

REGULATION III – CONTROL OF AIR CONTAMINANTS
RULE 348
AEROSPACE MANUFACTURING AND REWORK OPERATIONS

INDEX

SECTION 100 – GENERAL

- 101 PURPOSE
- 102 APPLICABILITY

SECTION 200 – DEFINITIONS

- 201 ABLATIVE COATING
- 202 ADHESION PROMOTER
- 203 ADHESIVE BONDING PRIMER
- 204 AEROSOL COATING
- 205 AEROSPACE VEHICLE OR COMPONENT
- 206 AIRCRAFT FLUID SYSTEMS
- 207 AIRCRAFT TRANSPARENCY
- 208 ANTICHAFE COATING
- 209 ANTIQUE AEROSPACE VEHICLE OR COMPONENT
- 210 AQUEOUS CLEANING SOLVENT
- 211 BONDING MASKANT
- 212 CHEMICAL AGENT-RESISTANT COATING (CARC)
- 213 CHEMICAL MILLING MASKANT
- 214 CLEANING OPERATION
- 215 CLEANING SOLVENT
- 216 CLEAR COATING
- 217 CLOSED-CYCLE DEPAINTING SYSTEM
- 218 COATING
- 219 COATING OPERATION
- 220 COATING UNIT
- 221 COMMERCIAL EXTERIOR AERODYNAMIC STRUCTURE PRIMER
- 222 COMMERCIAL INTERIOR ADHESIVE
- 223 COMPATIBLE SUBSTRATE PRIMER
- 224 CONFINED SPACE

225 CORROSION PREVENTION SYSTEM
226 CRITICAL USE AND LINE SEALER MASKANT
227 CRYOGENIC FLEXIBLE PRIMER
228 CRYOPROTECTIVE COATING
229 CYANOACRYLATE ADHESIVE
230 ELECTRIC OR RADIATION-EFFECT COATING
231 ELECTROSTATIC DISCHARGE AND ELECTROMAGNETIC INTERFERENCE (EMI) COATING
232 ELEVATED TEMPERATURE SKYDROL RESISTANT COMMERCIAL PRIMER
233 EMISSION CONTROL SYSTEM (ECS)
234 EPOXY POLYAMIDE TOPCOAT
235 FIRE-RESISTANT (INTERIOR) COATING
236 FLEXIBLE PRIMER
237 FLIGHT TEST COATING
238 FLUSH CLEANING
239 FUEL TANK ADHESIVE
240 FUEL TANK COATING
241 GENERAL AVIATION
242 GENERAL AVIATION REWORK FACILITY
243 GRAMS PER LITER VOC
244 HAND-WIPE CLEANING OPERATION
245 HIGH TEMPERATURE COATING
246 HIGH VOLUME LOW PRESSURE (HVLP) SPRAY EQUIPMENT
247 INSULATION COVERING
248 INTERMEDIATE RELEASE COATING
249 LACQUER
250 LEAK
251 LIMITED ACCESS SPACE
252 METALIZED EPOXY COATING
253 MOLD RELEASE
254 NONSTRUCTURAL ADHESIVE
255 OPERATING PARAMETER VALUE
256 OPTICAL ANTI-REFLECTION COATING

257 PART MARKING COATING
258 PRETREATMENT COATING
259 PRIMER
260 RADOME
261 RAIN EROSION-RESISTANT COATING
262 RESEARCH AND DEVELOPMENT
263 RESIN SURFACE SEALER
264 ROCKET MOTOR BONDING ADHESIVE
265 ROCKET MOTOR NOZZLE COATING
266 RUBBER-BASED ADHESIVE
267 SCALE INHIBITOR
268 SCREEN PRINT INK
269 SEAL COAT MASKANT
270 SEALANT
271 SELF-PRIMING TOPCOAT
272 SEMI-AQUEOUS CLEANING SOLVENT
273 SILICONE INSULATION MATERIAL
274 SOLID FILM LUBRICANT
275 SOLIDS
276 SPACE VEHICLE
277 SPECIALIZED FUNCTION COATING
278 SPECIALTY COATING
279 SPRAY GUN
280 STRUCTURAL AUTOCLAVABLE ADHESIVE
281 STRUCTURAL NONAUTOCLAVABLE ADHESIVE
282 SURFACE PREPARATION
283 TEMPORARY PROTECTIVE COATING
284 THERMAL CONTROL COATING
285 TOPCOAT
286 TOUCH-UP AND/OR REPAIR OPERATIONS
287 VOC COMPOSITE PARTIAL VAPOR PRESSURE
288 WATERBORNE (WATER-REDUCIBLE) COATING
289 WET FASTENER INSTALLATION COATING

290 WING COATING

SECTION 300 – STANDARDS

- 301 LIMITATIONS–VOC EMISSIONS
- 302 EMISSION CONTROL SYSTEM
- 303 REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT
- 304 APPLICATION EQUIPMENT
- 305 SOLVENT CLEANING
- 306 SPRAY GUN CLEANING
- 307 VOC CONTAINMENT AND DISPOSAL
- 308 EXEMPTIONS

SECTION 400 – ADMINISTRATIVE REQUIREMENTS

- 401 COMPLIANCE SCHEDULE

SECTION 500 – MONITORING AND RECORDS

- 501 RECORDKEEPING AND REPORTING
- 502 COMPLIANCE DETERMINATION

MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS

REGULATION III – CONTROL OF AIR CONTAMINANTS

RULE 348
AEROSPACE MANUFACTURING AND REWORK OPERATIONS

SECTION 100 – GENERAL

- 101 **PURPOSE:** To limit the emission of volatile organic compounds (VOCs) from the manufacture and rework of aerospace vehicles and their components.
- 102 **APPLICABILITY:** This rule applies to the manufacture or rework of commercial, civil, or military aerospace vehicles. This rule does not apply to research and development, quality control, laboratory testing, electronic parts and assemblies (except for cleaning and coating of completed assemblies) and to rework operations performed on antique aerospace vehicles or components or space vehicles.

SECTION 200 – DEFINITIONS: For the purpose of this rule, the following definitions shall apply, in addition to those definitions found in Rule 100 (General Provisions and Definitions) of these rules. In the event of any inconsistency between any of the Maricopa County air pollution control rules, the definitions in this rule take precedence.

- 201 **ABLATIVE COATING:** A coating that chars when exposed to open flame or extreme temperatures, as would occur during the failure of an engine casing or during aerodynamic heating. The ablative char surface serves as an insulative barrier, protecting adjacent components from the heat or open flame.
- 202 **ADHESION PROMOTER:** A very thin coating applied to a substrate to promote wetting and form a chemical bond with the subsequently applied material.
- 203 **ADHESIVE BONDING PRIMER:** A primer applied in a thin film to aerospace components for the purpose of corrosion inhibition and increased adhesive bond strength by attachment. There are two categories of adhesive bonding primers, primers with a design cure at 250°F or below and primers with a design cure above 250°F.
- 204 **AEROSOL COATING:** A hand-held, pressurized, nonrefillable container that expels an adhesive or a coating in a finely divided spray when a valve on the container is depressed.
- 205 **AEROSPACE VEHICLE OR COMPONENT:** Any fabricated part, processed part, assembly of parts, or completed unit, with the exception of electronic components, of any aircraft, including but not limited to airplanes, helicopters, missiles, rockets, and space vehicles.

- 206 AIRCRAFT FLUID SYSTEMS:** Those systems that handle hydraulic fluids, fuel, cooling fluids, or oils.
- 207 AIRCRAFT TRANSPARENCY:** The aircraft windshield, canopy, passenger windows, lenses and other components which are constructed of transparent materials.
- 208 ANTICHAFFE COATING:** A coating applied to areas of moving aerospace components that may rub during normal operations or installation.
- 209 ANTIQUE AEROSPACE VEHICLE OR COMPONENT:** An antique aircraft, as defined by 14 CFR Part 45, or components thereof. An antique aerospace vehicle would not routinely be in commercial or military service in the capacity for which it was designed.
- 210 AQUEOUS CLEANING SOLVENT:** A solvent in which water is at least 80 percent of the solvent as applied.
- 211 BONDING MASKANT:** A temporary coating used to protect selected areas of aerospace parts from strong acid or alkaline solutions during processing for bonding.
- 212 CHEMICAL AGENT-RESISTANT COATING (CARC):** An exterior topcoat designed to withstand exposure to chemical warfare agents or the decontaminates used in these agents.
- 213 CHEMICAL MILLING MASKANT:** A coating that is applied directly to aluminum components to protect surface areas when chemical milling the component with a Type I or II etchant. This does not include bonding maskants, line sealers, and critical use and seal coat maskants. Additionally, maskants that must be used on an individual part or subassembly with a combination of Type I or II etchants and any of the above types of maskants (e.g., bonding, line sealers, and critical use and seal coat) are not included. Maskants that are defined as specialty coatings are not included under this definition.
- 214 CLEANING OPERATION:** Any operation that removes dirt or impurities from aerospace vehicles, components, or coating equipment. This may include spray gun, hand-wipe, and flush cleaning operations.
- 215 CLEANING SOLVENT:** A liquid material used for hand-wipe, spray gun, or flush cleaning. This definition excludes solutions that contain VOCs at a concentration less than 0.1% for carcinogenic VOCs or 1.0% for noncarcinogenic VOCs, as determined from manufacturers' representations.
- 216 CLEAR COATING:** A transparent coating usually applied over a colored opaque coating, metallic substrate, or placard to give improved gloss and protection to the color coat. In some cases, a clearcoat refers to any transparent coating without regard to substrate.

- 217 CLOSED-CYCLE DEPAINTING SYSTEM:** A dust free, automated process that removes permanent coating in small sections at a time, and maintains a continuous vacuum around the area(s) being depainted to capture emissions.
- 218 COATING:** A material that is applied to the surface of an aerospace vehicle or component to form a decorative or functional solid film, or the solid film itself.
- 219 COATING OPERATION:** Using a spray booth, tank, or other enclosure or any area, such as a hangar, for applying a single type of coating (e.g., primer); using the same spray booth for applying another type of coating (e.g., topcoat) constitutes a separate coating operation for which compliance determinations are performed separately.
- 220 COATING UNIT:** A series of one or more coating applicators and any associated drying area and/or oven wherein a coating is applied, dried, and/or cured. A coating unit ends at the point where the coating is dried or cured, or prior to any subsequent application of a different coating. It is not necessary to have an oven or flashoff area to be included in this definition.
- 221 COMMERCIAL EXTERIOR AERODYNAMIC STRUCTURE PRIMER:** A primer used on aerodynamic components and structures that protrude from the fuselage, such as wings and attached components, control surfaces, horizontal stabilizers, vertical fins, wing-to-body fairings, antennae, and landing gear and doors, for the purpose of extended corrosion protection and enhanced adhesion.
- 222 COMMERCIAL INTERIOR ADHESIVE:** Materials used in the bonding of passenger cabin interior components. These components must meet the FAA fireworthiness requirements.
- 223 COMPATIBLE SUBSTRATE PRIMER:** Either compatible Epoxy Primer or Adhesive Primer. Compatible Epoxy Primer is primer that is compatible with the filled elastomeric coating and is epoxy based. The compatible substrate primer is an epoxy-polyamide primer used to promote adhesion of elastomeric coatings such as impact-resistant coatings. Adhesive Primer is a coating that (1) inhibits corrosion and serves as a primer applied to bare metal surfaces or prior to adhesive application, or (2) is applied to surfaces that can be expected to contain fuel. Fuel tank coatings are excluded from this category.
- 224 CONFINED SPACE:** A space that (1) is large enough and so configured that an employee can bodily enter and perform assigned work; (2) is limited or restricted for entry or exit (for example, fuel tanks, fuel vessels, and other spaces that have limited entry); and (3) is not suitable for continuous employee occupancy.
- 225 CORROSION PREVENTION SYSTEM:** A coating system that provides corrosion protection by displacing water and penetrating mating surfaces, forming a protective barrier between the metal surface and moisture. Coatings containing oils or waxes are excluded from this category.

- 226 CRITICAL USE AND LINE SEALER MASKANT:** A temporary coating, not covered under other maskant categories, used to protect selected areas of aerospace parts from strong acid or alkaline solutions such as those used in anodizing, plating, chemical milling and processing of magnesium, titanium, or high strength steel, high precision aluminum chemical milling of deep cuts, and aluminum chemical milling of complex shapes. Materials used for repairs or to bridge gaps left by scribing operations (i.e., line sealer) are also included in this category.
- 227 CRYOGENIC FLEXIBLE PRIMER:** A primer designed to provide corrosion resistance, flexibility, and adhesion of subsequent coating systems when exposed to loads up to and surpassing the yield point of the substrate at cryogenic temperatures (-275°F and below).
- 228 CRYOPROTECTIVE COATING:** A coating that insulates cryogenic or subcooled surfaces to limit propellant boil-off, maintain structural integrity of metallic structures during ascent or re-entry, and prevent ice formation.
- 229 CYANOACRYLATE ADHESIVE:** A fast-setting, single component adhesive that cures at room temperature. Also known as "super glue."
- 230 ELECTRIC OR RADIATION-EFFECT COATING:** A coating or coating system engineered to interact, through absorption or reflection, with specific regions of the electromagnetic energy spectrum, such as the ultraviolet, visible, infrared, or microwave regions. Uses include, but are not limited to, lightning strike protection, electromagnetic pulse (EMP) protection, and radar avoidance. Coatings that have been designated "classified" by the Department of Defense are exempt.
- 231 ELECTROSTATIC DISCHARGE AND ELECTROMAGNETIC INTERFERENCE (EMI) COATING:** A coating applied to space vehicles, missiles, aircraft radomes, and helicopter blades to disperse static energy or reduce electromagnetic interference.
- 232 ELEVATED TEMPERATURE SKYDROL RESISTANT COMMERCIAL PRIMER:** A primer applied primarily to commercial aircraft (or commercial aircraft adapted for military use) that must withstand immersion in phosphate-ester (PE) hydraulic fluid (Skydrol 500b or equivalent) at the elevated temperature of 150°F for 1,000 hours.
- 233 EMISSION CONTROL SYSTEM (ECS):** A system, approved in writing by the Control Officer, designed and operated in accordance with good engineering practice to reduce emissions of volatile organic compounds. Such system consists of an emissions collection subsystem and an emissions processing subsystem.
- 234 EPOXY POLYAMIDE TOPCOAT:** A coating used where harder films are required or in some areas where engraving is accomplished in camouflage colors.
- 235 FIRE-RESISTANT (INTERIOR) COATING:** A coating applied to the interior cabin of an airplane that prevents the interior cabin from being easily ignited and from burning with extreme rapidity.

- 236 **FLEXIBLE PRIMER:** A primer that meets flexibility requirements such as those needed for adhesive bond primed fastener heads or on surfaces expected to contain fuel.
- 237 **FLIGHT TEST COATING:** A coating applied to aircraft other than missiles or single-use aircraft prior to flight testing to protect the aircraft from corrosion and to provide required marking during flight test evaluation.
- 238 **FLUSH CLEANING:** Removal of contaminants such as dirt, grease, oil, and coatings from an aerospace vehicle or component or coating equipment by passing solvent over, into, or through the item being cleaned. The solvent simply may be poured into the item being cleaned and then drained or assisted by air or hydraulic pressure or by pumping. Hand-wipe cleaning operations where wiping, scrubbing, mopping or other hand action are used are not included.
- 239 **FUEL TANK ADHESIVE:** An adhesive used to bond components exposed to fuel and must be compatible with fuel tank coatings.
- 240 **FUEL TANK COATING:** A coating applied to fuel tank components for the purpose of corrosion and/or bacterial growth inhibition and to assure sealant adhesion in extreme environmental conditions.
- 241 **GENERAL AVIATION (GA):** The segment of civil aviation that encompasses all facets of aviation except air carriers, commuters and military. General aviation includes charter and corporate-executive transportation, instruction, rental, aerial application, aerial observation, business, pleasure and other special uses.
- 242 **GENERAL AVIATION REWORK FACILITY:** Any aerospace facility with the majority of its revenues resulting from the reconstruction, repair, maintenance, repainting, conversion, or alteration of general aviation aerospace vehicles or components.
- 243 **GRAMS PER LITER VOC:** A weight of VOC per combined volume of VOC and coating solids, less water and exempt compounds, and can be calculated by the following equation:

$$\text{grams per liter} = \frac{W_s - W_w - W_{es}}{V_s - V_w - V_{es}}$$

Where:

W_s = weight of volatile organic compounds in grams

W_w = weight of water in grams

W_{es} = weight of exempt compounds in grams

V_s = volume of material in liters

V_w = volume of water in liters

V_{es} = volume of exempt compounds in liters

- 244 HAND-WIPE CLEANING OPERATION:** Removing contaminants such as dirt, grease, oil, and coatings from an aerospace vehicle or component by physically rubbing it with a material such as a rag, paper, or cotton swab that has been moistened with a cleaning solvent. This definition excludes the use of rags or other material used only to dry excess solvent from a part or product after removal from a vat or any other solvent bath.
- 245 HIGH TEMPERATURE COATING:** A coating designed to withstand temperatures of more than 350°F.
- 246 HIGH VOLUME LOW PRESSURE (HVLP) SPRAY EQUIPMENT:** Spray equipment that is used to apply coating by a spray gun that operates at 10.0 psig of atomizing air pressure or less at the air cap.
- 247 INSULATION COVERING:** Material that is applied to foam insulation to protect the insulation from mechanical or environmental damage.
- 248 INTERMEDIATE RELEASE COATING:** A thin coating applied beneath topcoats to assist in removing the topcoat in depainting operations and generally to allow the use of less hazardous depainting methods.
- 249 LACQUER:** A clear or pigmented coating formulated with a nitrocellulose or synthetic resin to dry by evaporation without a chemical reaction. Lacquers are resolvable in their original solvent.
- 250 LEAK:** A liquid that is allowed to seep or drip or to otherwise enter or escape in either of the following ways:
- a. Three or more drops, including misting and clouding; or
 - b. A puddle greater than one square inch.
- 251 LIMITED ACCESS SPACE:** Internal surfaces or passages of an aerospace vehicle or component that cannot be reached without the aid of an airbrush or a spray gun extension for the application of coatings.
- 252 METALIZED EPOXY COATING:** A coating that contains relatively large quantities of metallic pigmentation for appearance and/or added protection.
- 253 MOLD RELEASE:** A coating applied to a mold surface to prevent the molded piece from sticking to the mold as it is removed.
- 254 NONSTRUCTURAL ADHESIVE:** An adhesive that bonds nonload bearing aerospace components in noncritical applications and is not covered in any other specialty adhesive categories.
- 255 OPERATING PARAMETER VALUE:** A minimum or maximum value established for a control equipment or process parameter that, if achieved by itself or

in combination with one or more other operating parameter values, determines that an owner or operator has complied with an applicable emission limitation.

- 256 OPTICAL ANTI-REFLECTION COATING:** A coating with a low reflectance in the infrared and visible wavelength ranges that is used for antireflection on or near optical and laser hardware.
- 257 PART MARKING COATING:** Coatings or inks used to make identifying markings on materials, components, and/or assemblies. These markings may be either permanent or temporary.
- 258 PRETREATMENT COATING:** An organic coating that contains at least 0.5 percent acids by weight and is applied directly to metal surfaces to provide surface etching, corrosion resistance, adhesion, and ease of stripping.
- 259 PRIMER:** The first layer and any subsequent layers of identically formulated coating applied to the surface of an aerospace vehicle or component. Primers are typically used for corrosion prevention, protection from the environment, functional fluid resistance, and adhesion of subsequent coatings. Primers that are defined as specialty coatings are not included under this definition.
- 260 RADOME:** The nonmetallic protective housing for electromagnetic transmitters and receivers (e.g., radar, electronic countermeasures, etc.).
- 261 RAIN EROSION-RESISTANT COATING:** A coating or coating system used to protect the leading edges of parts such as flaps, stabilizers, radomes, engine inlet nacelles, etc. against erosion caused by rain impact during flight.
- 262 RESEARCH AND DEVELOPMENT:** An operation whose primary purpose is for research and development of new processes and products and that is conducted under the close supervision of technically trained personnel and is not involved in the manufacture of final or intermediate products for commercial purposes, except in a de minimis manner.
- 263 RESIN SURFACE SEALER:** A coating designed or intended to seal the pores of high porosity cast surfaces of aerospace components composed of magnesium, aluminum or their alloys to prevent corrosion.
- 264 ROCKET MOTOR BONDING ADHESIVE:** An adhesive used in rocket motor bonding applications.
- 265 ROCKET MOTOR NOZZLE COATING:** A catalyzed epoxy coating system used in elevated temperature applications on rocket motor nozzles.
- 266 RUBBER-BASED ADHESIVE:** A quick setting contact cement that provides a strong, yet flexible bond between two mating surfaces that may be of dissimilar materials.

- 267 **SCALE INHIBITOR:** A coating that is applied to the surface of a part prior to thermal processing to inhibit the formation of scale.
- 268 **SCREEN PRINT INK:** Inks used in screen printing processes during fabrication of decorative laminates and decals.
- 269 **SEAL COAT MASKANT:** An overcoat applied over a maskant to improve abrasion and chemical resistance during production operations.
- 270 **SEALANT:** A material used to prevent the intrusion of water, fuel, air, or other liquids or solids from certain areas of aerospace vehicles or components. There are two categories of sealants: extrudable/rollable/brushable sealants and sprayable sealants.
- 271 **SELF-PRIMING TOPCOAT:** A topcoat that is applied directly to an uncoated aerospace vehicle or component for purposes of corrosion prevention, environmental protection, and functional fluid resistance. More than one layer of identical coating formulation may be applied to the vehicle or component. The coating is not subsequently topcoated with any other product formulation.
- 272 **SEMIAQUEOUS CLEANING SOLVENT:** A solvent wherein at least 60% of the solvent solution as applied must be water.
- 273 **SILICONE INSULATION MATERIAL:** An insulating material applied to exterior metal surfaces for protection from high temperatures caused by atmospheric friction or engine exhaust. These materials differ from ablative coatings in that they are not "sacrificial."
- 274 **SOLID FILM LUBRICANT:** A very thin coating consisting of a binder system containing as its chief pigment material one or more of the following: molybdenum, graphite, polytetrafluoroethylene (PTFE), or other solids that act as a dry lubricant between faying surfaces.
- 275 **SOLIDS:** The nonvolatile portion of the coating that after drying makes up the dry film.
- 276 **SPACE VEHICLE:** A man-made device, either manned or unmanned, designed for operation beyond earth's atmosphere. This definition includes integral equipment such as models, mock-ups, prototypes, molds, jigs, tooling, hardware jackets, and test coupons. Also included is auxiliary equipment associated with test, transport, and storage that through contamination can compromise the space vehicle performance.
- 277 **SPECIALIZED FUNCTION COATING:** A coating that fulfills extremely specific engineering requirements that are limited in application and are characterized by low volume usage. This category excludes coatings covered in other Specialty Coating categories.
- 278 **SPECIALTY COATING:** A coating that, even though it meets the definition of a primer, topcoat, or self-priming topcoat, has additional performance criteria beyond

those of primers, topcoats, and self-priming topcoats for specific applications. These performance criteria may include, but are not limited to, temperature or fire resistance, substrate compatibility, antireflection, temporary protection or marking, sealing, adhesively joining substrates, or enhanced corrosion protection.

- 279 SPRAY GUN:** A device that atomizes a coating or other material and projects the particulates or other material onto a substrate.
- 280 STRUCTURAL AUTOCLAVABLE ADHESIVE:** An adhesive used to bond load carrying aerospace components that is cured by heat and pressure in an autoclave.
- 281 STRUCTURAL NONAUTOCLAVABLE ADHESIVE:** An adhesive cured under ambient conditions that is used to bond load carrying aerospace components or other critical functions, such as nonstructural bonding in the proximity of engines.
- 282 SURFACE PREPARATION:** The removal of contaminants from the surface of an aerospace vehicle or component or the activation or reactivation of the surface in preparation for the application of a coating.
- 283 TEMPORARY PROTECTIVE COATING:** A coating applied to provide scratch or corrosion protection during manufacturing, storage, or transportation. Two types include peelable protective coatings and alkaline removable coatings. These materials are not intended to protect against strong acid or alkaline solutions. Coatings that provide this type of protection from chemical processing are not included in this category.
- 284 THERMAL CONTROL COATING:** A coating formulated with specific thermal conductive or radiative properties to permit temperature control of the substrate.
- 285 TOPCOAT:** A coating that is applied over a primer on an aerospace vehicle or component for appearance, identification, camouflage, or protection. Topcoats that are defined as specialty coatings are not included under this definition.
- 286 TOUCH-UP AND/OR REPAIR OPERATIONS:** That portion of the coating operation that is the incidental application of coating used to cover minor imperfections in the coating finish or to achieve complete coverage. This definition includes out-of-sequence or out-of-cycle coating.
- 287 VOC COMPOSITE PARTIAL VAPOR PRESSURE:** The sum of the partial pressures of the compounds defined as VOC's and is determined by the following calculation:

$$PP_s = \frac{\sum_{i=1}^n \frac{W_i}{MW_i} \times VP_i}{\frac{W_w}{MW_w} + \frac{W_e}{MW_e} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

Where:

W_i = Weight of the "i"th VOC compound, grams.

W_w = Weight of water, grams.

W_e = Weight of non-HAP, non-VOC compound, grams.

MW_i = Molecular weight of the "i"th VOC compound, g/g-mole.

MW_w = Molecular weight of water, g/g-mole.

MW_e = Molecular weight of exempt compound, g/g-mole.

PP_c = VOC composite partial pressure at 20°C, mm Hg.

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

288 WATERBORNE (WATER-REDUCIBLE) COATING: A coating which contains more than 5 percent water by weight as applied in its volatile fraction.

289 WET FASTENER INSTALLATION COATING: A primer or sealant applied by dipping, brushing, or daubing to fasteners that are installed before the coating is cured.

290 WING COATING: A corrosion-resistant topcoat that is resilient enough to withstand the flexing of the wings.

SECTION 300 – STANDARDS

301 LIMITATIONS: VOC EMISSIONS: No person shall apply any surface coating including any VOC-containing materials added to the original coating supplied by the manufacturer, which contain VOC in excess of the limits in Tables 1a and 1b, unless the emissions are controlled in accordance with the provisions of Section 302 of this rule.

Table 1a

PRIMER or TOPCOAT TYPE	VOC LIMITS (g/L)
All Primers (except Specialty or General Aviation Rework Facility Primers)	350 g/l
All Topcoats (except Specialty or General Aviation Rework Facility Topcoats)	420 g/l
General Aviation Rework Facility Primers	540 g/l
General Aviation Rework Facility Topcoats	540 g/l

Table 1b

Type of Specialty Coating	VOC Limits (g/L)
Ablative Coating	600
Adhesion Promoter	890

Type of Specialty Coating	VOC Limits (g/L)
Adhesive Bonding Primers: Cured at 250°F or below	850
Adhesive Bonding Primers: Cured above 250°F	1030
Adhesives: Commercial Interior	760
Adhesives: Cyanoacrylate	1,020
Adhesives: Fuel Tank	620
Adhesives: Nonstructural	360
Adhesives: Rocket Motor Bonding	890
Adhesives: Rubber-based	850
Adhesives: Structural Autoclavable	60
Adhesives: Structural Nonautoclavable	850
Antichafe Coating	660
Bearing Coating Compounds	620
Caulking and Smoothing Compounds	850
Chemical Agent-Resistant Coating	550
Clear Coating	720
Commercial Exterior Aerodynamic Structure Primer	350
Compatible Substrate Primer	350
Corrosion Prevention Compound	710
Cryogenic Flexible Primer	350
Cryoprotective Coating	600
Coatings Related To Electromagnetism And/Or Other Radiation Electric Or Radiation-Effect Coating	600
Electrostatic Discharge and Electromagnetic Interference (EMI) Coating	800
Elevated Temperature Skydrol Resistant Commercial Primer	350
Epoxy Polyamide Topcoat	420
Fire-Resistant (Interior) Coating	800
Flexible Primer	350
Flight-Test Coatings: Missile or Single Use Aircraft	420
Flight-Test Coatings: All Other	840
Fuel-Tank Coating	720
High-Temperature Coating	850
Insulation Covering	740
Intermediate Release Coating	750
Lacquer	830
Maskant: Bonding Maskant	420
Maskant: Critical Use and Line Sealer Maskant	420
Maskant: Seal Coat Maskant	420
Metallized Epoxy Coating	740
Mold Release	780
Optical Anti-Reflective Coating	750
Part Marking Coating	850
Pretreatment Coating	780
Rain Erosion-Resistant Coating	420

Type of Specialty Coating	VOC Limits (g/L)
Resin Surface Sealer	695
Rocket Motor Nozzle Coating	660
Scale Inhibitor	880
Screen Print Ink	840
Sealants: Extrudable/Rollable/Brushable Sealant	240
Sealants: Sprayable Sealant	600
Self-priming Topcoat	420
Silicone Insulation Material	850
Solid Film Lubricant	880
Specialized Function Coating	890
Temporary Protective Coating	250
Thermal Control Coating	800
Wet Fastener Installation Coating	675
Wing Coating	420

302 EMISSION CONTROL SYSTEM: As an alternative to meeting the applicable coating VOC limits set forth in Section 301, an operator can comply with this rule by operating an Emission Control System (ECS) approved by the Control Officer, provided that the control system has a combined VOC emissions capture and control equipment efficiency of at least 81 percent by weight.

303 REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT:

303.1 Operation and Maintenance (O&M) Plan Required for ECS:

- a. An owner or operator shall provide and maintain (an) O&M Plan(s) for any ECS, any other emission processing equipment, and any ECS monitoring devices that are used pursuant to this rule or to an air pollution control permit.
- b. The owner or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used pursuant to this rule.
- c. An owner or operator of a facility that is required to have an O&M Plan pursuant to this subsection must fully comply with all O&M Plans that the owner or operator has submitted for approval, but which have not yet been approved, unless notified otherwise by the Control Officer in writing.

304 APPLICATION EQUIPMENT: A person shall use one or more of the following application techniques in applying any primer or topcoat to aerospace vehicles or components: flow/curtain coat; dip coat; roll coating; brush coating; cotton-tipped swab application; electrodeposition (DIP) coating; high volume low pressure (HVLP) spraying; electrostatic spray; or other coating application methods that can

demonstrate and be approved by the Control Officer as having at least a 65% transfer efficiency, which is equivalent to the transfer efficiency of HVLP or electrostatic spray application methods.

305 SOLVENT CLEANING: The following requirements apply to solvent cleaning operations:

305.1 Hand-Wipe Cleaning: Cleaning solvents used in hand-wipe cleaning operations shall utilize an aqueous cleaning solvent, or have a VOC composite vapor pressure less than or equal to 45 millimeters of mercury (mm Hg) at 20°C.

305.2 Flush Cleaning: For cleaning solvents used in the flush cleaning of parts, assemblies, and coating unit components, the used cleaning solvent (except for semi-aqueous cleaning solvents) must be emptied into an enclosed container or collection system that is kept closed when not in use or captured with wipers, provided they comply with the VOC handling requirements of Section 307 of this rule.

305.3 Dip Cleaning: Dip cleaning using solvents is subject to the requirements of Rule 331.

306 SPRAY GUN CLEANING: All spray guns must be cleaned by one or more of the following methods:

306.1 Enclosed spray gun cleaning system, provided that it is kept closed when not in use and leaks are repaired within 14 days from when the leak is first discovered. If the leak is not repaired by the 15th day after detection, the solvent shall be removed and the enclosed cleaner shall be shut down until the leak is repaired or its use is permanently discontinued;

306.2 Unatomized discharge of solvent into a waste container that is kept closed when not in use;

306.3 Disassembly of the spray gun and cleaning in a vat that is kept closed when not in use; or

306.4 Atomized spray into a waste container that is fitted with a device designed to capture atomized solvent emissions.

307 VOC CONTAINMENT AND DISPOSAL: All fresh and used VOC containing material, including but not limited to cleaning solvents, coatings, thinners, rags, and their residues, shall be stored in closed, leak free, legibly labeled containers when not in use. In addition, the owner or operator must implement handling and transfer procedures to minimize spills during filling and transferring the cleaning solvent to or from enclosed systems, vats, waste containers, and other cleaning operation equipment that hold or store fresh or used cleaning solvents.

308 EXEMPTIONS:

308.1 Coatings: The following coatings types are exempt from the VOC limits set forth in Tables 1a and 1b in Section 301 of this rule:

- a. Touchup coatings;
- b. Hand-held aerosol can operations;
- c. DOD "classified" coatings;
- d. Coating of space vehicles; and
- e. Low usage coatings used in separate formulations in volumes of less than 50 gallons per year with a maximum exemption of 200 gallons total for such formulations applied annually.

308.2 Application Equipment: The following operations are exempt from the requirements of Section 304 of this rule:

- a. Any situation that normally requires the use of an airbrush or an extension on the spray gun to properly reach limited access spaces;
- b. The application of specialty coatings;
- c. The application of coatings that contain fillers that adversely affect atomization with HVLP spray guns and that the permitting agency has determined cannot be applied by any of the application methods;
- d. The application of coatings that normally have a dried film thickness of less than 0.0013 centimeter (0.0005 in.) and that the permitting agency has determined cannot be applied by any of the application methods;
- e. The use of airbrush application methods for stenciling, lettering, and other identification markings; and
- f. Touch-up and repair operations.

308.3 Solvent Cleaning Operations: The following are exempt from the requirements of Section 305 of this rule:

- a. Cleaning during the manufacture, assembly, installation, maintenance, or testing of components of breathing oxygen systems that are exposed to the breathing oxygen;
- b. Cleaning during the manufacture, assembly, installation, maintenance, or testing of parts, subassemblies, or assemblies that are exposed to strong oxidizers or reducers (e.g., nitrogen tetroxide, liquid oxygen, hydrazine);
- c. Cleaning and surface activation prior to adhesive bonding;

- d. Cleaning of electronics parts and assemblies containing electronics parts;
- e. Cleaning of aircraft and ground support equipment fluid systems that are exposed to the fluid, including air-to-air heat exchangers and hydraulic fluid systems;
- f. Cleaning of fuel cells, fuel tanks, and confined spaces;
- g. Surface cleaning of solar cells, coated optics, and thermal control surfaces;
- h. Cleaning during fabrication, assembly, installation, and maintenance of upholstery, curtains, carpet, and other textile materials used on the interior of the aircraft;
- i. Cleaning of metallic and nonmetallic materials used in honeycomb cores during the manufacture or maintenance of these cores, and cleaning of the completed cores used in the manufacture of aerospace vehicles or components;
- j. Cleaning of aircraft transparencies, polycarbonate, or glass substrates;
- k. Cleaning and solvent usage associated with research and development, quality control, or laboratory testing;
- l. Cleaning operations using nonflammable liquids conducted within 5 feet of energized electrical systems. Energized electrical systems means any AC or DC electrical circuit on an assembled aircraft once electrical power is connected, including interior passenger and cargo areas, wheel wells and tail sections; and
- m. Cleaning operations identified in an Essential Use Waiver which has been reviewed and approved by the U.S. EPA and the voting parties of the International Montreal Protocol Committee [sections 604(d)(1) and (g)(2) of the Act].

308.4 General Exemptions: Cotton-tipped swabs used for very small cleaning operations and aqueous cleaning solvents are exempt from the requirements of Section 307 of this rule.

308.5 Small Sources: Sections 301 and 302 of this rule shall not apply to any one facility from which the total VOC emissions from all operations subject to this rule emit less than 15 pounds (6.8 kg) per day and less than two tons (1814 kg) per year of VOCs prior to any controls.

SECTION 400 – ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE SCHEDULE: All facilities subject to this rule shall meet all applicable provisions of this rule by October 4, 1999. The intention to use an ECS in

accordance with Section 302 of this rule shall be announced to the Control Officer in writing by July 6, 1999, and be in use by April 7, 2000.

SECTION 500 – MONITORING AND RECORDS

501 RECORDKEEPING AND REPORTING: Any person subject to this rule shall comply with the following requirements. Records shall be retained for five years and shall be made available to the Control Officer upon request.

501.1 Coatings: Each owner or operator using coatings listed in Section 301 of this rule shall maintain a current list of coatings in use, VOC content as applied and records of the monthly usage of such materials in pounds per gallon or grams per liter.

501.2 Cleaning Solvents: Each owner or operator shall:

- a. Maintain a current list of all aqueous and semi-aqueous hand-wipe cleaning solvents used with corresponding water contents.
- b. Maintain a current list of all vapor pressure compliant hand-wipe cleaning solvents in use with their respective vapor pressures or, for blended solvents, VOC composite vapor pressures and records of the monthly usage of such cleaning solvents.
- c. Maintain a current list of all hand-wipe cleaning processes using cleaning solvents with a vapor pressure greater than 45 mm Hg and records of the monthly usage of such cleaning solvents.

501.3 Enclosed Spray Gun Cleaners: Any person using an enclosed spray gun cleaner shall visually inspect the seals and all other potential sources of leaks at least once per month while the spray gun cleaner is in operation. Records of these inspections shall be kept and made available upon request by the Control Officer.

502 COMPLIANCE DETERMINATION: The test methods for those subparts of 40 CFR Part 60, Appendix A adopted as of July 1, 1998, as listed below, are adopted by reference as indicated. These adoptions by reference include no future editions or amendments. Copies of test methods referenced in subsection 502.1 are available at the Maricopa County Air Quality Department, 1001 N. Central Ave., Phoenix, AZ, 85004. When more than one test method is permitted for a determination, an exceedance of the limits established in the rule determined by any of the applicable test methods constitutes a violation of this rule.

502.1 Test Methods:

- a. **Coatings:** The VOC content of coatings (less water and less non-precursor organic compounds) as applied shall be determined by manufacturer's supplied data or Method 24 of 40 CFR part 60, Appendix A. If there is a discrepancy between the manufacturer's formulation data

and the results of the Method 24 analysis, compliance shall be based on the results from the Method 24 analysis. For waterborne (water-reducible) coatings, only manufacturer's supplied data can be used to determine the VOC content of each formulation.

- b. Control Equipment:** Measurements of VOC emissions from control equipment shall be conducted in accordance with EPA Methods 18, 25, and/or 25A, 40 CFR 60, Appendix A.