

SAFETY DATA SHEET

GC Enhancer

Prepared under WHMIS 2015 (Hazardous Products Regulations, SOR/2015-17) / GHS Rev. 5.

DOCUMENT ID	VERSION	ISSUED	EFFECTIVE
HSS-PL-GCE-SDS	1.0	2026-09-03	2026-09-03

1 Identification

Product name	GC Enhancer (PCR additive for GC-rich and difficult templates)
Supplied in	Every HoppeSylar DNA polymerase and master mix kit (Taq, Hot Start Taq, ROBUST, High Fidelity, M4 Taq, and the 2X master mixes), as a 1 mL vial in the standard kits and as larger fills (10 mL, 50 mL) in the 5,000 U and bulk kits. Kit component; not sold separately.
Product type	Aqueous solution of betaine with dimethyl sulfoxide (DMSO); a PCR co-solvent additive.
Catalogue number	None of its own: a kit component, identified by the kit catalogue numbers above.
Recommended use	Laboratory reagent component of a polymerase chain reaction (PCR) kit. For laboratory research use only (RUO).
Restrictions on use	Not for food, drug, pesticide, or biological-product use. Not for human or animal diagnostic or therapeutic use.
Supplier	HoppeSylar Scientific Inc., 79 Bessemer Road, Unit 1, London, ON N6E 1P9, Canada
Origin	Developed and manufactured in Canada.
Emergency telephone	1-833-727-7522 · Email: info@hoppesylar.com

2 Hazard Identification

WHMIS 2015 / GHS classification	Not classified. This product does not meet the criteria for any physical, health, or environmental hazard class under WHMIS 2015 (Hazardous Products Regulations, SOR/2015-17) / GHS Rev. 5.
Basis for non-classification	The product is an aqueous solution of betaine (a naturally occurring osmolyte, not classified for any hazard, and the largest component by weight) with dimethyl sulfoxide (DMSO) at 12.5% by volume. Betaine is not classified. Neat DMSO has a closed-cup flash point of 87 °C and is classified by its supplier as a combustible liquid (Category 4, flash point above 60 °C and up to 93 °C); it carries no health or environmental classification on the purchased-grade sheet. Flammable-liquid classification of a mixture rests on the mixture's own flash point: diluting DMSO to 12.5% by volume in an aqueous solution raises the flash point well above that of the neat solvent and above the 93 °C ceiling of Category 4 (estimated by vapour-pressure calculation from the composition, not measured), so no flammable-liquid category applies. No component reaches any health or environmental classification cut-off, individually or under the mixture-additivity rules.
Signal word	None.
Pictograms	None.
Hazard statements	None.
Precautionary statements	PREVENTION P264 Wash hands thoroughly after handling. · P280 Wear protective gloves and eye protection. (Voluntary good-laboratory-practice handling for a research reagent; no precautionary statement is required by classification.)
Other hazards	No data indicating a hazard not otherwise classified (HNOC). As with any laboratory reagent, avoid unnecessary skin and eye contact and do not ingest.

3 Composition / Information on IngredientsSubstance type: mixture (aqueous solution). The composition below is the **shipped** formulation, computed from the manufacturing formulation of record.

Component	CAS-No	Concentration (w/w %, GHS band)
Betaine (trimethylglycine)	107-43-7	25-50%
Water (nuclease-free)	7732-18-5	25-50%
Dimethyl sulfoxide (DMSO)	67-68-5	10-25%

Components are listed in descending concentration as GHS bands, computed from the manufacturing formulation of record on a 1.0 g/mL basis; the finished solution is somewhat denser and betaine and water are of similar magnitude, so their order may interchange, but every band holds for any realistic density. DMSO is 12.5% by

volume (10 to 25% by weight band). None of the three components is classified for health, physical or environmental hazards at the shipped concentration, so none drives a classification (Sections 2 and 11). No carcinogen, mutagen, or reproductive toxicant (CMR) is present.

4 First-Aid Measures

Eye contact	Rinse cautiously with water for several minutes, holding the eyelids open. Remove contact lenses if present and easy to do, then continue rinsing. Get medical attention if irritation develops and persists.
Skin contact	Wash with plenty of soap and water. Remove contaminated clothing. Get medical attention if irritation develops and persists.
Inhalation	Not an expected route of exposure for this low-volatility aqueous liquid. Remove the person to fresh air if any discomfort occurs.
Ingestion	Rinse mouth with water. Do not induce vomiting. Get medical attention if a large amount is swallowed or if symptoms occur.
Symptoms / effects	None expected under normal handling. Transient mild eye or skin irritation may occur with direct or prolonged contact.
Note to physician	Treat symptomatically.

5 Fire-Fighting Measures

Suitable media	Water spray, water fog, dry chemical, carbon dioxide (CO ₂), or alcohol-resistant foam. Use media appropriate to the surrounding fire.
Unsuitable media	None known.
Specific hazards	Not a flammable liquid: the product is an aqueous betaine solution whose only solvent, DMSO (12.5% by volume), has a closed-cup flash point of 87 °C when neat; dilution in water raises the mixture's flash point above that of the neat solvent (Section 9). The product as supplied does not readily support combustion; the dried residue (betaine) is combustible. Hazardous combustion products may include carbon monoxide, carbon dioxide, and oxides of nitrogen and sulfur.
Firefighter PPE	Self-contained breathing apparatus (SCBA) and full protective gear for any surrounding fire.

6 Accidental Release Measures

Personal precautions	Wear protective gloves and eye protection. Avoid contact with eyes and skin. No special emergency measures are required for this small-volume, non-classified reagent.
Environmental	Avoid release to drains and waterways where practical; see Section 12. No special environmental precautions are required.
Containment / cleanup	Absorb the spill with paper towel or an inert absorbent. Wipe up, then clean the area with water. Place waste in a labelled container for disposal in accordance with Section 13.

7 Handling and Storage

Safe handling	Handle in accordance with good laboratory practice. Avoid contact with eyes. Wear the PPE in Section 8. Wash hands after handling. DMSO is readily absorbed through intact skin and can carry dissolved substances with it: avoid skin contact and wear the gloves in Section 8.
Safe storage	Store frozen at -20 °C with the rest of the kit; keep the container tightly closed. Thaw completely and mix before use.
Incompatibilities	Strong oxidising agents; strong acids (DMSO).

8 Exposure Controls / Personal Protection

Exposure limits	Betaine: no occupational exposure limit (supplier sheet). Dimethyl sulfoxide (DMSO): not listed in the Ontario Table of Ontario Regulation 833 or in US OSHA Table Z-1, and no ACGIH TLV is recorded for it in the sources consulted (a German MAK of 50 ppm, 160 mg/m ³ , exists and is noted for reference). The product is an aqueous liquid dispensed in small volumes and does not generate a relevant vapour concentration in normal use (DMSO vapour pressure 0.55 hPa at 20 °C, neat). <i>Occupational exposure limits checked against the ACGIH TLV list, US OSHA 29 CFR 1910.1000 Table Z-1, and Ontario Regulation 833 (Ontario Table).</i>
Engineering controls	General laboratory ventilation is sufficient. No special engineering controls are required.
Eye / face protection	Safety glasses meeting CSA Z94.3.
Skin protection	Gloves and a lab coat. DMSO permeates common glove materials: for the small-volume pipetting this product is used for, nitrile gloves are acceptable against splash contact (DMSO's supplier sheet gives nitrile, 0.2 mm, a breakthrough time of 38 minutes for the neat solvent) provided a contaminated glove is removed and replaced at once; for prolonged or immersive contact use a glove material rated for DMSO, such as butyl rubber.
Respiratory protection	Not required under normal handling of this low-volatility aqueous liquid.

9 Physical and Chemical Properties

Physical state	Liquid	Flash point	None expected below 93 °C, so no flammable-liquid category applies (estimated by calculation from the composition, not measured): the only solvent, DMSO, has a closed-cup flash point of 87 °C when neat and is present at 12.5% v/v in an aqueous solution.
Appearance	Clear, colourless liquid	Boiling point (initial)	About 100 °C (aqueous solution; not measured)
Odour	No data available for the mixture (DMSO is stated as odourless on its supplier sheet)	Flammability (solid, gas)	Not applicable (liquid)
Odour threshold	No data available	Flammable / explosive limits	Not applicable
Vapour pressure	No data available for the mixture (DMSO neat: 0.55 hPa at 20 °C)	Vapour density (air = 1)	No data available
Colour	Colourless	Oxidising properties	None
pH	No measured value; expected near neutral (betaine solutions are pH 5 to 7 at 5%; DMSO is neutral), far from the extremes that would indicate corrosivity	Relative density	Not measured (the composition is computed on a 1.0 g/mL basis)
Melting / freezing point	No data available (supplied frozen at -20 °C)	Solubility	Miscible with water
Evaporation rate	No data available	Partition coeff. (log K _{ow})	No data available
Auto-ignition temperature	No data available (DMSO neat: 300 to 302 °C)	Viscosity	No measured value
Decomposition temperature	No data available	Explosive properties	None

The product is an aqueous betaine solution with DMSO at 12.5% by volume. Neat DMSO (flash point 87 °C, closed cup) is a Category 4 combustible liquid; in this product it is diluted in water, which raises the flash point above that of the neat solvent and above the 93 °C ceiling of Category 4, so the product is not a flammable liquid; this is the basis for the absence of any flammability (H225 / H226 / H227) classification in Section 2. Component values are from the purchased-grade supplier sheets; properties without a sourced value are stated as "No data available" rather than calculated.

10 Stability and Reactivity

Reactivity / stability	Stable under the recommended storage and handling conditions. No hazardous polymerisation. No hazardous reactions known.
Conditions to avoid	Repeated freeze/thaw cycles and prolonged storage above -20 °C (may reduce performance; not a safety hazard). Keep away from strong oxidisers and strong acids.
Incompatible materials	Strong oxidising agents; strong acids (DMSO).
Decomposition products	Thermal decomposition may yield carbon monoxide, carbon dioxide, and oxides of nitrogen and sulfur (from betaine and DMSO).

11 Toxicological Information

Likely routes of exposure	Skin and eye contact during pipetting are the only realistic routes; ingestion is unlikely; inhalation is not an expected route for this low-volatility aqueous liquid. DMSO penetrates intact skin readily (Section 7).
Acute toxicity (product)	Not classified. Betaine (oral LD50 about 11 g/kg, rat) and DMSO (oral LD50 28,300 mg/kg, rat) are both practically non-toxic; by the GHS calculation method the mixture is not acutely toxic by the oral, dermal, or inhalation route.
Skin corrosion / irritation	Not classified. Transient mild irritation may occur with prolonged direct contact.
Serious eye damage / irritation	Not classified. Betaine is not classified for eye effects. Supplier classifications for DMSO differ (the purchased-grade sheet assigns no eye class and reports slight, reversible irritation in the standard rabbit test; one other supplier lists mild eye irritation, Category 2B); this sheet follows the purchased-grade sheet. Transient mild irritation may occur with direct contact.
Respiratory / skin sensitisation	Not classified. Neither betaine nor DMSO is classified as a respiratory or skin sensitiser.
STOT (single / repeated)	Not classified.
Aspiration hazard	Not classified (aqueous solution; not a hydrocarbon or other substance of the type that classifies for aspiration).

Carcinogenicity / mutagenicity / reproductive toxicity (CMR)	Not classified. Neither component carries a carcinogen, germ-cell mutagen or reproductive-toxicant classification under WHMIS 2015 / GHS, and neither is listed as a carcinogen by IARC, NTP, or ACGIH.
Component reference data	Provided for disclosed components with reference values, none of which is present at a classifying level in the finished mixture: - Dimethyl sulfoxide (DMSO): oral LD50 28,300 mg/kg (rat); dermal LD50 40,000 mg/kg (rat); inhalation LC0 >5.33 mg/L (rat, 4 h); practically non-toxic. DMSO penetrates skin readily and can carry dissolved substances with it (see Section 7). - Betaine: oral LD50 about 11 g/kg (rat; Cosmetic Ingredient Review safety assessment, 2014, consistent with the European registration dossier value of 11,179 mg/kg); practically non-toxic. Not classified for any health hazard; the purchased-grade supplier sheet states no acute-toxicity value.

Where a measured value is not available for a component, classification is by calculation; the finished mixture is not classified by either route.

12 Ecological Information

Ecotoxicity	Not classified as hazardous to the aquatic environment. Neither betaine nor DMSO carries an aquatic hazard classification. DMSO reference data: fish LC50 >25,000 mg/L, daphnia EC50 24,600 mg/L, algae EC50 17,000 mg/L (supplier sheet).
Persistence	DMSO: 31% degradation in 28 days in an aerobic test, not readily biodegradable (supplier sheet). Betaine: no persistence data is stated on its supplier sheet. Both are water-miscible.
Bioaccumulation	Low potential.
Mobility	Highly mobile in soil and water due to water miscibility.
Other adverse effects	None known.

13 Disposal Considerations

Dispose of contents and container in accordance with local, provincial, and federal regulations. This product is not classified as a hazardous waste on the basis of its composition; however, users must verify their own waste characterisation and applicable institutional requirements. Do not release large volumes to drains.

14 Transport Information

TDG (Canada)	Not Regulated. This product meets no transport hazard class under the Transportation of Dangerous Goods Regulations (SOR/2001-286). No UN number or packing group applies.
US DOT / IATA / IMDG	Not regulated for transport under United States DOT (49 CFR), IATA (air) or IMDG (sea). Confirm current requirements before any bulk or air shipment.
Environmental hazards	Not applicable; not a marine pollutant (no aquatic hazard classification, Section 12).
Transport in bulk (MARPOL Annex II / IBC Code)	Not applicable; not shipped in bulk.

15 Regulatory Information

Canada (WHMIS 2015)	Not classified under the Hazardous Products Regulations (SOR/2015-17). All components (water, betaine and dimethyl sulfoxide) are listed on the Canadian Domestic Substances List (DSL).
Other jurisdictions	No component is listed under California Proposition 65. Confirm inventory status (for example US TSCA) for the destination jurisdiction before export.

16 Other Information

Prepared by HoppeSyler Scientific Inc. · **Approved by:** HoppeSyler Scientific Inc.

Revision history

Version	Date	Change
1.0	2026-09-03	First HoppeSyler Scientific Safety Data Sheet for this kit component under the HoppeSyler name, prepared under WHMIS 2015 / GHS Rev. 5. Product determined not classified : an aqueous betaine solution with 12.5% v/v DMSO, neither component classified at the shipped concentration. Composition computed from the manufacturing formulation of record and disclosed by GHS band; the DMSO content is now stated at its formulated level (12.5% by volume), correcting the 2 to 5% shown in the GC Extender section of the earlier combined kit Safety Data Sheet (CSR Taq DNA Polymerase, revision date January 18, 2025). Prepared 2026-08-16; approved for release 2026-09-03.

Legend

GHS = Globally Harmonized System; WHMIS = Workplace Hazardous Materials Information System; TDG = Transportation of Dangerous Goods; DSL = Domestic Substances List; RUO = Research Use Only; PCR = Polymerase Chain Reaction; DMSO = dimethyl sulfoxide; CMR = carcinogen / mutagen / reproductive toxicant; STOT = specific target

organ toxicity; PPE = personal protective equipment; TLV = threshold limit value (ACGIH); PEL = permissible exposure limit (OSHA); TWA = time-weighted average; H = hazard statement; P = precautionary statement.

Disclaimer. The information herein is provided in good faith and believed accurate as of the issue date shown above. It is the user's responsibility to determine suitability for their purpose. HoppeSyler Scientific Inc. makes no warranty and assumes no liability for use of this information.

END OF SAFETY DATA SHEET