

VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT

RULE 74.18 - MOTOR VEHICLE AND MOBILE EQUIPMENT COATING OPERATIONS

(Adopted 1/28/92, Revised 12/13/94, 9/10/96)

A. Applicability

The provisions of this rule apply to any person who supplies, sells, offers for sale, applies or specifies the use of, coatings for motor vehicles, mobile equipment, and their parts or components.

B. Requirements

1. Group I Vehicles, Group II Vehicles/Equipment (color match required), and Small Production/Utility Bodies (color match required): * No person shall coat any Group I vehicles, their parts and components, any Group II vehicles and mobile equipment where color match is required, or any small production/utility bodies where color match is required, using any coating with a Reactive Organic Compound (ROC) content in excess of the following limits:

Limits	
Grams of ROC per Liter of Coating, Less Water and Exempt Organic Compounds	
Pretreatment Wash Primer	780
Primer/Primer Surfacer	250
Primer Sealer (until 1/1/97)	420
Primer Sealer (effective 1/1/97)	340
Multistage Topcoat	420
Single Stage Nonmetallic/Noniridescent Topcoat	420
Single Stage Metallic/Iridescent Topcoat	520
Water-Based Temporary Transit Coating	420
Specialty Coating	840

2. Group II Vehicles/Equipment (no color match required), Small Production/Utility Bodies (no color match required) and Large Production/Utility Bodies: * No person shall coat Group II vehicles and equipment or their parts and components where color match is not required, small production/utility bodies where color match is not required, or large production/utility bodies, using any coating with a ROC content in excess of the following limits, expressed as grams of ROC per liter of coating applied, excluding water and exempt organic compounds:

Limits
Grams of ROC per Liter of Coating, Less Water
and Less Exempt Organic Compounds

Pretreatment Wash Primer	780
Primer, Primer Surfacer, Primer Sealer	250
Multistage Topcoat	340
Single Stage Metallic/Iridescent Topcoat	420
Single Stage Nonmetallic/Noniridescent Topcoat	340
Camouflage	420
Specialty Coating	840

3. Add-on Control Equipment Option:
 - a. A person may comply with the provisions of Subsections B.1 or B.2 (coating limits) by using air pollution control equipment provided that:
 1. The combined control and capture efficiency shall reduce organic emissions from an emission collection system by at least 85 percent, by weight, and
 2. Written approval in the form of an Authority to Construct and a Permit to Operate for such equipment is received from the Air Pollution Control Officer (APCO).
 - b. A person may comply with the provisions of Subsection B.4 (transfer efficiency) by using add-on control equipment provided the combined control and capture efficiency is at least 92 percent, by weight.
4. Transfer Efficiency: No person shall apply any coating to any Group I or II vehicle or mobile equipment or their exterior parts and components unless one of the following methods is properly used:
 - a. Hand application methods
 - b. Electrophoretic dip coating
 - c. Electrostatic application, operated at a minimum of 60 KV
 - d. High-Volume, Low-Pressure (HVLP) application
 - e. Any other coating application method which has been demonstrated to be capable of achieving a t least 65 percent transfer efficiency.
5. Prohibition of Specification: No person shall solicit or require for use or specify the application of a coating on a Group I or II vehicle, mobile equipment, or their

parts or components if such use or application results in a violation of the provisions of this Rule. The prohibition of this Subsection shall apply to all written or oral contracts under the terms of which any coating which is subject to the provisions of this Rule is to be applied to any motor vehicle, mobile equipment, or their parts and components at any physical location within the District.

6. Prohibition of Sale:
 - a. Except as provided in Subsections B.6.b and B.6.c, and B.6.d, no person shall supply, offer for sale or sell, within the District, any coating that is regulated by Subsections B.1, B.2 or B.12 of this Rule if the application of such product is prohibited, at the time of sale.
 - b. The sales prohibition in Subsection B.6.a shall not apply to the sale of any coating supplied in a nonaerosol container with a capacity of 16 fluid ounces or less, and shall not apply to any coating in an aerosol container.
 - c. The prohibition in Subsection B.6.a shall apply to the sale of any coating that will be applied at any physical location within the District and shall not apply to any coating shipped outside of the District for use outside of the District, or sold in the District for use outside the District.
 - d. The prohibition in Subsection B.6.a shall not apply to the sale of coatings where the emissions to the atmosphere from the application of those coatings are controlled by an APCD approved ROC add-on control device that meets the requirements of Subsection B.3.
7. Compliance Statement Requirement: The manufacturer of coatings subject to this Rule shall include a designation of the VOC content as supplied, including coating components, expressed in grams per liter or pounds per gallon, excluding water and exempt organic compounds, on labels or data sheets. This designation shall include a statement of manufacturer's recommendation regarding thinning, reducing, or mixing with any other VOC containing materials. This statement shall include the VOC on an as-applied basis, excluding water and exempt organic compounds, based on the manufacturer's recommendations.
8. Surface Preparation and Cleanup Solvent: The requirements of this Subsection shall apply to any person using organic solvent for surface preparation and cleanup.
 - a. Closed containers shall be used for the storage or disposal of solvent-containing cloth or paper used for surface preparation and cleanup. Containers shall be nonabsorbent.
 - b. No person shall use organic solvent for cleanup unless:

- 1) An enclosed gun washer or "low emission spray gun cleaner" that has been approved in writing by the APCO is properly used for spray equipment cleaning, and
 - 2) The ROC composite partial pressure of organic solvent used for cleanup, including spray equipment cleaning, is less than 45 mm Hg at a temperature of 20°C.
- c. No person shall use ROC-containing materials which have a ROC content of more than 200 grams per liter of material for substrate surface preparation prior to coating.
9. Liquid Cleaning Material Compliance Statement: Effective September 10, 1997, the manufacturer of liquid cleaning materials used in coating operations shall designate on product labels or data sheets the ROC content and ROC Composite Partial Pressure of cleaning materials as supplied. This designation shall include recommendations regarding mixing with any other ROC containing materials, and express the cleaning material ROC content when used in accordance with the manufacturer's recommendations. All letters and numbers used to designate ROC or VOC content on product labels shall be visible and legible.
 10. Storage of ROC-Containing Materials: All ROC containing materials, including but not limited to, fresh or spent solvent, coatings and reducers, shall be kept in closed containers when not in use.
 11. Specialty Coatings: No person shall use any specialty coating with a ROC content in excess of 840 grams of ROC per liter of coating applied, excluding water and exempt organic compounds. Use of all specialty coatings, except antiglare/safety coatings, shall not exceed 10.0 percent of all coatings applied, averaged on a monthly (calendar) basis.
 12. Spray Booth and Prep Stations: No person shall apply any coating to any motor vehicle, mobile equipment, or their parts or components, unless that application is performed within a properly maintained and operated Spray Booth or properly maintained and operated Prep Station.
 13. Coatings Containing 1,1,1-Trichloroethane: No person shall apply any coating to any motor vehicle, mobile equipment, or their parts or components, if that coating contains 1,1,1-trichloroethane.
 14. Pretreatment Wash Primers: No person shall apply a pretreatment wash primer if the amount used has exceeded 10 percent of the total volume of all undercoats applied, averaged on a monthly (calendar) basis.

15. Adhesion Promoters: No person shall use, sell, or offer for sale adhesion promoters as a topcoat.

C. Exemptions

1. Any motor vehicle or mobile equipment coating operation which uses only hand-held, nonrefillable aerosol cans, 16 ounces or less (NET WT), shall be exempt from this rule.
2. Subsection B.4, which specifies the coating application transfer efficiency, shall not apply to coatings applied from hand-held, nonrefillable aerosol cans.
3. Subsection B.8.b.2, which specifies the ROC composite partial pressure of solvents in spray gun washing equipment, shall not apply to the testing of such equipment if performed in accordance with the test method in Subsection E.7.
4. With prior written approval of the APCO, the requirements of Subsection B.12, Spray Booths and Prep Stations, shall not apply to the coating of motor vehicle(s) which due to shape or size, cannot reasonably be contained in any available substitute spray booth. A person wishing to qualify for this exemption must comply with the following requirements:
 - a. A written petition must be submitted on a case by case basis to the APCO stating the motor vehicle(s) to be coated, the size of the substitute spray booth available, the physical size of the motor vehicle(s) (i.e. length, width, and height), number of motor vehicle(s) to be coated, estimated volume of coating used, and the ROC content, chromium content, and lead content of each coating used.
 - b. The coatings used shall not contain any lead or chromium, with the exception of weld-thru primers.
 - c. If the APCO grants written approval, then such approval shall:
 - 1) Be valid only for the coating operation and coatings specified in the petition.
 - 2) Contain limits on coating volume.
 - 3) Contain a time limit not to exceed one year.
5. The requirements of Subsection B.12, Spray Booths and Prep Stations, shall not apply to the application of:
 - a. Any undercoat that does not contain chromium or lead, and is:

- 1) Limited to one major panel or
 - 2) Applied to an interior part of a motor vehicle, where that part can only be coated while the motor vehicle is immobilized.
- b. Any weld-thru primer.
- c. Any coating that does not contain lead or chromium and is applied to a motor vehicle engine compartment or a mating assembly of engine and suspension components.
6. The requirements of B.4 (Transfer Efficiency), and B.12 (Spray Booths) shall not apply to mobile automotive touch-up coating operations provided that:
- a. Application is done using either a paint brush or an air brush with a cup that holds no more than 4 ounces of paint, and
 - b. Coatings applied contain no lead or chromium.
7. The requirements of B.4 (Transfer Efficiency), and B.12 (Spray Booths) shall not apply to touch-up coating of Group II Vehicles/Mobile equipment using a paint brush or roller.

D. Recordkeeping Requirements

1. Any person subject to this rule shall:
 - a. Maintain and make available to District personnel, a current list of in-house coatings (including specialty coatings) that provides all of the coating data necessary to evaluate compliance, including the following information, as applicable:
 - 1) Coating, catalyst and reducer used
 - 2) Mix ratio of components used
 - 3) ROC content of coating as applied (less water and less exempt organic compounds)
 - 4) Coating category from Subsections B.1, B.2 or B.10 that corresponds with each coating used
 - 5) Whether or not a coating contains any chromium or lead, if that coating is applied outside of a spray booth or prep station.
 - b. Maintain records which show on a daily basis the following information:

- 1) Coating identification and mix ratio of components used in each coating or quantity of each component used.
 - 2) Quantity of each coating (including each specialty coating) applied. This quantity need not include toners that are added for color matching after preparation of the initial weighed color batch.
 - 3) Type of vehicle coated (Group I or II)
 - 4) For coatings applied outside of a Spray Booth or Prep Station, list major panel coated or interior part of immobilized vehicle coated.
2. Any person subject to the requirements of this rule shall have the manufacturer's specification sheets of solvents used for substrate surface cleaning and application equipment cleanup available for review and shall maintain records which show on a monthly basis, the following for each solvent:
- a. Identification of each solvent and its use.
 - b. ROC content of solvent, in grams per liter
 - c. Volume of solvent used. If purchase records are used to determine the amount of solvents used, then records and manifests of the amounts of solvents disposed of or sent to a recycler must also be maintained.
3. Any person producing utility bodies must keep records of the number of utility bodies coated each day.
4. Any person using an emission control system as a means of complying with this rule shall maintain daily records of key system operating and maintenance procedures which will demonstrate continuous operation and compliance of the emission control device during periods of emission producing activities. Key system operating parameters are those necessary to ensure compliance with subsection B.3 such as temperatures, pressures and flow rates.
5. All records shall be retained for a minimum of two years from the date of each entry and shall be made available to District personnel upon request.

E. Test Methods

1. Coating ROC content shall be determined using EPA Method 24. The exempt organic compound content of coatings or solvents shall be determined using ASTM Method D4457-85. Compliance with the prohibition of sale (Subsection B.6) shall be determined by measuring the ROC content of each and every

component of a coating or coating system which has been reduced using the manufacturer's recommended type and maximum amount of reducer.

2. The measurement of acid content of pretreatment wash primers shall be done in accordance with ASTM Method D 1613-85 (modified).
3. The measurement of the metal and silicon content of metallic/iridescent coatings shall be determined by Method 311 (Determination of Percent Metal in Metallic Coatings by Spectrographic Method) of the SCAQMD "Laboratory Method of Analysis for Enforcement Samples."
5. Transfer Efficiency shall be determined in accordance with the South Coast Air Quality Management District method entitled "Spray Equipment Transfer Efficiency Test Procedure for Equipment Users" or a method which shall:
 - a. Be modeled after the test method described in the EPA document (EPA/600/2-88/-26b) "Development of Proposed Standard Test Method for Spray Painting Transfer Efficiency."
 - b. Simulate the transfer efficiency achieved during the actual operations.
 - c. Have received written approval by the APCO.
6. ROC composite pressure of a solvent shall be calculated using a widely accepted published source such as: Boublik, T., V. Fried and E. Hala, "The Vapor Pressure of Pure Substances," Elsevier Scientific Publishing Co., New York (1973), Perry's Chemical Engineer's Handbook, McGraw-Hill Book Company, CRC Handbook of Chemistry and Physics, Chemical Rubber Publishing Company (1986-87), and Lange's Handbook of Chemistry, John A. Dean, editor, McGraw-Hill Book Company (1985). The true vapor pressure of a component in a solvent mix may be determined by ASTM Method D2879-86. The ROC composite pressure of a solvent mix consisting entirely of ROC may be determined by ASTM Method D2879-86.
7. The active and passive solvent losses from spray gun cleaning systems shall be determined using South Coast Air Quality Management District's "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems" dated October 3, 1989. The test solvent for this determination shall be any lacquer thinner with a minimum vapor pressure of 105 mm Hg at 20 °C. The minimum test temperature shall be 15 °C.
8. The presence of chromium in a coating shall be determined using ASTM Method D 3718-85a.
9. The presence of lead in a coating shall be determined using ASTM Method D 3335-85a.

F. Violations

Failure to comply with any provision of this rule shall constitute a violation of this rule.

G. Definitions:

1. "Active Solvent Losses": The emissions during all steps of a spray gun equipment cleaning operation, expressed in units of grams of solvent loss per cleaning cycle.
2. "Adhesion Promoter": A specialty coating formulated to be applied over an OEM topcoat or other hard finish as a midcoat prior to the application of a topcoat.
3. "Antiglare/Safety Coating": A coating formulated to eliminate glare for safety purposes on interior surfaces of a vehicle and which shows a reflectance of 25 or less on a 60° gloss meter.
4. "Basecoat/Clearcoat System": A multistage topcoat system composed of a pigmented basecoat portion and two transparent clearcoat portions. Basecoat/clearcoat multistage topcoat systems' ROC content shall be calculated according to the following formula:

$$\text{ROC } T_{bc/cc} = \frac{\text{ROC}_{bc} + 2 \text{ROC}_{cc}}{3}$$

Where:

$\text{ROC } T_{bc/cc}$ = the average of the sum of the ROC content as applied in the basecoat (bc) and clearcoat (cc) system.

ROC_{bc} = the actual ROC content as applied of any given basecoat.

2ROC_{cc} = two times the actual ROC content as applied of any given clearcoat.

5. "Camouflage Coating": A coating applied on motor vehicles to conceal such vehicles from detection.
6. "Catalyst": A substance whose presence initiates the reaction between chemical compounds.
7. "Cleanup": The removal of uncured coating from any surface.
8. "Color Match": The ability of a repair coating to blend into an existing coating so that color difference is not visible.

9. "Coating": A liquid, liquefiable or mastic composition which is converted to a solid protective, decorative, or functional adherent film after application as a thin layer.
10. "Electrophoretic Dip": A coating application method where the coating is applied by dipping the component into a coating bath and an electrical potential difference exists between the component and the bath.
11. "Electrostatic Application": A sufficient charging of atomized paint droplets to cause deposition principally by electrostatic attraction. This application shall be operated at a minimum of 60 KV power.
12. "Exempt Organic Compounds": As defined in Rule 2 of these Rules.
13. "Grams of ROC per Liter of Coating Less Water and Exempt Organic Compounds": The weight of ROC per combined volume of ROC and coating solids and can be calculated by the following equation:

$$\begin{array}{l} \text{Grams of ROC per Liter} \\ \text{of Coating Less Water} \\ \text{and Less Exempt Organic Compounds} \end{array} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where:

- W_s = Weight of volatile compounds (grams)
- W_w = Weight of water (grams)
- W_{es} = Weight of exempt organic compounds (grams)
- V_m = Volume of material (liters)
- V_w = Volume of water (liters)
- V_{es} = Volume of exempt organic compounds (liters)

14. "Grams of ROC per Liter of Material": The weight of ROC per volume of material and can be calculated by the following equation:

$$\begin{array}{l} \text{Grams of ROC per Liter} \\ \text{of Material} \end{array} = \frac{W_s - W_w - W_{es}}{V_m}$$

Where:

- W_s = Weight of volatile compounds (grams)
- W_w = Weight of water (grams)
- W_{es} = Weight of exempt organic compounds (grams)
- V_m = Volume of material (liters)

15. "Group I Vehicles": These include passenger cars, large/heavy duty truck cabs and chassis, light and medium duty trucks and vans, and motorcycles.

16. "Group II Vehicles/Equipment": These include public transit buses, mobile equipment, or military tanks or other tracked military vehicles.
17. "Gun Washer": Electrically or pneumatically operated system that is designed to clean spray application equipment while enclosed. A gun washer may also be considered a gun cleaning system that consists of spraying solvent into an enclosed container using a snug fitting.
18. "Hand Application Methods": The application of coatings by nonmechanical hand-held equipment including but not limited to paint brushes, hand rollers, caulking guns, trowels, spatulas, syringe daubers, rags, and sponges.
19. "High-Volume, Low-Pressure Application (HVLP)": Spray equipment which uses a high volume of air delivered at pressures between 0.1 and 10 psig measured at the spray gun air cap and which operates at a maximum fluid delivery pressure of 50 psig.
20. "Immobilized": A vehicle is immobilized or incapable of being moved, only when an engine or wheel has been removed so that the engine or wheel compartments can be coated.
21. "Interior Motor Vehicle Part": Any interior part of the motor vehicle, including but not limited to the engine, engine compartment, wheel well, suspension component or passenger compartment, that is not a "major panel" or exterior motor vehicle panel.
22. "Large Production/Utility Bodies": The production of utility bodies at a rate greater than 20 vehicles per day.
23. "Low emission spray gun cleaner": Any properly used spray equipment cleanup device which has passive solvent losses of no more than 0.6 grams per hour and has active solvent losses of no more than 15 grams per operating cycle as defined by the test method in Subsection E.7.
24. "Major Panel": Any exterior motor vehicle panel including but not limited to the roof, hood, doors, quarter panel, fender, bumper, soft bumper cover, deck lid, luggage lid, rear body panel, cowl top panel, rocker panel, and front header panel.
25. "Metallic/Iridescent Topcoat": Any topcoat which contains more than 5 g/l (.042 lb/gal) of iridescent particles, composed of metal as metallic particles or silicon as mica particles, as applied, where such particles are visible in the dried film.
26. "Mobile Equipment": Any equipment which may be drawn or is capable of being driven on a roadway, including, but not limited to, truck bodies, truck trailers, camper shells, mobile cranes, bulldozers, concrete mixers, street cleaners, golf carts, all terrain vehicles, implements of husbandry, and hauling equipment used

inside and around airports, docks, depots, and industrial and commercial plants, but excluding utility bodies.

27. "Motor Vehicle": A vehicle which is self-propelled and which is physically capable of being driven on a highway.
28. "Multistage Topcoat": A topcoat system which consists of a basecoat/clear coat system (2 stage) or basecoat/midcoat/clear coat system (3 stage).
29. "Operating Cycle": An operating cycle consists of all steps carried out during a cleaning operation.
30. "Passive Solvent Losses": The passive solvent losses are the emissions from spray gun cleaning equipment when the equipment sits idle between cleaning cycles and are a result of natural evaporation from the equipment.
31. "Prep Station": Any spraying area that meets the requirements for a "Limited Spraying Area" from Section 45.207 of the Uniform Fire Code and that prevents the escape to the atmosphere of overspray particulate using properly maintained filters and positive mechanical ventilation.
32. "Pretreatment Wash Primer": Any coating which contains a minimum of 0.5% acid, by weight, is necessary to provide surface etching and is applied directly to bare metal surfaces to provide corrosion resistance and adhesion.
33. "Primer": Any coating applied prior to the application of a topcoat for the purpose of corrosion resistance and adhesion of the topcoat.
34. "Primer Sealer": Any coating applied prior to the application of a topcoat for the purpose of adhesion of the topcoat, color uniformity, and to promote the ability of an undercoat to resist penetration by the topcoat.
35. "Primer Surfacer": Any coating applied prior to the application of a topcoat for the purpose of corrosion resistance, adhesion of the topcoat, and which promotes a uniform surface by filling in surface imperfections.
36. "ROC Composite Partial Pressure": The sum of the partial pressures of the compounds defined as ROCs. ROC composite partial pressure is calculated as follows:

$$PP_c = \frac{\sum_{i=1}^n \left(\frac{w_i}{MW_i} \right) (VP_i)}{\left(\frac{w_w}{MW_w} \right) + \sum_{e=1}^n \left(\frac{w_e}{MW_e} \right) + \sum_{i=1}^n \left(\frac{w_i}{MW_i} \right)}$$

Where:

W_i = Weight of the "i"th ROC compound, in grams

W_w = Weight of water, in grams

W_e = Weight of the "e"th exempt organic compound, in grams

MW_i = Molecular weight of the "i"th ROC compound, in g/(g-mole)

MW_w = Molecular weight of water, in g/(g-mole)

MW_e = Molecular weight of the "e"th exempt compound, in g/(g-mole)

PP_c = ROC composite partial pressure at 20 C, in mm Hg

VP_i = Vapor pressure of the "i"th ROC compound at 20 C, in mm Hg.

37. "Reactive Organic Compound (ROC)": As defined in Rule 2 of these rules. The term "volatile organic compound" (VOC) is equivalent to ROC.
38. "Reducer": Any volatile liquid used to reduce the viscosity of the coating. This liquid may be solvents, diluents or mixtures of both.
39. "Small Production/Utility Bodies": The production of utility bodies at a rate of 20 vehicles per day or less.
40. "Specialty Coatings": Coatings which are necessary due to unusual and uncommon job performance requirements. These coatings include, but are not limited to, weld-thru primers, adhesion promoters, uniform finish blenders, elastomeric materials, gloss flatteners, bright metal trim repair, antiglare/safety coatings, impact resistant coatings, rubberized asphaltic underbody coatings, water hold-out coatings, and multicolor coatings that exhibit more than one color when applied from a single container.
41. "Spray Booth": Any power ventilated structure of varying dimensions and construction provided to enclose or accommodate a spraying operation and which meets the Uniform Fire Code. A spray booth shall confine and limit, by dry or wet filtration, the escape to the atmosphere of overspray particulate matter.
42. "Three-Stage Coating System": A multistage topcoat system composed of a pigmented basecoat portion, a semi-transparent midcoat portion, and two transparent clearcoat portions. Three-stage coating systems' ROC content shall be calculated according to the following formula:

$$\text{ROC } T_{3\text{-stage}} = \frac{\text{ROC}_{bc} + \text{ROC}_{mc} + 2 \text{ROC}_{cc}}{4}$$

Where:

$\text{ROC } T_{3\text{-stage}}$ = the average of the ROC content as applied in the basecoat (bc), midcoat (mc), and clearcoat (cc) system.

ROC_{bc} = the ROC content as applied in the basecoat.
ROC_{mc} = the ROC content as applied of any given midcoat.
2 ROC_{cc} = two times the ROC content as applied of any given clearcoat.

43. "Topcoat": Any coating applied over a primer or an original OEM finish for the purpose of protection or appearance. For the purposes of this rule, either a basecoat/clearcoat system or 3-stage coating system shall be considered jointly as a topcoat.
44. "Transfer Efficiency": The ratio of the weight of coating solids which adhere to the object being coated to the weight amount of coating solids used in the application process, expressed as a percentage.
45. "Undercoat": Any pretreatment wash primer, primer, primer surfacer, or primer sealer.
46. "Utility Body": A special purpose compartment or unit that will be bolted, welded, or affixed onto an existing cab and chassis. The compartment may serve as storage for equipment of parts.
47. "Water-Based Temporary Transit Coating": Any water-based coating that is intended to protect new motor vehicle finishes from certain forms of damage such as iron dust, soot, acid rain, and other airborne pollutants during transit and is removed prior to sale of the vehicle.
48. "Weld-Thru Primer": Any primer applied from an aerosol can, 16 ounces or less, to bare steel prior to welding that steel area. The purpose of the weld-thru primer is to inhibit corrosion in the weld area.

* = clerical corrections made