Safety Data Sheet

Revision Date: 23 April 2021

1. PRODUCT AND COMPANY IDENTIFICATION

Product name:	MVS DMSO QualAssure™ C, D and E and MVS DMSO Range C, D and E Sample Solutions
Product number:	MVS-216, MVS-217, MVS-218
Recommended Use:	Calibration testing solution for use with the Artel MVS® Multichannel Verification System
Restrictions:	Use only with the Artel MVS
Company:	Artel, Inc. 25 Bradley Drive Westbrook, Maine 04092-2013
Telephone:	207-854-0860 888-406-3463 (toll-free)
Fax:	207-854-0867
Emergency Telephone:	Verisk 3E (Account Number 13998) USA/Canada: 855-212-6039 Outside USA/Canada: 001-760-602-8703

2. HAZARDS IDENTIFICATION

Warning: Combustible liquid, GHS Classification, Category 4.

Precautionary Statements

Prevention: Keep away from flames and hot surfaces. No smoking. Wear appropriate personal protective equipment such as a lab coat/smock, heavier weight (15-18 mil) natural rubber or butyl rubber gloves, and safety glasses with side-shields or a full face shield. Note: this recommendation is advisory only and should be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. This recommendation should not be construed as offering an approval for any specific use scenario.

Response: In case of Fire, use “alcohol” foam, dry chemical or carbon dioxide to extinguish.
Storage: Keep cool. Store in a well-ventilated location that does not exceed a temperature of 30 °C.

HMIS Classification

Health hazard: 2 **Chronic health hazard**: 0
Flammability: 2
Physical hazards: 0

NFPA Rating

Health hazard: 0
Fire: 2
Reactivity Hazard: 0

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	DMSO readily penetrates skin and may carry other dissolved chemicals into the body. May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.

Aggravated Medical Condition	This product contains dimethyl sulfoxide (DMSO). Avoid contact with DMSO solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body. No data are available on the ability of DMSO to carry Ponceau S through the skin.

This product is a mixture of components. The mixture has not been tested. Hazards are determined using information supplied by the manufacturer of components, applying OSHA regulations and applying best professional judgment.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Proprietary, DMSO-based solution containing the following:

Component	CAS No.	Concentration or Weight %
Dimethyl sulfoxide	67-68-5	≥ 99%
Ponceau S (Acid Red 112)	6226-79-5	< 0.2%

Ponceau S is present below applicable cut-off/concentration limits, as per OSHA definition.

Component Synonyms:
DMSO
Methyl sulfoxide
Dimethyl sulfoxide

Ponceau S
Acid Red 112
3-Hydroxy-4-(2-sulfo-4-[4-sulfophenylazo]phenylazo)-2,7-naphthalenedisulfonic acid sodium salt
Tetrasodium 3-hydroxy-4-(2-sulphonato-4-(4-sulphonatophenylazo)phenylazo)naphthalene-2,7-disulphonate

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Special protective equipment for firefighters
Wear self contained breathing apparatus for firefighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sulphur oxides, Nitrogen oxides (NOx), Sodium oxides.

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid breathing vapors, mist or gas. Remove all sources of ignition. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Use appropriate personal protective equipment such as a lab coat/smock, heavier weight (15-18 mil) natural rubber or butyl rubber gloves, and safety glasses with side-shields or a full face shield. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

Note: the recommendation for specific personal protective equipment is advisory only and should be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. This recommendation should not be construed as offering an approval for any specific use scenario.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in a container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal**.**

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid inhalation of vapor or mist. Keep away from flames and hot surfaces - No smoking. Take measures to prevent the buildup of electrostatic charge. To avoid contact with skin, eyes and clothing, use appropriate personal protective equipment such as a lab coat/smock, safety glasses with side-shields or a full face shield, and heavier weight (15-18 mil) natural rubber or butyl rubber gloves. Nitrile gloves are *not* recommended for use with DMSO if extended contact with hands is expected.

Note: the recommendation for specific personal protective equipment is advisory only and should be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. This recommendation should not be construed as offering an approval for any specific use scenario.

Conditions for safe storage
Hygroscopic. Keep container tightly closed in a dry, cool and well-ventilated place. Store below 30 °C.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Dimethyl sulfoxide	67-68-5	TWA	250 ppm	AIHA. Workplace Environmental Exposure Levels (WEEL)
Ponceau S	6226-79-5	NA	NA	No occupational exposure limit.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Heavier weight natural or butyl rubber gloves of 15-18 mil thickness are preferred. Nitrile gloves are *not* recommended for use with DMSO if extended contact with hands is expected. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

This recommendation is advisory only and should be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. This recommendation should not be construed as offering an approval for any specific use scenario.

Eye protection
Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Impervious clothing, the type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid, dark red, opaque
Color	dark red

Safety data
The following data are available from the manufacturer of the components, and are not data generated for the mixture. The component for which the information is known is given below, along with a clarification as to which component the information comes from. If no specification is given, then the data pertains to the mixture.

pH	no data available
Melting/ freezing point	Melting point/range for DMSO: 16 - 19 °C (61 - 66 °F) - lit.
Boiling point	for DMSO: 189 °C (372 °F) - lit.
Flash point	for DMSO: 87 °C (189 °F) - closed cup
Ignition temperature	for DMSO: 301 °C (574 °F)
Auto ignition temperature	no data available for DMSO or Ponceau S
Lower explosion limit	for DMSO: 3.5 %(V)
Upper explosion limit	for DMSO: 42 %(V)
Vapor pressure	for DMSO: 0.55 hPa (0.41 mmHg) at 20 °C (68 °F)
Density	1.1 g/cm3
Water solubility	completely miscible
Partition coefficient, n-octanol/water	for DMSO: log Pow: -2.03
Relative vapor density	for DMSO: 2.70- (Air = 1.0)
Odor	slightly fishy/sweet
Odor Threshold	no data available
Evaporation rate	no data available
Decomposition temperature	no data available
Viscosity	no data available/not applicable

10. STABILITY AND REACTIVITY

Reactivity and Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
Heat, flames and sparks.

Materials to avoid
Acid chlorides, Phosphorus halides, Strong acids, Strong oxidizing agents, Strong reducing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sulphur oxides, Nitrogen oxides (NOx), Sodium oxides.
Other decomposition products - no data available.

11. TOXICOLOGICAL INFORMATION

Toxicity data are available for the DMSO component; no data are available for the mixture. No toxicity data are known for Ponceau S dissolved in DMSO at a concentration of less than 1%. The information provided below describes the toxicological information for DMSO.

Acute toxicity

Oral LD50

LD50 Oral - rat - 14,500 mg/kg

Inhalation LC50
LC50 Inhalation - rat - 4 h - 40250 ppm

Dermal LD50
LD50 Dermal - rabbit - > 5,000 mg/kg

Other information on acute toxicity
no data available

Skin corrosion/irritation
Skin - rabbit - No skin irritation - 4 h

Serious eye damage/eye irritation
Eyes - rabbit - Mild eye irritation

Respiratory or skin sensitization
no data available

Germ cell mutagenicity

Genotoxicity in vitro - mouse - lymphocyte
Cytogenetic analysis

Genotoxicity in vitro - mouse - lymphocyte
Mutation in mammalian somatic cells.

Genotoxicity in vivo - rat - Intraperitoneal
Cytogenetic analysis

Genotoxicity in vivo - mouse - Intraperitoneal
DNA damage

Carcinogenicity

Carcinogenicity - rat - Oral
Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

Carcinogenicity - mouse - Oral
Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Leukaemia Skin and Appendages: Other: Tumors.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

Reproductive toxicity - rat - Intraperitoneal
Effects on Fertility: Abortion.
Reproductive toxicity - rat - Intraperitoneal
Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Reproductive toxicity - rat - Subcutaneous
Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).
Reproductive toxicity - mouse - Oral
Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).
Specific Developmental
Abnormalities: Musculoskeletal system.

Teratogenicity
Developmental Toxicity - mouse - Intraperitoneal
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities:
Musculoskeletal system.

Specific target organ toxicity - single exposure (Globally Harmonized System)
Inhalation - May cause respiratory irritation.

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Aggravated Medical Condition	Avoid contact with DMSO solutions containing toxic materials or materials with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through skin and may carry such materials into the body. No data are available on the ability of DMSO to carry Ponceau S through the skin.

Signs and Symptoms of Exposure
Effects due to ingestion may include: Nausea, Fatigue, Headache

Synergistic effects
no data available

Additional Information
RTECS: PV6210000, RTECS: QJ6600000. Not listed as a carcinogen in the NTP Report on Carcinogens, or found to be potential carcinogen in the IARC Monographs, or by OSHA.

12. ECOLOGICAL INFORMATION

Toxicity data are available for the DMSO component; no data are available for the mixture. No toxicity data are known for Ponceau S dissolved in DMSO at a concentration of less than 1%. The information provided below describes the toxicological information for DMSO.

Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 34,000 mg/l - 96 h LC50 - Oncorhynchus mykiss (rainbow trout) - 35,000 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia pulex (Water flea) - 27,500 mg/l
Toxicity to algae	EC50 - Lepomis macrochirus (Bluegill) - > 400,000 mg/l - 96 h

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects
no data available

13. DISPOSAL CONSIDERATIONS

Product

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Not an RCRA hazardous waste as supplied. Observe all federal, state, and local waste disposal laws. State and local regulations may differ from federal regulations. Always comply with local disposal regulations.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

NA-Number: 1993 Class: CBL Packing group: III
Proper shipping name: Combustible liquid, n.o.s. (Dimethyl sulfoxide)
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

The following regulatory information is believed accurate as of the date of this SDS. Check all applicable laws for possible changes.

OSHA Hazards

Combustible Liquid, Target Organ Effect

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Fire Hazard, Chronic Health Hazard

Massachusetts Right to Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right to Know Components

Dimethyl sulfoxide	CAS-No. 67-68-5	Revision Date: 2007-03-01
Tetrasodium 3-hydroxy-4-(2-sulphonato-4-(4-sulphonatophenylazo)phenylazo)naphthalene-2,7-disulphonate	CAS-No. 6226-79-5	Revision Date:

New Jersey Right to Know Components

Dimethyl sulfoxide	CAS-No. 67-68-5	Revision Date: 2007-03-01
Tetrasodium 3-hydroxy-4-(2-sulphonato-4-(4-sulphonatophenylazo)phenylazo)naphthalene-2,7-disulphonate	CAS-No. 6226-79-5	Revision Date:

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Revision Date: 23-April-2021

Disclaimer

The information provided in this SDS is consistent with the information provided to Artel, Inc. by the manufacturer of the components of the mixture, except as stated otherwise, and is believed to be accurate but does not purport to be all inclusive and shall be used as a guide only. No warranty or guarantee is expressed or implied with respect to the information provided. Artel, Inc. shall not be held liable for any damage resulting from handling or contact with the above product.