

IN THE COURT OF COMMON PLEAS
MAHONING COUNTY, OHIO

STATE OF OHIO, ex rel.
RICHARD CORDRAY
ATTORNEY GENERAL OF OHIO

Plaintiff,

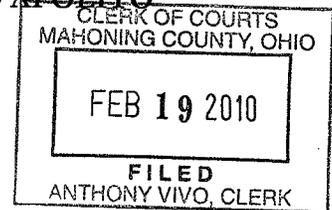
v.

SPECTRUM METAL FINISHING, INC.

Defendant.

CASE NO. 2007 CV 02631

JUDGE L. D'APOLITO



CONSENT ORDER AND FINAL JUDGMENT ENTRY

Plaintiff, the State of Ohio, on relation of its Attorney General Richard Cordray ("Plaintiff"), at the written request of Chris Korleski, the Director of Environmental Protection, filed a Complaint seeking injunctive relief and civil penalties from Defendant Spectrum Metal Finishing, Inc. ("Defendant") for violations of Revised Code ("R.C.") Chapter 3704 and the rules promulgated thereunder.

Therefore, without the trial, admission, or determination of any issue of fact or law, and upon the consent of the parties hereto, it is hereby ORDERED, ADJUDGED, and DECREED as follows:

I. DEFINITIONS

1. As used in this Order, the following terms are defined as follows:
 - a. "Facility" means Defendant's coating operations located at 535 Bev Road, Youngstown, Ohio.
 - b. "Ohio EPA" means the Ohio Environmental Protection Agency.

- c. "Director" means the Director of the Ohio Environmental Protection Agency.
- d. "Permit to Install" has the same meaning as set forth in Ohio Adm.Code Chapter 3745 31.
- e. "Synthetic Minor Permit to Install" has the same meaning as set forth in Ohio Adm.Code Chapter 3745-77.

II. JURISDICTION AND VENUE

2. The Court has jurisdiction over the parties and the subject matter of this case. The Complaint states a claim for which relief can be granted pursuant to R.C. Chapter 3704. Venue is proper in this Court.

III. PERSONS BOUND

3. The provisions of this Consent Order shall apply to and be binding upon the parties to this action in accordance with Rule 65(D) of the Ohio Rules of Civil Procedure.

IV. SATISFACTION OF LAWSUIT AND RESERVATION OF RIGHTS

4. Plaintiff alleges in its Complaint that Defendant has owned and operated the Facility in such a manner as to result in violations of the air pollution control laws and rules of the State of Ohio. Completion of the terms of this Consent Order shall constitute full satisfaction of any civil and administrative liability of Defendant to Plaintiff for the claims alleged in Plaintiff's Complaint up to the date of the Court's entry of this Consent Order.

5. This Consent Order shall not be construed to limit the authority of Plaintiff to seek relief for violations not alleged in the Complaint, nor shall this Consent Order bar the State of Ohio from bringing any action against Defendant for any violations that occur after the entry of this Consent Order. Nothing in this Consent Order shall be construed to relieve Defendant of its obligations to comply with applicable federal, State or local statutes, regulations, or ordinances.

V. CIVIL PENALTY

6. Pursuant to and in accordance with R.C. 3704.06, Defendant is enjoined and ordered to pay a total civil penalty of Four Hundred Twenty Thousand Dollars (\$420,000.00) to the State of Ohio. Such penalty shall be paid as follows:

- a. Defendant shall implement a supplemental environmental project ("SEP") by installing and operating a Regenerative Thermal Oxidizer for the capture and control of volatile organic compound emissions in a manner described in paragraph 12 below, and as identified in Attachment "A." The estimated total installed cost of the SEP exceeds One Million Four Hundred Thousand Dollars (\$1,400,000). For installation and operation of the SEP to achieve a 16-ton emission limit for volatile organic compounds, Defendant shall offset Three Hundred Twenty Thousand Dollars (\$320,000) of the total civil penalty in conjunction with the anticipated environmental benefits.
- b. Beginning twelve (12) months after entry of this Consent Order, Defendant shall fund a SEP by making a contribution of Twenty Thousand Dollars (\$20,000.00) of the remaining civil penalty to Ohio EPA's Clean Diesel School Bus Program Fund (Fund 5CD0). Defendant shall make four (4) quarterly payments in the amount of Five Thousand Dollars (\$5000.00), which shall be delivered on or before the last day of each quarter beginning the first quarterly month following the twelfth month in which this Consent Order is entered. The quarterly payments shall be by cashier's or certified check payable to the order of "Treasurer, State of Ohio" and specifying that such monies be deposited in Fund 5CD0 established by Ohio EPA for the Clean Diesel School Bus Program. The checks, together with a letter

identifying the Defendant, shall be delivered to Karen Pierson or her successor, Paralegal, Office of the Attorney General of Ohio, Environmental Enforcement Section, 30 East Broad Street, 25th Floor, Columbus, Ohio, 43215-3400. The memorandum portion of the checks, or some other prominent location on the transmittal letters or documentation, shall include a reference to "A.G. EAGO No. 330260."

- c. Beginning twelve (12) months after entry of this Consent Order, Defendant shall pay the remaining amount of the total civil penalty – Eighty Thousand Dollars (\$80,000.00) —by four (4) quarterly payments in the amount of Twenty Thousand Dollars (\$20,000.00), which shall be delivered on or before the last day of each quarter beginning the first quarterly month following the twelfth month in which this Consent Order is entered. The quarterly payments shall be by cashier's or certified checks payable to the order of "Treasurer, State of Ohio" and delivered to Karen Pierson or her successor, Paralegal, Office of the Attorney General of Ohio, Environmental Enforcement Section, 30 East Broad Street, 25th Floor, Columbus, Ohio 43215-3400. The memorandum portion of the checks, or some other prominent location on the transmittal letters or documentation, shall include a reference to "A.G. EAGO No. 330260."

7. In the event that quarterly payments in paragraphs 6.b and 6.c are not timely received by this office per the above terms, the remaining balance of the amounts due under those paragraphs shall become immediately due and payable. Defendant shall have ten (10) days from the original due date to correct non-payment by providing a notification of the deficiency in writing and remitting the delinquent payment to Karen Pierson, Paralegal, or her successor, Office of the

Attorney General of Ohio, Environmental Enforcement Section, 30 East Broad Street, 25th Floor, Columbus, Ohio 43215-3400. If an instance of non-payment is corrected in accordance with the above procedure, Defendant shall remit the remaining balance of the civil penalty per the original quarterly installment schedule.

VI. PERMANENT INJUNCTION

8. Defendant is hereby enjoined and ordered to comply immediately and permanently with R.C. 3704.05(C) and (G), the Permit to Install provisions of Ohio Adm.Code Chapter 3745-31, and the Title V permitting provisions of Ohio Adm.Code Chapters 3745-77 and 78.

9. Defendant is hereby enjoined and ordered to timely submit all required permit applications for the installation or modification of sources of air pollutants, annual compliance certifications, fee emission reports, deviation reports, and/or any other reporting and recordkeeping obligations for Defendant's operations.

Synthetic Minor Permit to Install Application

10. Defendant agrees and is enjoined and ordered to submit an application for a Synthetic Minor Permit to Install for the coating line (emissions unit K002) within thirty (30) days of entry of this Consent Order. Such application shall provide for the implementation of all relevant capture equipment, control equipment, and control measures, including the equipment identified in paragraph 11, for achieving the annual allowable emissions limit of not greater than 16 tons per year of volatile organic compounds. The application shall also identify and provide for a program of regular inspection and maintenance of the regenerative thermal oxidizer described in paragraph 12

11. Defendant is hereby enjoined and ordered to comply with the terms and conditions of the final Synthetic Minor Permit to Install for emissions unit K002 to be issued by Ohio EPA

pursuant to paragraph 10 unless and until Ohio EPA issues a modification or renewal of such Permit.

Installation and Operation of Regenerative Thermal Oxidizer

12. Defendant has proposed to install and operate a regenerative thermal oxidizer for emissions unit K002 to reduce volatile organic compound emissions. Defendant has proposed and identified the control equipment as a Telkamp Model 25 Roxidizer RTO ("RTO"), in Attachment "A." Defendant shall install and begin operation of this control equipment with all necessary capture equipment for emissions unit K002 within two hundred and thirty (230) days from the date that the final Synthetic Minor Permit to Install is issued by Ohio EPA.

13. Compliance tests (stack tests) for emissions unit K002 must be performed in accordance with the terms and conditions of the Synthetic Minor Permit to Install identified in paragraph 10 and any subsequent modifications thereof.

Odor Abatement Study

14. Following the installation of RTO identified in paragraph 12 Defendant agrees and is hereby ordered to hire an independent, third-party consultant to perform an odor review and abatement study of Defendant's operations at its facility. The odor abatement study shall be a comprehensive review of all emissions sources and activities, and shall include an evaluation of the capture and control efficiencies for all sources and activities that generate odors. The odor abatement study shall only be required if, after installation of the RTO, Ohio EPA receives complaints of odors from the public, and if, after reasonable investigation, Ohio EPA concludes that Defendant's operations are the likely cause.

15. Within three days of retaining the services of the consultant, pursuant to paragraph 14, Defendant shall notify Ohio EPA, in writing, as to the name and address of the consultant and the date of retention.

16. Within ninety (90) days of written notice from Ohio EPA that Defendant shall conduct the odor abatement study, the independent, third-party consultant shall submit a complete report to Ohio EPA for its review and comment. Such report shall identify all significant sources of odors at the facility, the emission rates for such sources, the additional control measures and/or practices that could be employed to minimize or eliminate the odors from the Facility, and the capital and operating costs for each of such control measures and practices.

VII. STIPULATED PENALTIES

17. If Defendant fails to comply with any requirement or deadline contained in Section V or Section VI of this Consent Order, Defendant is liable for and shall pay stipulated penalties in accordance with the following schedule for each failure to comply:

- a. For each day of each failure to comply with a requirement or deadline of this Consent Order, up to and including thirty (30) days – Two Hundred Fifty Dollars (\$250.00) per day for each requirement or deadline not met.
- b. For each day of each failure to comply with a requirement or deadline of this Consent Order, from thirty-one (31) to sixty (60) days – Five Hundred Dollars (\$500.00) per day for each requirement or deadline not met.
- c. For each day of each failure to comply with a requirement or deadline of this Consent Order, over sixty (60) days – Seven Hundred Fifty Dollars (\$750.00) per day for each requirement or deadline not met.

18. In addition to the provisions of paragraphs 7 and 17 above, if Defendant fails to comply with any payment deadline contained in paragraphs 6b or 6c of this Consent Order, Defendant is liable for and shall pay a stipulated penalty equal to five percent (5%) of the amount of the overdue payment on any payment that is between one (1) and fifteen (15) days late. If payment is

overdue beyond the fifteenth day, stipulated payments shall accrue in accordance with the payment schedule provided in paragraph 17.

19. If Defendant fails to meet any of the requirements set forth in Section V or Section VI of this Consent Order, Defendant shall immediately be liable for payment of stipulated penalties imposed by this Consent Order without any demand by or notice from the State of Ohio. Payment of all stipulated penalties shall be paid by the Defendant by its delivering to Plaintiff, c/o Karen Pierson or her successor, Paralegal, at the Office of the Attorney General of Ohio, Environmental Enforcement Section, 30 East Broad Street, 25th Floor, Columbus, Ohio 43215, a certified check in that amount, payable to the order of "Treasurer, State of Ohio," immediately upon the occurrence of the violation giving rise to the penalty.

20. The imposition, payment and collection of stipulated penalties pursuant to this Consent Order shall not prevent Plaintiff from pursuing additional remedies, civil, criminal, or administrative, for violations of applicable laws.

VIII. SUBMITTAL OF DOCUMENTS

21. All documents required to be submitted to Ohio EPA and the Northeast District Office of Ohio EPA pursuant to this Consent Order shall be submitted to the following addresses:

Ohio Environmental Protection Agency
Division of Air Pollution Control
Attn: James Orlemann
Assistant Chief, SIP Development & Enforcement Section
Lazarus Government Center
50 West Town Street
Columbus, Ohio 43215

Ohio Environmental Protection Agency
Division of Air Pollution Control, Northeast District Office
Attn: Ed Fasko
Senior Environmental Specialist
2110 East Aurora Road
Twinsburg, Ohio 44087

or to such addresses as Ohio EPA may hereafter designate in writing.

IX. TERMINATION OF CONSENT ORDER

22. The terms and conditions of the Consent Order shall continue for five (5) years from the date of entry of this Consent Order or until Defendant has complied with all obligations and milestones set forth in Section V and Section VI of this Consent Order, whichever is later. Termination of any or all of the provisions of this Consent Order may also be granted upon a joint motion of the parties.

X. RETENTION OF JURISDICTION

23. The Court will retain jurisdiction of this action for purposes of enforcing this Consent Order.

XI. POTENTIAL FORCE MAJEURE

24. If any event occurs which causes or may cause a delay of any requirements of this Consent Order, Defendant shall notify the Ohio EPA in writing within fourteen (14) days of the event, describing in detail the anticipated length of the delay, the precise cause or causes of the delay, the measures taken and to be taken by the Defendant to prevent or minimize the delay, and the timetable by which measures will be implemented. Defendant will adopt all reasonable measures to avoid or minimize any such delay.

25. In any action by Plaintiff to enforce any of the provisions of this Consent Order, Defendant may raise that it is entitled to a defense that its conduct was caused by reasons entirely beyond its control such as, by way of example and not limitations, acts of God, strikes, acts of war or civil disturbances. While Plaintiff does not agree that such a defense exists, it is, however, hereby agreed upon by Defendant and Plaintiff that it is premature at this time to raise and adjudicate the existence of such a defense and that the appropriate point at which to adjudicate the existence of such a defense is at the time that an enforcement action, if any, is commenced by the Plaintiff. At that time, Defendant will bear the burden of proving that any delay was or will be caused by

circumstances entirely beyond the control of Defendant. Unanticipated or increased costs associated with the implementation of any action required by this Consent Order, or changed financial circumstances, shall not constitute circumstances entirely beyond the control of Defendant or serve as a basis for an extension of time under this Consent Order. Failure by Defendant to comply with the notice requirements of this Section shall render this Section void and of no force and effect as to the particular incident involved. It shall be at the option of Plaintiff to construe the failure as a waiver of Defendant's right to request an extension of its obligations under this Consent Order based on such incident. An extension of one date based on a particular incident does not mean that Defendant qualifies for an extension of a subsequent date or dates. Defendant must make an individual showing of proof regarding each incremental step or other requirement for which an extension is sought. Acceptance of this Consent Order with a Potential Force Majeure Clause does not constitute a waiver by Defendant of any rights or defenses it may have under applicable law.

XII. COURT COSTS

26. Defendant is hereby ordered to pay all court costs of this action.

XIII. ENTRY OF CONSENT ORDER AND JUDGMENT BY CLERK

27. Pursuant to Civ.R. 58, upon signing of this Consent Order by the Court, the clerk is directed to enter it upon the journal. Within three (3) days of entering the judgment upon the journal, the clerk is directed to serve upon all parties, notice of the judgment and its date of entry upon the journal in the manner prescribed by Civ.R. 5(B) and note the service in the appearance docket.

XIV. AUTHORITY TO ENTER INTO THE CONSENT ORDER

28. Each signatory for Defendant represents and warrants that he/she has been duly authorized to sign this document and so bind the corporation to all terms and conditions thereof.

IT IS SO ORDERED.

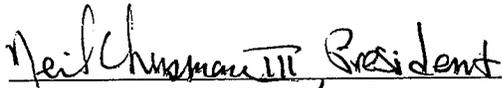
February 3, 2010
DATE

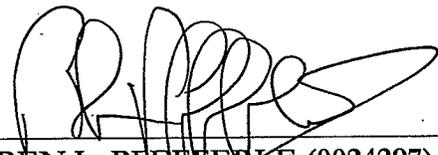


JUDGE DIAPOLITO
Mahoning County Court of Common Pleas

APPROVED:

SPECTRUM METAL FINISHING, INC.


Neil Chapman III, President
Authorized Representative of
Defendant Spectrum Metal Finishing, Inc.

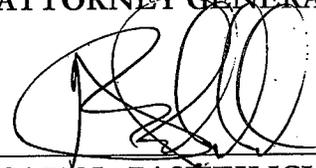


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Attorneys for Plaintiff, State of Ohio

Attachment "A"



METAL FINISHING, INC.
535 Bev Road
Youngstown, Ohio

TELLKAMP SYSTEMS, INC.
VOC Control System

QUOTATION NO. TSI 06-3804R2
June 13, 2008

June 13, 2008

Spectrum Metal Finishing, Inc.
535 Bev Road
Youngstown, OH 44512

Attention: Mr. Dave McCleary
Mr. Tim Rowe

Subject: Quotation No. TSI 06-3804R2
VOC Control System

Gentlemen:

We are pleased to present our quotation covering manufacturing, delivering and installing the VOC Control System for your upcoming project. The enclosed specifications describe the equipment and related items we intend to supply.

Upon approval please sign and return one (1) copy of the enclosed Specification & Quotation.

We look forward to working with Spectrum Metal Finishing, Inc.

Sincerely,
TELLKAMP SYSTEMS, INC.

Martin E. Tellkamp

Martin E. Tellkamp
Chief Executive Officer

MET:mg
Enclosure

CONFIDENTIALITY STATEMENT

The data contained herein shall not be disclosed, duplicated, or used in whole or in part for any other purpose than to evaluate the proposal. Provided that if a contract is awarded to the offerer as a result of, or in connection with the submission of these data, the customer shall have the right to duplicate, use and disclose the data to the extent provided in the contract. This restriction does not limit the right to use information contained in the data if it is obtained from another source without restriction.

EXECUTIVE OVERVIEW

Tellkamp Systems, Inc. is pleased to submit our proposal for a VOC Control System to Spectrum Metal Finishing, Inc. Our approach reflects our best understanding of both the current and future requirements of Spectrum Metal Finishing, Inc. as outlined in the request.

We fully understand the commitment made by Spectrum Metal Finishing, Inc. to maintain state-of-the-art control systems that provide employees and neighbors with the safest possible environment in which to work and live in. The success of the Spectrum Metal Finishing, Inc. project is too important to trust to anyone with a less than full understanding of the technologies involved and a proven track record in systems integration required to successfully install a complete VOC Control System.

Tellkamp Systems, Inc. has been on the leading edge of industrial coating process control for more than thirty-five (35) years. Our installed base represents our commitment to the continued success of our customers and to our experience in integrating control strategies that provide a high return on investment.

Roxidizer® Regenerative Thermal Oxidizer (RTO) Technology incorporates many design and performance characteristics most of which are found only in the Roxidizer® RTO. A partial list includes the following characteristics and components:

- High Destruction Efficiency
- High Thermal Efficiency
- Low Cost of Ownership
- Low Operating Costs
- Reduced Capital Equipment Costs
- Trace Quantities of NOx Contribution from the Heat Source
- Minimal Maintenance Requirements
- Unmatched Experience in VOC Capture Techniques
- High Return on Investment

Our purpose is to design, manufacture and install VOC Control Systems that will protect people, products and ambient environments from exposure to VOCs. To that end, we have set a standard for innovation and manufacturing excellence that is unequalled in the industry. Tellkamp Systems, Inc. Roxidizer® RTO Systems provide VOC control that is easier to use and less costly to operate and maintain than other types of available equipment.

CORPORATE QUALIFICATIONS

Tellkamp Systems, Inc. has been a leader in the Industrial Finishing & Coatings Marketplace for more than thirty-five (35) years. During this time, we have earned a reputation for providing state of the art equipment engineered to our clients' exacting requirements. We have turnkey, installed projects throughout the United States, Mexico and China. Project sizes range from \$100,000.00 to \$4,500,000.00 and include companies such as Boeing Aircraft, Fairchild Aerospace, YKK Corporation (USA), Ricoh Electronics, Interlake, Kim Lighting, UpRight, Inc. and Hitek Finishing.

We maintain direct control over every aspect of project design, engineering, fabrication, installation and start-up. Our experience in permitting and installing projects across the United States is unmatched in the industry. Our strength has always been our ability to work with clients to design systems that offer the flexibility and growth required to stay competitive in today's marketplace.

Tellkamp Systems, Inc. has committed the resources and personnel to assure Spectrum Metal Finishing, Inc. that their VOC Control System will be completed on schedule and will perform the functions it was designed for. With a project of this scope, and importance, Tellkamp Systems, Inc. is the best choice for a project partnership with Spectrum Metal Finishing, Inc.



Model 4 (4,000 CFM) Roxidizer® RTO

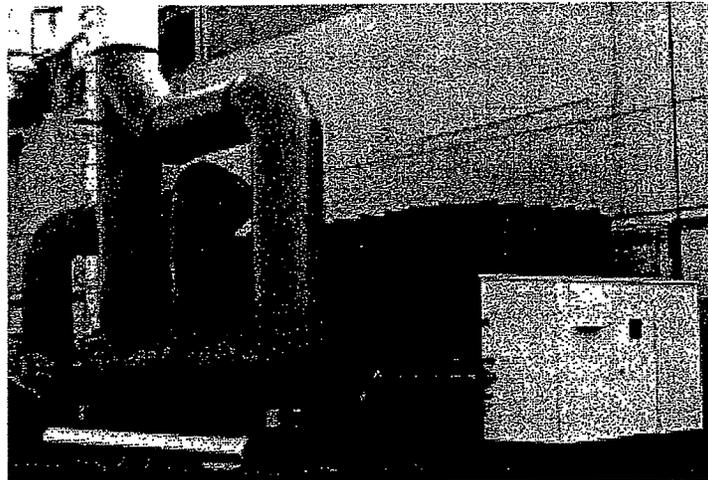
SYSTEM DESIGN CRITERIA

The existing horizontal paint finishing system is designed to paint aluminum extrusions with a maximum part opening of 38" wide x 73" high. The conveyORIZED system is designed to continuously process the extrusions through each step in the paint finishing process. The horizontal paint system is designed for the application of three (3) coats of wet paint in a single circuit around the conveyor system. An integrated system for VOC abatement will be included in the design of the liquid paint system. The Roxidizer® Air Volume Reduction system will include recirculating spray booths, flash-off area enclosures and regenerative thermal oxidation to control VOC emissions from the aluminum extrusion painting process.

The Roxidizer® VOC Control System is designed to control the VOC emissions at Spectrum Metal Finishing, Inc. The total volume of exhaust airflow, which will be sent to the Model 25 Roxidizer® Regenerative Thermal Oxidizer (RTO) for VOC destruction, is 25,200 cfm.

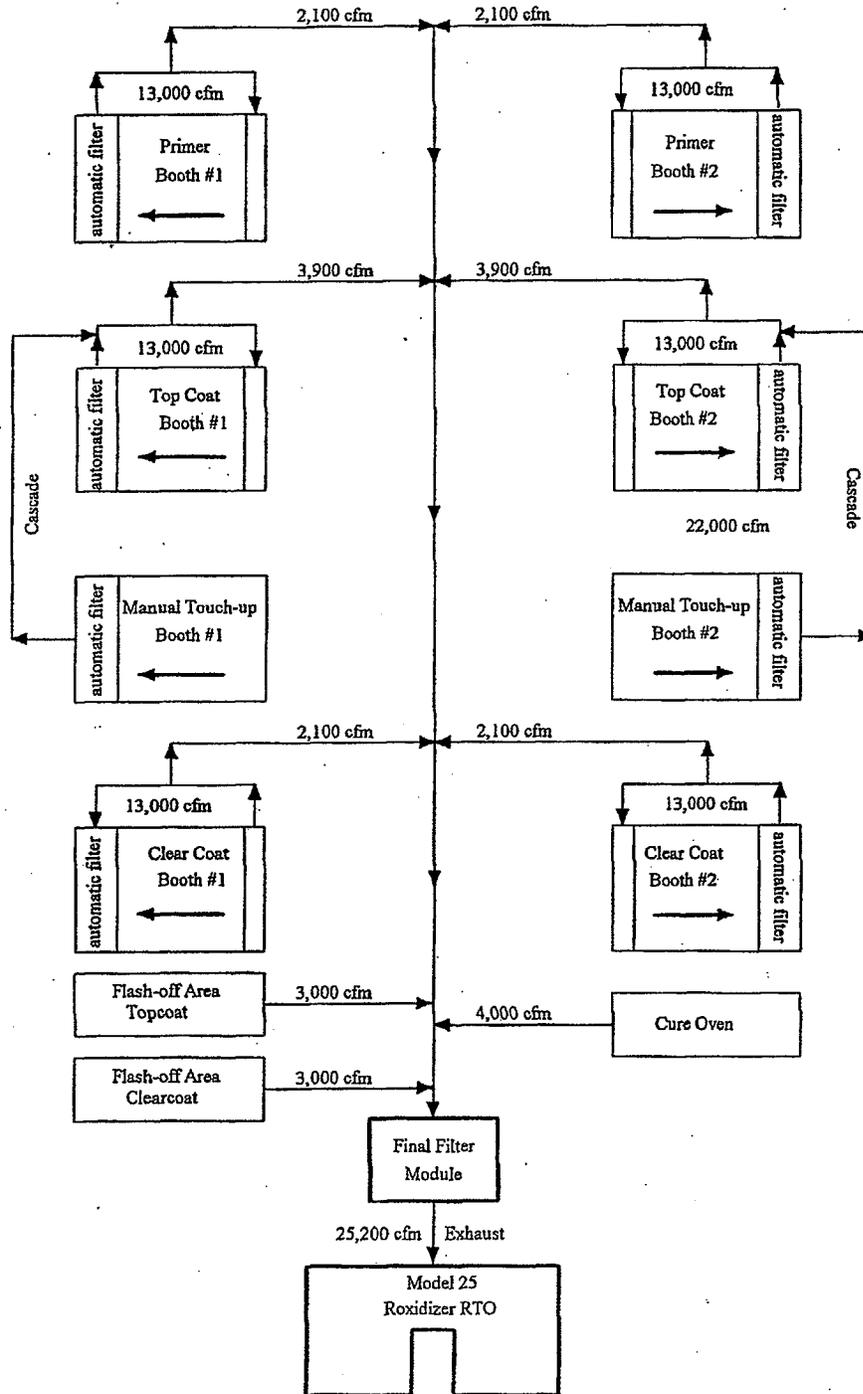
The Roxidizer® RTO will operate with high thermal efficiency (95% minimum during normal operation) and high VOC destruction efficiency (greater than 98%). The Roxidizer® low operating costs and minimal maintenance requirements assure the highest possible return on investment.

Utilities available are 460 volt electrical, natural gas at 1,000 Btu/cu. ft. and compressed air at 125 psig.



Model 25 (25,000 CFM) Roxidizer® RTO

Spectrum Metal Finishing VOC Abatement Air Flow Schematic



1.0 RECIRCULATING SPRAY BOOTHS

1.1 Manual Spray Booths - Two (2) Required

Two (2) Tellkamp Systems, Inc. 12' - 0" wide x 10' - 6" tall x 9' - 6" deep ID spray booths shall be supplied for topcoat touch-up. The spray booths will be fabricated using eighteen (18) gauge booth panel construction with 18" diameter in-line exhaust fan and ductwork. The touch-up booths shall be ducted to the auto recycle booths. A conveyor guard and cap will be provided to minimize contamination of the conveyor and load bars. The guard will close down to within 6" of the top of the part.

1.2 Automatic Recycle Spray Booth System Design - Six (6) Required

The Tellkamp Automatic Recirculating Spray Booth allows for a large reduction in the spray booth exhaust volume, while still providing the proper air velocity over the work. This is accomplished by recirculating approximately 80% of the spray booth exhaust. The vapor concentration is monitored at several locations in the booth, with a multi-point combustibles analyzer. The analyzer compares these signals and selects the highest as an input to a controller. If the combustibles concentration exceeds the set point, the paint application system will be shutdown automatically until the problem is found and corrected. The overspray collection filter is automatically fed into the flow stream while rolling the spent element on a second roll. This system utilizes a differential pressure switch to sense the pressure drop across the filter element.

1.3 Booth Details

The booths shall be 12' - 0" wide x 10' - 6" high x 21' - 0" deep I.D. The recirc/exhaust blower will be sized at 13,000 scfm at 2½" S.P. The booth will have conveyor openings at either end, and be fabricated of 18 gauge sheet metal.

2.0 AIR VOLUME REDUCTION SYSTEM

2.1 Air Volume Reduction Strategy

Exhaust Source	Typical Liquid Paint System	Tellkamp's Revised Airflows
Primer Booth #1	13,000 cfm	2,100 cfm
Primer Booth #2	13,000 cfm	2,100 cfm
Top Coat Booth #1	13,000 cfm	3,900 cfm
Top Coat Booth #2	13,000 cfm	3,900 cfm
Touch-up Booth #1	13,000 cfm	-----
Touch-up Booth #2	13,000 cfm	-----
Clear Coat Booth #1	13,000 cfm	2,100 cfm
Clear Coat Booth #2	13,000 cfm	2,100 cfm
Flash-off Enclosures	5,000 cfm	5,000 cfm
Bake Oven	4,000 cfm	4,000 cfm
Total Exhaust Volume To Oxidizer	113,000 cfm	25,200 cfm

2.2 Air Recycle Equipment

Tellkamp Systems, Inc. shall supply the following equipment to provide air recycle for the spray booths. Tellkamp Systems, Inc. shall supply all sheet metal enclosures, ductwork, stacks, and structural steel per TSI engineering drawings.

- 2.2.1 Eight (8) auto advance high efficiency filter mechanisms for final filtration prior to recycle.
- 2.2.2 Lower explosive limit solvent detector for high level shutdown of spray equipment.
- 2.2.3 Six (6) 13,000 CFM circulation fans to simulate normal air movement.
- 2.2.4 Motor control center with starters and controls for air recycle equipment.
- 2.2.5 Eight (8) damper valves for exhaust to Roxidizer®.
- 2.2.6 Exhaust fans to oxidizer as required.
- 2.2.7 Flash tunnel enclosures fabricated of 18 gauge galvanized steel.

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO)

The Roxidizer® RTO patented design consists of two insulated heat exchanger beds filled with MLM® structured ceramic media designed for 95% thermal efficiency. Between the heat exchange beds is a combustion chamber with a burner (used only for start-up and idle modes of operation). The process gas flow is switched back and forth between the heat exchange beds using a patented four-way switching valve.

Included in our scope of equipment supply:

- FD (Forced-Draft) Fan with Motor
- Final Filter Module for Particulate
- Combustion Air Blower with Motor, Motor Starter
- Automatic Fuel-Injection System
- Control Panel with Allen-Bradley Series SLC 5/03 Controller with Panelview 600
- Control Room Enclosure (For Panel, Valve Trains and Compressor)
- All Required FM Valve Trains
- Stainless Steel Stack (Terminates twenty-six (26) Feet Above RTO Base)
- Air Compressor Package (Optional)

3.1 Preliminary Dimensions and Weights - Model 25 RTO

- 3.1.1 Dimensions: 34' long x 34' wide x 12' high
- 3.1.2 Weight: 134,000 lbs. (Including Heat Exchange Media)
- 3.1.3 Weight of Heaviest Piece (The Main Skid): 33,000 lbs.

3.2 Flexible, Modular Design

- 3.2.1 The Roxidizer® RTO arrives at the job site in three major sections:
 - Main Skid Assembly
 - Switching Valve Assembly
 - Main Fan Assembly

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.2 Flexible, Modular Design - continued

3.2.2 The main skid includes the heat exchange beds, the burner and valve trains and the enclosed control room (mounted onto the main skid).

Once on the job site, final assembly is completed with all bolted connections; no field welding is required.

3.2.3 The Roxidizer® RTO will be pre-plumbed and pre-wired prior to shipment and will have only two single connecting points once on site: one (1) for 460/3/60 power and one for five (5) psi natural gas.

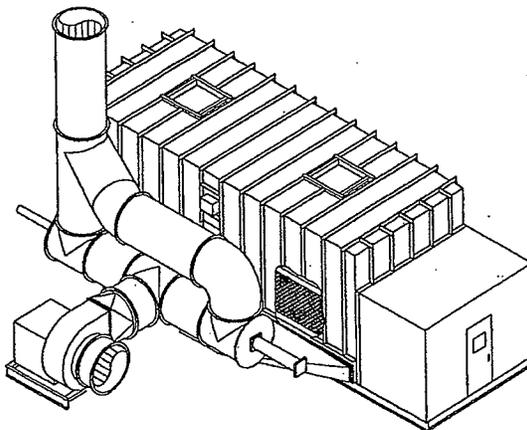
If Purchaser chooses not to purchase the dedicated air compressor (Optional), a third connection on the RTO for 100 psi compressed air is required. Tellkamp recommends purchase of the optional air compressor.

3.2.4 The RTO control panel (with PLC) will be mounted onto the main RTO skid inside a fully enclosed, lighted control room enclosure.

Also enclosed within the control room will be the valve trains, combustion air blower and compressor (compressor optional).

If the Purchaser chooses to have the control panel mounted other than on the RTO itself; there will be additional electrical and mechanical work involved. This option will be quoted on request.

3.2.5 The Roxidizer® RTO is designed such that it can be easily disassembled and moved to a new location for re-assembly.



3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.3 Integrated Air Compressor - (Optional)

The four-way switching valve that directs the airflow between the two (2) thermal beds is pneumatically operated. Compressed air (100 psi) is required on a 24 hour basis. Controls for the skid-mounted air compressor/air dryer are located within the main motor control center of the Roxidizer®.

3.4 Design & Operating Principles

3.4.1 Interface with Process

If Purchaser has any special interface requirements that may affect the design of the RTO system, these should be brought to Tellkamp Systems, Inc.'s attention. It is our intention that the Roxidizer® RTO is as transparent to the process as is practical.

3.4.2 Process Combustion & Heat Recovery

3.4.2.1 The Roxidizer® RTO operates by heating the contaminated process exhaust air to a high enough temperature to oxidize the combustible contaminants (e.g. solvents) to carbon dioxide (CO₂) and water vapor (H₂O).

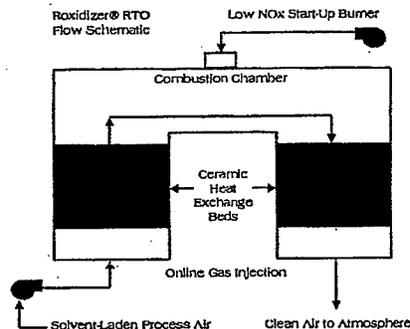
3.4.2.2 In order to reduce the use of auxiliary fuel, the process exhaust is first preheated in the ceramic heat exchanger, using the high-temperature combustion chamber exhaust (1400 °F to 1600 °F) as the source of heat. This is often referred to as "primary heat recovery."

3.4.2.3 The more efficient the ceramic bed heat exchanger is, the less will be the auxiliary fuel usage for the oxidizer. The proposed Roxidizer® RTO has a thermal efficiency of 95%, which will reduce fuel usage to a minimum.

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.4 Design & Operating Principles - continued

3.4.3 Description of Preheat & Combustion



- When contaminated air enters the Roxidizer® RTO, it passes vertically upward through one of the ceramic heat exchange beds. Its temperature rapidly increases as it approaches the horizontal combustion chamber overhead.
- By the time the air reaches the top of the ceramic bed, most of the combustible contaminants have already oxidized to carbon dioxide and water vapor. The remaining combustibles are then maintained at the operating temperature for a predetermined period of time (known as "retention time" or "dwell time") to complete the combustion process.
- The clean, hot process air is then passed vertically downward through the second ceramic heat exchange bed, where it gives up its (newly acquired) heat to the ceramic media and then exhausts to atmosphere.
- Since the heat exchanger is 95% thermally efficient the final exhaust to atmosphere is only 60 °F to 70 °F hotter than when it first entered the RTO. For example, if the contaminated air stream enters the RTO at 100 °F, the clean air stream will exhaust to atmosphere at approximately 170 °F. (Temperature increases at higher solvent concentrations).
- If the concentration of combustibles increases above the level required for fuel-free operation (typically 3% to 4% LEL), the PLC compensates by allowing the operating temperature to "float" upwards while automatically resetting the RTO exhaust temperature as required to absorb the excess heat (up to approximately 8% LEL).

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.4 Design & Operating Principles - continued

3.4.3 Description of Preheat & Combustion - continued

- For still higher concentrations of combustibles, the Roxidizer® RTO can be designed with a heat exchanger bypass that "shunts" a portion of the air around the hot side of the heat exchanger. The heat exchanger bypass will handle up to 25% LEL.

3.4.4 Switching Valve

- It is the function of the switching valve to redirect the contaminated and cleaned air streams to and from the heat exchange beds at whatever intervals are needed to maintain efficient combustion and temperature balance.
- The heart of any RTO is the valve assembly. In order for the RTO to do its job, the valve system must operate consistently and without leakage.
- The Tellkamp switching valve assembly is located between the RTO forced-draft fan and the RTO itself. [See drawings attached to this proposal].
- The Tellkamp switching valve is a patented double-bladed, machine-finished, poppet valve designed to be 99.9% airtight.
- The Tellkamp valve assembly operates as a rigid, one-piece mechanism, thus completely avoiding the "out of synch" factor that can sometimes make even the best multi-valve systems leak.
- The valve shaft rides on bearings with elliptical greasing grooves that are automatically lubricated by a dedicated, air-operated grease pump.
- An important feature of the Roxidizer® RTO is that it uses temperature to determine when the valves should be switched, rather than basing it on clock timing. Temperature control is much more efficient and has the added benefit of maintaining more uniform temperature gradients throughout the heat exchange beds.
- The switching valve will be pneumatically operated by the air compressor (Optional). A soft-stop feature will allow the valve to move rapidly but without the noise associated with high-speed metal-to-metal contact.

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.4 Design & Operating Principles - continued

3.4.3 Description of Preheat & Combustion - continued

- The cylindrical switching valve housing is equipped with motorized drain valves to remove condensed water. The drain valves operate automatically during idle and shutdown modes and are closed during start-up and normal operation.

3.5 Fuel Injection System

3.5.1 At start-up the RTO burner is used to preheat the ceramic beds. Once an appropriate temperature is reached, the burner shuts off and the Tellkamp fuel injection system takes over.

3.5.2 Using the same PID loop as the burner, the fuel injection system introduces just enough natural gas to maintain the operating temperature. If your process has a sufficient concentration of combustibles (3% to 4% LEL), fuel injection will taper down, eventually reaching fuel-free operation.

3.6 Temperature Range

The Roxidizer® RTO has an operating temperature capability of up to 1800 °F, but will operate normally at a minimum temperature of 1450 °F in the VOC destruction mode. Short excursions to 2000 °F are possible without damage to equipment.

3.7 Materials of Construction

3.7.1 The RTO shell will be minimum 3/16"-carbon steel (ASTMA36) with reinforcing ribs as required.

3.7.2 The shell will be internally lined with Pyro Bloc monolithic refractory insulation, edge-grained fiber 6" thick and fastened to the shell by embedded stainless steel appliances with studs welded to the shell interior.

3.7.3 All internal bare steel will be coated with mastic to reduce dewpoint corrosion.

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.7 Materials of Construction - continued

- 3.7.4 The switching valve housing will be Schedule 10 (1/4" thickness) steel.
- 3.7.5 The patented switching valve assembly will be constructed of anodized aluminum (harder than steel, but one-third the weight of steel). The valve shaft will be supported by specially designed bronze bearings with greasing grooves. The switching valve assembly is expected to last for the life of the RTO, with no routine maintenance.
- 3.7.6 The main process fan will meet AMCA Type B Standard 99 04010-86 for Spark-Resistant Construction (SRC), which requires that the fan have a nonferrous impeller and ring, and be constructed such that two ferrous parts will not rub or strike together.
- 3.7.7 The room enclosure (housing panel, burner valve trains, combustion air blower and optional compressor) will be fiberglass.
- 3.7.8 The RTO stack will be fabricated of 304 stainless steel and will have two EPA-approved test ports.

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.8 Typical Brands of Purchased Components

3.8.1 Maxon Burner & Gas Control Valves

3.8.2 Fireye Flame Safety Control

3.8.3 Lantec Ceramic Packing

3.8.4 Honeywell Modulating Motors, Gas Valves, Temperature Limiters & Chart Recorder

3.8.5 Ingersoll-Rand Air Compressor - (Optional)

3.8.6 Asco Solenoid Valves

3.8.7 Dwyer Pressure Indicators & Switches

3.8.8 Allen Bradley SLC 5/03 Series PLC & Operator Interface

3.8.9 Parker Air Cylinder

3.8.10 Rockwell Pressure Regulators

3.8.11 Fan Engineering Combustion Blower

3.8.12 Lincoln Automatic Lubricator

3.8.13 New York Blower Main Process Fan

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.9 Operation & Maintenance

3.9.1 Start-Up/Shutdown/Idle

- 3.9.1.1 One push of a button initiates either start-up, idle or shutdown mode.
- 3.9.1.2 At initial (cold) start-up, the Roxidizer® RTO burner is used to increase the temperature of the incoming air temperature. Once the Roxidizer® RTO has reached an appropriate temperature, the burner shuts off and the Tellkamp fuel injection system takes over.
- 3.9.1.3 If your process has a sufficient concentration of combustibles (e.g. solvents), the fuel injection system will taper down, eventually reaching fuel-free operation.
- 3.9.1.4 Shutdown mode is initiated by pushing the "Shutdown/Reset" pushbutton. It is also initiated automatically if a fault occurs.
- 3.9.1.5 Idle Mode is used to maintain RTO readiness during brief process shutdowns or over weekends. During idle the main fan is off, the combustion air blower is on, and the burner operates on an on/off basis as required to compensate for radiant and convection losses from the RTO shell. Full operation following idle takes from 0 to 20 minutes, depending upon the specific time within the idle cycle.
- 3.9.1.6 There is little if any fuel penalty for using Idle Mode in lieu of a shutdown (since a cold start-up will use about as much fuel to recover the heat lost during shutdown). There is however 4 kW of power consumption (for the combustion air blower, the compressor and controls).
- 3.9.1.7 **NOTE:** The main advantage of Idle Mode is that it eliminates repeated start-ups. Statistically, most burner or controls problems for fuel-burning devices occur during start-up. The Tellkamp Idle Mode gives the Purchaser the option of avoiding this at a modest cost per hour.

3.0 ROXIDIZER® REGENERATIVE THERMAL OXIDIZER (RTO) - continued

3.10 Personnel Requirements

- 3.10.1** The amount of time required to operate the Roxidizer® RTO is literally minutes per day. The PLC handles all operating functions; the operator need only push one button to initiate the mode of operation.
- 3.10.2** All routine maintenance and most repair maintenance of the Roxidizer® RTO can be performed by one person, standing at ground level, outside the Roxidizer® RTO . . . no Confined Space requirement . . . no man-lifts . . . no service "teams".
- 3.10.3** Trouble-shooting of the controls, control panel, burner systems, and (Optional) compressor system is performed inside the weather-protected control enclosure mounted directly on the Roxidizer® RTO skid.
- 3.10.4** Maintenance labor (preventive) is approximately two (2) hours per month, and a once yearly 8-hour system inspection and evaluation is suggested.
- 3.10.5** The Roxidizer® RTO has only one moving part . . . the automatic switching valve . . ., which is self-lubricating and requires no routine maintenance.
- 3.10.6** On the roof of each heat exchange bed is a 24" x 24"-bolted door for easy access, should it ever be required.

3.11 Design Criteria

- VOC Destruction: 98% or 10 ppm outlet, whichever is greater
- Thermal Efficiency: 95% minimum

4.0 ESTIMATED UTILITIES CONSUMPTION

4.1 VOC Control System Utility Requirements

Roxidizer® VOC Control System: 25,200 cfm (design)
RTO Size: Model 25 Roxidizer®
Main Fan Motor Size: 100 HP
Combustion Fan Motor Size: 3 HP
Connected Load: 200 amps

ROXIDIZER® RTO	MODEL 25
Exhaust Airflow	25,200 cfm
Thermal Efficiency	95% minimum
Btu's Required For VOC Destruction	2,100,000 BTU/hr
Btu Contribution From VOC Emissions (12.5 gal/hr)	<1,200,000 BTU/hr>
Supplemental Natural Gas Requirement (\$11.50/MMBtu assumed)	900,000 BTU/hr (\$10.35/hr)
Electrical Requirement (\$0.06/kWh assumed)	41.4 kW/hr (\$2.48/hr)
TOTAL HOURLY OPERATING COST	\$12.83/hr

NOTES:

1. Power consumption includes main fan motor, combustion air blower, air compressor and controls.
2. Fuel usage includes 220,000 BTUH for radiant and convective losses from RTO surface.
3. The net heating value (16,000 BTU/lb.) has been used in our fuel calculations.
4. During all scenarios (except idle), auxiliary fuel is introduced by fuel injection. The RTO burner is used only for start-up and idle.

5.0 ENGINEERING

Engineering drawings shall be supplied to allow Tellkamp Systems, Inc. field crews to install all equipment supplied by Tellkamp Systems, Inc.

6.0 SYSTEM DOCUMENTATION

As part of the VOC abatement and paint system package, Tellkamp Systems, Inc. shall include appropriate support documentation. The document package shall include engineering drawings (structural, utilities, system layout) and an owner's manual (operating instructions, lists of components, and part numbers).

7.0 FREIGHT

Freight to the job site is included.

8.0 SERVICE & SUPPORT

Tellkamp Systems, Inc. provides complete service and support for each Roxidizer® system sold. Service is available on a 24-hour basis using a pager system. Service and support is directed from our Santa Fe Springs, California headquarters. Service for this project will be directed from our Pittsburgh, Pennsylvania office.

9.0 ITEMS NOT INCLUDED

- 9.1 Utilities brought in and connected to TSI equipment. (Electrical, water, air, sewer).
- 9.2 Any refinements not called out in our quotation.
- 9.3 Liquid paint application equipment, application equipment installation.
- 9.4 Taxes, licenses, permits and permit fees.
- 9.5 Sprinklers, if required.
- 9.6 Electrical connection to each control panel furnished by TSI.
- 9.7 Roxidizer® mounting pad.
- 9.8 Lab testing, if required.
- 9.9 Plant lighting.
- 9.10 Roof penetrations.
- 9.11 Equipment changes required by governmental agencies.

10.0 ROXIDIZER® RTO SYSTEM BENEFITS

- 10.1 All of the related equipment supplied under this quotation is manufactured and installed by Tellkamp Systems, Inc. This reduces interface problems associated with third-party contracts.
- 10.2 "No-burner" (flame-free) operation eliminates thermal NOX formation.
- 10.3 With only one moving part, downtime and maintenance requirements are minimized.
- 10.4 High thermal efficiency reduces fuel costs to a bare minimum.
- 10.5 Los Angeles and Pittsburgh based service and support quickly resolves any operating problems.
- 10.6 One person standing at ground level from outside the ROXIDIZER® RTO can perform all routine maintenance, and most repair maintenance.
- 10.7 Advanced structured-ceramic heat-transfer media means maximum thermal efficiency with ultra low-pressure drop.
- 10.8 The fully enclosed and lighted control room enclosure (mounted on the Roxidizer® RTO) allows servicing and troubleshooting of the gas trains, controls and control panel without exposure to inclement weather.
- 10.9 Mastic coating applied to all internal bare steel provides dewpoint corrosion resistance.
- 10.10 The overriding design philosophy for the Roxidizer® RTO is described in three words:
- 10.11 Simplicity. . . Reliability. . . Maintainability
- 10.12 Every feature, every component, every control of the Roxidizer® RTO has been standardized and proven reliable time and time again.

11.0 PRICING & TERMS

11.1	AIR VOLUME REDUCTION SYSTEM	\$819,590.00
	Eight (8) Spray Booth Modifications	
	Three (3) Flash Tunnel Enclosures	
	Ductwork to the Roxidizer® RTO	
	Engineering	
	Freight	
	Installation	
	Field Electrical	
11.2	ROXIDIZER® RTO SYSTEM	\$615,000.00
	Model 25 Roxidizer® RTO	
	Freight	
	Installation	
	Remote Panel	
	TOTAL	\$1,434,590.00
11.3	Integral Roxidizer® Air Compressor (Optional)	\$ 5,450.00
11.4	Hot Gas Bypass for High Solvent Loading (Optional)	\$22,400.00
11.5	Variable Frequency Drive (Optional)	\$12,000.00
11.6	TERMS:	30% - Cash with Order
		Balance - Progressive Monthly
		5% - Upon Completion
11.7	DELIVERY:	Twenty (20) to Twenty-Eight (28) Weeks
		After Receipt of Purchase Order & Project Down Payment
11.8	FREIGHT:	Included
11.9	QUOTE GOOD FOR NINETY (90) DAYS	

