	115.29	Deg F
LVG O.D. Coil	105.78	Deg F
<b>Subcool</b>	<b>9.5</b>	<b>Deg F</b>
Entg I.D. PSIG 2	238.18	PSIG
Saturation Temp	113.63	Deg F
Entg I.D. Coil	102.55	Deg F
<b>Subcool</b>	<b>11.08</b>	<b>Deg F</b>
ID Coil Loop #1	48.98	Deg F
ID Coil Loop #2	54.32	Deg F
ID Coil Loop #3	53.11	Deg F
Lvg I.D. Psig 3	78.47	PSIG
Saturation Temp	46.56	Deg F
LVG I.D. Coil	53.3	Deg F
<b>Superheat</b>	<b>6.74</b>	<b>Deg F</b>
Entg O.D. psig 4	78.28	PSIG
Saturation Temp	46.44	Deg F
ENT O.D. Coil	67.12	Deg F
<b>Superheat</b>	<b>20.68</b>	<b>Deg F</b>
Vapor O.D. Coil	177	Deg F
Suction At Comp.	68.78	Deg F
Flowmeter	104.65	Deg F
Inlet Grid	80.16	Deg F
Outlet Grid	62.31	Deg F
Tunnel Grid	64.07	Deg F
I.D. Tree	80.2	Deg F
O.D. Tree # 1	95.57	Deg F
O.D. Tree # 2	94.57	Deg F
O.D. Tree # 3	95.14	Deg F
FlowMeter 1	0.86	GPM
<b>Voltage (A to B)</b>	<b>231.55</b>	<b>Volts</b>
<b>Voltage (B to C)</b>	<b>232.22</b>	<b>Volts</b>
<b>Voltage (C to A)</b>	<b>230.61</b>	<b>Volts</b>
Amps 1	9.16	Amps
Amps 2	8.13	Amps
Amps 3	7.6	Amps
kWatts 1	1.13	Kwatts
kWatts 2	0.8	Kwatts
kWatts 3	0.89	Kwatts
<b>Cond. Unit Kwatts</b>	<b>2.84</b>	<b>Kwatts</b>
<b>Kwatt Total</b>	<b>3.283119</b>	<b>Kwatts</b>
Frequency	59.9	Hz
<b>C1 Flow Rate</b>	<b>488.58</b>	<b>lb/Hr</b>
<b>C1 Refrigerant</b>	<b>33975.94</b>	<b>BTU/Hr</b>
Total Refrigerant	33975.94	BTU/Hr
Unit Static	-0.21	In water
Dis Air Flow	1250.48	CFM
Dis Air Flow 2	1203.07	SCFM
Sensible Capacity	22749.7	BTU / Hr
Gross Air Side Capacity	34543.03	BTU / Hr
<b>Net Air Side Capacity</b>	<b>33039.2</b>	<b>BTU / Hr</b>
<b>EER (COP)</b>	<b>10.06</b>	<b>BTU/W x Hr</b>
<b>Refrigerant Balance</b>	<b>101.67</b>	<b>Air / Ref</b>

Locations	Average	Units
Indoor Dry Bulb	80	Deg F
Indoor Wet Bulb	68	Deg F
Discharge Dry Bulb	63.27	Deg F
Discharge Wet Bulb	59.57	Deg F
Outdoor Dry Bulb	92.02	Deg F
Outdoor Wet Bulb	82.81	Deg F
Discharge @ Comp	181	Deg F
Lvg O.D. Psig 1	233.18	PSIG
Saturation Temp	112.12	Deg F
LVG O.D. Coil	105.36	Deg F
<b>Subcool</b>	<b>6.76</b>	<b>Deg F</b>
Entg I.D. PSIG 2	228.79	PSIG
Saturation Temp	110.75	Deg F
Entg I.D. Coil	101.8	Deg F
<b>Subcool</b>	<b>8.95</b>	<b>Deg F</b>
ID Coil Loop #1	48.69	Deg F
ID Coil Loop #2	55.88	Deg F
ID Coil Loop #3	54.06	Deg F
Lvg I.D. Psig 3	80.7	PSIG
Saturation Temp	48	Deg F
LVG I.D. Coil	55.9	Deg F
<b>Superheat</b>	<b>7.9</b>	<b>Deg F</b>
Entg O.D. psig 4	80.55	PSIG
Saturation Temp	47.9	Deg F
ENT O.D. Coil	69.75	Deg F
<b>Superheat</b>	<b>21.85</b>	<b>Deg F</b>
Vapor O.D. Coil	171.47	Deg F
Suction At Comp.	71.44	Deg F
Flowmeter	103.6	Deg F
Inlet Grid	80.26	Deg F
Outlet Grid	62.73	Deg F
Tunnel Grid	64.51	Deg F
I.D. Tree	80.32	Deg F
O.D. Tree # 1	92.17	Deg F
O.D. Tree # 2	92.75	Deg F
O.D. Tree # 3	91.41	Deg F
FlowMeter 1	0.88	GPM
<b>Voltage (A to B)</b>	<b>229.96</b>	<b>Volts</b>
<b>Voltage (B to C)</b>	<b>230.78</b>	<b>Volts</b>
<b>Voltage (C to A)</b>	<b>229.08</b>	<b>Volts</b>
Amps 1	8.89	Amps
Amps 2	7.9	Amps
Amps 3	7.38	Amps
kWatts 1	1.04	Kwatts
kWatts 2	0.77	Kwatts
kWatts 3	0.92	Kwatts
<b>Cond. Unit Kwatts</b>	<b>2.73</b>	<b>Kwatts</b>
<b>Kwatt Total</b>	<b>3.173801</b>	<b>Kwatts</b>
Frequency	59.9	Hz
<b>C1 Flow Rate</b>	<b>501.42</b>	<b>lb/Hr</b>
<b>C1 Refrigerant</b>	<b>35293.23</b>	<b>BTU/Hr</b>
Total Refrigerant	35293.23	BTU/Hr
Unit Static	-0.21	In water
Dis Air Flow	1263.68	CFM
Dis Air Flow 2	1204.94	SCFM
Sensible Capacity	22187.79	BTU / Hr
Gross Air Side Capacity	34475.16	BTU / Hr
<b>Net Air Side Capacity</b>	<b>32968.99</b>	<b>BTU / Hr</b>
<b>EER (COP)</b>	<b>10.39</b>	<b>BTU/W x Hr</b>
<b>Refrigerant Balance</b>	<b>97.68</b>	<b>Air / Ref</b>

### Difference after Cold-Plus™

Locations	Difference	Percent
Indoor Dry Bulb	0	0.0%
Indoor Wet Bulb	1.01	1.5%
Discharge Dry Bulb	0.47	0.7%
Discharge Wet Bulb	1.28	2.2%
Outdoor Dry Bulb	-2.97	-3.1%
Outdoor Wet Bulb	17.28	26.4%
Discharge @ Comp	-5.7	-3.1%
Lvg O.D. Psig 1	-10.54	-4.3%
Saturation Temp	-3.17	-2.7%
LVG O.D. Coil	-0.42	-0.4%
<b>Subcool</b>	<b>-2.74</b>	<b>-28.8%</b>
Entg I.D. PSIG 2	-9.39	-3.9%
Saturation Temp	-2.88	-2.5%
Entg I.D. Coil	-0.75	-0.7%
<b>Subcool</b>	<b>-2.13</b>	<b>-19.2%</b>
ID Coil Loop #1	-0.29	-0.6%
ID Coil Loop #2	1.56	2.9%
ID Coil Loop #3	0.95	1.8%
Lvg I.D. Psig 3	2.23	2.8%
Saturation Temp	1.44	3.1%
LVG I.D. Coil	2.6	4.9%
<b>Superheat</b>	<b>1.16</b>	<b>17.2%</b>
Entg O.D. psig 4	2.27	2.9%
Saturation Temp	1.46	3.1%
ENT O.D. Coil	2.63	3.9%
<b>Superheat</b>	<b>1.17</b>	<b>5.7%</b>
Vapor O.D. Coil	-5.53	-3.1%
Suction At Comp.	2.66	3.9%
Flowmeter	-1.05	-1.0%
Inlet Grid	0.1	0.1%
Outlet Grid	0.42	0.7%
Tunnel Grid	0.44	0.7%
I.D. Tree	0.12	0.1%
O.D. Tree # 1	-3.4	-3.6%
O.D. Tree # 2	-1.82	-1.9%
O.D. Tree # 3	-3.73	-3.9%
FlowMeter 1	0.02	2.3%
<b>Voltage (A to B)</b>	<b>-1.59</b>	<b>-0.7%</b>
<b>Voltage (B to C)</b>	<b>-1.44</b>	<b>-0.6%</b>
<b>Voltage (C to A)</b>	<b>-1.53</b>	<b>-0.7%</b>
Amps 1	-0.27	-2.9%
Amps 2	-0.23	-2.8%
Amps 3	-0.22	-2.9%
kWatts 1	-0.09	-8.0%
kWatts 2	-0.03	-3.8%
kWatts 3	0.03	3.4%
<b>Cond. Unit Kwatts</b>	<b>-0.11</b>	<b>-3.9%</b>
<b>Kwatt Total</b>	<b>-0.10932</b>	<b>-3.3%</b>
Frequency	0	0.0%
<b>C1 Flow Rate</b>	<b>12.84</b>	<b>2.6%</b>
<b>C1 Refrigerant</b>	<b>1317.29</b>	<b>3.9%</b>
Total Refrigerant	1317.29	3.9%
Unit Static	0	0.0%
Dis Air Flow	13.2	1.1%
Dis Air Flow 2	1.87	0.2%
Sensible Capacity	-561.91	-2.5%
Gross Air Side Capacity	-67.87	-0.2%
<b>Net Air Side Capacity</b>	<b>-70.21</b>	<b>-0.2%</b>
<b>EER (COP)</b>	<b>0.33</b>	<b>3.3%</b>
<b>Refrigerant Balance</b>	<b>-3.99</b>	<b>-3.9%</b>

## **\*Why Intertek ETL**

Intertek's expertise is backed by 120 years of product testing, which began when Edison established the Lamp Testing Bureau. It was later renamed 'Electrical Testing Laboratories', giving start to the nationally recognized ETL label. Known worldwide for providing product testing solutions, Intertek ETL and its many global partners have built upon Edison's initial foundation and now provide the most efficient path to energy savings testing.

Intertek is the largest tester of consumer goods in the world and has a network of more than 1,000 laboratories across around 100 countries. Intertek has been testing HVAC/R for over six decades and has partnered with AHRI (Air-Conditioning, Heating, and Refrigeration Institute) for over 50 years. Intertek certifies that HVAC/R equipment used in the US and abroad meets the performance claims by manufacturers when measured by the standards established by AHRI.

## **\*\*Why a Brand-New Unit**

By using a completely new unit, there is no possibility of existing oil fouling to contaminate test results. This allows us to prove unequivocally that Cold-Plus improves the thermodynamics of the A/C process even when there is no oil fouling to be removed.