CONDITIONAL EXEMPTION REQUEST

WALT DISNEY WORLD CO.

SEPTEMBER 30, 1998

SUPPLEMENTAL INFORMATION

CONTENTS

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
   Name: Lee Schmudde
   Title: Vice-President, Legal

2. Owner/Authorized Representative or Responsible Official Mailing Address:

   Organization/Firm: Walt Disney World, Co.
   Street Address: P.O. Box 10,000
   City: Lake Buena Vista State: FL Zip Code: 32830-1000

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: (407) 828-3701 Fax: (407) 828-3239

4. Owner/Authorized Representative or Responsible Official Statement:

   I, the undersigned, am the owner or authorized representative of the facility (non-Title V source) addressed in this Application for Air Permit or the responsible official, as defined in Chapter 62-213, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described in this application so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. If the purpose of this application is to obtain an air operation permit or operation permit revision for one or more emissions units which have undergone construction or modification, I certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

Signature

9/30/15A
Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: Robert Beaver
   Registration Number: 32528

2. Professional Engineer Mailing Address:

   Organization/Firm: Walt Disney World Co.
   Street Address: P.O. Box 10,000
   City: Lake Buena Vista State: FL Zip Code: 32830-1000

3. Professional Engineer Telephone Numbers:
   Telephone: (407) 828- 1584 Fax: (407) 934- 7927

4. Professional Engineer Statement:

   I, the undersigned, hereby certify, except as particularly noted herein, that:*

   (1) To the best of my knowledge, there is reasonable assurance (a) that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; or (b) for any application for a Title V source air operation permit, that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application;

   (2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application; and

   (3) For any application for an air construction permit for one or more proposed new or modified emissions units, the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

   Signature   Date 9/30/98

   (seal)

* Attach any exception to certification statement.

Attachment A

NSA Boat Maintenance and Painting Facility

Class	Manufacturer	Material Name	Maximum Annual Usage, gal	lb VOC/gal	Potential VOC Emissions: Annual lb	Annual tons	Hourly, lb/hr
Acrylic Polyurethane	Froggy Primers & Paints	Super-Zinc 5	100	3.5	350	0.18	8.8
Acrylic Polyurethane	Sikkens	Autocryl Filler (spray ready)[1]	100	4.4	437	0.22	10.9
Epoxy coating	American Finishes	Amer-Poxy primers (ready to spray)[2]	100	5.3	530	0.27	13.3
Epoxy primer	Sikkens	Washprimer CR (ready to spray)[3]	100	6.3	630	0.32	15.8
Polyurethane undercoat	Froggy Primers & Paints	Supertuff	100	3.0	300	0.15	7.5
Sign Paint	Akzo Nobel	Grip-Flex Intermix (ready to spray)[4]	50	7.6	380	0.19	19.0
Specialty Clear	Dupont	Adhesion Promoter 222S	50	6.6	330	0.17	16.5
Urethane Alkyd Enamel	Gavlon	Gavlon 510 (various colors)	100	4.6	460	0.23	11.5
		Totals	**700 gallons**		**3,417**	**1.7**	**19.0**

Application Rates - based on production capacity

Typical Application Rate	**100**	gal/yr
Maximum usage rate:	**10**	gal/hr
Maximum usage rate:	**700**	gal/yr

Emissions factor calculations:

Annual pounds VOC applied:	**3,417**
Annual tons VOC applied:	**1.7**

[1]Reference techical data sheet, based on mix ratio of 10 parts paint , 5 parts hardener, 3 parts reducer

Autocryl filler:	*3.1 lb VOC/gal*
Autocryl hardener 1•2•3 or MS40:	*5.0 lb VOC/gal*
Sikkens reducer 1•2•3 Slow:	*7.6 lb VOC/gal*
Spray ready = (10 x 3.1 + 5 x 5.0 + 3 x 7.6) ÷ 18 parts=	***4.4 lb VOC/gal***

[2]Reference techical data sheet, based on mix ratio of 2 parts AP primer, 1 part AP catalyst, 1 part UT reducer

AP Primer	*4.3 lb VOC/gal*
AP Catalyst	*5.2 lb VOC/gal*
UT Reducer	*7.4 lb VOC/gal*
Spray ready = (2 x 4.3 + 1 x 5.2 + 1 x 7.4) ÷ 4 parts =	***5.3 lb VOC/gal***

[3]Reference techical data sheet, based on mix ratio of 1 parts Washprimer CR, 1 part Washhardener

Washprimer CR	*5.9 lb VOC/gal*
Washhardener	*6.7 lb VOC/gal*
Spray ready = (1 x 5.9 + 1 x 6.7) ÷ 2 parts =	***6.3 lb VOC/gal***

[4]Reference techical data sheet, based on mix ratio of 1 parts Grip-Flex, 2 parts T2003 or T2004 reducers

Grip-Flex	*7.5 lb VOC/gal*
T2003	*6.8 lb VOC/gal*
T2004	*7.6 lb VOC/gal*
Spray ready = (1 x 7.5 + 2 x 7.6) ÷ 3 parts =	***7.6 lb VOC/gal***

FRöGGY Primers & Paints

SUPER-ZINC 5

DESCRIPTION: High solids, zinc loaded, moisture-cured single component polyurethane primer/top coat

COLOR/GLOSS: Light gray color - flat

USE:
As a high performance primer on steel
As a fast dry shop primer
As a primer for polyurethane or epoxy top coats
As a solution for coating cold or damp surfaces

SOLIDS BY VOLUME: 52%

VOC CONTENT: 3.5 pounds per gallon (442 grams per liter)

COVERAGE: 280 square feet at 3 MILS

NUMBER OF COATS: 1

TYPICAL SYSTEMS:
a. 1 or 2 coats at 3 to 4 mils Super-Zinc 5
b. 1 coat at 2 to 3 mils Super-Zinc 5 plus finish coats of polyurethanes

DRY TIMES:
TO TOUCH: 15 to 30 minutes
TO HANDLE: 4 to 6 hours
TO RECOAT: 30 minutes with itself or 6 hours to overnight depending on top coat used
TO IMMERSE: 1 hour

FEATURES OF THIS PRODUCT:

* When applied by brush, coating will level out
* Can be applied over damp/cold surfaces
* Harder finish in less time than conventional primers. Smooth, dense finish, no overspray

Froggy Primers & Paints PO Box 766 Boca Raton, FL 33429
Phone 561-393-0336, FAX 561-395-5262, eMail froggyfl@aol.com

problems, no bubbling when topcoats are applied. Very fine zinc particle
* zinc-rich qualities give cathodic protection to coated steel
* can be applied below 32°F and humidities up to 99%
* single component advantage - no mixing or measuring

APPLICATION INFORMATION:

SURFACE PREPARATION:	* Immersion: SSPC-SP 10 "near white blast cleaning" with 1.0 to 2 mil profile * non-immersion: SSPC-SP6 "commercial blast cleaning" as a minimum preferred
METHOD:	brush, roller, conventional or airless spray
THINNER:	Z-34

ORDERING INFORMATION:

PACKAGING:	1 gallon cans 3 gallon drums

ADDITIONAL INFORMATION:

SAFETY:	see msds
APPLICATION:	see detailed directions
TEMPERATURE RESISTANCE:	dry continuous 360°F dry intermittent 420°F
TECHNICAL:	* see chemical resistance chart * may be welded

This information is presented as accurate and correct, in good faith, to assist the user in specification and application. No warranty is expressed or implied. No liability is assumed. Product specifications are subject to change without notice.

MATERIAL SAFETY DATA SHEET

MANUFACTURER: FROGGY PRIMERS & PAINTS
P. O. Box 766
BOCA RATON,
FL. 33429.
USA.

EMERGENCY PHONE: [800)424-9300

PREPARATION DATE: October 1, 1996

SECTION 1: IDENTIFICATION

PRODUCT NAME: SUPER ZINC
PRODUCT CODE: 6035
DOT SHIPPING NAME: PAINT,PAINT RELATED MATERIAL
DOT ID NUMBER: UN 1263
DOT HAZARD CLASSIFICATION: FLAMMABLE LIQUID
PRODUCT APPEARANCE & ODOR: LIQUID ,SOLVENT ODOR

SECTION 2: COMPONENTS & HAZARD INFORMATION

COMPONENT	CAS No.	CONC. %W/W	OSHA TWA	ACGIH TLV
NAPTHA	64742-95-6	10-30	50 PPM	
ZINC	7440-66-6	30-60	10 MG/M3	
ZINC OXIDE	1314-13-2	1-5	10 MG/M3	
DIPHENYLMETHANE DIISOCYANATE (MD)	26447-40-5	1-5	0.02 MG/M3	

SECTION 3: PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING RANGE: 305° -340°F
EVAPORATION RATE [BuAc = 1]: N/A
SPECIFIC GRAVITY: 2.65±5@ 77°F
VAPOR DENSITY [Air = 1]: NA
SOLUBILITY IN WATER: REACTS
VAPOR PRESSURE (mm Hg): 1.33 Kpa at 100°F
VISCOSITY: 1100 CPS @ 77°F
VOIATILES (% WEIGHT): C. 22

SECTION 4: REACTIVITY DATA

STABILITY: Stable
CONDITIONS TO AVOID: sparks, open flames, heat and excesive heat
INCOMPATIBILITY: Water,amines, strong bases, alcohols
HAZARDOUS DECOMPOSITION PRODUCTS:Carbon monoxide, oxides of nitrogen
HAZARDOUS POLYMERIZATION: Will not occur

SECTION 5: FIRE AND EXPLOSION INFORMATION

FLASH POINT [PM CC]: 105°F
EXPLOSIVE LIMIT [% Vol.]: UPPER 7 LOWER 0.6
NFPA HAZARD CLASS HEALTH: 1 FLAMMABILITY: 3 REACTIVITY: 1
[HAZARD RANKING: 0 = LEAST 1 = SLIGHT 2 = MODERATE 4 = EXTREME]
UNUSUAL FIRE/EXPLOSION HAZARDS: None known
EXTINGUISHING MEDIA: Dry chemical, foam,water fog, CO2
SPECIAL FIRE-FIGHTING PROCEDURES: Wear self-contained breathing apparatus in confined areas or when exposed to combustion products. Use water spray to cool fire exposed containers. Cover with sand or earth.
HAZARDOUS COMBUSTION PRODUCTS: C0, CO2, OXIDES OF NOTROGEN, ZINC OXIDE FUMES

SECTION 6: HEALTH HAZARDS AND ROUTES OF ENTRY

EYE CONTACT: May cause mild eye irritation.
SKIN CONTACT: May cause mild skin irritation. Prolonged or repeated skin contact may cause allergic sensitization.
INHALATION: Breathing vapors or mists may cause irritation of the nose and throat.
INGESTION: Ingestion of quantities may cause irritation of the digestive tract, and cause adverse heath effects.

SECTION 7: EMERGENCY AND FIRST-AID PROCEDURES

EYE CONTACT: Flush with lots of clean water for 15 minutes. If irritation or redness develops and persists, seek medical attention.
SKIN CONTACT: Remove contaminated clothing and wash affected areas thoroughly with mild soap and water. If irritation or redness develops and persists, seek medical attention.
INHALATION: Move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.
INGESTION: Aspiration hazard. Do not induce vomiting or give anything by mouth as this material can enter lungs and cause severe lung damage. If victim is drowsy or unconscious, place head on left side with the head down. If possible, do not leave victim unattended. Seek medical attention. NOTE TO PHYSICIAN; GASTRIC LAVAGE MAY BE NECCESSARY

SECTION 8: SPECIAL PROTECTION INFORMATION

VENTILATION: Maintain airborne concentrations below the established exposure limits [see Section 2] via mechanical ventilation or exhaust systems as necessary.
RESPIRATORY PROTECTION: Respiratory protection is advised when concentrations exceed the established exposure limits. Depending on the airborne concentration use a respirator or gas mask with appropriate cartridges or cannisters [NIOSH approved] or supplied air equipment.
EYE PROTECTION: Approved eye protection [eg, goggles with side shields] is recommended to safeguard against potential eye contact, irritation, or injury.
SKIN: Chemical resistant gloves (butyl or nitrile rubber) recommended.
OTHER PROTECTIVE MEASURES: WEAR IMPERMEABLE APRON & BOOTS. EYE BATH & SAFETY SHOWER SHOULD BE AVIALABLE.

COMMENTS: A source of clean water should be readily accesible in the work area for flushing eyes and skin. Chemical and solvent resistant clothing should be worn. Good manufacturing practices should always be followed.

SECTION 9: SPILL AND LEAK PROCEDURES

PRECAUTIONS IN CASE OF RELEASE OR SPILL:Flammable Keep all sources of ignition and hot metal surfaces away from spill/release. Isolate hazard area and limit entry. Stop spill/release if it can be done without risk. Wear appropriate protective equipment as conditions warrant. Avoid eye and skin contact and inhalation of vapors. Prevent spilled material from entering sewers, storm drains, and natural waterways. Dike and pump away far ahead of spill for later recovery and disposal. Use absorbent material for pick-up. Notify fire authorities and appropriate federal,state, and local agencies. Immediate clean-up of any spill material is recommende.

WASTE DISPOSAL METHODS: Dispose of product in accordance with local, state, and federal regulations.

SECTION 10: STORAGE AND SPECIAL PRECAUTIONS

Store in a cool, dry location. Store away from ignition sources. Store in tightly closed containers

SECTION 11: PRECAUTIONARY WARNING

WARNING ! FLAMMABLE. ASPIRATION HAZARD IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. KEEP AWAY FROM HEAT, SPARKS, FLAME, OR OTHER IGNITION SOURCES [eg, STATIC ELECTRICITY, PILOT LIGHTS, OR MECHANICAL/ELECTRICAL EQUIPMENT]. DO NOT TASTE OR SWALLOW. IF SWALLOWED, DO NOT INDUCE VOMITING. CALL A PHYSICIAN. IN CASE OF CONTACT, FLUSH EYES OR SKIN WITH LOTS OF CLEAN WATER .

SECTION 12: DOCUMENTARY INFORMATION

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date of issuance. However, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED, OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION, OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.

This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose, and on the condition that he assumes the risk of his use thereof.

AUTOCRYL® FILLER OFF WHITE

DESCRIPTION:

Autocryl Filler Off White is a tintable zinc chromate free acrylic urethane surfacer that can be used in two different ways:

1. As a wet-on-wet (non-sanding) primer-sealer that may be topcoated with Autocryl or Autobase.
2. As a primer-surfacer that can be sanded for extra smoothness. Being urethane based, Autocryl Filler Off White provides excellent holdout of gloss of the topcoats applied over it.

Its wet-on-wet qualities make it an ideal primer-sealer for car refinishing and commercial vehicle finishing. For commercial vehicles, it is recommended to first apply a coat of Washprimer CR.

PRODUCT & ADDITIVES:

PRODUCT: Autocryl Filler Off White

HARDENERS:
—Autocryl Hardener 1·2·3™
—Autocryl Hardener MS40: may be used in place of Autocryl Hardener 1·2·3. This will not affect the mixing ratio, flow or drying characteristics of Autocryl Filler Off White (See TDS #6.58).

REDUCERS:
—Sikkens Reducer 1·2·3 Fast: for spot and panel repairs.
Temperature Range: 60°F–75°F (16°C–24°C).
—Sikkens Reducer 1·2·3 Slow: for spot and panel repairs.
Temperature Range: 70°F–85°F (20°C–30°C). Also for larger areas at lower temperatures.
—Sikkens Reducer 1·2·3 Extra Slow: for larger areas and overall refinishing.
Temperature Range: 80°F–95°F (27°C–35°C).

ADDITIVES:
—Sikkens Retarder: to be used in combination with Sikkens Reducer 1·2·3 during high temperature or while spraying very large objects (See TDS #6.20).
—Autocryl Elast-O-Actif: to be used to increase the flexibility of Autocryl Filler Off White when applied to plastic parts (See TDS #6.8).

BASIC RAW MATERIALS:
Autocryl Filler Off White: Hydroxy acrylic resins
Autocryl Hardener 1·2·3: Polyisocyanate resin
Autocryl Hardener MS40: Polyisocyanate resin

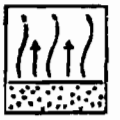
APPLICATION:

1.  Contains acrylic resins, xylene and other ingredients. When mixed, Autocryl Filler Off White contains isocyanates.

2.  100:50:30
Autocryl Filler Off White
Autocryl Hardener 1·2·3/
Autocryl Hardener MS40
Sikkens Reducer 1·2·3

3.  Use the Sikkens Measuring Stick #1 (Black).

4.  2–3 : 1
0.058"–0.067" (1.4–1.7 mm)
40–50 psi (3–4 bar)

5.  5–10 minutes at 70°F (20°C)

6.  (Wet-On-Wet)
Minimum 15 min. at 70°F (20°C)
(Non-Sanding)
Maximum 7 hours at 70°F (20°C)

AUTOCRYL® FILLER OFF WHITE

SUITABLE SURFACES:

Autocryl Filler Off White can be applied over:
—Existing finishes, degreased and sanded with #240 to #320 grit paper dry or #400 to #500 grit wet.
—Steel, degreased and sanded with #80 then #120 grit dry.
—Fiberglas gelcoat, degreased and sanded with #240 grit dry. If the gelcoat is broken and has been sanded through, under no circumstance should Autocryl Filler Off White be applied. Recommended is the use of Polysurfacer. Please see TDS #3.5.1.
—Autocryl Filler 3+1or Autonova® Filler, sanded with #320 to #360 grit dry or #500 to #600 grit wet.
—Sikkens Washprimers, after applying 1 coat, allow Washprimer CR to dry for 15–20 minutes or Washprimer EM to dry for 30 minutes. Then, non-sanding, proceed with Autocryl Filler Off White.
—Primer Surfacer EP, allow the correct drying time, then sand with #320 to #360 grit paper dry or #500 to #600 grit wet.
—Kombi Putty, sanded with #240 to #280 grit dry or #400 to #500 grit wet.

Although Autocryl Filler Off White will provide adequate adhesion and protection when applied directly over bare steel, for larger areas or new vehicles including zinc coating, stainless steel and aluminum, Autocryl Filler Off White must always be applied over Washprimer CR. (See TDS #1.1.8)

MIXING RATIO:

100 Parts by volume of Autocryl Filler Off White
50 Parts by volume of Autocryl Hardener 1·2·3 or Autocryl Hardener MS40
30 Parts by volume of Sikkens Reducer 1·2·3.
For easy and accurate mixing, use the Sikkens Measuring Stick #1 (black).

SPRAYING VISCOSITY:

17–18 sec. ZAHN cup #2 (15–16 sec. DIN cup #4) at 70°F (20°C)

POT LIFE:

Four hours at 70°F (20°C) Two hours at 80°F (28°C)

SPRAY GUN & PRESSURE:

	Fluid Tip	Spraying Pressure	Fluid Pressure
Siphon Feed	0.055"–0.067" (1.4–1.7 mm)	40–50 psi (3–4 bar)	
Gravity Feed	0.051"–0.055" (1.3–1.4 mm)	40–50 psi (3–4 bar)	
Pressure Feed	0.039"–0.047" (1.0–1.2 mm)	40–50 psi (3–4 bar)	8–10 psi (0.6–0.8 bar)
HVLP Siphon	0.071"–0.087" (1.8–2.2 mm)	max 10 psi (max 0.8 bar)	
HVLP Gravity	0.051"–0.059" (1.3–1.5 mm)	max 10 psi (max 0.8 bar)	

AUTOCRYL® FILLER OFF WHITE

APPLICATION METHOD:

—As a Wet-On-Wet (Non-Sanding) Primer Sealer:
Always spray one thin, single coat first, especially over bare metal areas. Allow this to flash for 5–10 minutes, then apply one single wet coat. If necessary, one more single coat may be applied after an additional 5–10 minute flash time.

—As a Primer-Surfacer that can be sanded for extra smoothness:
Apply two to three single flowing coats, allowing 5–10 minutes flash time between coats. The number of coats depends on the film thickness desired.

FILM THICKNESS:

1.0–1.2 mil per single wet coat.

CLEANING OF EQUIPMENT:

With Sikkens Cleaning Solvent or lacquer thinner.

DRYING TIME:

	70°F (20°C)	80°F (27°C)	100°F (38°C)	140°F (60°C)
To Sand	8 hours	7 hours	3 hours	1 hour
To Recoat (wet-on-wet)	15 minutes	10 minutes	10 minutes	N/A

NOTE:

Autocryl Filler Off White can be top coated wet-on-wet after a flash off time of 15 minutes at 70°F (20°C) at which time the product has set to an eggshell gloss. Within a maximum of 7 hours at 70°F (20°C), it can be top coated with Autocryl and Autobase without sanding. After a drying time of 7 hours at 70°F (20°C), Autocryl Filler Off White must be sanded before further recoating.

SANDING:

After the stated dry times, Autocryl Filler Off White can be sanded with #360 to #400 grit paper dry or #500 to #600 grit wet.

RECOATABILITY:

Autocryl Filler Off White (wet-on-wet or sanded) can be top coated with either Autocryl or Autobase.

SPOT REPAIRS:

Spot repairs or fading out can be made with Autocryl Filler Off White (wet-on-wet). After applying the two coats in the repair area, add to the ready to spray material, 100% Sikkens Reducer 1-2-3 and fade out in the area adjacent to the repair. Then spray pure Reducer SRA to complete the fade out. (See TDS #6.28, Reducer SRA.)

TINTING:

If desired, Autocryl Filler Off White can be tinted with 10% of Autocryl toners. Recommended toners are: Black 242, Red 568, Blue 575, Green 732, Yellow 558

spray pure Reducer SRA to complete the fade out. (See TDS #6.28, Reducer SRA.)

TINTING: If desired, Autocryl Filler Off White can be tinted with 10% of Autocryl toners. Recommended toners are: Black 242, Red 568, Blue 575, Green 732, Yellow 558. The Autocryl toner should be added before hardening and reducing Autocryl Filler Off White.

COVER RATE: Approximately 270 sq. ft./liter of unmixed paint per single coat.

AUTOCRYL® FILLER OFF WHITE

STOCK KEEPING:

COLOR: Off-white

CONTAINER SIZE:

Autocryl Filler Off White:	1 quart (946 ml) and 1 gallon (3.785 lt)
Autocryl Hardener 1·2·3:	1 quart (946 ml) and 1 gallon (3.785 lt)
Autocryl Hardener MS40:	1 pint (475 ml), 1/2 gallon (1.89 lt) and 1 gallon (3.785 lt)
Sikkens Reducer 1·2·3:	1 gallon (3.785 lt) and 5 gallons (18.9 lt)

SHELF LIFE:

Autocryl Filler Off White:	Two years if stored unopened at room temperature
Autocryl Hardener 1·2·3:	One year if stored unopened at room temperature
Autocryl Hardener MS40:	One year if stored unopened at room temperature

SAFETY ASPECTS:

FLASH POINTS (CLOSED CUP):

Autocryl Filler Off White:	78°F (26°C)
Autocryl Hardener MS40:	97°F (36°C)
Autocryl Hardener 1·2·3:	81°F (27°C)
Sikkens Reducer 1·2·3 Extra Slow:	75°F (24°C)

VOC CONTENT:

Autocryl Filler Off White:	3.1 lb/gal	370 g/liter
Autocryl Hardener 1·2·3:	5.0 lb/gal	600 g/liter
Autocryl Hardener MS40:	5.0 lb/gal	600 g/liter
Sikkens Reducer 1·2·3 Slow:	7.6 lb/gal	910 g/liter

READY TO SPRAY VOC:

Mixing Ratio: 100:50:30	4.3 lb/gal	515 g/liter

NOTICE: Do not handle until the Material Safety Data Sheets have been read and understood. Regulations require that all employees be trained on Material Safety Data Sheets for all chemicals with which they come in contact. The manufacturer recommends the use of an air supplied respirator when exposed to vapors or spray mist.

American FINISHES™

PRODUCT AND APPLICATION INFORMATION
Page 1 of 3
June 1996

AP440sp (gray), AP450sp (white), AP410Csp (epoxy primer catalyst), AP420Csp (fast primer catalyst)

DESCRIPTION:

Amer-Poxy primers, mixed 2:1 with AP410Csp or AP420Csp catalyst, produce a lead and chromate free epoxy primer that provides excellent adhesion to many types of properly prepared steel, galvanized steel, fiberglass, aluminum, and plastic body fillers. Amer-Poxy primers are corrosion resistant. With some reduction modification they may be used as an excellent sealer to be topcoated with American Finishes fleet and automotive refinish color coats.

PRODUCTS:

AP440sp	Gray Epoxy Primer
AP450sp	White Epoxy Primer
AP410Csp	Epoxy Primer Catalyst
AP420Csp	Fast Epoxy Primer Catalyst

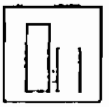
PREPARATION:

Wash surface with soap and water, then clean with ST600sp Wax and Grease Remover or ST700sp Low VOC Wax and Grease Remover.

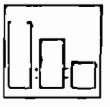
Sand bare metal with 80-180 grit abrasive. Sand old finishes with 320-400 grit dry or 600 grit wet.

Reclean with ST600sp or ST700sp. Chemical treatment or the use of conversion coatings will improve adhesion and performance of the finish system. Prime aluminum and stainless substrate within 72 hours. **PRIME CARBON STEEL IMMEDIATELY AFTER CLEANING.**

MIXING:



2 parts AP Primer : 1 part AP Catalyst gives 3.6# VOC/gal.



2 parts AP Primer: 1 part AP Catalyst: ½ part UT Reducer gives 5.0# VOC/gal.
2 parts AP Primer : 1 part AP Catalyst : 1 part UT Reducer gives 5.3# VOC/gal.

AMERICAN FINISHES ★ 8201 - 100TH Street ★ Kenosha, Wisconsin 53142-7739
Phn: 800-947-4349 ★ Fax: (414)947-0444

Amer-Poxy Primers may be reduced as sealers with UT reducers based upon current VOC limits. Above information indicates VOC per gallon at different reductions.

DO NOT BLEND AP410Csp AND AP420Csp CATALYSTS.

Note - thoroughly mix AP Primer and AP Catalyst (5 minutes mechanical agitation recommended). Once mixed, allow 30 minutes induction period if using AP410Csp. No induction period is necessary if using AP420sp.

Pot Life:
with AP410Csp : 72 hours at 70°F (21°C)
with AP420Csp : 8 hours at 70°F (21°C)

APPLICATION INSTRUCTIONS:

Air Pressure HVLP: 10psi at the air cap
Conventional: 50psi at the gun

Coats: **Apply 1-2 medium coats to achieve 0.7-1.5 mils Dry Film Thickness. Apply 1.0 mils minimum over bare metal.**

DRY TIMES:

Between coats allow 10-15 minutes

Dry time to topcoat:	AP410Csp	AP420Csp
Primer w/o reducer	60 minutes	30 minutes
Sealer w/reducer	30 minutes	15 minutes

NOTE: If used over lacquer products all topcoats must be applied the same day or lifting will occur.

TINTING & ADDITIVES:

Amer-Poxy Primer cannot be tinted. AP primers may be blended if all portions are properly catalyzed. Additives cannot be added to AP primers.

PAINTING OF FLEXIBLE PARTS:

Amer-Poxy Primer reduced as a sealer with UT reducer may be used on flexible parts other than bare polypropylene or TPO substrates. Use AP410Csp catalyst. Do not use AP420Csp catalyst.

AMERICAN FINISHES ★ 8201 - 100TH Street ★ Kenosha, Wisconsin 53142-7739
Phn: 800-947-4349 ★ Fax: (414)947-0444

REPAIR OR RECOATING:

Amer-Poxy primer may be recoated up to one week. After one week AP primer must be cleaned with ST600sp or ST700sp Wax and Grease Remover then scuffed with a medium/fine Scotchbrite™ or fine sandpaper.

Reclean with ST600sp or ST700sp and reapply one additional coat of AP primer. Allow 30 minutes dry time at 70°F (21°C) before applying additional finishing products.

CLEAN UP:

Clean equipment thoroughly with UT Reducer or other appropriate solvent after each use.

Follow EPA guidelines for proper storage and disposal of solvent borne waste paint.

PROPERTIES:

VOC AP Primer-	Package:	4.3 lbs/gallon US
VOC AP Catalyst-	Package:	5.2 lbs/gallon US
VOC - 2:1 Ratio-	Applied:	4.6 lbs/gallon US

Excellent humidity resistance (500 hrs. at 100°F/38°C and 100% relative humidity)
Excellent salt spray resistance (500 hrs at 100°F/38°C with 5% solution)
Very good color holdout

IMPORTANT

The contents of this package may have to be blended with other components before the product can be used.

Before opening the packages, be sure you understand the warning messages on the labels of all components, since the mixture will have hazards of all its parts. Spray equipment must be handled with due care and in accordance with manufacturer's recommendations. Follow label directions for respirator use. Wear eye and skin protection. Observe all applicable precautions.

See Material Data Safety Sheet and Labels for additional information and handling instructions. EMERGENCY MEDICAL OR SPILL CONTROL INFORMATION (800)424-9300;IN CANADA (514)645-1320.

WARNING

Proper performance of Amer-Poxy Primers and other American Finishes products requires blending, according to directions, of multiple products. Substitution of alternate materials, whether American Finishes brand or other, or varying from specified ratios, voids any and all written, unwritten or implied performance warranties.

AMERICAN FINISHES ★ 8201 - 100TH Street ★ Kenosha, Wisconsin 53142-7739
Phn: 800-947-4349 ★ Fax: (414)947-0444

WASHPRIMER CR

DESCRIPTION:

A transparent yellow, self-etching washprimer with superior corrosion resistance and excellent adhesion on steel, galvanized steel, aluminum and stainless steel. Initially developed for the aircraft industry, but modified to be used in the car refinishing, commercial and agricultural vehicle market eliminating the need for metal conditioning.

PRODUCT & ADDITIVES:

PRODUCT: Washprimer CR

HARDENER: Washhardener

BASIC RAW MATERIAL:

Washprimer CR: Polyvinyl butyral resins
Washhardener: Phosphoric acid

APPLICATION:

1. 

Contains polyvinyl butyral resins.
When mixed, contains phosphoric acid.

2. 

100:100
Washprimer CR
Washhardener

3. 

Use the Sikkens Measuring Stick.
All Measuring Sticks may be used.

4. 

1x1
0.063"–0.071" (1.6–1.8 mm)
40–50 psi (3–4 bar)

5. 

(non-sanding)
After 15 minutes at 70°F (20°C)
Within 8 hours at 70°F (20°C)

SUITABLE SURFACES:

—Steel, after degreasing and sanding with #80 then #120 grit paper dry or scuff with a red scuffing pad.
—Galvanized steel, after degreasing and sanding with #120 grit dry or scuff with a red scuffing pad.
—Aluminum, after degreasing, scuff with a red scuffing pad or sand with #150 to #180 grit dry.
—Stainless steel, after degreasing and sanding with #150 to #180 grit dry or scuff with a red scuffing pad.

—Stainless steel, after degreasing and sanding with #150 to #180 grit dry or scuff
h a red scuffing pad.

WASHPRIMER CR

MIXING RATIO: Mix: 100 parts by volume of Washprimer CR with
100 parts by volume of Washhardener
For easy and accurate mixing, use the Sikkens Measuring Stick.

SPRAYING VISCOSITY: The proper spraying viscosity is achieved by using a 1:1 mixing ratio.
17–18 sec. ZAHN cup #2 (15–16 sec. DIN #4) at 70°F (20°C).

POT LIFE: 8 hours at 70°F (20°C).

SPRAY GUN & PRESSURE:

	Fluid Tip	Spraying Pressure	Fluid Pressure
Siphon Feed	0.063"–0.071" (1.6–1.8 mm)	40–50 psi (3–4 bar)	
Gravity Feed	0.055"–0.063" (1.4–1.6 mm)	40–50 psi (3–4 bar)	
Pressure Feed	0.039"–0.047" (1.0–1.2 mm)	40–50 psi (3–4 bar)	8–10 psi (0.6–0.8 bar)
HVLP Siphon	0.087"–0.099" (2.2–2.6 mm)	max 10 psi (max 0.8 bar)	
HVLP Gravity	0.059"–0.071" (1.5–1.8 mm)	max 10 psi (max 0.8 bar)	

RECOMMENDED CONDITIONS OF

RECOMMENDED CONDITIONS OF APPLICATION:

Minimum temperature: 60°F (15°C)
Relative humidity: maximum 75%

APPLICATION METHOD:

Only apply one medium coat. Do not attempt to spray until coverage is achieved since the material is transparent.

FILM THICKNESS:

0.3 – 0.4 mils for this one medium coat.

CLEANING OF EQUIPMENT:

With Sikkens Cleaning Solvent or lacquer thinner.

DRYING TIME:

	60°F (15°C)	70°F (20°C)	100°F (38°C)
Dust Free	15 minutes	10 minutes	8 minutes
Recoat	25 minutes	15 minutes	10 minutes
To Sand	N/A	N/A	N/A

NOTE:

Do not sand Washprimer CR.

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WASHPRIMER CR

RECOATABILITY: Washprimer CR can be recoated (non-sanding) after 15 minutes but within 8 hours at 70°F (20°C) with: Autocryl® Filler 3+1, Autocryl Filler 3110, Autocryl Filler Off White, Autocryl Sealer Transparent, Autosurfacer Non-Sanding, Autonova® Filler, Priming

RECOATABILITY: Washprimer CR can be recoated (non-sanding) after 15 minutes but within 8 hours at 70° F (21°C) with: Autocryl® Filler 3+1, Autocryl Filler 3+1, Autocryl Filler Off White, Autocryl Sealer Transparent, Autosurfacer Non-Sanding, Autonova® Filler, Priming Filler 680, Autocoat LV, and Autocryl.

NOTE: Do not apply Autobase directly over Washprimer CR.

NOTE: Never apply a polyester based product directly over Washprimer CR.

COVER RATE: Approximately 260 sq. ft./liter of unmixed paint per single coat.

STOCK KEEPING:

COLOR: Yellow

CONTAINER SIZE:
Washprimer CR: 1 quart (946 ml) and 1 gallon (3.785 lt)
Washhardener: 1 quart (946 ml) and 1 gallon (3.785 lt)

SHELF LIFE: One year if stored unopened at room temperature.

SAFETY ASPECTS:

FLASH POINT (CLOSED CUP):

Washprimer CR:	55°F (13°C)
Washhardener:	46°F (8°C)

VOC CONTENT:

Washprimer CR:	5.9 lb/gal	710 g/liter
Washhardener:	6.7 lb/gal	805 g/liter

READY TO SPRAY VOC:

Washprimer CR:	6.3 lb/gal	755 g/liter

NOTICE: Do not handle until the Material Safety Data Sheets have been read and understood. Regulations require that all employees be trained on Material Safety Data Sheets for all chemicals with which they come in contact. The manufacturer recommends the use of an organic vapor respirator or air supplied respirator when exposed to vapors or spray mist.

AKZO NOBEL COATINGS 4041 Seaboard Rd, ORLANDO, FL 32808

FAX

Date: 8-5-98

Number of pages including cover sheet: 8

To: Bryan Fleis

Phone:

Fax phone:

CC:

From: D. MCGOWAN

Phone: (407) 578-5221

Fax phone: (407) 578-5230

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

Tech sheets on
(4pgs) 2072 W/ white filler +
(3pgs) 1042 CR primer follow:

FRöGGY Primers & Paints

SUPERTUFF

DESCRIPTION: MIOX flake filled, moisture-cured, single component, highly refined coal tar polyurethane, highly chemically resistant coating.

COLOR/GLOSS: Black; matte finish.

USE:
- As a safe substitute for coal tar epoxy.
- As a fast-set immersion finish coat for concrete, steel, or aluminum.

SOLIDS BY VOLUME: 60%

VOC CONTENT: 3 pounds per gallon (356 grams per liter.)

COVERAGE: Theoretical 239 square feet at 4 mils.

NUMBER OF COATS:
- As a finish coat: 1 or 2
- As a system (no primer): 3

TYPICAL SYSTEMS:
3 coats at 4 to 5 mils per coat
or
1 coat **SUPER-ZINC** at 2 to 3 mils.
2 coats of **SUPERTUFF** at 4 to 5 mils per coat.

DRY TIMES:

To Touch:	1 to 2 hours
To Handle:	12 hours
To Recoat:	2 to 4 hours
To Immerse:	1 hour

FEATURES OF THIS PRODUCT:
- Can immerse in one hour of application.
- No window on recoat times.
- Can be applied during humid or foggy conditions or in temperatures below freezing.
- Coal tar is refined and, so has less odor than coal tar epoxy
- Exceeds chemical resistance of coal tar epoxy.
- Excellent abrasion resistance, due to MIOX content.
- Will bond well to existing coal tar epoxy
- Bonds well to shop applied **SUPER-ZINC.**
- Out performs any coal tar epoxy.

Froggy Primers & Paints PO Box 766 Boca Raton, FL 33429
Phone 561-393-0336, FAX 561-395-5262, eMail froggyfl@aol.com

FRöGGY

Temperature Resistance:

Dry continuous:	250°F.
Dry intermittent:	300°F.
Wet continuous:	176°F.
Wet intermittent:	212°F.

APPLICATION INFORMATION:

Surface Preparation: Over other materials: Clean, may be damp.
Over bare steel: SSPC-SP10 "Near White Blast Cleaning".

Method: By mitt, brush, roller, conventional or airless spray

NOTE: Can be applied to marginally or lightly rusted surfaces as long as loose particles have been removed.Some reduction of ultimate performance may be encountered.

Thinner: Thinner: Z-34

ORDERING INFORMATION:

Packaging: 1 gallon cans.
5 gallon drums.

Weight (Net): 12.1 pounds per gallon.

ADDITIONAL INFORMATION:

Safety: See MSDS sheet.

Application: See application instructions.

This information is presented as accurate and correct, in good faith, to assist the user in specification and application. No warranty is expressed or implied. No liability is assumed. Product specifications are subject to change without notice.

MEMBER

MATERIAL SAFETY DATA SHEET

MANUFACTURER: FROGGY PRIMERS & PAINTS
P. O. Box 755
BOCA RATON,
FL. 33429.
USA.

EMERGENCY
PHONE: [800)424-9300

PREPARATION
DATE: October 1, 1996

SECTION 1: IDENTIFICATION

PRODUCT NAME: SUPER TUFF
PRODUCT CODE: 6035
DOT SHIPPING NAME: PAINT,PAINT RELATED MATERIAL
DOT ID NUMBER: UN 1263
DOT HAZARD CLASSIFICATION: FLAMMABLE LIQUID
PRODUCT APPEARANCE & ODOR: LIQUID ,SOLVENT ODOR

SECTION 2: COMPONENTS & HAZARD INFORMATION

COMPONENT	CAS No.	CONC. %W/W	OSHA TWA
NAPTHA	64742-95-6	10-30	100
REFINED TAR, VOLATILES	65996-93-2	1-10	N/D
4.4 DIPHENYLMETHANE DIISOCYANATE (MDI)	101-68-8	1-5	0.02 mg
MICAEOUS IRON OXIDE	12715-03-0	10-30	10MG/M3

SECTION 3: PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING RANGE: 305° -340°F
EVAPORATION RATE [BuAc = 1]: N/A
SPECIFIC GRAVITY: 1.43 @ 77°F
VAPOR DENSITY [Air = 1]: NA
SOLUBILITY IN WATER: REACTS
VAPOR PRESSURE 1.33 Kpa at 100°F

SECTION 4: REACTIVITY DATA

STABILITY: Stable
CONDITIONS TO AVOID: sparks, open flames, heat and excesive heat
INCOMPATIBILITY: Water,amines, strong bases, alcohols
HAZARDOUS DECOMPOSITION PRODUCTS:Carbon monoxide, oxides of nitrogen
HAZARDOUS POLYMERIZATION: Will not occur

SECTION 5: FIRE AND EXPLOSION INFORMATION

FLASH POINT [PM CC]: 105°F
EXPLOSIVE LIMIT [% Vol.]: UPPER 7 LOWER 0.6
NFPA HAZARD CLASS
HEALTH: 2 FLAMMABILITY: 3 REACTIVITY: 1
[HAZARD RANKING: 0 = LEAST 1 = SLIGHT 2 = MODERATE 4 = EXTREME]
UNUSUAL FIRE/EXPLOSION HAZARDS: None known
EXTINGUISHING MEDIA: Dry chemical, foam,water fog, CO2
SPECIAL FIRE-FIGHTING PROCEDURES: Wear self-contained breathing apparatus in confined areas or when exposed to combustion products. Use water spray to cool fire exposed containers. Cover with sand or earth.

SECTION 6: HEALTH HAZARDS AND ROUTES OF ENTRY

EYE CONTACT: May cause mild eye irritation.
SKIN CONTACT: May cause mild skin irritation. Prolonged or repeated skin contact may cause allergic sensitization.
INHALATION: Brathing vapors or mists may cause irritation of the nose and throat.
INGESTION: Ingestion of quantities may cause irritation of the digestive tract, and cause adverse heath effects.

SECTION 7: EMERGENCY AND FIRST-AID PROCEDURES

EYE CONTACT: Flush with lots of clean water for 15 minutes. If irritation or redness develops and persists, seek medical attention.
SKIN CONTACT: Remove contaminated clothing and wash affected areas thoroughly with mild soap and water. If irritation or redness develops and persists, seek medical attention.
INHALATION: Move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.
INGESTION: Aspiration hazard. Do not induce vomiting or give anything by mouth as this material can enter lungs and cause severe lung damage. If victim is drowsy or unconscious, place head on left side with the head down. If possible, do not leave victim unattended. Seek medical attention. NOTE TO PHYSICIAN: GASTRIC LAVAGE MAY BE NECCESSARY

SECTION 8: SPECIAL PROTECTION INFORMATION

VENTILATION: Maintain airborne concentrations below the established exposure limits [see Section 2) via mechanical ventilation or exhaust systems as necessary.

RESPIRATORY PROTECTION: Respiratory protection is advised when concentrations exceed the established exposure limits. Depending on the airborne concentration use a respirator or gas mask with appropriate cartridges or cannisters [NIOSH approved] or supplied air equipment.
EYE PROTECTION: Approved eye protection [eg, goggles with side shields] is recommended to safeguard against potential eye contact, irritation, or injury.
SKIN: Chemical resistant gloves (butyl or nitrile rubber) recommended.
COMMENTS: A source of clean water should be readily accesible in the work area for flushing eyes and skin. Chemical and solvent resistant clothing should be worn. Good manufacturing practices should always be followed.

SECTION 9: SPILL AND LEAK PROCEDURES
PRECAUTIONS IN CASE OF RELEASE OR SPILL:Flammable Keep all sources of ignition and hot metal surfaces away from spill/release. Isolate hazard area and limit entry. Stop spill/release if it can be done without risk. Wear appropriate protective equipment as conditions warrant. Avoid eye and skin contact and inhalation of vapors. Prevent spilled material from entering sewers, storm drains, and natural waterways. Dike and pump away far ahead of spill for later recovery and disposal. Use absorbent material for pick-up. Notify fire authorities and appropriate federal,state, and local agencies. Immediate clean-up of any spill material is recommende.
WASTE DISPOSAL METHODS: Dispose of product in accordance with local, state, and federal regulations.

SECTION 10: STORAGE AND SPECIAL PRECAUTIONS
Store in a cool, dry location. Store away from ignition sources. Store in tightly closed containers

SECTION 11: PRECAUTIONARY WARNING
WARNING ! FLAMMABLE. ASPIRATION HAZARD IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. KEEP AWAY FROM HEAT, SPARKS, FLAME, OR OTHER IGNITION SOURCES [eg., STATIC ELECTRICITY, PILOT LIGHTS, OR MECHANICAL/ELECTRICAL EQUIPMENT]. DO NOT TASTE OR SWALLOW. IF SWALLOWED, DO NOT INDUCE VOMITING. CALL A PHYSICIAN. IN CASE OF CONTACT, FLUSH EYES OR SKIN WITH LOTS OF CLEAN WATER .

SECTION 12: DOCUMENTARY INFORMATION
DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES
The information in this document is believed to be correct as of the date of issuance. However, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED, OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION, OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.
This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose, and on the condition that he assumes the risk of his use thereof.

AKZO NOBEL

091510
TECHNICAL DATA SHEET
Page 1 of 2
October, 1994

GRIP-FLEX™ INTERMIX

DESCRIPTION:

GRIP-FLEX Intermix Sign Paint is a color matching system designed for the backlit sign industry. Over 2,000 colors are available at your fingertips, from 16 base colors, whenever needed. Additional color formulations are being developed continuously to make this mixing system the most versatile in the sign industry today.

All color formulations are made by weight, which provides the most accurate, reproducible colors possible.

GRIP-FLEX Intermix Sign Paint does not contain lead.

PRODUCT & ADDITIVES

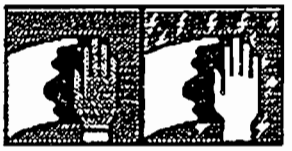
MAIN PRODUCT: GRIP-FLEX Intermix Sign Paint

REDUCERS: USE ONLY T-2003 OR T-2004 when spraying plastic. DO NOT USE aromatic solvents, such as xylene, toluene, T-2001 or T-2002. GRIP-FLEX Intermix is not compatible with aromatic reducing solvents.

BASIC RAW MATERIALS: GRIP-FLEX Intermix: Acrylic resins and completely lead free pigment system.

APPLICATION:

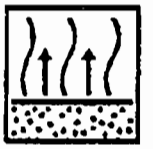
1.  Contains acrylic resins, solvent and other special ingredients.

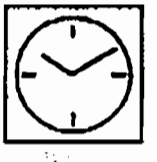
2.  Remove any existing surface contaminates and static electricity.

3.  100 parts GRIP-FLEX
200 parts reducer

4.  Siphon feed: .063" (1.6 mm)
Pressure feed: .043" (1.1 mm)
Gravity feed: .055" (1.4 mm)
HVLP: .031–.059" (0.8–1.5 mm)

5.  Spray 4–12 light coats depending on the color and translucency desired.

6.  Flash 3–5 minutes between each coat.

7.  Dry to recoat:
at 70°F (20°C) 10 minutes
Dry for installation:
at 70°F (20°C) 24 hours

SUITABLE SURFACES:

—Acrylic, impact modified acrylic, ABS, CAB polycarbonate, styrene, and most rigid and flexible vinyls.
—Existing GRIP-FLEX finishes.

AKZO NOBEL

GRIP-FLEX™ INTERMIX

APPLICATION TECHNIQUES FOR PLASTIC:

When spray painting a backlit sign, it is essential that some type of back lighting is utilized. This will allow the spray painter to apply the paint more evenly, obtaining the desired reflected and transmitted color.

When painting translucent colors on plastic, you will be required to build up the paint film slowly. Use many light coats. If one or two heavy coats are used, undesirable light and dark spots, known as mottling, will appear. Usually 6–12 fine coats are required. Allow 3–5 minutes flash between coats. Note, the 6–12 coat rule is a guideline, The spray pattern, equipment, viscosity, temperature, and operator experience will play an important role in achieving the desired result.

When spraying darker, more opaque intermix color formulations, it is necessary to use Matte Clear (10AFR-02201). When mixing with the paint, in a proportion of 1:1 by volume before thinning, Matte Clear will make it possible for you to apply more coats, thereby, minimizing mottling.

This technique can be used with any color to obtain a more even film build.

APPLICATION TO FLEXIBLE VINYL:

Refer to VPS Technical Data Sheet.

APPLICATION TO HIGH-IMPACT ACRYLIC:

When decorating High-Impact Acrylic, use the High Impact Additive (10AFR-022750) to prevent loss of impact resistance.

STOCK KEEPING:

COLOR: 16 toner colors

CONTAINER SIZE: 1 gallon (3.785 liters) and 1 liter

POT LIFE: After reducer added – 3 months

SHELF LIFE: Two years if unopened containers are stored at room temperature.

SAFETY ASPECTS:

NOTICE: Do not handle until the Material Safety Data Sheets have been read and understood. Regulations require that all employees be trained on Material Safety Data Sheets for all chemicals with which they come in contact. The manufacturer recommends the use of an organic vapor respirator or air supplied respirator when exposed to vapors or spray mist.

DISCLAIMER:

The technical information and suggestions for use made herein are based on Akzo Nobel Coatings Inc. research and experience and are believed to be reliable but such information and suggestions do not constitute a warranty.

Since Akzo Nobel Coatings Inc. has no control over the conditions under which the product is transported, stored, handled, used or applied, buyers must determine for themselves, by preliminary tests or otherwise, the suitability of the products for their purpc

Akzo Nobel Coatings Inc.
5555 Spalding Drive
Norcross, GA 30092 USA
(404) 662-8464

Akzo Nobel Coatings Ltd.
110 Woodbine Downs Blvd. – Unit 4
Etobicoke, ON, Canada M9W 5S6
(416) 671-6633

MSDS 000305

RECEIVED

AUG 0 3 1993

INDUSTRIAL

MATERIAL SAFETY DATA SHEET

Grip Flex Spray Colors

Date of Preparation: June, 1993

Section I - Product Information

Manufacturer: Akzo Coatings Inc.
5555 Spalding Drive
Norcross, GA 30092

Emergency Telephone:
Chemtrec: 800-424-9300
Poisindex: 303-832-3332

Product Class: Acrylic Coating
Transport Class: UN1263
Packing Group: III
Shipping Name: Paint

Product Codes: 106,106T,110,157,180,281,285,310,311,311LF,315,325,325LF,326,326LF,346,357,383,403,431,470,480,500,523 525,535,535LF,583,584,585,585LF,595,595LF,613,632,633,641,642,700,720,838,900,933.
Colors with LF suffix are lead free versions of leaded colors.

Section II - Hazardous Ingredients

Hazardous Ingredient All contain the following:	% by weight	CAS No.	Vapor Press.	ACGIH TLV	OSHA PEL	LD_{50} Oral	LD_{50} Derm	LC_{50} Inhal.	LEL
Ethyl Acetate	1-5%	141-78-6	72.8	400ppm	400ppm	11300	n. av.	1600	2.2
N-butyl Alcohol *(SARA313)*	15.0%	71-36-3	4.4	50ppm	50ppm	790	3400	8000	1.4
Toluene *(SARA313)(P65)*	10.6%	108-88-3	22.0	50ppm	100ppm	5000	14000	4000	1.2
Methyl Alcohol *(SARA313)*	1.5%	67-56-1	96.0	200ppm	200ppm	5628	20000	64000	1.1
Propylene Glycol Methyl Ether	5-20%	107-98-2	12.5	100ppm	100ppm	6052	12000	n. av.	1.6
Ethyl Alcohol	25-55%	64-17-5	44.0	1000ppm	1000ppm	7060	20000	20000	3.3
106,106T,110,157,&180 also contain:									
Titanium Dioxide	5-20%	13463-67-7	n. ap.	10mg/m^3	10mg/m^3	n. av.	n. av.	n. av.	n.ap
311,325,326 also contain:									
Lead Chromate *(SARA313)(P65)*	13.5%	7758-97-6	n. ap.	.01mg/m^3	n. av.	5000	n. av.	n. av.	n.ap
535,585,595 also contain:									
Lead Molybdate/Chromate *(SARA313)(P65)*	4.5%	12656-85-8	n. ap.	.01mg/m^3	n. av.	2000	n. av.	n. av.	n.ap
383 also contains:									
Isopropyl Alcohol	1-5%	67-63-0	32.4	400ppm	400ppm	5840	13000	12000	2.0
Brass Powder	11.6%	000	n. ap.	n. av.	n. av.	n. av.	n. av.	n. av.	n.ap
106,106T,157,&500 also contain:									
2-butoxyethanol *(SARA313)*	2.5%	111-76-2	0.8	25ppm	25ppm	1480	490	700	1.1
632,633,641,838 also contain:									
Aluminum Flake *(SARA313)*	3.5%	7429-90-5	n. ap.	10mg/m^3	10mg/m^3	n. av.	n. av.	n. av.	n.ap
Stoddard Solvent	1-5%	8052-41-3	2.0	100ppm	100ppm	n. av.	n. av.	n. av.	1.0
Xylene *(SARA313)*	1.1%	1330-20-7	9.6	100ppm	100ppm	4300	14100	5000	1.5
900,933 also contain:									
Carbon Black	1-5%	1333-86-4	n. ap.	3.5mg/m^3	3.5mg/m^3	n. av.	n. av.	n. av.	n.ap

If an ingredient is marked as *(SARA 313)*, it contains a chemical which is subject to the requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). You may be required to submit this MSDS to state and local emergency response agencies (SERC & LEPC) and to your local fire department. Also, you may be affected by other sections of this law, depending on the chemicals and amounts that you inventory at your location. To learn more about your responsibilities, call the EPA Hotline (800) 535-0202. If an ingredient is marked with a *(P65)* this chemical is known to the state of California to cause cancer or reproductive toxicity.

Section III - Physical Data

Evaporation Rate: Slower than ether
Vapor Pressure: Heavier than air
Boiling Range: 149-249F
Weight per Gallon: 7.2-9.1
Percent Volatile by Volume: 66-87

Section IV - Fire or Explosion Hazard

Flash Point (SFCC): 41F
Lower Explosive Limit: 1.2
NFPA Flammability: I B
Extinguishing Media: Foam, carbon dioxide, dry chemicals.
Unusual Fire and Explosion Hazards: Keep containers tightly closed, isolate from heat, electrical equipment, sparks and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions, overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
Special Fire Fighting Procedures: Water should be used to cool containers exposed to fire. Fire fighting personnel should wear self-contained breathing apparatus.

Section V- Reactivity Data

Stability: Stable under non-emergency conditions.
Incompatibility (materials to avoid): Alkalis, acids, oxidizers.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Heat, flame, sparks.
Hazardous Decomposition Products: Oxides of carbon, various hydrocarbons.

Section VI - Toxicological Properties

Threshold Limit Value: None established for this product. For further information, see Section II - Hazardous Ingredients
Cancer Risks: Hexavalent chromium from chromate compounds is listed by ACGIH as a confirmed human carcinogen (A1), NTP as a known carcinogen and IARC as being carcinogenic to humans (group 1). Lead from lead chromate is listed by ACGIH as a suspected human carcinogen (A2), and by IARC as possibly being carcinogenic to humans (group 1).
Exposure Effects: Acute and Chronic
Inhalation: Nasal and respiratory irritation, dizziness, weakness, fatigue, nausea, headache, possible unconsciousness, chemical pneumonitis, central nervous system depression and even asphyxiation. Delayed lung

damage, kidney, liver, and cardiac disorders, red blood cell and leukocyte disorders which may result in anemia.
Skin contact: Extraction of natural oils with resulting dry skin, irritation, redness and dermatitis. Chronic sensitization to skin may occur.
Eye contact: *Irritation, redness, pain, blurred vision,* sensation of seeing halos around lights.
Ingestion: Gastrointestinal irritation, nausea, vomiting and diarrhea; kidney damage, blood system damage.
Other Health Effects:
Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.

Section VII - Preventive Measures

Steps To Be Taken In Case Material Is Released Or Spilled: Remove all sources of ignition. Avoid breathing vapors, ventilate confined area. Dike to reduce extent of spill. Remove with inert absorbent using non-sparking tools. If necessary report to applicable government agency.
Waste Disposal Method: Dispose of in accordance with federal, state and local pollution requirements. In addition, rags, spray booth filters, paint suits, empty cans, etc., contaminated with product may be hazardous waste. Determine whether contaminated items are hazardous and dispose of as appropriate.
Respiratory Protection: Adequate ventilation is required. In confined areas use NIOSH/MSHA approved airline respirator or hood. If monitoring demonstrates levels below TLV or PEL wear a NIOSH/MSHA approved respirator device. If using 311,325,326,535,585,595, be aware that these colors contain lead. Use NIOSH/MSHA approved respirator with HEPA Dust Cartridges for concentrations below 0.05mg/m^3 as Pb. For concentrations above 0.05 mg/m^3 as Pb, use full face respirator or air supplied respirator. See OSHA Standard 29 CFR Section 1910.1025. See safety equipment supplier for evaluation and recommendation. In cases where no monitoring for airborne contaminants has been carried out, assume maximum exposure and use paint suit, goggles, gloves, and air supplied respiratory equipment.
Ventilation: Provide sufficient ventilation to keep vapor concentration below the given TLV and/or PEL. For baking finishes, exhaust vapors emitted during heating. Remove decomposition products formed during welding or flame cutting of surfaces coated with this product.
Protective Gloves: Required for prolonged or repeated contact. Refer to safety equipment supplier for effective glove recommendations.
Eye Protection: Use safety goggles designed to protect against splash of liquids when spraying or when working with open liquids such as during mixing or pouring.
Other Protective Equipment: Eye bath and shower should be available. Use chemical resistant apron, boots or other clothing if needed to avoid repeated or frequent contact. Liquid may penetrate shoes and leather causing delayed irritation.
Hygienic Practices: Wash hands before eating, smoking, or using the washroom. Launder clothing before reuse.
Precautions To Be Taken In Handling And Storing: Store containers out of sun and away from heat, sparks, and open flames. Store plastic containers of flammable liquids inside closed, approved boxes or safety cabinets. Close all containers after each use. Consult NFPA and local codes for additional storage requirements.
Other Precautions: Use approved bonding and grounding procedures. Observe label precautions. Keep closures tight and container upright to prevent leakage. Never use pressure to empty container; drum is not a pressure vessel. Avoid breathing sanding dust. Do not weld or flame cut on empty drum.

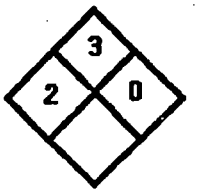
Section VIII - First Aid Measures

Emergency and First Aid Procedures:
Inhalation - move to fresh air, give artificial respiration if necessary; **skin contact** - wash with soap and water, not solvent;
Eye contact - flush with water for at least 15 minutes, consult a physician;
Ingestion - drink one or two glasses of water to dilute. Do not induce vomiting. Consult a physician or poison control center immediately. Treat symptomatically
Medical Conditions Prone to Aggravation: Pulmonary disorders, skin conditions.

Section IX - Preparation Information

Prepared by Akzo Coatings Car Refinish Technical Department.
Phone: 404-662-8464
Reference sources used in addition to raw material supplier MSDS information:
American Conference of Governmental Industrial Hygienists, *1992-1993 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, ACGIH, Cincinnati, OH 1992.
Lewis, Richard J. Sr., *Hazardous Chemicals Desk Reference*, Second Edition, Van Nostrand Reinhold, New York, 1991.
U.S. Department of Health and Human Services, Centers for Disease Control, *NIOSH Pocket Guide to Chemical Hazards*, NIOSH, Cincinnati, OH, 1990.
DO NOT HANDLE UNTIL THE MANUFACTURER'S SAFETY PRECAUTIONS HAVE BEEN READ AND UNDERSTOOD. REGULATIONS REQUIRE THAT ALL EMPLOYEES BE TRAINED ON MATERIAL SAFETY DATA SHEETS FOR ALL PRODUCTS WITH WHICH THEY COME IN CONTACT.

NFPA 704



(1) F/Y P/N R/N AH/Y CH/Y
(2) 8.03 - 10.91 lbs/gal
(3) F 14
(4) Liquid Mixture

MSDS 000292

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AUG 0 3 1993

INDUSTRIAL HYGIENE

MATERIAL SAFETY DATA SHEET

Grip Flex Solvents

Date of Preparation: June, 1993

Section I - Product Information

Manufacturer: Akzo Coatings Inc.
5555 Spalding Drive
Norcross, GA 30092

Shipping Name: Paint Related Material

Packing Group: II
Product Code: See Section II
Product Class: Solvent Blend

Emergency Telephone:
Chemtrec: 800-424-9300
Transport Class: UN1263
Poisindex: 303-832-3332

Section II - Hazardous Ingredients

Hazardous Ingredient	% by weight	CAS No.	Vapor Press.	ACGIH TLV	OSHA PEL	LD_{50} Oral	LD_{50} Derm	LC_{50} Inhal.	LEL
T2003 contains:									
2-butoxy Ethyl Acetate*(SARA313)*	9.5%	112-07-2	0.5	n. av.	n. av.	2400	1500	n. av.	0.8
Ethyl Acetate	1-5%	141-78-6	72.8	400ppm	400ppm	11300	n. av.	1600	2.2
Ethyl Alcohol	45-60%	64-17-5	44.0	1000ppm	1000ppm	7060	20000	20000	3.3
N-butyl Alcohol*(SARA313)*	18.9%	71-36-3	4.4	50ppm	50ppm	790	3400	8000	1.4
Toluene*(SARA313)(P65)*	16.0%	108-88-3	22.0	50ppm	100ppm	5000	14000	4000	1.2
Xylene*(SARA313)*	3.0%	1330-20-7	9.5	100ppm	100ppm	4300	14100	5000	1.5
Methyl Alcohol*(SARA313)*	2.2%	67-56-1	96.0	200ppm	200ppm	5628	20000	64000	1.1
T2004 contains:									
Ethyl Acetate	1-5%	141-78-6	72.8	400ppm	400ppm	11300	n. av.	1600	2.2
Ethyl Alcohol	45-60%	64-17-5	44.0	1000ppm	1000ppm	7060	20000	20000	3.3
N-butyl Alcohol*(SARA313)*	25.3%	71-36-3	4.4	50ppm	50ppm	790	3400	8000	1.4
Toluene*(SARA313)(P65)*	16.3%	108-88-3	22.0	50ppm	100ppm	5000	14000	4000	1.2
Xylene*(SARA313)*	3.4%	1330-20-7	9.5	100ppm	100ppm	4300	14100	5000	1.5
Methyl Alcohol*(SARA313)*	2.3%	67-56-1	96.0	200ppm	200ppm	5628	20000	64000	1.1
T1003 contains:									
2-butoxyethanol*(SARA313)*	62.6%	111-76-2	0.6	25ppm	25ppm	1480	490	700	1.1
Stoddard Solvent	10-25%	8052-41-3	2.0	100ppm	100ppm	n. av.	n. av.	n. av.	1.0
DiethyleneGlycolButylEther*(SARA313)*	20.0%	112-34-5	0.1	n. av.	n. av.	6560	4120	n. av.	1.0
T1004 contains:									
2-butoxyethanol*(SARA313)*	11.7%	111-76-2	0.6	25ppm	25ppm	1480	490	700	1.1
DiethyleneGlycolButylEther*(SARA313)*	88.3%	112-34-5	0.1	n. av.	n. av.	6560	4120	n. av.	1.0
T1007 contains:									
2-butoxyethanol*(SARA313)*	80.5%	111-76-2	0.6	25ppm	25ppm	1480	490	700	1.1
V M & P Naphtha	10-25%	8032-32-4	38.0	300ppm	300ppm	n. av.	n. av.	1600	0.9
T4000 contains:									
Ethyl Alcohol	>85%	64-17-5	44.0	1000ppm	1000ppm	7060	20000	20000	3.3
Ethyl Acetate	1-5%	141-78-6	72.8	400ppm	400ppm	11300	n. av.	1600	2.2
Isopropyl Alcohol	5-20%	67-63-0	32.4	400ppm	400ppm	5840	13000	12000	2.0
Methyl Alcohol*(SARA313)*	4.0%	67-56-1	96.0	200ppm	200ppm	5628	20000	64000	1.1
T2001 contains:									
Aromatic Naphtha 100	1-5%	64742-95-6	3.0	50ppm	500ppm	4700	n. av.	3670	0.9
Ethylbenzene*(SARA313)*	14.3%	100-41-4	10.0	100ppm	100ppm	3500	5000	4000	1.0
Toluene*(SARA313)(P65)*	19.9%	108-88-3	22.0	50ppm	100ppm	5000	14000	4000	1.2
Xylene*(SARA313)*	61.0%	1330-20-7	9.5	100ppm	100ppm	4300	14100	5000	1.5
T2002 contains:									
Aromatic Naphtha 100	>90%	64742-95-6	3.0	50ppm	500ppm	4700	n. av.	3670	0.9
Toluene*(SARA313)(P65)*	5.1%	108-88-3	22.0	50ppm	100ppm	5000	14000	4000	1.2
T3000 contains:									
2-butoxy Ethyl Acetate*(SARA313)*	15.8%	112-07-2	0.5	n. av.	n. av.	2400	1500	n. av.	0.8
PropyleneGlycolMethylEtherAcetate	25-40%	108-65-6	3.8	n. av.	n. av.	8532	5000	n. av.	1.5
N-butyl Acetate	50-65%	123-86-4	8.0	150ppm	150ppm	14000	n. av.	2000	1.7

Further Infomation for Individual Products

Product/Code	Boiling Range	% Vol Volume	Weight per gal.	Flash Point	LEL	NFPA Flam.
PC & Ecology Spray Thinner T2003	147-367F	100	7.6	90F	0.8	I C
Fast PC & Ecology Spray Thinner T2004	147-284F	100	6.8	41F	1.0	I B
PC Retarder and Screen Thinner T1003	300-453F	94	7.5	121F	0.9	II
Super Retarder T1004	336-453F	100	7.9	154F	0.9	III A
Trouble Free T1007	200-401F	94	7.4	74F	0.9	I C
Remover for Polycarbonate T4000	147-180F	100	6.6	46F	2.0	I B
Fast Spray Thinner & Cleaner T2001	230-340F	100	7.3	59F	0.9	I B
Spray Thinner & Reducer T2002	230-344F	100	7.3	85F	0.9	I C
Vibrolite Spray Thinner T3000	147-284F	100	6.8	41F	1.0	I B

If an ingredient is marked as *(SARA 313)*, it contains a chemical which is subject to the requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). You may be required to submit this MSDS to state and local emergency response agencies (SERC & LEPC) and to your local fire department. Also, you may be affected by other sections of this law, depending on the chemicals and amounts that you inventory at your location. To learn more about your responsibilities, call the EPA Hotline (800) 535-0202. If an ingredient is marked with a *(P65)* this chemical is known to the state of California to cause cancer or reproductive toxicity.

Section III - Physical Data

Evaporation Rate: Slower than ether
Vapor Pressure: Heavier than air

Section IV - Fire or Explosion Hazard

Extinguishing Media: Foam, carbon dioxide, dry chemicals.
Unusual Fire and Explosion Hazards: Keep containers tightly closed, isolate from heat, electrical equipment, sparks and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. During emergency conditions, overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.
Special Fire Fighting Procedures: Water should be used to cool containers exposed to fire. Fire fighting personnel should wear self-contained breathing apparatus.

Section V- Reactivity Data

Stability: Stable under non-emergency conditions.
Incompatibility (materials to avoid): Alkalis, oxidizers, alkali metals, water, amines, nitric acid, sodium hypochlorite, metal compounds.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: High temperatures, flame, sparks.
Hazardous Decomposition Products: Oxides of carbon, toxic fumes, various hydrocarbons.

Section VI - Toxicological Properties

Threshold Limit Value: None established for this product. For further information, see Section II - Hazardous Ingredients
Cancer Risks: No ingredients in these products are known to NTP, IARC or OSHA to be carcinogenic.
Exposure Effects: Acute and Chronic
Inhalation: Nasal and respiratory irritation, dizziness, weakness, fatigue, nausea, headache, possible unconsciousness, chemical pneumonitis, central nervous system depression and even asphyxiation. Delayed lung damage, kidney, liver, and cardiac disorders, red blood cell and leukocyte disorders which may result in anemia.
Skin contact: Extraction of natural oils with resulting dry skin, irritation, redness and dermatitis. Chronic sensitization to skin may occur.
Eye contact: Irritation, redness, pain, blurred vision, sensation of seeing halos around lights.
Ingestion: Gastrointestinal irritation, nausea, vomiting and diarrhea; kidney damage, blood system damage.
Other Health Effects:
Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.

Section VII - Preventive Measures

Steps To Be Taken In Case Material Is Released Or Spilled: Remove all sources of ignition. Avoid breathing vapors, ventilate confined area. Dike to reduce extent of spill. Remove with inert absorbent using non-sparking tools. If necessary report to applicable government agency.
Waste Disposal Method: Dispose of in accordance with federal, provincial and local pollution requirements. In addition, rags, spray booth filters, paint suits, empty cans, etc., contaminated with product may be hazardous waste. Determine whether contaminated items are hazardous and dispose of as appropriate.
Respiratory Protection: Adequate ventilation is required. In confined areas use NIOSH/MSHA approved airline respirator or hood. If monitoring demonstrates levels below TLV or PEL wear a NIOSH/MSHA approved respirator device. In cases where no monitoring for airborne contaminants has been carried out, assume maximum exposure and use paint suit, goggles, gloves, and air supplied respiratory equipment. See safety equipment supplier for evaluation and recommendation.
Ventilation: Provide sufficient ventilation to keep vapor concentration below the given TLV and/or PEL. For baking finishes, exhaust vapors emitted during heating. Remove decomposition products formed during welding or flame cutting of surfaces coated with this product.
Protective Gloves: Required for prolonged or repeated contact. Refer to safety equipment supplier for effective glove recommendations.
Eye Protection: Use safety goggles designed to protect against splash of liquids when spraying or when working with open liquids such as during mixing or pouring.
Other Protective Equipment: Eye bath and shower should be available. Use chemical resistant apron, boots or other clothing if needed to avoid repeated or frequent contact. Liquid may penetrate shoes and leather causing delayed irritation.
Hygienic Practices: Wash hands before eating, smoking, or using the washroom. Launder clothing before reuse.
Precautions To Be Taken In Handling And Storing: Store containers out of sun and away from heat, sparks, and open flames. Close all containers after each use. Consult NFPA and local codes for additional storage requirements.
Other Precautions: Use approved bonding and grounding procedures. Observe label precautions. Keep closures tight and container upright to prevent leakage. Never use pressure to empty container; drum is not a pressure vessel. Do not weld or flame cut on empty drum.

Section VIII - First Aid Measures

Emergency and First Aid Procedures:
Inhalation - move to fresh air, give artificial respiration if necessary; skin contact - wash with soap and water, not solvent;
Eye contact - flush with water for at least 15 minutes, consult a physician;
Ingestion - drink one or two glasses of water to dilute. Do not induce vomiting. Consult a physician or poison control center immediately. Treat symptomatically
Medical Conditions Prone to Aggravation: Pulmonary conditions, skin disorders.

Section IX - Preparation Information

Prepared by Akzo Coatings Car Refinish Technical Dept.
Reference sources used in addition to raw material supplier:
American Conference of Governmental Industrial Hygienists, *1992-1993 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, ACGIH, Cincinnati, OH 1992.
Lewis, Richard J. Sr., *Hazardous Chemicals Desk Reference*, Second Edition, Van Nostrand Reinhold, New York, 1991.
U.S. Department of Health and Human Services, Centers for Disease Control, *NIOSH Pocket Guide to Chemical Hazards*, NIOSH, Cincinnati, OH, 1990.

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DuPont Automotive

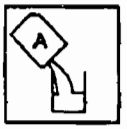
Adhesion Promoter 222S

Description

222S is a ready-to-spray adhesion promoter for use over OEM clearcoat finishes.

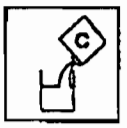
General Information

Components
222S - Adhesion Promoter



Mix Ratio/Viscosity
Ready-to-spray.

Pot Life
Indefinite.



Additives

Accelerator:	Not recommended.
Fish Eye Eliminator:	Not recommended.
Flex Additive:	Not recommended.
Reducer:	Not required.
Retarder:	Not required.

Tinting
Not recommended.

Topcoats
ChromaPremier™ Basecoat
ChromaPremier™ Single-Stage (optional)
ChromaBase®
ChromaOne® (optional)

Application

Substrates
OEM finishes

Surface Preparation
- Sand with 1200 grit or finer.
- Remove sanding residue with Final Klean™ 3901S, Lacquer and Enamel Cleaner 3939S or Low VOC Final Klean™ 3909S.
- Tack area free of any dust or dirt particles.

Adhesion Promoter 222S

Gun Setups*

Conventional

Siphon Feed:	1.5 mm - 1.7 mm (.059" - .067")
Gravity Feed:	1.4 mm - 1.6 mm (.055" - .063")

HVLP

Siphon Feed:	1.5 mm - 1.7 mm (.059" - .067")
Gravity Feed:	1.3 mm - 1.5 mm (.051" - .059")

Air Pressure*

Conventional

Siphon Feed:	30 - 35 psi @ the gun.
Gravity Feed:	25 - 30 psi @ the gun.
HVLP	6 - 8 psi @ the gun cap.

*The listed setups cover the usual range for various application equipment. For information on specific manufacturers' equipment, see the Appendix section titled "Equipment Information."

Application

Apply 1 medium coat beyond the entire repair area. (See Blending Procedure in the Systems & Procedures section.)

Flash/Dry Times

Air Dry

Time to Topcoat:	5 - 10 minutes @ 70°F.

Recoatability/Re-repair

222S may be recoated at any stage.

Tips for Success

If 222S dries for more than 2 hours, tack and reapply 1 coat of 222S.

Cleanup

Clean spray equipment as soon as possible with DuPont Lacquer Thinner.

Physical Properties

VOC: 6.6 lbs/gal ready-to-spray.
Flash Point: See MSDS.

VOC Regulated Areas

These directions refer to the use of products which may be restricted or require special mixing instructions in VOC regulated areas. Follow mixing and usage recommendations in the VOC Compliant Products Chart for your area.

Safety and Handling

Before using any DuPont product, be sure to read all safety directions and warnings. WEAR A PROPERLY FITTED VAPOR/PARTICULATE RESPIRATOR approved by NIOSH for use with paints (TC-23C), eye protection, gloves and protective clothing during application and until all vapors and spray mists are exhausted. In confined spaces, or in situations where continuous spray operations are typical, or if proper respirator fit is not possible, wear a positive pressure, supplied-air respirator (NIOSH TC-19C). In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. This product is intended for industrial use only by professional, trained painters.

MATERIAL SAFETY DATA SHEET

REPLACES SALES
JANUARY 1, 1998

SPECIALTY CLEARS

Section I - Manufacturer

Manufacturer:
DuPont Co.
Automotive
Wilmington, Delaware 19898
Telephone:
Product Information (800)441-7515
Medical emergency (800) 441-3637
Transportation emergency (800) 424-9300 (CHEMTREC)
Product: Specialty clears: (2223, 380S, 480S, 980S, 1775S,1780S,1782S, 3700S, 3705S, 3710S, 3789S, 9600S, 9601S)
OSHA Hazard Class: Flammable liquid
DOT Shipping Name: Paint, UN1263; Paint Related Materials, UN1263
Hazardous Materials Information: See Section X.

Section II - Hazardous Ingredients

(See Section X)

Ingredients	CAS No.	Vapor Pressure (20° C. mm Hg)	Exposure Limits *
Acetone	67-64-1	184.0	500 ppm-A 8 hr TWA 750 ppm-A 15 min (STEL) 1000 ppm-O 8 hr TWA
Acrylic polymer A	9011-14-7	None	None-A,O
Acrylic polymer B	25133-97-5	None	None-A,O
Acrylic polymer C	68215-54-9	None	None-A,O
Acrylic polymer D	74082-30-7	None	None-A,O
Acrylic polymer E	Not Available	None	None-A,O
Acrylic polymer F	Not Available	None	None -A,O
Acrylic polymer G	25852-37-3	None	None-A,O
Acrylic polymer H	Not Available	None	None -A,O
Acrylic polymer I	Not Available	None	None -A,O
Acrylic polymer J	Not Available	None	None -A,O
Aliphatic polyamine	Not Available	Unknown	None-A,O
Aromatic hydrocarbon	64742-95-6	10 @ 25°C	None-A,O
Beta-(3-(2H-benzotriazole-2-YL)-4-hydroxy-5-tert-butylphenyl) propionate	104810-47-1	Unknown	None -A,O
Bis(1-2,2,6,6,-pentamethyl-4-piperdinyl) sebacate	41556-26-7	6.0	None-A,O
Blocked diamine	Not Available	.4	None-A,O
Butyl acetate	123-86-4	8.0	150 ppm-A,O 200 ppm-A 15 min(STEL)
Butyl benzyl phthalate	85-68-7	0.8	5.0 mg/m³-D None-A,O
Cellulose acetate butyrate	9004-36-8	None	None-A,O
Diethylene glycol monobutyl ether	112-34-5	0.1	5 ppm-D None-A,O
Diethyl phthalate	84-66-2	1.0	5 mg/m³-A,O
Diisobutyl ketone	108-83-8	1.7	25 ppm-A 50 ppm-O
Ethyl acetate	141-78-6	76.0	400 ppm-A,O
Ethylbenzene	100-41-4	7.0	100 ppm-A,O 125 ppm-A 15 min(STEL)
Ethyl 3-ethoxy propionate	763-69-9	Unknown	None-A,O
Ethylene glycol monobutyl ether acetate	112-07-2	0.3	20 ppm-D Skin None-A,O
Heptane	142-82-5	40.0	400 ppm-A 500 ppm-O 500 ppm-A 15 min(STEL)
Hexyl acetate isomers	88230-35-7	0.7	50 ppm-A None-O
Isopropyl alcohol	67-63-0	33.0	400 ppm-A,O 500 ppm-A 15 min(STEL) 400 ppm-D 8&12 hr
Methyl amyl ketone	110-43-0	2.2	50 ppm-A 100 ppm-O
Methyl ethyl ketone	78-93-3	71.0	200 ppm-A,O 300 ppm-A 15 min(STEL) 200 ppm-D 8&12 hr TWA 300 ppm-D 15 min TWA
Methyl isoamyl ketone	110-12-3	4.5	50 ppm-A None-O
Methyl isobutyl ketone	108-10-1	15.0	50 ppm-A 100 ppm-O 75 ppm-A 15 min(STEL)
Mixed dibasic esters	Not Available	0.2	10 mg/m3-D None-A,O
n-butyl alcohol	71-36-3	5.5	50 ppm-A, C Skin 100 ppm-O 25 ppm-D 50 ppm-D 15 min. TWA
Oxo-octyl acetate	108419-32-5	1.0	50 ppm-S None-A,O
Petroleum naphtha	64742-89-8	50.0	300 ppm-A,O 400 ppm-A,O 15 min(STEL) 100 ppm-D
Polyester resin	65086-73-9	None	None-A,O
Primary amyl acetate	628-63-7	4.0	100 ppm-A,O
Propionic acid, n-butyl ester	590-01-2	5.4	None-A,O
Propylene glycol methyl ether	107-98-2	10.9	100 ppm-A None-O 150 ppm-A 15 min(STEL)
Propylene glycol monomethyl ether acetate	108-65-6	3.7	None-A,O 10 ppm-D
Substituted benzotriazole	127519-17-9	9.0	None-A,O
Toluene	108-88-3	36.7	50 ppm-A Skin 200 ppm-O 300 ppm-O Ceiling 500 ppm-O 10 min MAX 50 ppm-D 8&12 hr TWA
Trimer of hexamethylene diisocyanate	3779-63-3	None	1.0ug/m³-S 15 min(STEL)

			0.5 ug/m³-S None-A,O
Water	7732-18-5	23.6	None-A,O
Xylene	1330-20-7	7.0	100 ppm-A,O 150 ppm-A 15 min(STEL) 100 ppm-D 8&12 hr 150 ppm-D 15 min TWA
1-Methylimidazole	616-47-7	0.4	None-A,O
1,2,4-Trimethyl benzene	95-63-6	7.0	25 ppm-A,O
1,6-Hexamethylene diisocyanate	822-06-0	Unknown	5 ppb -A None-O
2(2'-hydroxy-3,5'-diteramytphenyl)benzotriazole	822-06-0	Unknown	None-A,O

A = ACGIH TLV; O= OSHA; D = DuPont internal limit; S = Supplier Furnished limit; STEL = Short Term Exposure Limit; C= Ceiling.

Section III - Physical Data

Evaporation rate: Less than ether
Vapor Density: Heavier than air
Solubility in water: Miscible
Percent volatile by volume: 6.4% - 100%
Percent volatile by weight: 4.9% - 100%
Boiling range: 54°C- 900°C/129°F- 1652°F
Gallon weight: 6.70 - 9.43 lbs./gallon

Section IV - Fire and Explosion Data

Flash point (closed cup): See Section X for exact values.
Flammable limits: 0.2%-16.0%
Extinguishing media: Universal aqueous film-forming foam, carbon dioxide, dry chemical.
Special fire fighting procedures: Full protective equipment, including self-contained breathing apparatus, is recommended. Water from fog nozzles may be used to cool closed containers to prevent pressure build up.
Unusual fire & explosion hazards: When heated above the flash point, emits flammable vapors which, when mixed with air, can burn or be explosive. Fine mists or sprays may be flammable at temperatures below the flash point.

Section V - Health Hazard Data

General Effects:
Ingestion: Gastrointestinal distress. In the unlikely event of ingestion, call a physician immediately and have the names of ingredients available. DO NOT INDUCE VOMITING.
Inhalation: May cause nose and throat irritation. Repeated and prolonged overexposure to solvents may lead to permanent brain and nervous system damage. Eye watering, headaches, nausea, dizziness and loss of coordination are signs that solvent levels are too high. If affected by inhalation of vapor or spray mist, remove to fresh air. If breathing difficulty persists, or occurs later, consult a physician.
Skin or eye contact: May cause irritation or burning of the eyes. Repeated or prolonged liquid contact may cause skin irritation with discomfort and dermatitis. In case of eye contact, immediately flush with plenty of water for at least 15 minutes; call a physician. In case of skin contact, wash with soap and water. If irritation occurs, contact a physician.
Specific Effects:
Acrylic polymer F Contact may cause skin irritation with discomfort or rash. May cause eye irritation with discomfort, tearing, or blurred vision. **Acrylic polymer I** Contact may cause skin irritation with discomfort or rash. May cause eye irritation with discomfort, tearing, or blurred vision. **Aromatic hydrocarbon** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Bis(1,2,2,6,6-pentamethyl-4-piperdinyl) sebacate** Repeated exposure may cause allergic skin rash, itching, swelling. **Butyl acetate** May cause abnormal liver function. Tests for embryotoxic activity in animals has been inconclusive. Has been toxic to the fetus in laboratory animals at doses that are toxic to the mother. **Butyl benzyl phthalate** Extremely high oral doses have caused tissue changes in the liver and testes of laboratory animals. Extremely high vapor aerosol doses have caused atrophy of the spleen and reproductive organs. Mice and rats were fed diets containing 0.6% and 1.2% of butyl benzyl phthalate. At the highest dose leukemias of the blood forming system were seen in female rats. No leukemia effect was seen in the female rats fed the lower level or in any of the mice. **Diethyl phthalate** May cause eye irritation with discomfort, tearing, or blurred vision. **Diethylene glycol monobutyl ether** Contact may cause skin irritation with discomfort or rash. Recurrent overexposure may result in liver and kidney injury. High doses in laboratory animals have shown non specific effects such as irritation, weight loss, moderate blood changes. Tests for mutagenic activity in bacterial or mammalian cell cultures have been inconclusive. **Diisobutyl ketone** Extremely high oral and inhalation doses in laboratory animals have shown weight changes in various organs such as the liver, kidney, brain, heart and adrenal gland. In addition liver and kidney injury were observed at the extremely high inhalation level. In another inhalation study there was a slight depression in the white blood cell count. Repeated exposure may cause allergic skin rash, itching, swelling. **Ethyl acetate** Prolonged and repeated high exposures of laboratory animals resulted in secondary anemia with an increase in white blood cells; fatty degeneration, cloudy swelling and an excess of blood in various organs. **Ethylbenzene** Recurrent overexposure may result in liver and kidney injury. Studies in laboratory animals have shown reproductive, embryotoxic and developmental effects. Has shown mutagenic activity in laboratory cell culture tests. Tests in some laboratory animals demonstrate carcinogenic activity. Individuals with preexisting diseases of the central nervous system, lungs, liver, or kidneys may have increased susceptibility to the toxicity of excessive exposures. **Ethyl 3-ethoxy propionate** Has been toxic to the fetus in laboratory animals at doses that are toxic to the mother. **Ethylene glycol monobutyl ether acetate** Can be absorbed through the skin in harmful amounts. May destroy red blood cells May cause abnormal kidney function. **Heptane** Contact may cause skin burns. May cause eye irritation with discomfort, tearing, or blurred vision. May cause central nervous system effects such as dizziness, headache, nausea; and loss of conciousness. May cause temporary upper respiratory and/or lung irritation with cough, difficult breathing, or shortness of breath Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Isopropyl alcohol** Ingestion studies on laboratory animals showed that very high oral doses caused increased liver and kidney weights. **Methyl amyl ketone** Ingestion studies on laboratory animals showed that very high oral doses caused increased liver and kidney weights. **Methyl ethyl ketone** High concentrations have caused embryotoxic effects in laboratory animals. Methyl ethyl ketone has been demonstrated to potentiate (i.e., shorten the time of onset) the peripheral neuropathy caused by either n-hexane or methyl n-butyl ketone. MEK by itself has not been demonstrated to cause peripheral neuropathy. Liquid splashes in the eye may result in chemical burns. **Methyl isoamyl ketone** Extremely high oral doses in laboratory animals have shown weight changes in various organs such as the liver, kidney and adrenal gland. In addition liver injury was observed. **Methyl isobutyl ketone** Recurrent overexposure may result in liver and kidney injury. Individuals with preexisting diseases of the central nervous system or lungs may have increased susceptibility to the toxicity of excessive exposures. **Mixed dibasic esters** High airborne levels in rats have shown mild injury to olfactory region of the nose. **N-butyl alcohol** Liquid splashes in the eye may result in chemical burns. May cause abnormal blood forming function with anemia. Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. **Petroleum naphtha** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Primary amyl acetate** Recurrent overexposure may result in liver and kidney injury. **Propylene glycol methyl ether** Overexposure may lead to kidney, liver and lung damage. Individuals with preexisting diseases of the liver may have increased susceptability to the toxicity of excessive exposures. Can be absorbed through the skin in harmful amounts. **Propylene glycol monomethyl ether acetate** May cause moderate eye burning. Recurrent overexposure may result in liver and kidney injury. **Toluene** Recurrent

overexposure may result in liver and kidney injury. High airborne levels have produced irregular heart beats in animals and occasional palpitations in humans. Rats exposed to very high airborne levels have exhibited high frequency hearing deficits. The significance of this to man is unknown. **WARNING:** This chemical is known to the State of California to cause birth defects or other reproductive harm. Chromosomal changes in the circulating blood of exposed work been reported. The significance of these reports is unclear of exposure to other substances. Individuals with *preexisting diseases of the central nervous system may have* increased susceptibility to the toxicity of excessive exposures. **Trimer of hexamethylene diisocyanate** Repeated exposure may cause allergic skin rash, itching, swelling. May cause eye irritation with discomfort, tearing, or blurred vision. Repeated overexposure to isocyanates may cause lung injury, including a decrease in lung function, which may be permanent. Overexposure may cause asthma-like reactions with shortness of breath, wheezing, cough, which may be permanent; or permanent lung sensitization. This effect may be delayed for several hours after exposure. Individuals with preexisting lung disease, asthma or breathing difficulties may have increased susceptibility to the toxicity of excessive exposures. **Xylene** Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. Individuals with pre-existing disease of the central nervous system, kidneys, liver, cardiovascular system, lungs, or bone marrow may have increased susceptibility to the toxicity of excessive exposures. **1,6-Hexamethylene diisocyanate** May cause temporary upper respiratory and/or lung irritation with cough, difficult breathing, or shortness of breath Overexposure may cause asthma-like reactions with shortness of breath, wheezing, cough, which may be permanent; or permanent lung sensitization. This effect may be delayed for several hours after exposure. Prolonged skin contact may cause chemical burns. Liquid splashes in the eye may result in chemical burns. Individuals with preexisting lung disease, asthma or breathing difficulties may have increased susceptibility to the toxicity of excessive exposures. **2(2'-hydroxy-3,5'-diteramylphenyl)benzotriazole** Contact may cause skin irritation with discomfort or rash. May cause eye irritation with discomfort, tearing, or blurred vision.

Section VI - Reactivity Data

Stability: Stable
Incompatibility (materials to avoid): None reasonably foreseeable.
Hazardous decomposition products: CO, CO_2, smoke.
Hazardous polymerization: Will not occur.

Section VII - Spill or Leak Procedures

Steps to be taken in case material is released or spilled: Ventilate area. Remove sources of ignition. Prevent skin contact and breathing of vapor. Wear a properly fitted vapor/particulate respirator NIOSH approved (TC-23C). Confine and remove with inert absorbent.
If the material contains, or is mixed with an isocyanate activator/ hardener, wear a continuous flow supplied air respirator (NIOSH approved TC-19C) and pour liquid decontaminate solution over the spill and allow to sit 10 minutes minimum. Typical decontamination for isocyanate containing solutions are:

20% Surfactant (Tergitol TMN 10)
80% Water

or 0-10% Ammonia
2-5% Detergent
Balance water

Pressure can be generated. Do not seal container. After 48 hours, material may be sealed and disposed of. Confine and remove with inert absorbent.
Waste disposal method: Do not allow material to contaminate ground water systems. Incinerate absorbed material in accordance with federal, state, and local requirements. Do not incinerate in closed containers.

Section VIII - Special Protection Information

Respiratory: Do not breathe vapors or mists. When these products are used with paints requiring isocyanate hardener or activator, wear a continuous flow supplied air respirator NIOSH approved (TC-19C) when mixing hardener/activator with the paint, during application and until all vapor and spray mist are exhausted. Do not permit anyone without respiratory protection in the painting area. Refer to the hardener/activator label instructions and MSDS for further information. If these products are used without an isocyanate hardener/activator, a properly fitted (NIOSH approved (TC-23C) paint spray respirator can be used.
Ventilation: Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits.
Protective clothing: Neoprene gloves and coveralls are recommended.
Eye protection: Desirable in all industrial situations. Include splash guards or side shields.

Section IX - Special Precautions

Precautions to be taken in handling and storing: Observe label precautions. Keep away from heat, sparks and flame. Close container after each use. Ground containers when pouring. Wash thoroughly after handling and before eating or smoking. Do not store above 120°F.
Other precautions: Do not sand, flame cut, braze or weld dry coating without a NIOSH approved respirator or appropriate ventilation.

Section X - Other Information

Section 313 Supplier Notification: The chemicals listed below with percentages are subject to the reporting requirements of Section 313 of the Emergency Planning and Right-To-Know Act of 1986 and of 40 CFR 372.

PRODUCT CODE **INGREDIENTS (See Section II)**

17755 acrylic polymer-C, bis(1,2,2,6,6-pentamethyl-4-piperdinyl) sebacate, butyl acetate, diethyl phthalate (1%*), ethylbenzene (0-2%*), methyl ethyl ketone (1%*), polyester resin, xylene (5-6%*), 1-methylimidazole, 2(2'-hydroxy-3,5'-diteramylphenyl)benzotriazole
GAL WT: 7.85 WT PCT SOLIDS: 36.15 VOL PCT SOLIDS: 31.41
SOLVENT DENSITY: 7.31 VOC LE: 5.0 VOC AP: 5.0 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

1780S acrylic polymer-D, ethyl 3-ethoxy propionate, ethylbenzene (0-2%*), methyl ethyl ketone (3%*), methyl isoamyl ketone, propionic acid n-butyl ester, propylene glycol monomethyl ether acetate, xylene (6-7%*)
GAL WT: 8.37 WT PCT SOLIDS: 53.13 VOL PCT SOLIDS: 47.03
SOLVENT DENSITY: 7.41 VOC LE: 3.9 VOC AP: 3.9 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

1782S acrylic polymer-H, butyl acetate, diisobutyl ketone, ethyl acetate, methyl isoamyl ketone, methyl isobutyl ketone (10%*), polyester resin, propylene glycol monomethyl ether acetate, toluene (2%*)
GAL WT: 7.94 WT PCT SOLIDS: 40.95 VOL PCT SOLIDS: 33.80
SOLVENT DENSITY: 7.06 VOC LE: 4.7 VOC AP: 4.7 H: 1 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

2225 acetone, acrylic polymer-B, ethyl acetate, ethylbenzene (1-4%*), isopropyl alcohol, mixed dibasic esters, n-butyl alcohol (7%*), petroleum naphtha, toluene (3-4%*), xylene (12-15%*)
GAL WT: 7.06 WT PCT SOLIDS: 5.78 VOL PCT SOLIDS: 4.09
SOLVENT DENSITY: 6.94 VOC LE: 6.7 VOC AP: 5.4 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3700S acrylic polymer-F, bis(1,2,2,6,6-pentamethyl-4-piperdinyl) sebacate, butyl acetate, diethylene glycol monobutyl ether (5%*), ethyl acetate, ethylbenzene (0-2%*), hexyl acetate isomers, methyl ethyl ketone (7%*), methyl isobutyl ketone (2%*), oxo-octyl acetate, propionic acid, n-butyl ester, propylene glycol methyl ether, propylene glycol monomethyl ether acetate, substituted benzotriazole, xylene (7-9%*)
GAL WT: 7.75 WT PCT SOLIDS: 34.40 VOL PCT SOLIDS: 30.00
SOLVENT DENSITY: 7.26 VOC LE: 5.1 VOC AP: 5.1 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3705S butyl acetate, trimer of hexamethylene diisocyanate, 1,6-hexamethylene diisocyanate (<0.5%),
GAL WT: 9.43 WT PCT SOLIDS: 85.01 VOL PCT SOLIDS: 83.59
SOLVENT DENSITY: 7.34 VOC LE: 0.5 VOC AP: 0.5 H: 3 F: 1
R: 1 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC

3710S aliphatic polyamine (36%*), blocked diamine (55%*), ethylbenzene (0-2%*), xylene (6-8%*),
GAL WT: 7.10 WT PCT SOLIDS: 91.32 VOL PCT SOLIDS: 91.44

SOLVENT DENSITY: 7.20 VOC LE: 0.6 VOC AP: 0.6 H: 3 F: 3 R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3785S acetone, isopropyl alcohol, water,
GAL WT: 6.70 WT PCT SOLIDS: 0.80 VOL PCT SOLIDS: 0.51
SOLVENT DENSITY: 6.68 VOC LE: 6.5 VOC AP: 5.3 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3805 acetone, acrylic polymer-A, acrylic polymer-G, butyl benzyl phthalate, cellulose acetate butyrate, ethyl benzene (0-1%*), isopropyl alcohol, methyl ethyl ketone (6%*), mixed dibasic esters, propylene glycol monomethyl ether acetate, toluene (19%*), xylene (2-3%*)
GAL WT: 7.81 WT PCT SOLIDS: 33.40 VOL PCT SOLIDS: 26.59
SOLVENT DENSITY: 7.10 VOC LE: 4.7 VOC AP: 3.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

4809 acetone, acrylic polymer-A, acrylic polymer-G, butyl benzyl phthalate, cellulose acetate butyrate, heptane, isopropyl alcohol, methyl ethyl ketone (3%*), methyl isoamyl ketone, n-butyl alcohol (4%*), propylene glycol monomethyl ether acetate, toluene (8%*), xylene (0-1%*)
GAL WT: 7.01 WT PCT SOLIDS: 14.81 VOL PCT SOLIDS: 10.62
SOLVENT DENSITY: 6.88 VOC LE: 5.8 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

96005 acrylic polymer-E, acrylic polymer-F, acrylic polymer-J, aromatic hydrocarbon, beta-(3-(2h-benzotriazol-2-yl)-4-hydroxy-5-tert, bis(1,2,2,6,6-pentamethyl-4-piperdinyl) sebacate, butyl acetate, ethylbenzene (0-1%*), hexyl acetate isomers, methyl amyl ketone, methyl ethyl ketone (7%*), xylene (4-6%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 7.82 WT PCT SOLIDS: 51.70 VOL PCT SOLIDS: 45.27
SOLVENT DENSITY: 6.90 VOC LE: 3.8 VOC AP: 3.8 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

96018 butyl acetate, ethyl acetate, ethylbenzene (1-3%*), ethylene glycol monobutyl ether acetate (3%*), primary amyl acetate, propylene glycol monomethyl ether acetate, toluene (20%*), xylene (10-12%*)
GAL WT: 7.48 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 7.48 VOC LE: 7.5 VOC AP: 7.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

9808 acrylic polymer-I, butyl acetate, ethyl acetate, ethylbenzene (8-9%*), methyl isobutyl ketone (3%*), propylene glycol monomethyl ether acetate, toluene (1%*), xylene (25-26%*)
GAL WT: 7.96 WT PCT SOLIDS: 35.97 VOL PCT SOLIDS: 30.72
SOLVENT DENSITY: 7.38 VOC LE: 5.1 VOC AP: 5.1 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

Notice: The data in this material safety data sheet relate only to the specific material designated herein and do not relate to use in combination with any other material or in any process.

Product Manager - Refinish Sales

Prepared by D. G. Detweiler

DIRECT TO METAL

Gavlon

Post-it Fax Note | Date 8-5-98 | # of pages 4
To Brian Ross
Fax# 407-774-7227
From [illegible]
Phone# 800-955-1747.

Product Data Sheet – 510 SELF-PRIMING MODIFIED URETHANE ENAMEL

GENERAL PROPERTIES	Versatile Gavlon 510 prepares, primes, top coats, and protects in one step. This enamel has excellent weathering, flexibility and fume resistant properties. 510 can be applied over a trace oil film, water and rusted surfaces without priming.
GENERIC TYPE	A modified urethane enamel designed primarily for spray applications.
SPECIFICATION DATA	Gloss, 60° specular : 85-90% Theoretical coverage: mil ft. per gallon : 481 Drying time, 75°F, Touch : 15 min. Recoat : 30 min. Handle : 1 hour Solids content, by volume : 30% ±1% Weight per gallon, lbs. : 8.3 ±.3 Flash Point, P.M.C.C., OSHA Class 1B : 73°F Recommended film thickness per coat, mils : 2-4 Dry
FINISHES AND COLORS	510 is a high gloss enamel available in standard as well as custom colors. 510 is packaged in 1, 5, 55 gallon, and 13 oz. aerosol cans.
TEMPERATURE LIMIT (Dry)	Continuous 200°F; Intermittent 250°F
MIXING	Care should be taken to completely redisperse all of the pigment that may have settled to the bottom of the container. *Power mix for 3-5 minutes or until completely dispersed.*
THINNING & CLEAN UP	Thinning — Conventional spraying: 1 pint Gavlon 5130 thinner to 1 gallon paint. Airless spraying 1/2 pint 5130 to 1 gallon paint. Electrostatic spraying 1 pint 5130-ES to 1 gallon paint. To retard drying use up to 8 ozs. of Gavlon 0700 Retarder per gallon of paint. Clean up with Gavlon 5130 thinner or a lacquer thinner.
SPRAY EQUIPMENT	Conventional spraying-DeVilbiss MBC 510 or JGA gun with FX fluid tip and 704, 765 or S8 air cap. Airless spraying should be a low ratio (24:1) pump; 510 can be atomized as low as 1500 PSI at the gun. The DeVilbiss JCB510-31, with .009-.011 spray tip (5° to 50° angle) is recommended.
FOOD PROCESSING	Gavlon 510 is chemically acceptable by USDA for application to surfaces where there is a possibility of incidental food contact. This applies only to the colors white, black, green and gray (Non Lead).

CHEMICAL RESISTANCE RESULTS

EXPOSURE	MILD FUMES: WEATHERING	HEAVY FUMES: SPLASH & SPILLAGE
ACID	R	R
ALKALINE	NR	NR
SALTS	R	R
DETERGENTS	R	R
WATER	R	R

R—Recommended NR—Not Recommended

SURFACE PREPARATION AND APPLICATION CONDITIONS (Gen.) FOR 510

All surfaces should be free, as much as possible of: oil, grease, moisture and loose rust; remove all scaling rust mechanically. Spraying is the best application method for 510. For general use, no priming is required.

STEEL: Clean as above, check previous coatings for softness or poor bonding — remove all loose or poorly bonded coatings.

ALUMINUM AND GALVANIZED: All surfaces shall be clean, dry and free from oil, grease and other contaminants. Detergent wash and water rinse to remove water soluble dirt; solvent clean to remove all grease and oil. Oxidation on weathered surfaces shall be mechanically removed or acid etched prior to application. Consult Gavlon for specific recommendations.

Temperature can be 40°F-110°F. Do not use over inorganic zinc.

	Dry film thickness
Primer: None required	
Finish: 510	2-4 mils
Primer: 9106 Vinyl Wash	0.5 mils
Finish: 510B; deisgned for use over 9106	2-4 mils

WARNING!
FLAMMABLE-VAPOR HARMFUL
CAUSES EYE IRRITATION
ABSORPTION THROUGH SKIN MAY BE HARMFUL
CONTAINS ISOBUTYL ACETATE, GLYCOL ETHER SOLVENTS AND TOLUENE

Keep away from heat, sparks and flame. Avoid breathing of vapor or spray mist. Avoid contact with eyes and skin. Do not take internally. Do not use on toys, furniture or surfaces or other articles which might be chewed by children. Wash hands thoroughly after using and before smoking or eating.

Use only with adequate ventilation.

Keep closures tight and upright to prevent leakage. Keep container closed when not in use. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

FIRST AID: In case of skin contact, wash thoroughly with soap and water; for eyes, flush immediately with plenty of water for 15 minutes and call a physician. Remove and wash contaminated clothing before reuse. (Discard contaminated shoes.) If affected by inhalation of vapor, remove to fresh air. If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

FOR INDUSTRIAL USE ONLY

MATERIAL SAFE Y DATA SHEET
FOR COATINGS, RESINS AND RELATED MATERIALS (NPCA 1-84)

HMIS RATINGS	
HEALTH	3
FLAMMABILITY	3
REACTIVITY	0
PERSONAL PROTECTIVE EQUIPMENT	X

Section I—PRODUCT IDENTIFICATION

MANUFACTURER: **GAVLON INDUSTRIES, INC.**
9808 South I-35 P. O. Box 17307
Austin, Texas 78745 Austin, Texas 78760

EMERGENCY TELEPHONE NUMBER: (713) 466-3866
INFORMATION TELEPHONE NUMBER: (512) 282-1115

PRODUCT CLASS: Urethane Alkyd Enamel

MANUFACTURER'S CODE IDENTIFICATION: 510

DATE OF PREPARATION: 2-23-90

TRADE NAME: GAVLON 510 Enamel Any Color

Section II—HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	PERCENT BY WEIGHT	OCCUPATIONAL EXPOSURE LIMITS TLV ACGIH	OCCUPATIONAL EXPOSURE LIMITS PEL OSHA	VAPOR PRESSURE (mm. Hg)
VM&P Naphtha	64742-89-8	17	300 ppm	500 ppm	45@25°C.
n-Butanol	71-36-3	7	50	100	5.5@20°C.
Toluene	108-88-3	1	100	200	54@25°C.
Isopropanol	67-63-0	8	400	400	32.8@20°C.
2-Butoxyethanol	111-76-2	3	25	50	0.6@20°C.
Isobutyl Acetate	110-19-0	13	150	150	13@20°C.
Propylene Gylcol Monomethyl Ether Acetate	108-65-6	2	NA	NA	3.7@20°C.
Methyl Ethly Ketone	78-93-3	1	200	200	78@20°C.

Section III—PHYSICAL DATA

BOILING RANGE: 175-340°F. VAPOR DENSITY: Heavier than air
Appearance & odor: White liquid; characteristic non-resicual odor.
EVAPORATION RATE: Slower than Ether % VOLATILE VOLUME: 68 WT/GAL: 7.8 - 9.9

Section IV—FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION: OSHA IB FLASH POINT: 78°F. (TCC)
DOT Flammable Liquid LEL: 1.0

EXTINGUISHING MEDIA: Use National Fire Protection Association Class B Extinguishers (CO_2, dry chemical or foam) for NFPA Class B fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed. Isolate from heat, electrical equipment, sparks and open flames. Closed containers may explode when exposed to extreme heat. Do not apply to surfaces that are above 140°F.

SPECIAL FIREFIGHTING PROCEDURES: Water spray may be ineffective. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat. If water is used, fog nozzles are preferable. Full protective equipment including self-contained breathing apparatus is needed to protect fire fighters from exposure.

Section V—HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE: Acute inhalation—anaesthetic; irritation of the respiratory tract or acute nervous system, depression, headache, dizziness, staggering gait or coma. Skin or eye contact—irritation. Chronic inhalation—lethargy, narcosis; lung, liver and kidney damage. Ingestion-may result in vomiting,.May be harmful or fatal is swallowed.
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: Preexisting eye, skin, respiratory and medical disorders may be aggravated.
PRIMARY ROUTE(S) OF ENTRY: ☒ DERMAL ☒ INHALATION ☐ INGESTION

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation:	Remove to fresh air. Restore breathing.
Splash (eyes):	Flush immediately with large amounts of water for at least 15 minutes. Take to a physician for medical treatment.
Splash (skin):	Wash affected areas with soap and water. Remove contaminated clothing.
Ingestion:	Drink 1 or 2 glasses of water to dilute. Do not induce vomiting. Consult physician or poison control center immediately. (1-800-392-8549)

Section VI—REACTIVITY DATA

STABILITY: ☐ UNSTABLE ☒ STABLE

HAZARDOUS POLYMERIZATION ☐ MAY OCCUR ☒ WILL NOT OCCUR
HAZARDOUS DECOMPOSITION PRODUCTS: CO_2 and Nitrogen Oxides; Carbon Monoxide.

CONDITIONS TO AVOID: Heat, sparks and flame.

INCOMPATABILITY (MATERIALS TO AVOID): Oxidizing agents such as nitric acid.

Section VII—SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Absorb and place in sealable containers.

WASTE DISPOSAL: Disposal must be accomplished in compliance with local, state and federal regulations.

Section VIII—SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: In outdoor or open areas used approved mechanical-filter respirator to remove solid air borne particles of overspray during spray application. In restricted ventilation areas use approved chemical-mechanical filters designed to remove a combination of particulate and gas and vapor. In confined areas, use approved air line type of respirators or hoods.

VENTILATION: Provide general dilution or local exhaust ventilation in volume and pattern to keep TLV of most hazardous ingredient in SECTION II below acceptable limit, LEL in SECTION IV below state limit, and to remove decomposition products during welding or flame cutting surfaces coated with this product.

PROTECTIVE GLOVES: Neoprene or rubber gloves required for prolonged or repeated contact.

EYE PROTECTION: Safety eyewear including splash guards.

OTHER PROTECTIVE EQUIPMENT: Outerwear to protect against clothing contamination and skin contact.

HYGIENIC PRACTICES: Wash hands before eating, drinking or using tobacco products.

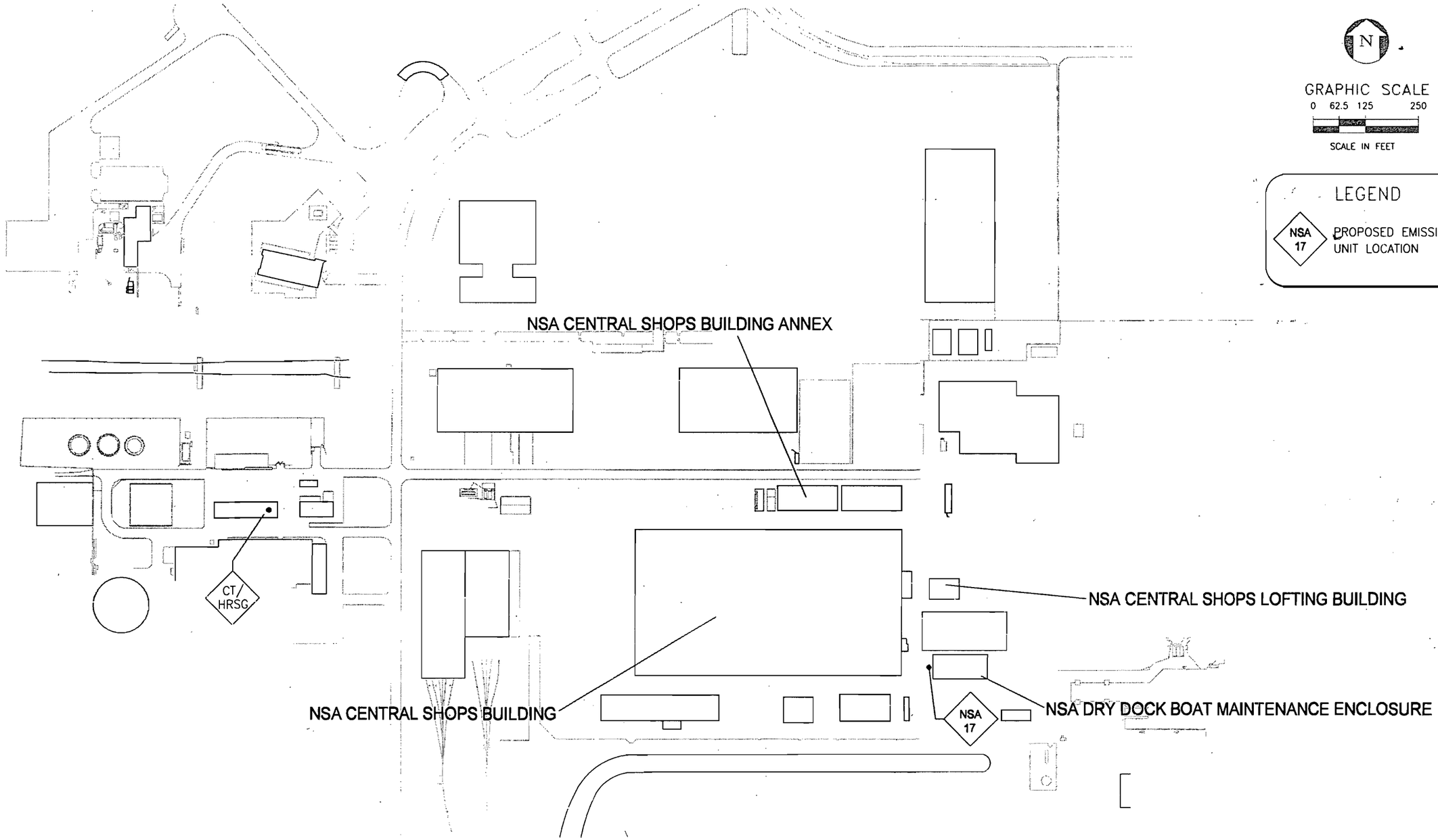
Section IX—SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Do not store above 120° F. Store large quantities in buildings designed and protected for storage of OSHA Classification Flammable Liquid indicated in SECTION IV.

OTHER PRECAUTIONS: Do not take internally. Containers should be grounded when pouring. Avoid storing near open flames. Do not flame cut, braze or weld without approved respirator or appropriate ventilation.

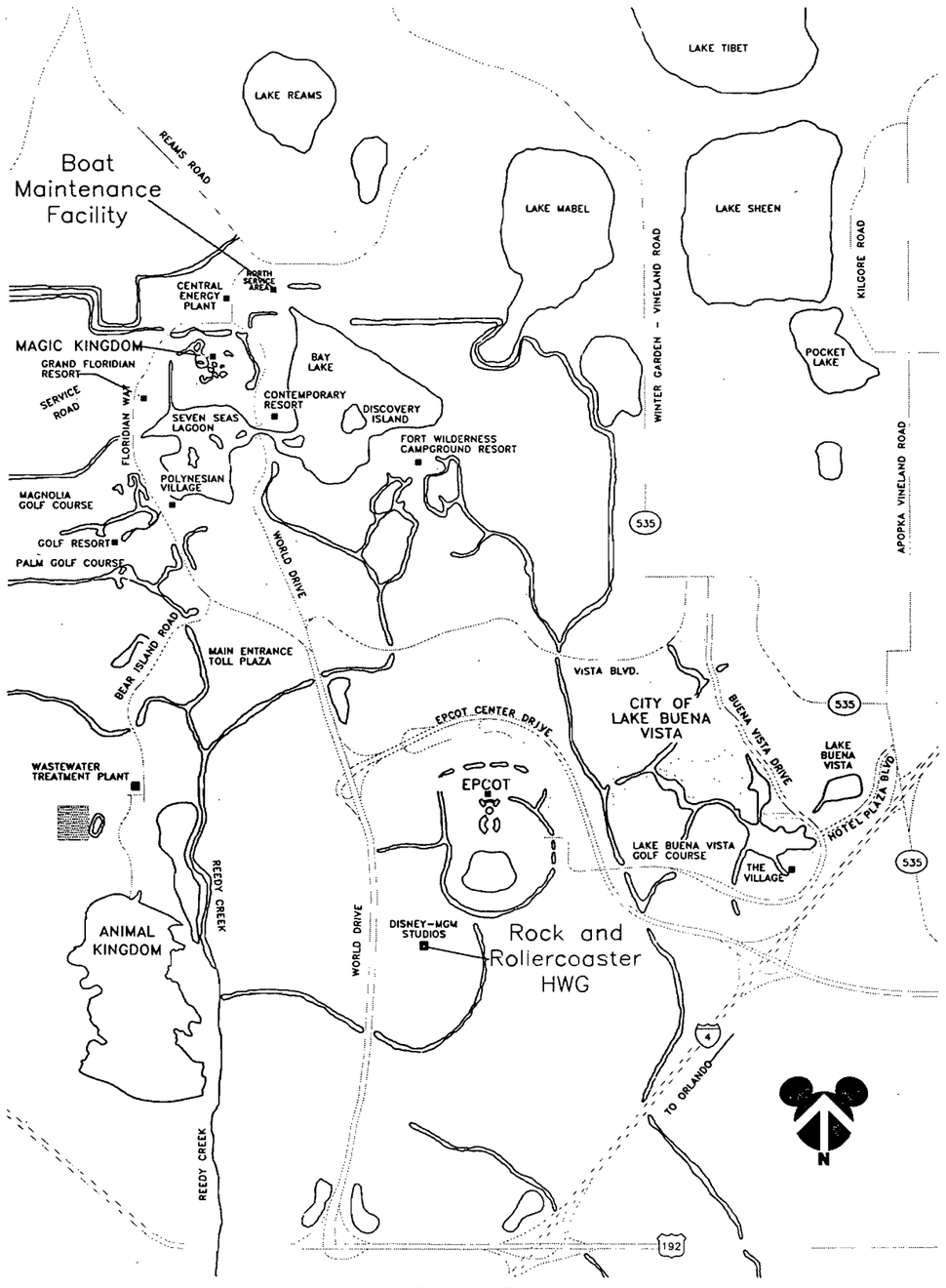
L:\DOCUMENTS\PERMITS\CENTRAL SHOPS\BOAT MAINTENANCE DRY DOCK\PLOT PLAN.DWG

09/25/1998

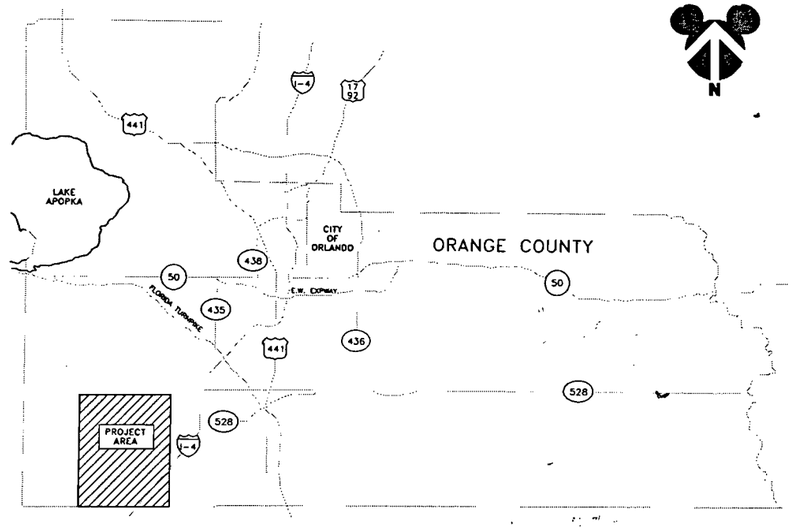


ATTACHMENT B
FACILITY PLOT PLAN
NORTH SERVICE AREA DRY DOCK FACILITY - BOAT MAINTENANCE AND PAINTING ENCLOSURE

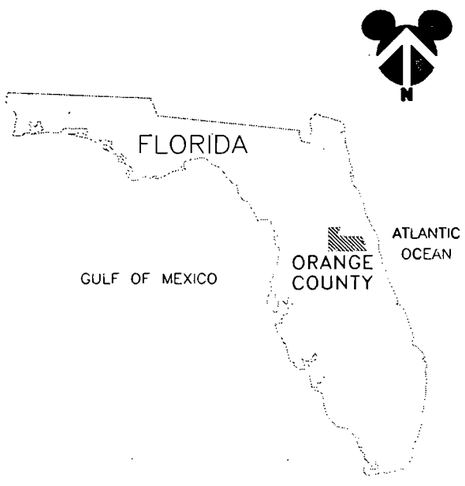
Walt Disney World®



SITE LOCATION MAP



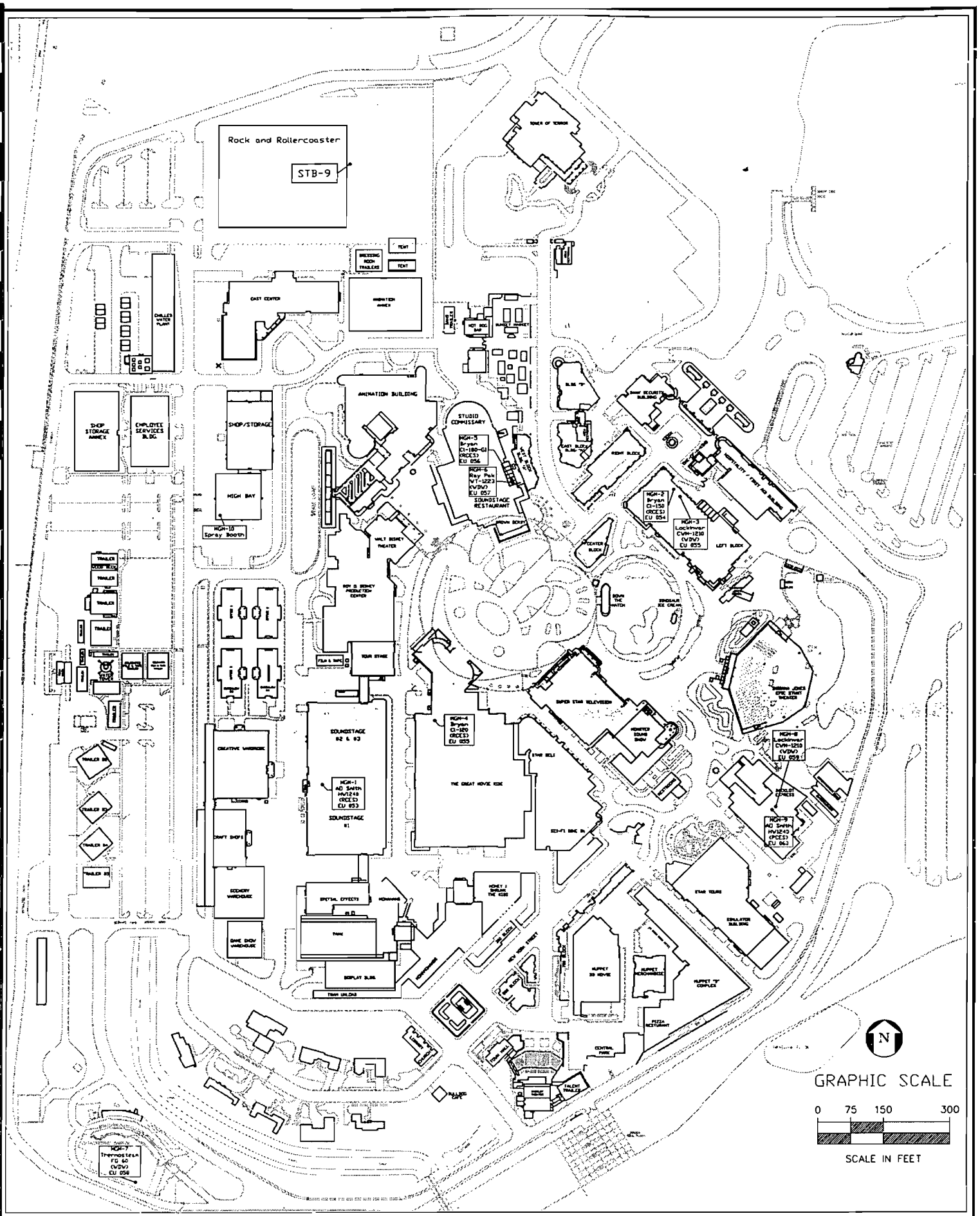
VICINITY MAP



LOCATION MAP

ATTACHMENT C
AREA MAP SHOWING FACILITY LOCATIONS
BOAT MAINTENANCE FACILITY AND ROCK AND ROLLERCOASTER HOT WATER GENERATOR

Walt Disney World®



ATTACHMENT D
FACILITY PLOT PLAN
DISNEY-MGM STUDIOS ROCK AND ROLLERCOASTER HOT WATER GENERATOR (STB-9)

Attachment D
EMISSIONS CALCULATION WORKSHEET

Pollutant →			CO		NO_x		PM/PM_{10}		SO_2		VOC			
Control Factors (CF) →			0%		0%		0%		0%		0%			
Uncontrolled Pollutant Emission Factors (UPEF)[d] →			21 lb/MM ft³		100 lb/MM ft³		11.9 lb/MM ft³		0.6 lb/MM ft³		5.8 lb/MM ft³			
Source No.	Location	Heat Input, MMBtu/hr	lb/hr[b]	tpy[a]	lb/hr[b]	tpy[a]	lb/hr[b]	tpy[a]	lb/hr[b]	tpy[a]	lb/hr[b]	tpy[a]	Hourly fuel usage, MMft³/hr[c]	Annual fuel usage, MMft³/yr[d]
STB-9	Rock and Rollercoaster	1.800	0.038	0.166	0.180	0.788	0.021	0.094	0.001	0.005	0.010	0.046	0.002	15.77

Boiler/Water heater Operating Hours = 24 hr/day x 7 days/wk x 52 wk/yr = 8760 hrs/yr

Natural Gas Heat Value = 1000 Btu/ft³

Example calculations:

[a] Annual Emissions:

Heat Input (MMBtu/hr) x Operating hours (8760 hr/yr) x gas heat value (ft³/1000 Btu) x UPEF (lb/MMft³) x (100- CF) (%) x 1 ton/2000 lb = tpy

[b] Hourly Emissions:

Heat Input (MMBtu/hr) x gas heat value (ft³/1000 Btu) x UPEF (lb/MMft³) x (100- CF) (%)= lb/hr

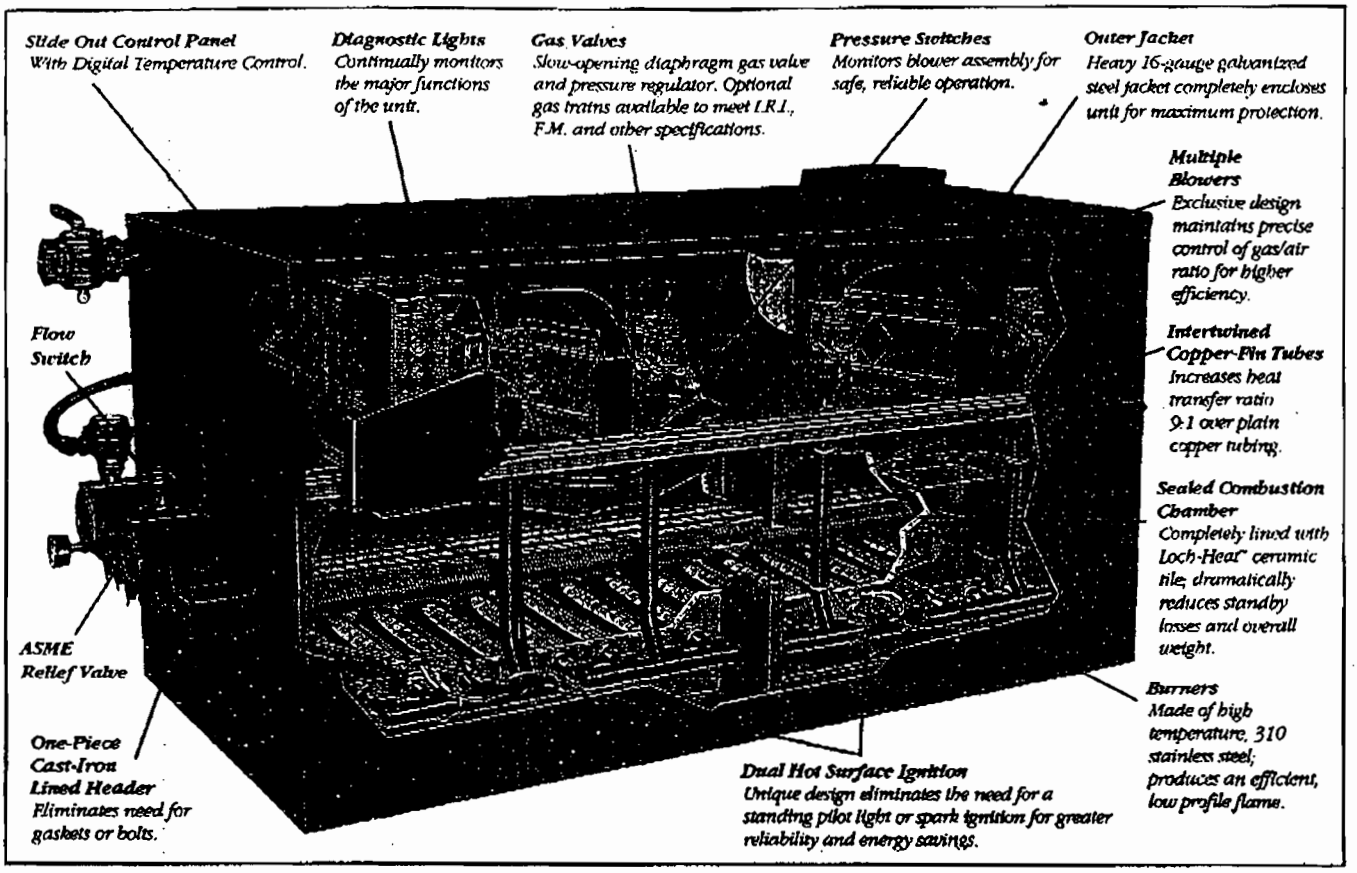
[c] Hourly fuel usage:

Heat Input (MMBtu/hr) x gas heat value (ft³/1000 Btu) = MMft³/hr

[d] Reference AP-42, October 1996

Copper-Fin II 990-2070

Featuring Proportional Firing



What Is Proportional Firing?

All Copper-Fin II commercial gas boilers feature a sealed combustion chamber to minimize heat loss, and a power-assisted fan provides just the right amount of combustion air to ensure the best combustion. But with the newest additions to the Copper-Fin II line, we've taken that a step further.

These new models not only maintain the ideal blend of gas and air for combustion, they do so in proportional amounts. They provide a measured response to the demand for heat—as much or as little as needed—while always maintaining the ideal gas/air ratio.

How It Works

Multiple gas valves supply the burners in stages, and multiple blowers maintain the proper airflow to ensure the most efficient combustion at each level of use. All are controlled by our built-in sequencer*. With digital accuracy, it carefully monitors the need for heat, and as demand increases or decreases, it automatically adjusts the blower output and gas valves.

As the demand is met, the system shuts down gradually, turning off gas valves and reducing combustion air intake in direct proportion. This allows the Copper-Fin II to maintain a virtually constant setting. In fact, it's accurate to within 1° Fahrenheit—a remarkable achievement in a unit of this capacity!

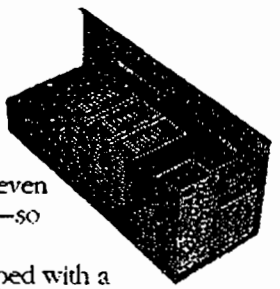
**Featuring Digital Temperature Control (DTC).*

Consistent Performance

Conventional boilers achieve peak efficiency only when they're running at maximum capacity. When the demand for heat is lower, the efficiency is lower too. But the Copper-Fin II models with proportional firing not only offer more accurate temperature control, they consistently provide peak performance even when operating at reduced inputs. That means maximum energy savings at every level of usage.

Plus, our Copper-Fin heat exchanger provides superior heat transfer. In fact, it's nine times more efficient than conventional copper tubing.

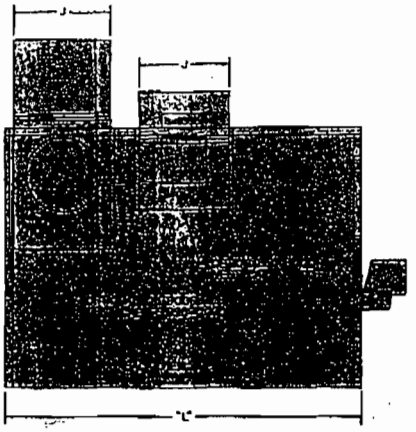
Total System Redundancy

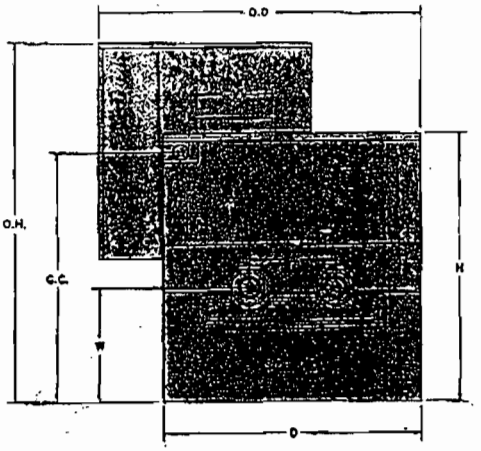


Proportional firing also means unmatched reliability. Every major component has a back-up—multiple gas valves, multiple fans, even dual Hot Surface Ignition Systems—so downtime is virtually eliminated.

What's more, each unit is equipped with a comprehensive Diagnostic Information Center; it alerts the operator if there is a problem and helps to isolate it quickly. The 990-2070 series also features the industry's first slide-out control panel with plug-in components. A built-in circuit breaker eliminates fuses, too—making servicing fast and easy.

Copper-Fin II Boiler Dimensions & Specifications





MODEL NO	BTU INPUT	BTU OUTPUT	GAS CONN.	WATER CONN.	A	D	O.D.	G.C.	H	O.H.	J	L	V	W	WT.
CHN0300	300,000	252,000	¾"	2"	6½"	22¼"	27⅛"	21"	28⅛"	34⅜"	12¼"	30¼"	5"	11¾"	270
CHN0400	399,999	336,000	1"	2"	6½"	22¼"	27⅛"	21"	28⅛"	34⅜"	12¼"	37¼"	6"	11¾"	310
CHN0500	500,000	420,000	1"	2"	6½"	22¼"	27⅛"	21"	28⅛"	34⅜"	12¼"	45¼"	6"	11¾"	352
CHN0650	650,000	546,000	1¼"	2"	6½"	22¼"	27⅛"	21"	28⅛"	34⅜"	12¼"	56⅛"	8"	11¾"	413
CHN0750	750,000	630,000	1¼"	2"	6½"	22¼"	27⅛"	21"	28⅛"	34⅜"	12¼"	63⅛"	8"	11¾"	447
CHN0990	990,000	831,600	1½"	2½"	11½"	33½"	41¾"	33"	35⅛"	47¼"	14"	48⅜"	10"	15"	804
CHN1260	1,260,000	1,058,400	1½"	2½"	11½"	33½"	41¾"	33"	35⅛"	47¼"	16"	58⅛"	12"	15"	1018
CHN1440	1,440,000	1,209,600	2"	2½"	11½"	33½"	41¾"	33"	35⅛"	47¼"	16"	68⅛"	12"	15"	1126
CHN1800	1,800,000	1,512,000	2"	2½"	11½"	33½"	41¾"	33"	35⅛"	47¼"	18"	82⅛"	14"	15"	1269
CHN2070	2,070,000	1,738,800	2"	2½"	11½"	33½"	41¾"	33"	35⅛"	47¼"	18"	92⅛"	14"	15"	1376

Note: Change 'N' to 'L' to denote L.P. model. No deration on L.P. models.

Standard Features

- 84% Thermal Efficiency
- Sealed Combustion Chamber
- Hot Surface Ignition
- "310" Stainless Steel Burners
- Redundant Gas Valves
- Unique Gasketless Copper-Fin Heat Exchanger
- Loch-Heat™ Ceramic Tile Combustion Chamber
- ASME 160# W.P.
- 50 psi ASME Pressure Relief Valve
- NOx Rating of 9.9 ppm
- Diagnostic Control Panel
- 24v Controls
- Temperature/Pressure Gauge
- Air Pressure Switch
- Manually-Operated/Lubricated Plug Cock
- 10-Year Warranty
- Guaranteed Against Thermal Shock
- Stackable
- Fits Through Standard 36" Doorframes
- 3" Clearance From Combustible Walls
- Category 1 Venting

Additional Features (990-2070 Models)

- Proportional Firing
- Dual Hot Surface Ignition Systems
- Multiple Blowers
- Built-In Sequencer
- Digital Temperature Control (DTC)
- Slide-Out Control Panel with Plug-In Components
- Terminal Strip
- Expanded 15-Light Diagnostic Panel
- Flow Switch
- Manual Reset High Limit
- Terminal Strip for E.M.S. Hook-ups

Optional Equipment

- Powered Vent Cap for Horizontal DirectAire™ Venting (110v) and sidewall
- Cupro Nickel Heat Exchanger
- Manual Reset Hi-Limit (Models 300-750)
- Alarm Bell
- Flow Switch (Models 300-750)
- Low Water Cut-Off
- Mod-u-Pak Sequencer
- All Bronze Pump
- Multi-Stack Stand
- Outdoor Reset

Available Firing Systems

300-750	990-2070	
F9	M9	Electronic Control with Hot Surface Ignition (Standard)
F3	M3	FM Approved*
F4	M4	IRI*
F5	M5	Illinois School Code*
F7	M7	California Code

* Indoor only.

Patent Pending

Boiler design certified by A.G.A. as hot water boilers for both natural gas and propane gas.

All models comply with ASME Boiler Pressure Vessel Code, Section IV, 160 psi working pressure

Canadian Gas Association

gama

A Space-Saving, Money-Saving Design

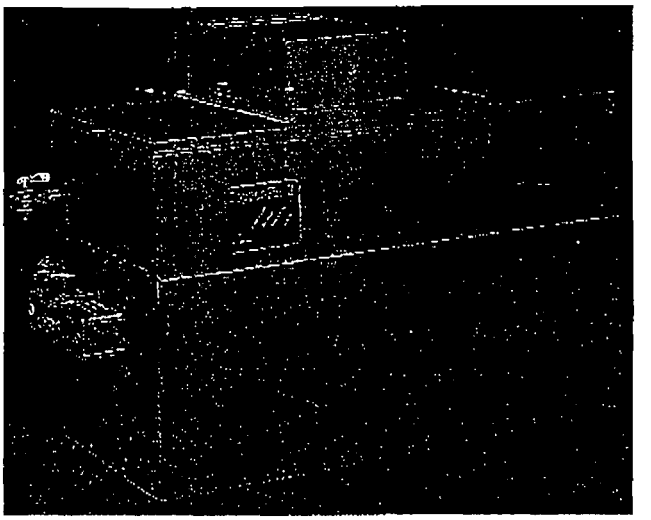
The entire Copper-Fin II line offers you greater flexibility and ease of installation. Because of their high efficiency, these units are also compact enough to fit through standard 36" doorways intact. Even our 2 million BTU model is only 32" wide.

Once inside, these space-saving designs leave more room in the mechanical room. Plus, the Copper-Fin II offers four indoor venting options, including Lochinvar's own power-assisted DirectAire™ system. Or use them with the optional outdoor vent hood.

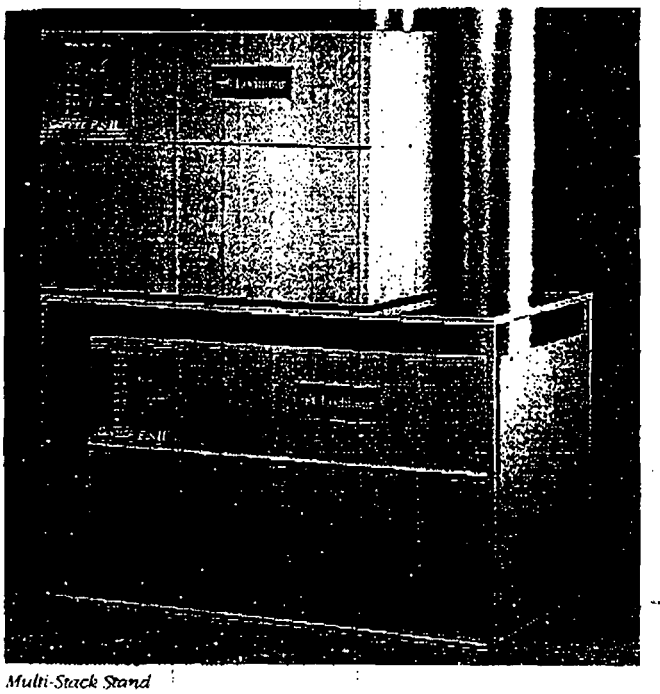
What's more, the sealed combustion chamber minimizes heat loss so dramatically that Copper-Fin II units require only 3" clearance from combustible walls. And the optional new Multi-Stack stand allows you to put two units in the space normally required for one.

High-efficiency, fan assisted combustion means you can use a smaller diameter vent stack, up to 8" smaller than typically required—making installation less expensive and less time-consuming.

So save energy, save space, and save on installation costs—with Copper-Fin II boilers.



The Copper-Fin II® Outdoor Model



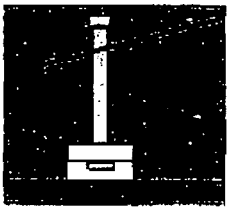
Multi-Stack Stand

Vent Cost Savings

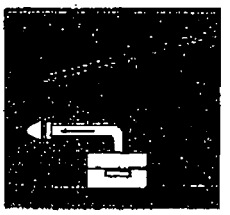
INPUT	CONVENTIONAL VENT SIZE	COPPER-FIN II VENT SIZE	$ SAVINGS*
300,000	8"	5"	253.00
400,000	10"	6"	657.00
500,000	10"	6"	657.00
650,000	12"	8"	731.00
750,000	14"	8"	1,450.00
990,000	16"	10"	1,790.00
1,260,000	16"	12"	1,463.00
1,440,000	18"	12"	2,432.00
1,800,000	20"	14"	3,526.00
2,070,000	22"	14"	3,738.00

**Comparison based on 25' vent system using Type "B" double wall vent material, storm collar and vent cap.*

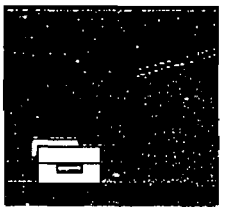
Venting Options



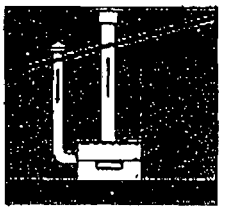
Conventional
Vents into conventional flue or vent breaching using Type B category flue.



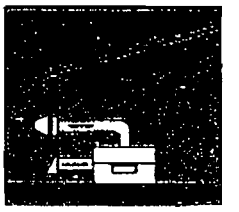
Side Wall
Vents directly through the outside wall using the optional powered side wall cap. Ideal when a vent stack is not practical.



Outdoor
Requires an add-on outdoor vent cap. Use when indoor space is a problem or if outdoor location gives better access.

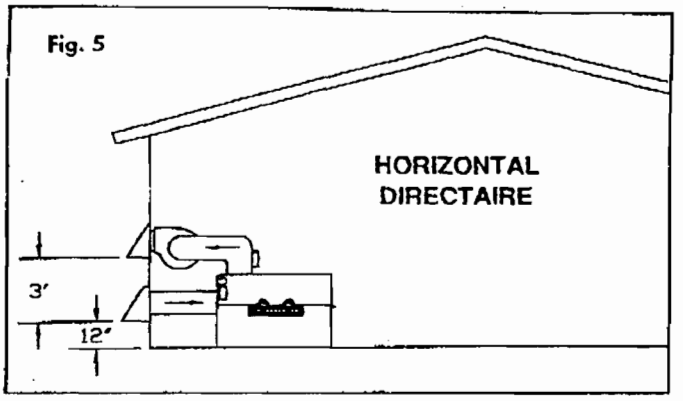


DirectAire Vertical
Draws fresh combustion air from outside, and vents combustion by-products through conventional vertical flue.



DirectAire Horizontal
Again, draws fresh combustion air from outside, then vents by-products through side wall using optional louvered vent cap

Fig. 5



HORIZONTAL DIRECTAIRE

For venting flue products horizontally to outdoors, follow all requirements in the installation instructions for side wall venting.

The horizontal DirectAire system requires installation of a single wall pipe to supply combustion air from outdoors directly to the unit. The maximum length of this pipe is 50 equivalent feet (15.24m). Subtract 5 feet (1.52m) per elbow.

Combustion air supplied from outdoors must be free of contaminants (See Combustion and Ventilation Air). To prevent recirculation of flue products into the combustion air inlet, follow all instructions in this section.

The combustion air inlet cap must be at least 3 feet (0.91m) below the powered vent cap, if within 10 feet (3.05m). The combustion air cap and powered vent cap MUST be located on the same wall and in the same pressure zone.

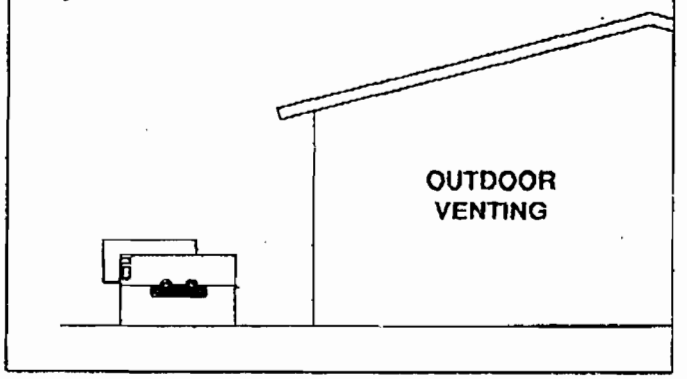
The combustion air cap must not be installed closer than 3 feet (0.91m) from an inside corner of an L-shaped structure.

The combustion air cap must be installed at least one foot (0.30m) above ground level and above normal snow levels.

The required horizontal DirectAire kit part numbers are listed by unit size. Each kit includes the special sidewall vent components for the flue, a combustion air intake cap for side wall mounting and the transition adaptor to attach the field supplied single wall air inlet pipe to the unit.

Input BTU/hr	Flue Size	Horizontal DirectAire Kit Number
990,000	10"	HDK3009
1,260,000	12"	HDK3010
1,440,000	12"	HDK3011
1,800,000	14"	HDK3012
2,070,000	14"	HDK3012

Fig. 6



OUTDOOR INSTALLATION

Units are self venting and can be used outdoors when installed with the optional Outdoor Cap. This cap mounts to the unit top and no additional vent piping is required.

WARNING: Outdoor models MUST be installed outdoors and MUST use the vent cap supplied by the manufacturer. Personal injury or product damage may result if any other cap is used or if an outdoor model is used indoors. All covers, doors and jacket panels must be properly installed to insure proper operation and prevent a hazardous condition.

Combustion air supply must be free of contaminants (See Combustion and Ventilation Air). To prevent recirculation of flue products into the combustion air inlet, follow all instructions in this section.

The venting areas must never be obstructed. Keep area clean and free of combustible and flammable materials. Maintain a minimum clearance of 3" to combustible surfaces and a minimum of 3" clearance to the air inlet. To avoid a blocked air inlet or blocked flue condition, keep the outdoor cap air inlet, flue outlet and drain slot clear of snow, ice, leaves, debris, etc.

A unit should not be located so that high winds can deflect off of adjacent walls, buildings or shrubbery causing recirculation. Recirculation of flue products may cause operational problems, bad combustion or damage to controls. The unit should be located at least 3 feet (0.19m) from any wall or vertical surface to prevent adverse wind conditions from affecting performance.

Multiple unit outdoor installations require 48" (1.22m) clearance between vent caps.

The outdoor cap must be located 4 feet (1.22m) below and 4 feet (1.22m) horizontally from any window, door, walkway or gravity air intake.

The combustion air inlet of the outdoor cap must be located at least one foot (0.30m) above grade and above normal snow levels.

The unit must be at least 10 feet (3.05m) away from any forced air inlet.

The unit must be at least 3 feet (0.91m) outside any overhang.

Clearances around outdoor installations can change with time. Do not allow the growth of trees, shrubs or other plants to obstruct the proper operation of the outdoor vent system.

Do not install in locations where rain from building runoff drains will spill into the boiler.

Flue gas condensate can freeze on exterior walls or on the vent cap. Frozen condensate on the vent cap can result in a blocked flue condition. Some discoloration to exterior building or unit surfaces can be expected. Adjacent brick or masonry surfaces should be protected with a rust resistant sheet metal plate.

The required outdoor cap part numbers are listed by unit size. Each kit includes the flue products outlet/combustion air inlet assembly.

Input BTU/hr	Outdoor Cap Kit Number
990,000	ODK3009
1,260,000	ODK3010
1,440,000	ODK3010
1,800,000	ODK3011
2,070,000	ODK3011

OUTDOOR VENT CAP INSTALLATION

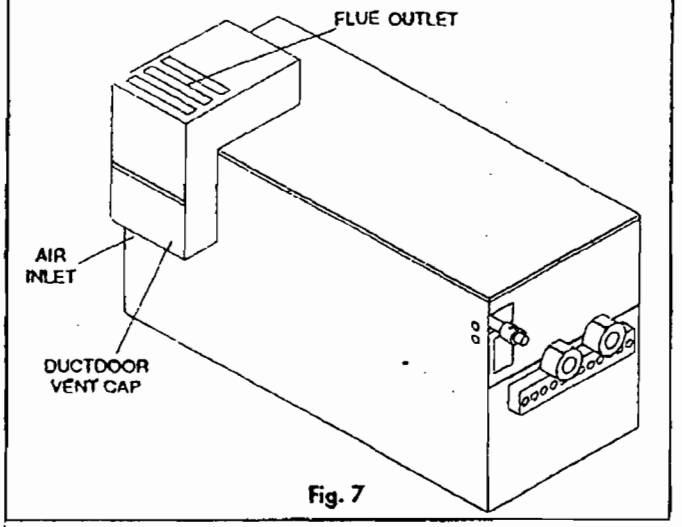


Fig. 7

GAS SUPPLY

Verify unit is supplied with type gas specified on data plate. Consult factory for installations above 2000 feet elevation.

INLET PRESSURE: Measured at the inlet pressure tap located at the main gas cock. This is upstream of the combination gas valves for each stage of operation.

TABLE A

	Nat. Gas	LPG
Max. (Inches-Water Column)	14"	14"
Min. (Inches-Water Column)	5"	11"

The maximum inlet gas pressure must not exceed the value specified. Minimum value listed is for the purpose of input adjustment.

MANIFOLD PRESSURE: Measured at the pressure tap on the downstream side of the combination gas valve for each stage of operation.

TABLE B

BTU Input	Nat. Gas	LPG
990,000-2,070,000	3.5"	10"

Manifold pressure tap located downstream of main gas valve.

GAS PRESSURE TEST

1. The appliance must be disconnected from the gas supply piping system during any pressure testing of that system at a test pressure in excess of 1/2 PSIG (3.5kPa). The appliance must be isolated from the gas supply piping system by closing a manual shutoff valve during any pressure testing of the gas supply piping system at test pressure equal to or less than 1/2 PSIG (3.5kPa).
2. The appliance and its gas connection must be leak-tested before placing it in operation.

GAS CONNECTION

1. Safe operation of unit requires properly sized gas supply piping. See data below.
2. Gas pipe size may be larger than heater connection.
3. Installation of a union is suggested for ease of service.
4. Install a manual main gas shutoff valve, outside of the appliance gas connection and before the gas valve, when Local Codes require.
5. A trap (drip leg) MUST be provided in the inlet of the gas connection to the unit.
6. Route bleeds and vents to the atmosphere, outside the building when required by Local Codes.

SINGLE UNIT INSTALLATIONS
SUGGESTED GAS PIPE SIZE TABLE C

BTU INPUT	DISTANCE FROM METER				
	0-50'	51'-100'	101'-200'	201'-300'	301'-500'
990,000	2"	2"	2½"	2½"	3"
1,260,000	2"	2½"	2½"	3"	3"
1,440,000	2"	2½"	3"	3"	3½"
1,800,000	2½"	2½"	3"	3"	3½"
2,070,000	2½"	3"	3"	3½"	4"

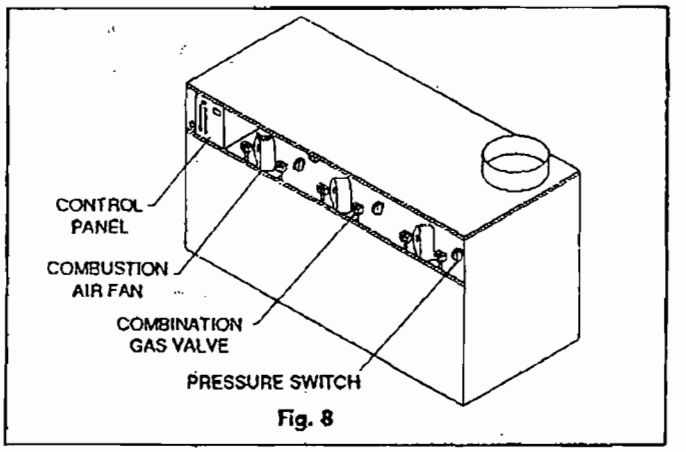


Fig. 8

COMBINATION GAS VALVES

Each stage of burner operation has a combination gas valve to cycle the gas supply on and off and regulate gas to the burners. Each valve has an individual gas control knob that must remain in the open position at all times when the unit is in service. The manifold gas pressure tap for each burner stage is located at the discharge side of the valve for each stage. The manifold pressure is preset at the factory and adjustment is not usually required. If the manifold pressure is to be adjusted the burner stage must be firing while the manifold pressure is set.

ELECTRICAL REQUIREMENTS (USA)

This appliance is wired for 120 volt service. The unit, when installed, must be electrically grounded in accordance with the requirements of the authority having jurisdiction or in the absence of such requirements, with the latest edition of the National Fuel Gas Code ANSI/NFPA No. 70.

1. All wiring between the unit and field installed devices shall be made with type T wire [63° F (35° C) rise].
2. Line voltage wire exterior to the appliance must be enclosed in approved conduit or approved metal clad cable.

AMP DRAW DATA
TABLE D

MODEL	FANS	CONTROLS	APPROXIMATE TOTAL AMPS
990	7.2	7.2	14.4
1260	7.2	7.2	14.4
1440	7.2	7.2	14.4
1800	10.8	7.2	18.0
2070	10.8	7.2	18.0