

## Application report

### It's Eclipse from start to "finish" in C.R. Metal Product's new finishing system.

#### Profile

#### Installation:

Powder Coating Line

#### Eclipse Products:

Immersolet burners  
RatioMatic burners  
InfraRed burners  
UltraRad burners

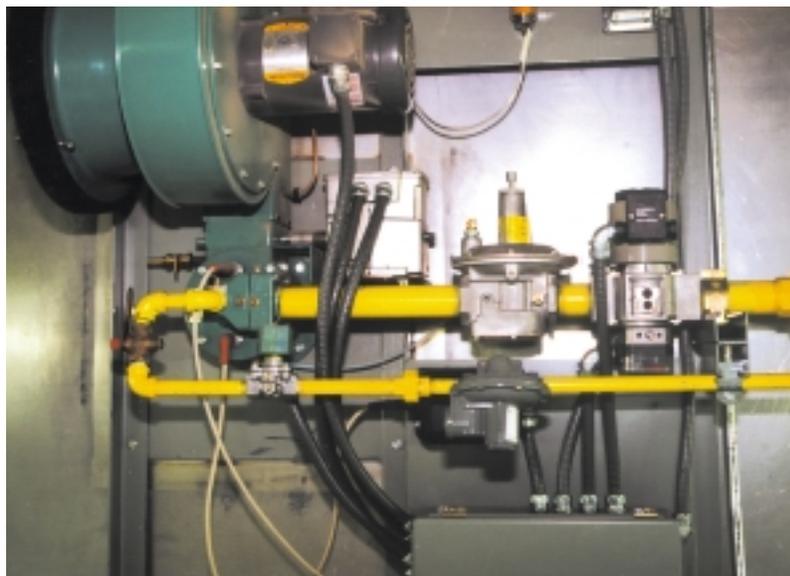
For more than 50 years, C.R. Metal Products has been providing their customers with "single source" solutions in design, metal fabrication, powder coating and silkscreening. They produce a variety of high tech metal parts including music amplifiers, computers and automotive parts. John Walters, co-owner of C.R. Metal Products says, "Today our customers choose us because we are more than a contractor. Our services span all key phases of a project."

Having had a working relationship with Fred Grass of BDC in St. Louis since 1990 when they replaced an old atmospheric box burner with an Eclipse RM200 v1.00 RatioMatic burner, Fred got the call when it was time for the combustion equipment. In October of 1997, Fred brought John to Eclipse to see first hand their new powder coating line that had recently been put into operation in their Rockford, IL manufacturing facility. (Details of this system can be found in Eclipse Application Report AR-144.) "It's extremely helpful and reassuring to be able to see the combustion equipment performing in an actual working finishing system," said John.

The CR Metal Products finishing system is now up and running like a charm. The following is a description by John of his own custom designed finishing system.

**Conveyor:** The 725 foot conveyor is the super clean inverted track type made by Richards Wilcox. The line has the least possible number of curves and hills to minimize dirt and also to minimize wear of the conveyor chain. The design allows the foreman total control of the system from one location because he can see every aspect of the coating process; loading, washing, quality, coating, baking temperature, speed controls, unloading, packaging, etc.

**Washer:** The washer is a five stage plus halo rinse. They include alkaline wash, rinse, iron phosphate, rinse, sealer rinse, tap water halo rinse. All rinses are backflowed to use the same water many times. The only water going down the drain is the overflow from the rinse tanks. All other water is recycled through



One of two Eclipse 200RM RatioMatic burners providing 10,000scfh of 400°F air for powder coating oven.

When the decision was made to put the entire manufacturing process under one roof, it became necessary to build a totally new finishing line from the ground up. The old line was designed and built in house by John in 1963 and has been running day in and day out ever since. But now it was time to bring together some of the new ideas John had been thinking about with today's technology.

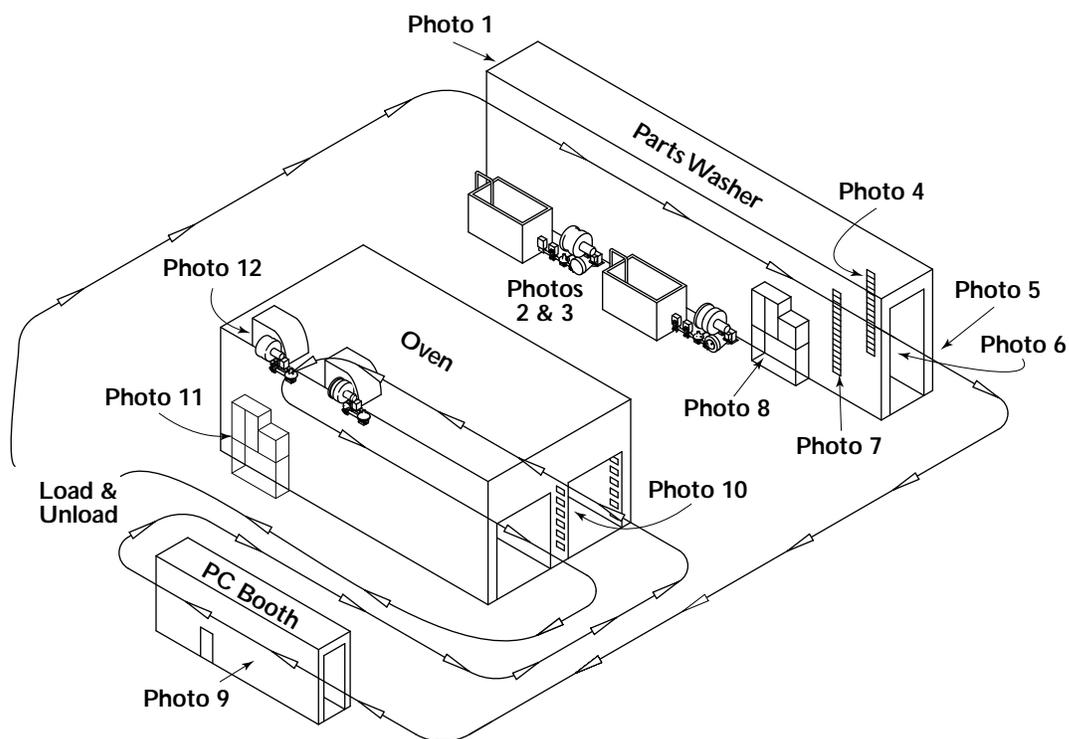
the water treatment tanks. The heating of the number one and number three tanks was accomplished with Eclipse ImmersoJet burners. The design of the electronics and manifolds was done by BDC Company. Each Eclipse burner, model I1003 v2.00, is rated at 550,000Btu/hr and can heat the 1200 gallon tanks to 130°F in thirty minutes. The ImmersoJet burner pushes flame and super heated gas through fifty-three feet of stainless steel pipe which is under water and does this with very little noise with approximately 80% efficiency. This system of heating has proven to be absolutely trouble free.

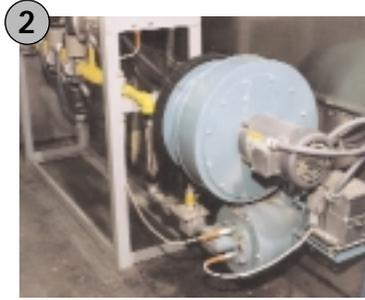
**Parts Dry-Off Section:** The parts dryer is a 16 foot long one pass, straight through tunnel. Heat is provided by Eclipse 100 Series, model 64IR infrared burners configured in four 66" vertical manifolds. Exhaust gases from the burners are utilized by drawing them through a fan and directing them onto the parts as they enter the dry off section. The dryer was designed to bring the temperature of the sheet metal parts to 150°F - 200°F, depending on the thickness of the sheet metal parts, in 2.5 minutes. The four banks of infrared burners are controlled by a reostat to give any amount of heat desired up to the 1,320,000 Btu/hr maximum capacity of the burners.

**Powder Booths:** There are two 10'x14' staggered booths. Each is a complete room to help keep the plant dust free. The booths have Nordson collectors that exhaust dust free air back inside the plant. The powder is applied to parts with Nordson electrostatic guns. This new powder line according to John, "has surpassed our dreams of superb quality."

**Cure Oven:** The cure oven is divided into two heating zones. Each zone is fired by an Eclipse RM200 v3.00 RatioMatic burner rated at 2,000,000 Btu/hr. Each zone can be controlled separately. This is advantageous when adjusting the heat range of texture finishes such as wrinkle paint. The burners have proven to be both stable and reliable. The oven is a 2 pass design having chain travel of 175 feet. The oven is able to accommodate work pieces up to 15'x6'x3'.

**Infrared Gel Zone:** This section is located at the entrance of the cure oven and consists of two 66" manifolds of Eclipse UltraRad burners. They are used to preheat and gel the powder quickly on heavy parts if needed. BDC designed the electronics so that the heat range is variable.





**Photo 1** Parts entering first stage of four stage washer.

**Photo 2** One of two 3" Immersolet burners each capable of heating a 1200 gallon tank to 130°F in thirty minutes.



**Photo 3** Immersolet burners with valve train and control panel.

**Photo 4** Parts entering dry-off stage of washer.



**Photo 5** Air side of pre-mix system for IR burners.

**Photo 6** Exit from parts washer showing IR burners in operation.



**Photo 7** 64IR burners in final stage of washer. Burners are configured in 4 zones providing 1.32 million Btu/hr.

**Photo 8** Control panels, temperature control and gas valve train for 64IR burners.



**Photo 9** Powder coating is applied in the two station PC Booth.

**Photo 10** UltraRad burners to preheat and gel the powder quickly on heavy parts.



**Photo 11** Control panel for RatioMatic burner(s). Motor starters and other heat generating devices are kept in a separate cabinet.

**Photo 12** One of two 200RM RatioMatic burners supplying a total of 4 million Btu/hr.



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**Eclipse Combustion**

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Litho in USA