



The revolution Ceramic oven panels for powder coating lines

COBALT  
by *NewpacFinishing*

# Introducing Ceramic Ovens Panel Systems

## History:

- 9 years of Research, Development and Full Scale tests.
- 21 Ceramic formulas tested for durability, impact and heat resistance.
- 8 Panel Designs tested.
- 2 Full scale lab ovens built for Energy savings evaluations.

## Strong Track record:

- 2004: The first two Ceramic dry off and curing ovens are installed.
- To date: 8 full block Ceramic ovens have cumulated 53.000 Hours of Operation.
- Energy Savings constantly exceed Lab. results.

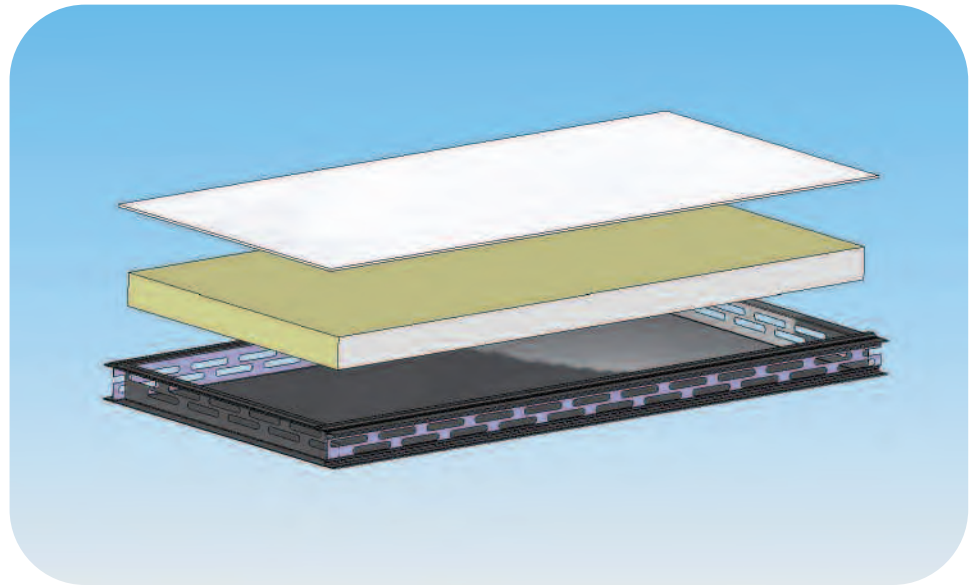
## Now:

- Growth in series manufacturing makes prices comparable to galvanized steel ovens !
- Ceramics allow for continuous innovation in oven design.

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Smart Airflow  
Design - **Updraft**  
air circulation  
provides for even  
temperature  
distribution with  
less energy  
consumption.



## General Design & Construction Principles



### COBALT Ceramic

Thickness: 5 to 7 mm.

- Refractory up to 4000°F
- Organic Minerals
- Water based
- No chemicals

### Insulation Material

3 to 5 in. thickness

- RockWool Brand Insulation
- High Density

### Galvanized Steel

- 20 ga. for the outside skin

**OVERALL  
DESIGN MAKES  
IT EASY TO  
WORK WITH  
CERAMIC  
PANELS.**

- Assembles like any classic oven panel.
- Tongue & Groove or Tray type assembly modes.
- Panels can be welded, bolted, cut.
- Panels can be molded in large dimension panels with no seams.

**Economical** ○ **Exceptional Refractory & Energy Efficiency**  
**Close to 6 times more heat efficient than Steel.**

**Safe** ○ **Safe, Environment Friendly & Recyclable**

- Organic Minerals are mixed during a cold fusion process.
- Water based.
- No chemicals, no additives.
- Non Toxic.
- Fire resistant and Refractory.

## General Properties of the COBALT Oven Ceramics

**Strong** ○ **Stronger than Stone (astm-a36 for a 1 in. layer)**

- **Ultimate Strength: 93 Mpa**  
Vs Marble: 15 - Vs Concrete: 3
- **Compressive Strength: 1267 PSI**  
Vs 1 in. Marble: 708 PSI

**Durable** ○ **No Corrosion**  
 Unlike Steel and Galvanized steel: no pickling, no surface oxydation.

**Stable** ○ **Lower Dilatation Factor than Steel**

**Ceramic Dilatation Factor: 2,2.10-6/K°**  
 Vs. Steel Factor: 5.10-6 /K°

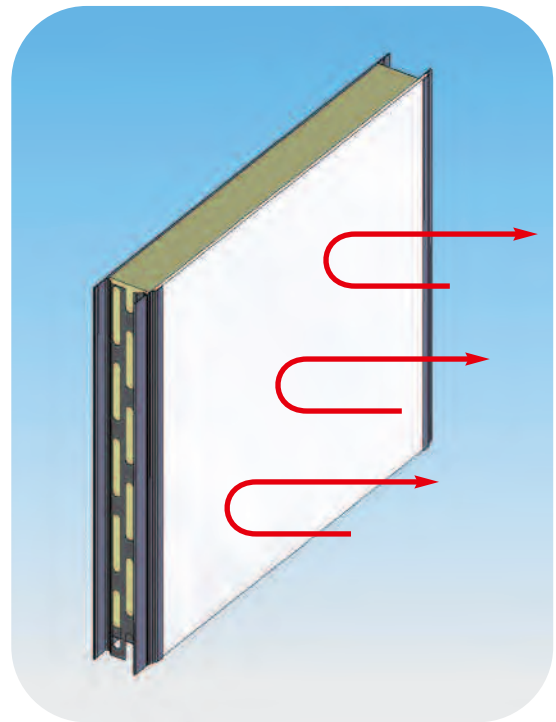
**A MORE  
 EFFICIENT WAY  
 OF BUILDING  
 OVEN.**



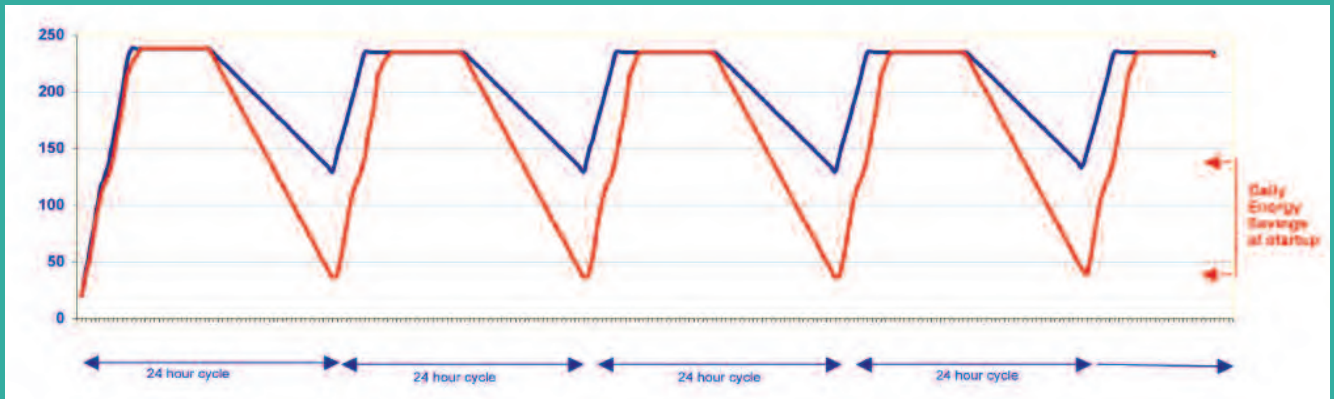
# The COBALT Advantage: Dramatic Energy Savings

**1** Less heat losses through COBALT Oven Walls

**2** Less calories consumed by the COBALT Ceramic inner lining.



# COBALT: Faster Startups with less energy.



During night hours, Cobalt ovens lose 4 times less calories than Steel ovens.

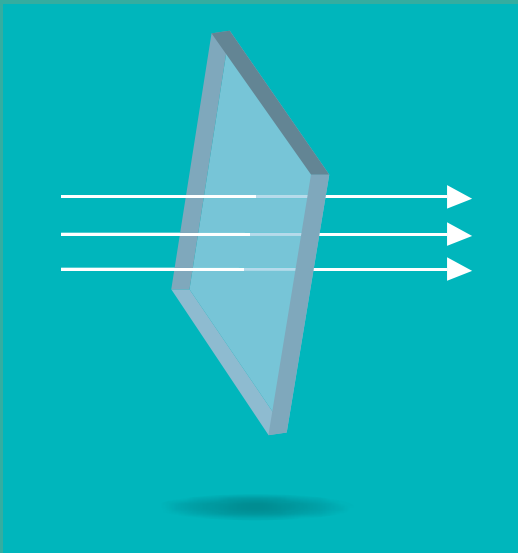


A Higher temperature in the morning means less energy used for heat up.



Ceramic Insulation keeps calories contained both during and after operation.

## Less energy to reach & maintain temperature



### Comparing K-Values

K-Value: amount of calories going through a material at a given temperature.

Thermal Conductivity Index  
W.m-1.K-1 @ 387°F

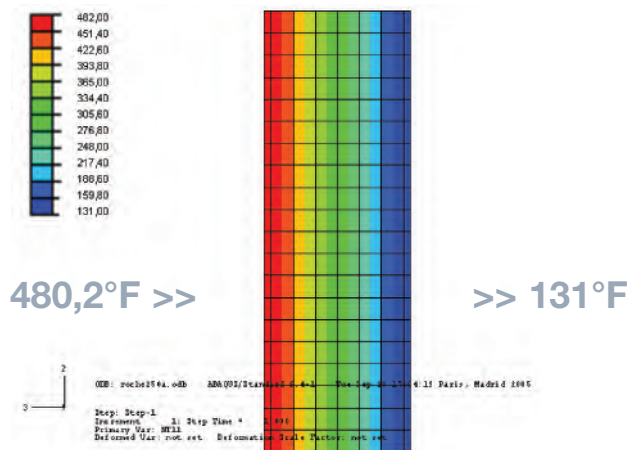
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<b>COBALT Ceramics</b> .....	<b>0,095</b>
<b>Steel</b> .....	<b>70</b>

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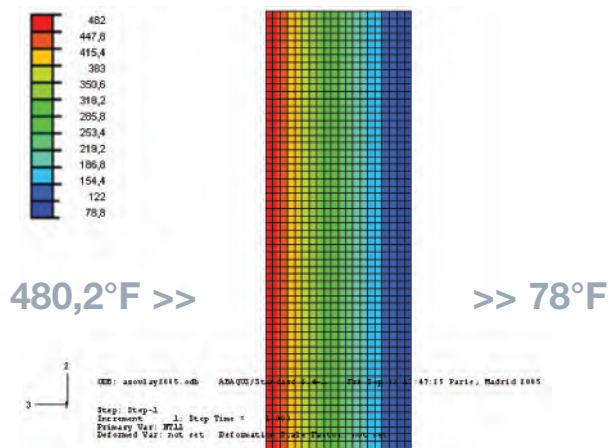
Aluminium .....	237
Iron .....	80,2
Glass .....	1,35
Water .....	0,60
Wood .....	0,04
Air .....	0,026

**COBALT OVENS CERAMICS ARE 737 TIMES LESS THERMAL CONDUCTIVE THAN STEEL.**

Temperature mapping for a Classic 6 in. **Steel Oven Panel** (°F)

Difference to Ambient Air:  $131^{\circ}\text{F} - 66,7^{\circ}\text{F} = 64,3^{\circ}\text{F}$

Lower heat conductivity means less heat losses In and Through walls

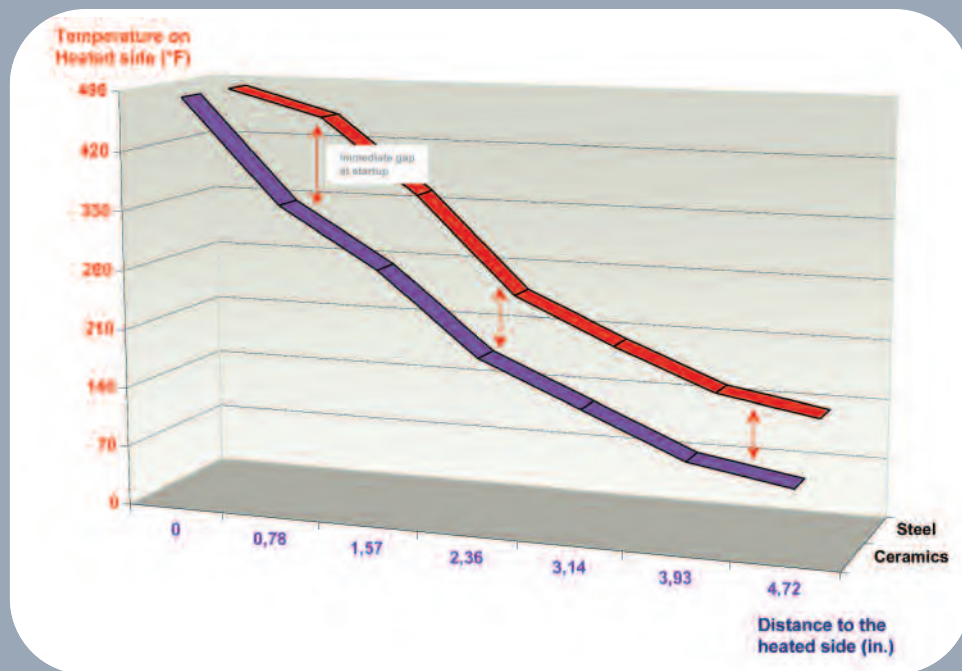
Temperature mapping for a 4 in. **Ceramic Oven Panel** (°F)

Difference to Ambient Air:  $78^{\circ}\text{F} - 66,7^{\circ}\text{F} = 11,3^{\circ}\text{F}$

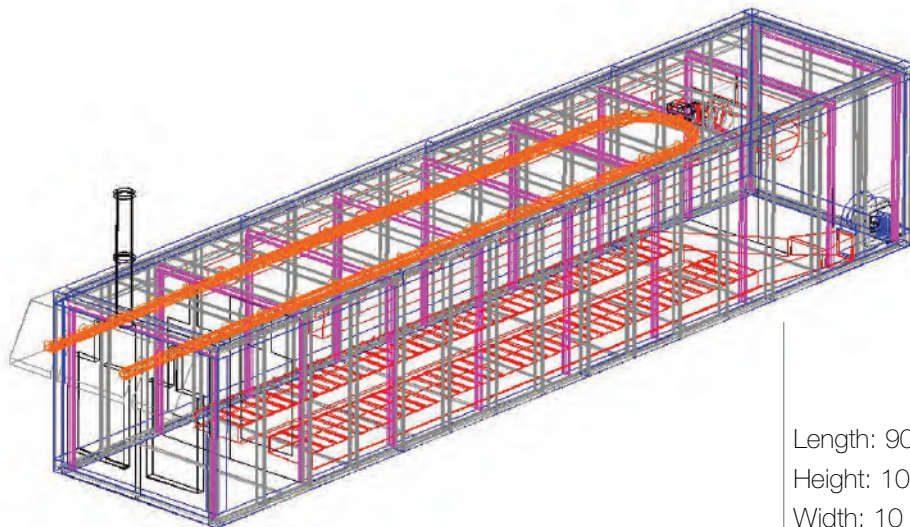
CERAMICS  
DEFLECT HEAT,  
WHILE STEEL  
ABSORBS IT.

COBALT Advantage Multiple of x 5,69

# Less calories cross the Ceramic Thermal Shield



FASTER  
STARTUP WITH  
LESS ENERGY.  
BETTER  
TEMPERATURE  
STABILITY  
OVER TIME  
WITH LESS  
ENERGY.



Length: 90 ft  
Height: 10 ft  
Width: 10 ft

## Comparative Case Study

	Classic GI Steel Oven	COBALT
Total Inner Mass – Panels	<b>51.391 lbs</b> (4830 sqft at 10,640 lbs/sq ft)	<b>40.233 lbs</b> (4830 sqft at 8,330 lbs/sq ft)
Total Inner Mass – Structure	<b>10.200 lbs</b>	<b>10.200 lbs</b>
Adjusted Specific Heat	<b>Steel: 0,11</b>	<b>Ceramic: 0,064</b>
<b>Q= CMT*</b>		

\* Quantity of heat needed = Specific Heat x Mass to be heated x Temperature

The total Inside Steel Mass to heat up at 400°F from a 66°F Ambiance is:

	<b>61.591 lbs and requires 2,600,000 BTU/h</b>	<b>50.433 lbs and requires 1,370,697 BTU/h</b>
If the total inner mass had been 61.591 lbs of Ceramics to heat (comparable to Steel), Energy needs would be still only be 1,604,000 BTU/h.		

**Startup Savings: 1,229,303 BTU/h**

**Ceramics Assumption:** 3 mm Ceramic Panel – Adjusted Specific Heat over an 8 hour Cycle: 0,064 BTU/lb °F for 40.233 lbs Ceramics and 0,11 for Steel. 4 in. Rockwool insulation. Combustion: Direct Gas Fire.

**Steel Assumption:** 15 ga. Galvanized Steel Oven - Adjusted Specific Heat over an 8 hour Cycle: 0,11 BTU/lb °F 6 in. Rockwool insulation. Combustion: Direct Gas Fire.



# Valuing the Savings over a 10-hour cycle

Classic 20 ga GI Steel Panel Oven	COBALT
Startup 1h at 100%: <b>2,600,000 BTU/h</b>	Startup 1h at 100%: <b>1,370,000 BTU/h</b>
Operation 9h at 40%: <b>9,360,000 BTU/h</b>	Operation 9h at 14%: <b>1,726,000 BTU/h</b>
Total 10h cycle: <b>11,960,000 BTU/h</b>	Total 10h cycle: <b>3,096,000 BTU/h</b>
<b>COBALT Savings: 8,863 MBTU/10h Cycle</b>	

## COBALT annual savings

Per 10-Hour Day: \$ 60,26 at 6,8 \$/MBTU of Natural gas

**X 220 days \$ 13.259**

Cost of a 90 ft x 12ft x 11 ft

Direct LPG Fire Cure COBALT Oven: **\$ 80.000**

**A HIGHER  
RETURN ON  
INVESTMENT BY  
+16%/YEAR**

# The Savings Matrix:

What you really save by using a COBALT Oven  
10 hours per day over 220 days

COBALT	Natural Gas Prices (\$/ MBTU)					
	\$ 7	\$ 8	\$ 9	\$ 10	\$ 11	\$ 12
<b>Cure Oven</b> Savings over a 10 hours cycle At 400°F: 8,863 MBTU	\$ 13.649	\$ 15.598	\$ 17.548	\$ 19.498	\$ 21.448	\$ 23.398
<b>Dryoff Oven</b> Savings over a 10 hours cycle At 300°F: 3,980 MBTU	\$ 6.142	\$ 7.004	\$ 7.880	\$ 8.756	\$ 9.631	\$ 10.507
<b>Total Savings</b> per 220 days of operation	<b>\$ 19.791</b>	<b>\$ 22.602</b>	<b>\$ 25.428</b>	<b>\$ 28.254</b>	<b>\$ 31.079</b>	<b>\$ 33.905</b>

**ALL THE  
BENEFITS OF  
AN ADVANCED  
TECHNOLOGY  
WITHOUT GOING  
OVER BUDGET.**

- COBALT Ovens have an increased speed of amortization.
- COBALT Ovens are price competitive with Classic Galvanized Steel ovens.





FULLY MODULAR...

NO CORROSION...

BOLTED, CUT, GLUED...

A large rectangular area with rounded corners, containing 15 horizontal lines for writing.

More questions ?  
Need a Quote ?

Contact us 24/7:  
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