



a member of the Roche Group

Material Safety Data Sheet

Material Name: RiboFix™ Reagent

MSDS ID: 00231488

*** Section 1 - Chemical Product and Company Identification***

Manufacturer Information

VENTANA MEDICAL SYSTEMS INC.
1910 E. Innovation Park Drive
Tucson, AZ 85755
Phone: (520) 887-2155

EMERGENCY TELEPHONE NUMBER:
(800) 424-9300 (USA/Canada)
CHEMTREC: +1 (703) 527-3887 (International)

Material Name: RiboFix™ Reagent

Product Number(s)

760-4126, 05268419001

Product Use

Research use only

*** Section 2 - Hazards Identification***

NFPA Ratings: Health: 3 Fire: 2 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Preparation

Carc.Cat.3,,Xi,Xn; R:20/21/22-36/37/38-43-40

Risks

Harmful by inhalation, in contact with skin and if swallowed.
Irritating to eyes, respiratory system and skin.
Limited evidence of a carcinogenic effect.
May cause sensitization by skin contact.

EMERGENCY OVERVIEW

Color: colorless to yellow

Physical Form: liquid

Odor: pungent odor

Major Health Hazards: potentially fatal if inhaled, harmful on contact with the skin, harmful if swallowed, respiratory tract irritation, skin irritation, eye irritation, allergic reactions, cancer hazard (in humans)

Physical Hazards: Flash back hazard. Combustible liquid and vapor.

POTENTIAL HEALTH EFFECTS

Inhalation

Short Term: potentially fatal if inhaled, irritation, allergic reactions, difficulty breathing, headache

Long Term: irritation, headache, nausea, drowsiness, difficulty breathing, cancer

Skin

Short Term: irritation, allergic reactions

Long Term: irritation

Eye

Short Term: irritation

Long Term: irritation

Ingestion

Short Term: irritation, nausea, vomiting, diarrhea, stomach pain, headache, changes in blood pressure, effects on the brain, lung congestion, dizziness, convulsions, unconsciousness, liver damage, heart damage, brain damage, kidney damage, coma

Long Term: irritation, vomiting, dizziness, allergic reactions, changes in blood pressure

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

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*** Section 3 - Composition/Information on Ingredients***

CAS #	Component / EU Number	Percent	Symbol(s)	Risk Phrase(s)
Not Available	NON-HAZARDOUS -	60-100	---	---
50-00-0	FORMALDEHYDE 200-001-8	7-13	T	R:23/24/25-34-40-43
7647-14-5	SODIUM CHLORIDE 231-598-3	1-5	Xi	R:36
7558-79-4	SODIUM PHOSPHATE, DIBASIC 231-448-7	<1	---	---
6381-92-6	ETHYLENEDIAMINETETRAACETIC ACID, DISODIUM SALT, DIHYDRATE -	<1	Xi	R:36
9002-93-1	POLYOXYETHYLATED OCTYL PHENOL -	<1	Xn Xi N	R:22-36-51/53

*** Section 4 - First Aid Measures***

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin

Wash contaminated areas with soap and water. Thoroughly clean and dry contaminated clothing before reuse. Get medical attention, if needed.

Eyes

Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion

If a large amount is swallowed, get medical attention.

*** Section 5 - Fire-Fighting Measures***

See Section 9 for Flammability Properties

Flammable Properties

Moderate fire hazard. Vapor/air mixtures are explosive above flash point. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

Extinguishing Media

carbon dioxide, regular dry chemical, regular foam, water

Fire Fighting Measures

Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Reduce vapors with water spray. Avoid inhalation of material or combustion by-products.

Hazardous Combustion Products

Thermal decomposition or combustion products: halogenated compounds, oxides of carbon, oxides of nitrogen, oxides of phosphorus, oxides of sodium, phosphine

Sensitivity to Mechanical Impact

Not sensitive

Sensitivity to Static Discharge

Yes

*** Section 6 - Accidental Release Measures***

Water Release

Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

Occupational Spill/Release

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water inside container. **Small spills:** Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal.

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*** Section 7 - Handling and Storage***

Handling Procedures

Wash thoroughly after handling.

Storage Procedures

Store and handle in accordance with all current regulations and standards. Store between 15 C and 30 C. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. See original container for storage recommendations. Keep separated from incompatible substances.

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*** Section 8 - Exposure Controls/Personal Protection***

Exposure Limits

FORMALDEHYDE (50-00-0)

ACGIH:	0.3 ppm Ceiling Sensitizer
NIOSH:	0.016 ppm TWA 0.1 ppm Ceiling (15 min) 20 ppm IDLH
OSHA:	2 ppm STEL (Irritant and potential cancer hazard, See 29 CFR 1910.1048, 15 min); 0.5 ppm Action Level; 0.75 ppm TWA 3 ppm TWA (unless specified in 1910.1048) 10 ppm STEL (unless specified in 1910.1048, 30 min) 5 ppm Ceiling (unless specified in 1910.1048) 0.75 ppm TWA 2 ppm STEL (see 29 CFR 1910.1048)
Austria:	0.5 ppm STEL; 0.6 mg/m3 STEL 0.5 ppm MAK; 0.6 mg/m3 MAK skin notation 0.5 ppm Ceiling; 0.6 mg/m3 Ceiling Skin sensitizer
Denmark:	0.3 ppm Ceiling; 0.4 mg/m3 Ceiling
Finland:	1 ppm STEL; 1.2 mg/m3 STEL 0.3 ppm TWA; 0.37 mg/m3 TWA 1 ppm Ceiling; 1.2 mg/m3 Ceiling
France:	1 ppm VLCT 0.5 ppm VME
Germany (DFG):	0.3 ppm MAK; 0.37 mg/m3 MAK (no irritation should occur during mixed exposure) 0.6 ppm Peak (no irritation should occur during mixed exposure); 0.74 mg/m3 Peak (no irritation should occur during mixed exposure) skin sensitizer
Greece:	2 ppm STEL; 2.5 mg/m3 STEL 2 ppm TWA; 2.5 mg/m3 TWA
Ireland:	2 ppm STEL; 2.5 mg/m3 STEL 2 ppm TWA; 2.5 mg/m3 TWA
Japan	0.2 ppm Ceiling; 0.24 mg/m3 Ceiling 0.1 ppm OEL; 0.12 mg/m3 OEL Group 2 airway sensitizer; Group 1 skin sensitizer
Netherlands:	0.5 mg/m3 STEL 0.15 mg/m3 TWA
Portugal:	0.3 ppm Ceiling Sensitizer
Spain:	0.3 ppm VLA-EC; 0.37 mg/m3 VLA-EC sensitizer
Sweden:	0.5 ppm LLV; 0.6 mg/m3 LLV 1 ppm CLV; 1.2 mg/m3 CLV Sensitizer
United Kingdom:	2 ppm STEL; 2.5 mg/m3 STEL 2 ppm TWA; 2.5 mg/m3 TWA

Ventilation

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face

Safety glasses or goggles are recommended when there is a potential for eye contact. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Protective Clothing

Lab coat or apron.

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Glove Recommendations

Wear appropriate chemical resistant gloves.

Protective Materials

latex

Respiratory Protection

No respirator is required under normal conditions of use.

*** Section 9 - Physical and Chemical Properties***

Physical State:	Liquid	Appearance:	Clear, colorless to yellow liquid
Color:	colorless to yellow	Physical Form:	liquid
Odor:	pungent odor	Odor Threshold:	Not available
pH:	6.439	Decomposition:	Not available
Flash Point:	85 °C	Evaporation Rate:	Not available
OSHA Flammability Class:	IIIA	LEL:	Not available
UEL:	Not available	Vapor Pressure:	Not available
Vapor Density (air = 1):	Not available	Density:	Not available
Water Solubility:	miscible	Log KOW:	Not available
Coeff. Water/Oil Dist.:	Not available	Auto Ignition:	Not available
Viscosity:	Not available	Volatility:	Not available

*** Section 10 - Stability and Reactivity***

Chemical Stability

Stable at normal temperatures and pressure.

Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Keep out of water supplies and sewers.

Materials to Avoid

bases, nitrogen dioxide, nitromethane, oxidizing materials, perchloric acid, perchloric acid-aniline mixtures

Decomposition Products

Thermal decomposition or combustion products: halogenated compounds, oxides of carbon, oxides of nitrogen, oxides of phosphorus, oxides of sodium, phosphine

Possibility of Hazardous Reactions

Will not polymerize.

*** Section 11 - Toxicological Information***

Acute and Chronic Toxicity

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

FORMALDEHYDE (50-00-0)

Inhalation LC50 Rat 0.578 mg/L 4 h; Oral LD50 Rat 500 mg/kg

SODIUM CHLORIDE (7647-14-5)

Inhalation LC50 Rat >42 g/m³ 1 h; Oral LD50 Rat 3 g/kg; Dermal LD50 Rabbit >10 g/kg

SODIUM PHOSPHATE, DIBASIC (7558-79-4)

Oral LD50 Rat 17 g/kg

POLYOXYETHYLATED OCTYL PHENOL (9002-93-1)

Oral LD50 Rat 1800 mg/kg

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RTECS Acute Toxicity (selected)

The components of this material have been reviewed, and RTECS publishes the following endpoints:

FORMALDEHYDE (50-00-0)

Inhalation: 203 mg/m3 Inhalation Rat LC50; 578 mg/m3/2 hour Inhalation Rat LC50; 250 ppm/2 hour Inhalation Rat LC50; 815 ppm/0.5 hour Inhalation Rat LC50; 250 ppm/4 hour Inhalation Rat LC50

Oral: 100 mg/kg Oral Rat LD50; 500 mg/kg Oral Rat LD50

Skin: 270 uL/kg Skin Rabbit LD50; 270 mg/kg Skin Rabbit LD50

SODIUM CHLORIDE (7647-14-5)

Oral: 3000 mg/kg Oral Rat LD50

SODIUM PHOSPHATE, DIBASIC (7558-79-4)

Oral: 17000 mg/kg Oral Rat LD50

Acute Toxicity Level

FORMALDEHYDE (50-00-0)

Highly Toxic: inhalation

Toxic: dermal absorption, ingestion

SODIUM CHLORIDE (7647-14-5)

Moderately Toxic: ingestion

SODIUM PHOSPHATE, DIBASIC (7558-79-4)

Non Toxic: ingestion

POLYOXYETHYLATED OCTYL PHENOL (9002-93-1)

Moderately Toxic: ingestion

Irritation/Corrosivity

RTECS Irritation

The components of this material have been reviewed, and RTECS publishes the following endpoints:

FORMALDEHYDE (50-00-0)

4 ppm/5 minute(s) Eyes Human; 1 ppm/6 minute(s) Eyes Human mild; 2 percent Skin Human; 150 ug/3 day(s) intermittent Skin Human mild; 750 ug Eyes Rabbit severe; 37 percent Eyes Rabbit severe; 750 ug/24 hour Eyes Rabbit severe; 10 mg Eyes Rabbit severe; 540 mg/open Skin Rabbit mild; 50 mg/24 hour Skin Rabbit moderate; 2 mg/24 hour Skin Rabbit severe

SODIUM CHLORIDE (7647-14-5)

10 mg Eyes Rabbit moderate; 100 mg/24 hour Eyes Rabbit moderate; 500 mg/24 hour Skin Rabbit mild

SODIUM PHOSPHATE, DIBASIC (7558-79-4)

500 mg/24 hour Eyes Rabbit mild; 500 mg/24 hour Skin Rabbit mild

Local Effects

FORMALDEHYDE (50-00-0)

Irritant: skin, eye

Corrosive: inhalation, skin, eye, ingestion

SODIUM CHLORIDE (7647-14-5)

Irritant: eye

ETHYLENEDIAMINETETRAACETIC ACID, DISODIUM SALT, DIHYDRATE (6381-92-6)

Irritant: eye

POLYOXYETHYLATED OCTYL PHENOL (9002-93-1)

Irritant: eye

Target Organs

FORMALDEHYDE (50-00-0)

immune system (sensitizer)

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Carcinogenicity

Component Carcinogenicity

FORMALDEHYDE (50-00-0)

ACGIH: A2 - Suspected Human Carcinogen
OSHA: Present
NIOSH: potential occupational carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen
IARC: Monograph 100F [in preparation]; Monograph 88 [2006]; Monograph 62 [1995]; Supplement 7 [1987] (Group 1 (carcinogenic to humans))
Austria: Group B Carcinogen
Denmark: Present
France: Carcinogen category 3
Germany: Category 4 (no significant contribution to human cancer)
Italy: Category 3 Carcinogen
Portugal: A2 - Suspected Human Carcinogen
Carcinogen

Mutagenic

No data available for the mixture.

RTECS Mutagenic

The components of this material have been reviewed, and RTECS publishes data for one or more components.

Reproductive Effects

No data available for the mixture.

RTECS Reproductive Effects

The components of this material have been reviewed, and RTECS publishes data for one or more components.

Tumorigenic

No data available for the mixture.

RTECS Tumorigenic

The components of this material have been reviewed, and RTECS publishes data for one or more components.

Medical Conditions Aggravated by Exposure

respiratory disorders, skin disorders and allergies

*** Section 12 - Ecological Information ***

Component Analysis - Aquatic Toxicity

FORMALDEHYDE (50-00-0)

Fish: 96 Hr LC50 Pimephales promelas: 22.6 - 25.7 mg/L [flow-through]; 96 Hr LC50 Lepomis macrochirus: 1510 µg/L [static]; 96 Hr LC50 Brachydanio rerio: 41 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: 0.032 - 0.226 mL/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 100 - 136 mg/L [static]; 96 Hr LC50 Pimephales promelas: 23.2 - 29.7 mg/L [static]

Invertebrate: 48 Hr LC50 Daphnia magna: 2 mg/L; 48 Hr EC50 Daphnia magna: 11.3 - 18 mg/L [Static]

SODIUM CHLORIDE (7647-14-5)

Fish: 96 Hr LC50 Lepomis macrochirus: 5560-6080 mg/L [flow-through]; 96 Hr LC50 Lepomis macrochirus: 12946 mg/L [static]; 96 Hr LC50 Pimephales promelas: 6020-7070 mg/L [static]; 96 Hr LC50 Pimephales promelas: 7050 mg/L [semi-static]; 96 Hr LC50 Pimephales promelas: 6420-6700 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: 4747-7824 mg/L [flow-through]

Invertebrate: 48 Hr EC50 Daphnia magna: 1000 mg/L; 48 Hr EC50 Daphnia magna: 340.7 - 469.2 mg/L [Static]

Mobility

No data available for the mixture.

Persistence & Degradation

No data available for the mixture.

Bioaccumulative Potential

No data available for the mixture.

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*** Section 13 - Disposal Considerations***

Disposal Methods

Dispose in accordance with all applicable regulations.

Component Waste Numbers

FORMALDEHYDE (50-00-0)

RCRA: waste number U122

*** Section 14 - Transport Information***

US DOT Information

Shipping Name: Combustible liquid, n.o.s. (Contains: FORMALDEHYDE)

UN/NA #: NA1993 **Hazard Class:** Combustible liquid **Packing Group:** III

TDG Information

Not regulated.

ADR Information

Not regulated.

RID Information

Not regulated.

IATA Information

Not regulated.

ICAO Information

Not regulated.

IMDG Information

Not regulated.

*** Section 15 - Regulatory Information***

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

FORMALDEHYDE (50-00-0)

SARA 302/304: 500 lb TPQ

100 lb EPCRA RQ

SARA 313: 0.1 % de minimis concentration

CERCLA: 100 lb final RQ; 45.4 kg final RQ

OSHA (safety): 1000 lb TQ

SODIUM PHOSPHATE, DIBASIC (7558-79-4)

CERCLA: 5000 lb final RQ; 2270 kg final RQ

SARA 311/312

Acute Health: Yes **Chronic Health:** Yes **Fire:** Yes **Pressure:** No **Reactive:** No

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component / EC Number	CAS	CA	MA	MN	NJ	PA	RI
FORMALDEHYDE	50-00-0	Yes	Yes	Yes	Yes	Yes	Yes
SODIUM PHOSPHATE, DIBASIC	7558-79-4	Yes	Yes	No	Yes	Yes	No

California Proposition 65

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

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Canadian Regulations

Canada WHMIS

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

FORMALDEHYDE (50-00-0)

0.1 %

WHMIS Classification

B3, D1A, D2A, D2B.

European Regulations

This preparation has been classified for the European Union according to Annex VI Directives 67/548/EEC and 99/45/EC.

Germany Water Classification

FORMALDEHYDE (50-00-0)

ID Number 112, hazard class 2 - hazard to waters

SODIUM CHLORIDE (7647-14-5)

ID Number 270, hazard class 1 - low hazard to waters

SODIUM PHOSPHATE, DIBASIC (7558-79-4)

ID Number 330, hazard class 1 - low hazard to waters

ETHYLENEDIAMINETETRAACETIC ACID, DISODIUM SALT, DIHYDRATE (6381-92-6)

ID Number 104, hazard class 2 - hazard to waters

POLYOXYETHYLATED OCTYL PHENOL (9002-93-1)

ID Number 2869, hazard class 1 - low hazard to waters

EU Marking and Labelling

Symbols

Xn Harmful

Xi Irritant

Risk Phrases

R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R36/37/38 Irritating to eyes, respiratory system and skin.

R43 May cause sensitization by skin contact.

R40 Limited evidence of a carcinogenic effect.

Safety Phrases

S24/25 Avoid contact with skin and eyes.

S36/37 Wear suitable protective clothing and gloves.

S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S53 Avoid exposure - obtain special instructions before use.

Japanese Regulations

Japan Designated Chemical Substances (PRTR Law)

The following components are subject to reporting requirements as specified by the "Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management" and are included in the "Pollutant Release and Transfer Register (PRTR)" of designated chemicals.

FORMALDEHYDE (50-00-0)

411 (Designated class 1 substance)

Japan Poisonous and Deleterious Substances

The following components are specified as poisonous and deleterious substances, and are regulated by Japan under the Poisonous and Deleterious Substances Control Law.

FORMALDEHYDE (50-00-0)

Deleterious, 1%; Deleterious

Industrial Safety and Health Law - Flammable Materials

No components of this material are specifically identified in Table 6-2 of the Enforcement Order of the Industrial Safety and Health Law which, if used in the workplace, require designation of an Operations Chief during confined space work and periodic machine inspections.

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Industrial Safety and Health Law - Label Disclosure

This list contains those harmful substances present in this product whose names are to be indicated on a container label as specified by Article 18 of the Enforcement Order of the Industrial Safety and Health Law.

FORMALDEHYDE (50-00-0)

0.1 % weight

Industrial Safety and Health Law - Organic Solvents

No components of this material are specifically identified in Table 6-2 of the Enforcement Order of the Industrial Safety and Health Law which, if used in the workplace, require designation of an Operations Chief during confined space work and periodic machine inspections.

* * * Section 16 - Other Information * * *

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Full text of R phrases in Section 3

R22 Harmful if swallowed.

R23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R34 Causes burns.

R36 Irritating to eyes.

R40 Limited evidence of a carcinogenic effect.

R43 May cause sensitization by skin contact.

R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Other Information

Limitations: The information and recommendations set forth in this MSDS are believed to be correct as of this date. Ventana Medical Systems, Inc. makes no warranty with respect to the content of this MSDS and disclaims all liability from reliance thereon.

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MSDS Update: 1/20/2011

End of Sheet 00231488