

## SAFETY DATA SHEET

Version 6.16  
Revision Date 09/08/2024  
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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : Methanol

Product Number : 322415  
Brand : Sigma-Aldrich  
Index-No. : 603-001-00-X  
CAS-No. : 67-56-1

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses : Laboratory chemicals, Synthesis of substances

**1.3 Details of the supplier of the safety data sheet**

Company : Sigma-Aldrich Inc.  
3050 SPRUCE ST  
ST. LOUIS MO 63103  
UNITED STATES

Telephone : +1 314 771-5765  
Fax : +1 800 325-5052

**1.4 Emergency telephone**

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-  
527-3887 CHEMTREC (International) 24  
Hours/day; 7 Days/week

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Flammable liquids (Category 2), H225  
Acute toxicity, Oral (Category 3), H301  
Acute toxicity, Inhalation (Category 3), H331  
Acute toxicity, Dermal (Category 3), H311  
Specific target organ toxicity - single exposure (Category 1), Eyes, Central nervous system, H370

For the full text of the H-Statements mentioned in this Section, see Section 16.

**2.2 GHS Label elements, including precautionary statements**

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Pictogram



Signal Word

Danger

Hazard Statements

H225

Highly flammable liquid and vapor.

H301 + H311 + H331

Toxic if swallowed, in contact with skin or if inhaled.

H370

Causes damage to organs (Eyes, Central nervous system).

Precautionary Statements

P210

Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.

P233

Keep container tightly closed.

P240

Ground/bond container and receiving equipment.

P241

Use explosion-proof electrical/ ventilating/ lighting/ equipment.

P242

Use only non-sparking tools.

P243

Take precautionary measures against static discharge.

P260

Do not breathe mist or vapors.

P264

Wash skin thoroughly after handling.

P270

Do not eat, drink or smoke when using this product.

P271

Use only outdoors or in a well-ventilated area.

P280

Wear protective gloves/ eye protection/ face protection.

P301 + P310 + P330

IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.

P303 + P361 + P353

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P304 + P340 + P311

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.

P307 + P311

IF exposed: Call a POISON CENTER or doctor/ physician.

P362

Take off contaminated clothing and wash before reuse.

P370 + P378

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P403 + P233

Store in a well-ventilated place. Keep container tightly closed.

P403 + P235

Store in a well-ventilated place. Keep cool.

P405

Store locked up.

P501

Dispose of contents/ container to an approved waste disposal plant.

## 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

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### SECTION 3: Composition/information on ingredients

#### 3.1 Substances

Synonyms : Methyl alcohol

Formula : CH<sub>4</sub>O

Molecular weight : 32.04 g/mol

CAS-No. : 67-56-1

EC-No. : 200-659-6

Index-No. : 603-001-00-X

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| Component       | Classification                                                                                                                                                     | Concentration |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>Methanol</b> |                                                                                                                                                                    |               |
|                 | Flam. Liq. 2; Acute Tox. 3;<br>STOT SE 1; H225, H301,<br>H331, H311, H370<br>Concentration limits:<br>>= 10 %: STOT SE 1,<br>H370; 3 - < 10 %: STOT<br>SE 2, H371; | <= 100 %      |

For the full text of the H-Statements mentioned in this Section, see Section 16.

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## SECTION 4: First aid measures

### 4.1 Description of first-aid measures

No data available

### 4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### 4.3 Indication of any immediate medical attention and special treatment needed

No data available

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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

No data available

### 5.2 Special hazards arising from the substance or mixture

Carbon oxides  
Combustible.

### 5.3 Advice for firefighters

No data available

### 5.4 Further information

No data available

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## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

For personal protection see section 8.

### 6.2 Environmental precautions

No data available

### 6.3 Methods and materials for containment and cleaning up

No data available

## 6.4 Reference to other sections

For disposal see section 13.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities

No data available

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Ingredients with workplace control parameters

| Component | CAS-No. | Value                           | Control parameters   | Basis                                                                                   |
|-----------|---------|---------------------------------|----------------------|-----------------------------------------------------------------------------------------|
| Methanol  | 67-56-1 | TWA                             | 200 ppm              | USA. ACGIH Threshold Limit Values (TLV)                                                 |
|           | Remarks | Danger of cutaneous absorption  |                      |                                                                                         |
|           |         | STEL                            | 250 ppm              | USA. ACGIH Threshold Limit Values (TLV)                                                 |
|           |         | Danger of cutaneous absorption  |                      |                                                                                         |
|           |         | ST                              | 250 ppm<br>325 mg/m3 | USA. NIOSH Recommended Exposure Limits                                                  |
|           |         | Potential for dermal absorption |                      |                                                                                         |
|           |         | TWA                             | 200 ppm<br>260 mg/m3 | USA. NIOSH Recommended Exposure Limits                                                  |
|           |         | Potential for dermal absorption |                      |                                                                                         |
|           |         | TWA                             | 200 ppm<br>260 mg/m3 | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants        |
|           |         | PEL                             | 200 ppm<br>260 mg/m3 | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |
|           |         | Skin                            |                      |                                                                                         |
|           |         | C                               | 1,000 ppm            | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |
|           |         | Skin                            |                      |                                                                                         |

|  |  |      |                                  |                                                                                         |
|--|--|------|----------------------------------|-----------------------------------------------------------------------------------------|
|  |  | STEL | 250 ppm<br>325 mg/m <sup>3</sup> | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |
|  |  | Skin |                                  |                                                                                         |

#### Biological occupational exposure limits

| Component | CAS-No. | Parameters                                               | Value   | Biological specimen | Basis                                     |
|-----------|---------|----------------------------------------------------------|---------|---------------------|-------------------------------------------|
| Methanol  | 67-56-1 | Methanol                                                 | 15 mg/l | Urine               | ACGIH - Biological Exposure Indices (BEI) |
|           | Remarks | End of shift (As soon as possible after exposure ceases) |         |                     |                                           |

#### Derived No Effect Level (DNEL)

| Application Area | Routes of exposure | Health effect              | Value                 |
|------------------|--------------------|----------------------------|-----------------------|
| Workers          | Skin contact       | Long-term systemic effects | 40mg/kg BW/d          |
| Consumers        | Skin contact       | Long-term systemic effects | 8mg/kg BW/d           |
| Consumers        | Ingestion          | Long-term systemic effects | 8mg/kg BW/d           |
| Workers          | Skin contact       | Acute systemic effects     | 40mg/kg BW/d          |
| Consumers        | Skin contact       | Acute systemic effects     | 8mg/kg BW/d           |
| Consumers        | Ingestion          | Acute systemic effects     | 8mg/kg BW/d           |
| Workers          | Inhalation         | Acute systemic effects     | 260 mg/m <sup>3</sup> |
| Workers          | Inhalation         | Acute local effects        | 260 mg/m <sup>3</sup> |
| Workers          | Inhalation         | Long-term systemic effects | 260 mg/m <sup>3</sup> |
| Workers          | Inhalation         | Long-term local effects    | 260 mg/m <sup>3</sup> |
| Consumers        | Inhalation         | Acute systemic effects     | 50 mg/m <sup>3</sup>  |
| Consumers        | Inhalation         | Acute local effects        | 50 mg/m <sup>3</sup>  |
| Consumers        | Inhalation         | Long-term systemic effects | 50 mg/m <sup>3</sup>  |
| Consumers        | Inhalation         | Long-term local effects    | 50 mg/m <sup>3</sup>  |

#### Predicted No Effect Concentration (PNEC)

| Compartment                   | Value       |
|-------------------------------|-------------|
| Soil                          | 23.5 mg/kg  |
| Sea water                     | 15.4 mg/l   |
| Fresh water                   | 154 mg/l    |
| Fresh water sediment          | 570.4 mg/kg |
| Onsite sewage treatment plant | 100 mg/kg   |

## 8.2 Exposure controls

### Personal protective equipment

#### Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Full contact

Material: butyl-rubber  
Minimum layer thickness: 0.7 mm  
Break through time: 480 min  
Material tested: Butoject® (KCL 898)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Splash contact

Material: Viton®

Minimum layer thickness: 0.7 mm

Break through time: 120 min

Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

### **Control of environmental exposure**

Prevent product from entering drains.

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## **SECTION 9: Physical and chemical properties**

### **9.1 Information on basic physical and chemical properties**

- |                                                 |                                                                          |
|-------------------------------------------------|--------------------------------------------------------------------------|
| a) Appearance                                   | Form: liquid<br>Color: colorless                                         |
| b) Odor                                         | characteristic                                                           |
| c) Odor Threshold                               | 10 ppm                                                                   |
| d) pH                                           | No data available                                                        |
| e) Melting point/freezing point                 | Melting point/ range: -98 °C (-144 °F)                                   |
| f) Initial boiling point and boiling range      | 64.7 °C 148.5 °F                                                         |
| g) Flash point                                  | 9.7 °C (49.5 °F) - closed cup - Regulation (EC) No. 440/2008, Annex, A.9 |
| h) Evaporation rate                             | 6.3 - Diethyl ether 1.9 - n-butyl acetate                                |
| i) Flammability (solid, gas)                    | No data available                                                        |
| j) Upper/lower flammability or explosive limits | Upper explosion limit: 44 %(V)<br>Lower explosion limit: 5.5 %(V)        |
| k) Vapor pressure                               | 169.27 hPa at 25 °C (77 °F)                                              |
| l) Vapor density                                | 1.11                                                                     |
| m) Density                                      | 0.791 g/mL at 25 °C (77 °F)                                              |
| Relative density                                | 0.79 - 0.820 °C                                                          |
| n) Water solubility                             | 1,000 g/l at 20 °C (68 °F) - completely miscible                         |

- |                                              |                                                                            |
|----------------------------------------------|----------------------------------------------------------------------------|
| o) Partition coefficient:<br>n-octanol/water | log Pow: -0.77 at 25 °C (77 °F) - (HSDB), Bioaccumulation is not expected. |
| p) Autoignition<br>temperature               | 455.0 °C (851.0 °F) at 1,013 hPa - DIN 51794                               |
| q) Decomposition<br>temperature              | Distillable in an undecomposed state at normal pressure.                   |
| r) Viscosity                                 | 0.54 - 0.59 mm <sup>2</sup> /s at 20 °C (68 °F) -                          |
| s) Explosive properties                      | No data available                                                          |
| t) Oxidizing properties                      | none                                                                       |

## 9.2 Other safety information

|                            |           |
|----------------------------|-----------|
| Minimum ignition<br>energy | 0.14 mJ   |
| Conductivity               | < 1 µS/cm |
| Relative vapor<br>density  | 1.11      |

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No data available

### 10.2 Chemical stability

No data available

### 10.3 Possibility of hazardous reactions

Risk of explosion with:

Oxidizing agents  
perchloric acid  
perchlorates  
salts of oxyhalogenic acids  
chromium(VI) oxide  
halogen oxides  
nitrogen oxides  
nonmetallic oxides  
chromosulfuric acid  
chlorates  
hydrides  
zinc diethyl  
halogens  
powdered magnesium  
hydrogen peroxide  
Nitric acid  
sulfuric acid  
permanganic acid  
sodium hypochlorite  
Exothermic reaction with:

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acid halides  
Acid anhydrides  
Reducing agents  
acids  
Bromine  
Chlorine  
Chloroform  
magnesium  
tetrachloromethane  
Risk of ignition or formation of inflammable gases or vapours with:  
Fluorine  
Oxides of phosphorus  
Raney-nickel  
Generates dangerous gases or fumes in contact with:  
Alkaline earth metals  
Alkali metals

#### **10.4 Conditions to avoid**

No data available

#### **10.5 Incompatible materials**

No data available

#### **10.6 Hazardous decomposition products**

In the event of fire: see section 5

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### **SECTION 11: Toxicological information**

#### **11.1 Information on toxicological effects**

##### **Acute toxicity**

Acute toxicity estimate Oral - 100.1 mg/kg

(Expert judgment)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Symptoms: Nausea, Vomiting

Acute toxicity estimate Inhalation - 4 h - 3.1 mg/l - vapor

(Expert judgment)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Symptoms: Irritation symptoms in the respiratory tract.

Acute toxicity estimate Dermal - 300.1 mg/kg

(Expert judgment)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

##### **Skin corrosion/irritation**

Skin - Rabbit

Result: No skin irritation

Remarks: (ECHA)

Remarks: Drying-out effect resulting in rough and chapped skin.



**Serious eye damage/eye irritation**

Eyes - Rabbit

Result: No eye irritation

Remarks: (ECHA)

**Respiratory or skin sensitization**

Sensitisation test: - Guinea pig

Result: negative

(OECD Test Guideline 406)

**Germ cell mutagenicity**

Based on available data the classification criteria are not met.

Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Test Type: In vitro mammalian cell gene mutation test

Test system: Chinese hamster lung cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

Test Type: Micronucleus test

Species: Mouse

Cell type: Bone marrow

Application Route: Intraperitoneal injection

Method: OECD Test Guideline 474

Result: negative

**Carcinogenicity**

Did not show carcinogenic effects in animal experiments.

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient 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 on OSHA's list of regulated carcinogens.

**Reproductive toxicity**

Based on available data the classification criteria are not met.

**Specific target organ toxicity - single exposure**

Causes damage to organs. - Eyes, Central nervous system

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**11.2 Additional Information**

RTECS: PC1400000

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Acute effects: , Headache, Dizziness, Drowsiness, narcosis, Blindness, Impairment of vision, irritant effects, Nausea, Vomiting, agitation, spasms, inebriation, Coma  
Drying-out effect resulting in rough and chapped skin.  
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Systemic effects:

acidosis  
drop in blood pressure  
agitation, spasms  
inebriation  
Dizziness  
Drowsiness  
Headache  
Impairment of vision  
Blindness  
narcosis  
Coma

Symptoms may be delayed.

Damage to:

Liver  
Kidney  
Cardiac  
Irreversible damage of the optical nerve.

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

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## SECTION 12: Ecological information

### 12.1 Toxicity

|                                                     |                                                                                                          |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Toxicity to fish                                    | flow-through test LC50 - <i>Lepomis macrochirus</i> (Bluegill) - 15,400.0 mg/l - 96 h (US-EPA)           |
| Toxicity to daphnia and other aquatic invertebrates | semi-static test EC50 - <i>Daphnia magna</i> (Water flea) - 18,260 mg/l - 96 h (OECD Test Guideline 202) |
| Toxicity to algae                                   | static test ErC50 - <i>Pseudokirchneriella subcapitata</i> (green algae) - ca. 22,000.0 mg/l - 96 h      |

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|                                    |                                                                                                |
|------------------------------------|------------------------------------------------------------------------------------------------|
|                                    | (OECD Test Guideline 201)                                                                      |
| Toxicity to bacteria               | static test IC50 - activated sludge - > 1,000 mg/l - 3 h<br>(OECD Test Guideline 209)          |
| Toxicity to fish(Chronic toxicity) | NOEC - Oryzias latipes (Orange-red killifish) - 7,900 mg/l - 200 h<br>Remarks: (External MSDS) |

## 12.2 Persistence and degradability

|                                 |                                                                     |
|---------------------------------|---------------------------------------------------------------------|
| Biodegradability                | Result: 99 % - Readily biodegradable.<br>(OECD Test Guideline 301D) |
| Biochemical Oxygen Demand (BOD) | 600 - 1,120 mg/g<br>Remarks: (IUCLID)                               |
| Chemical Oxygen Demand (COD)    | 1,420 mg/g<br>Remarks: (IUCLID)                                     |
| Theoretical oxygen demand       | 1,500 mg/g<br>Remarks: (Lit.)                                       |
| Ratio BOD/ThBOD                 | 76 %<br>Remarks: Closed Bottle test(IUCLID)                         |

## 12.3 Bioaccumulative potential

|                 |                                                              |
|-----------------|--------------------------------------------------------------|
| Bioaccumulation | Cyprinus carpio (Carp) - 72 d<br>at 20 °C - 5 mg/l(Methanol) |
|                 | Bioconcentration factor (BCF): 1.0                           |

## 12.4 Mobility in soil

Will not adsorb on soil.

## 12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

## 12.6 Endocrine disrupting properties

No data available

## 12.7 Other adverse effects

|                                   |                                                                                                                                                           |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Additional ecological information | Avoid release to the environment.                                                                                                                         |
| Stability in water                | at 19 °C83 - 91 % - 72 h<br>Remarks: Hydrolyzes on contact with water.Hydrolyzes readily.<br>- 2.2 yr<br>Remarks: reaction with hydroxyl radicals(IUCLID) |

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

No data available

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## SECTION 14: Transport information

### DOT (US)

UN number: 1230    Class: 3    Packing group: II  
Proper shipping name: Methanol  
Reportable Quantity (RQ): 5000 lbs  
Poison Inhalation Hazard: No

### IMDG

UN number: 1230    Class: 3 (6.1)    Packing group: II    EMS-No: F-E, S-D  
Proper shipping name: METHANOL

### IATA

UN number: 1230    Class: 3 (6.1)    Packing group: II  
Proper shipping name: Methanol

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## SECTION 15: Regulatory information

### CERCLA Reportable Quantity

| Components | CAS-No. | Component RQ (lbs) | Calculated product RQ (lbs) |
|------------|---------|--------------------|-----------------------------|
| Methanol   | 67-56-1 | 5000               | 5000                        |

### SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

### SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

### SARA 311/312

#### Hazards

: Fire Hazard  
Acute Health Hazard  
Chronic Health Hazard

### SARA 313

: The following components are subject to reporting levels established by SARA Title III, Section 313:

Methanol    67-56-1    >= 90 - <= 100 %

### US State Regulations

#### Massachusetts Right To Know

Methanol    67-56-1

#### Pennsylvania Right To Know

Methanol    67-56-1

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**Maine Chemicals of High Concern**

Product does not contain any listed chemicals

**Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

**Washington Chemicals of High Concern**

Product does not contain any listed chemicals

**California Prop. 65**

WARNING: This product can expose you to chemicals including Methanol, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**The ingredients of this product are reported in the following inventories:**

TSCA : All substances listed as active on the TSCA inventory

**TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

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**SECTION 16: Other information**

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact [mlsbranding@sial.com](mailto:mlsbranding@sial.com).

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