Kit Components

Product code	Description
S3771	**BCIP/NBT Color Development Substrate**

Components:

S381	BCIP
S380	Nitro-Blue Tetrazolium (NBT)

Safety Data Sheet
acc. to OSHA HCS

Printing date 02/03/2016 *Reviewed on 02/02/2016*

*
1: Identification

1.1 Product identifier
Trade name: BCIP

Article number: *S381*
Application of the substance / the mixture *Laboratory chemicals*

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier:

Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: *SDS author: Regulatory.Affairs@promega.com*
1.4 Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

*
2: Hazard(s) identification

2.1 Classification of the substance or mixture
Classification according to the Hazard Communication Standard (HCS)

Flame

Flam. Liq. 3 H226 Flammable liquid and vapor.

Health hazard

Repr. 1B H360D May damage the unborn child.

Acute Tox. 4 H312 Harmful in contact with skin.
Acute Tox. 4 H332 Harmful if inhaled.
Eye Irrit. 2 H319 Causes serious eye irritation.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008
The product is classified and labeled according to the CLP regulation.
Hazard pictograms *GHS02, GHS07, GHS08*
Signal word *Danger*

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Hazard-determining components of labeling:
N,N-dimethylformamide
Hazard statements
H226 Flammable liquid and vapor.
H312+H332 Harmful in contact with skin or if inhaled.
H319 Causes serious eye irritation.
H360D May damage the unborn child.
Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
Classification system:
NFPA ratings (scale 0 - 4)
Health = 2
Fire = 3
Reactivity = 0
HMIS-ratings (scale 0 - 4)
*Health = *2*
Fire = 3
Reactivity = 0
OSHA Hazard Overview (Criteria according to 29CFR1910.1200):
Toxic
Irritant
Combustible
Reproductive Hazard
Primary route(s) of entry:
Dermal
Inhalation
Oral
Target Organ(s):
May cause Liver damage (Hepatotoxin)
May affect Reproductive System (Mutagen, Teratogen)
May cause Kidney damage (Nephrotoxin)
2.3 Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.
Results of PBT and vPvB assessment
PBT: *Not applicable.*
vPvB: *Not applicable.*

*
3: Composition/information on ingredients

3.2 Chemical characterization: Mixtures
Description:
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances.
The exact concentration percentages of the hazardous substances are withheld as a Promega Corp. trade secret.

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Dangerous components:		
68-12-2	N,N-dimethylformamide Flam. Liq. 3, H226; Repr. 1B, H360D; Acute Tox. 4, H312; Acute Tox. 4, H332; Eye Irrit. 2, H319	75-100%
6578-06-9	5-Bromo-4-chloro-3-indolyl phosphate p-toluidine salt Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335	1.0-5.0%

Additional information: For the wording of the listed risk phrases refer to section 15.

*
4: First-aid measures

4.1 Description of first aid measures
General information:
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
After inhalation:
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
Seek medical treatment in case of complaints.
After skin contact: Immediately wash with water and soap and rinse thoroughly.
After eye contact:
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
After swallowing: If the patient feels unwell or is concerned, obtain medical advice.
4.2 Most important symptoms and effects, both acute and delayed None
4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

*
5: Fire-fighting measures

5.1 Extinguishing media
Suitable extinguishing agents: Use fire fighting measures that suit the environment.
5.2 Special hazards arising from the substance or mixture None known
5.3 Advice for firefighters
No special advice
In the case of fire, wear respiratory protective equipment and chemical protective suit.
Protective equipment: Mouth respiratory protective device.

*
6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Remove persons from danger area.
Wear protective clothing.
6.2 Environmental precautions:
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
6.3 Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to Section 13.
Ensure adequate ventilation.

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Trade name: BCIP

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6.4 Reference to other sections
See Section 7 for information on safe handling.
See Section 13 for disposal information.

*
7: Handling and storage

7.1 Precautions for safe handling
Keep receptacles tightly sealed.
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
Information about protection against explosions and fires: Keep respiratory protective device available.

7.2 Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: Keep receptacle tightly sealed.
7.3 Specific end use(s) No further relevant information available.

*
8: Exposure controls/personal protection

8.1 Control parameters

Components with limit values that require monitoring at the workplace:	
68-12-2 N,N-dimethylformamide	
PEL	Long-term value: 30 mg/m³, 10 ppm Skin
REL	Long-term value: 30 mg/m³, 10 ppm Skin
TLV	Long-term value: 30 mg/m³, 10 ppm Skin; BEI

Ingredients with biological limit values:	
68-12-2 N,N-dimethylformamide	
BEI	15 mg/L Medium: urine Time: end of shift Parameter: N-Methylformamide 40 mg/L Medium: urine Time: prior to last shift of workweek Parameter: N-Acetyl-S-(N-methylcarbamoyl) cysteine (semi-quantitative)

Additional information: The lists that were valid during the creation were used as basis.

8.2 Exposure controls
Personal protective equipment:
General protective and hygienic measures:
Ensure that washing facilities are available at the work place.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.

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(Contd. of page 4)

Store protective clothing separately.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Pregnant women should strictly avoid inhalation or skin contact.
Do not eat or drink while working.
Clean skin thoroughly immediately after handling the product.
Breathing equipment:
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
Protection of hands:
Protective gloves
Select the glove material considering penetration time, rate of diffusion and degradation time.
It is recommended that the selected protective gloves be tested and approved under NIOSH or EU Directive 89/686/EEC and the standard EN 374 derived from it.
Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
Eye protection:
Safety glasses
Use equipment for eye protection tested and approved under government NIOSH standards.

*
9: Physical and chemical properties

9.1 Information on basic physical and chemical properties
General Information
Appearance:

Form:	*Fluid*
Color:	*Colorless*
Odor:	*Not determined*
Odor threshold:	*Not determined.*
Change in condition	
Melting point/Melting range:	*-61 °C (-78 °F)*
Boiling point/Boiling range:	*152 °C (306 °F)*
Flash point:	*> 55 °C (> 131 °F)*
Flammability (solid, gaseous):	*Not applicable.*
Ignition temperature:	*440 °C (824 °F)*
Decomposition temperature:	*Not determined.*
Auto igniting:	*Product is not selfigniting.*
Danger of explosion:	*Product does not present an explosion hazard.*
Explosion limits:	
Lower:	*2.2 Vol %*
Upper:	*16 Vol %*
Vapor pressure at 20 °C (68 °F):	*3.5 hPa (3 mm Hg)*
Density at 20 °C (68 °F):	*0.95 g/cm³ (7.928 lbs/gal)*
Relative density	*Not determined.*
Vapor density	*Not determined.*
Evaporation rate	*Not determined.*

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Trade name: BCIP

(Contd. of page 5)

Solubility in / Miscibility with	
Water:	Fully miscible.
Partition coefficient (n-octanol/water):	Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	95.0 %
9.2 Other information	No further relevant information available.

*
10: Stability and reactivity

10.1 Reactivity No further relevant information available.
10.2 Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
10.3 Possibility of hazardous reactions No dangerous reactions known.
10.4 Conditions to avoid No further relevant information available.
10.5 Incompatible materials: Oxidizing agents
10.6 Hazardous decomposition products: No dangerous decomposition products known.

*
11: Toxicological information

11.1 Information on toxicological effects
Acute toxicity:
Harmful in contact with skin or if inhaled.

LD/LC50 values that are relevant for classification:		
68-12-2 N,N-dimethylformamide		
Oral	LD50	7600 mg/kg (Rat)
Dermal	LD50	5000 mg/kg (Rabbit)
Inhalative	LC50/4 h	9400 mg/l (Mouse)

Primary irritant effect:
on the skin: Based on available data, the classification criteria are not met.
on the eye:
Causes serious eye irritation.
Sensitization: Based on available data, the classification criteria are not met.
Additional toxicological information:

Carcinogenic categories

IARC (International Agency for Research on Cancer)		
68-12-2	N,N-dimethylformamide	3

NTP (National Toxicology Program)
None of the ingredients are listed.

OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients are listed.

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Trade name: BCIP

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*
12: Ecological information

12.1 Toxicity
Aquatic toxicity: Not harmful to the aquatic environment
12.2 Persistence and degradability Not available
12.3 Bioaccumulative potential Not known
12.4 Mobility in soil No further relevant information available.
Ecotoxical effects:
Remark: Not available
Additional ecological information:
General notes:
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
12.5 Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
12.6 Other adverse effects No further relevant information available.

*
13: Disposal considerations

13.1 Waste treatment methods
Recommendation:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

*
14: Transport information

14.1 UN-Number	
DOT, ADR, IMDG, IATA	UN2265
14.2 UN proper shipping name	
DOT, IATA	N,N-Dimethylformamide solution
ADR	2265 N,N-Dimethylformamide solution
IMDG	N,N-DIMETHYLFORMAMIDE solution
14.3 Transport hazard class(es)	
DOT	

Class	3 Flammable liquids

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Trade name: BCIP

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Label	3
ADR	
	
Class	3 (F1) Flammable liquids
Label	3
IMDG, IATA	
	
Class	3 Flammable liquids
Label	3
14.4 Packing group	
DOT, ADR, IMDG, IATA	III
14.5 Environmental hazards:	
Marine pollutant:	No
14.6 Special precautions for user	Warning: Flammable liquids
Danger code (Kemler):	30
EMS Number:	F-E,S-D
Stowage Category	A
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
Transport/Additional information:	
ADR	
Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
UN "Model Regulation":	UN 2265 N,N-DIMETHYLFORMAMIDE SOLUTION, 3, III

*

15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Sara

Section 355 (extremely hazardous substances):
None of the ingredients are listed.

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Safety Data Sheet
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Trade name: BCIP

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Section 313 (Specific toxic chemical listings):

68-12-2	N,N-dimethylformamide

TSCA (Toxic Substances Control Act):

All ingredients are listed.

Proposition 65

Chemicals known to cause cancer:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:

None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:

None of the ingredients are listed.

Chemicals known to cause developmental toxicity:

None of the ingredients are listed.

Cancerogenity categories

EPA (Environmental Protection Agency)

None of the ingredients are listed.

TLV (Threshold Limit Value established by ACGIH)

68-12-2	N,N-dimethylformamide	A4

NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients are listed.

National regulations:

Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph:(608)274-4330

Abbreviations and acronyms:
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: Internation Civil Aviation Organization
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labeling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)

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Trade name: BCIP

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LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 3: Flammable liquids, Hazard Category 3
Acute Tox. 4: Acute toxicity, Hazard Category 4
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2
Repr. 1B: Reproductive toxicity, Hazard Category 1B
STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3
**** Data compared to the previous version altered.***

Safety Data Sheet
acc. to OSHA HCS

Printing date 02/03/2016 *Reviewed on 02/02/2016*

*
1: Identification

1.1 Product identifier
Trade name: Nitro-Blue Tetrazolium (NBT)

Article number: S380
Application of the substance / the mixture Laboratory chemicals

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier:

Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com
1.4 Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

*
2: Hazard(s) identification

2.1 Classification of the substance or mixture
Classification according to the Hazard Communication Standard (HCS)

Flame

Flam. Liq. 3 H226 Flammable liquid and vapor.

Health hazard

Repr. 1B H360D May damage the unborn child.
STOT SE 2 H371 May cause damage to organs.

Acute Tox. 4 H312 Harmful in contact with skin.
Acute Tox. 4 H332 Harmful if inhaled.
Eye Irrit. 2 H319 Causes serious eye irritation.

2.2 Label elements
Labelling according to Regulation (EC) No 1272/2008
The product is classified and labeled according to the CLP regulation.
Hazard pictograms GHS02, GHS07, GHS08

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Nitro-Blue Tetrazolium (NBT)

(Contd. of page 1)

Signal word Danger

Hazard-determining components of labeling:
N,N-dimethylformamide
Nitro Blue Tetrazolium
Hazard statements
H226 Flammable liquid and vapor.
H312+H332 Harmful in contact with skin or if inhaled.
H319 Causes serious eye irritation.
H360D May damage the unborn child.
H371 May cause damage to organs.
Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
Classification system:
NFPA ratings (scale 0 - 4)
Health = 2
Fire = 3
Reactivity = 0
HMIS-ratings (scale 0 - 4)
Health = *2
Fire = 3
Reactivity = 0
OSHA Hazard Overview (Criteria according to 29CFR1910.1200):
Toxic
Irritant
Combustible
Reproductive Hazard
Primary route(s) of entry:
Dermal
Inhalation
Oral
Target Organ(s):
May cause Liver damage (Hepatotoxin)
May affect Reproductive System (Mutagen, Teratogen)
May cause Kidney damage (Nephrotoxin)
2.3 Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

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Trade name: Nitro-Blue Tetrazolium (NBT)

(Contd. of page 2)

*
3: Composition/information on ingredients

3.2 Chemical characterization: Mixtures
Description:
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances.
The exact concentration percentages of the hazardous substances are withheld as a Promega Corp. trade secret.

Dangerous components:		
68-12-2	N,N-dimethylformamide Flam. Liq. 3, H226; Repr. 1B, H360D; Acute Tox. 4, H312; Acute Tox. 4, H332; Eye Irrit. 2, H319	50-75%
298-83-9	Nitro Blue Tetrazolium STOT SE 1, H370; Acute Tox. 4, H302	1.0-5.0%

Additional information: For the wording of the listed risk phrases refer to section 15.

*
4: First-aid measures

4.1 Description of first aid measures
General information:
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
After inhalation:
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
Seek medical treatment in case of complaints.
After skin contact: Immediately wash with water and soap and rinse thoroughly.
After eye contact:
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
After swallowing: If the patient feels unwell or is concerned, obtain medical advice.
4.2 Most important symptoms and effects, both acute and delayed None
4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

*
5: Fire-fighting measures

5.1 Extinguishing media
Suitable extinguishing agents: Use fire fighting measures that suit the environment.
5.2 Special hazards arising from the substance or mixture None known
5.3 Advice for firefighters
No special advice
In the case of fire, wear respiratory protective equipment and chemical protective suit.
Protective equipment: Mouth respiratory protective device.

*
6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Remove persons from danger area.
Wear protective clothing.
6.2 Environmental precautions:
Dilute with plenty of water.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Nitro-Blue Tetrazolium (NBT)

(Contd. of page 3)

Do not allow to enter sewers/ surface or ground water.
6.3 Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to Section 13.
Ensure adequate ventilation.
6.4 Reference to other sections
See Section 7 for information on safe handling.
See Section 13 for disposal information.

*
7: Handling and storage

7.1 Precautions for safe handling
Keep receptacles tightly sealed.
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
Information about protection against explosions and fires: Keep respiratory protective device available.

7.2 Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: Keep receptacle tightly sealed.
7.3 Specific end use(s) No further relevant information available.

*
8: Exposure controls/personal protection

8.1 Control parameters

Components with limit values that require monitoring at the workplace:	
68-12-2 N,N-dimethylformamide	
PEL	Long-term value: 30 mg/m³, 10 ppm Skin
REL	Long-term value: 30 mg/m³, 10 ppm Skin
TLV	Long-term value: 30 mg/m³, 10 ppm Skin; BEI

Ingredients with biological limit values:	
68-12-2 N,N-dimethylformamide	
BEI	15 mg/L Medium: urine Time: end of shift Parameter: N-Methylformamide 40 mg/L Medium: urine Time: prior to last shift of workweek Parameter: N-Acetyl-S-(N-methylcarbamoyl) cysteine (semi-quantitative)

Additional information: The lists that were valid during the creation were used as basis.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

Trade name: Nitro-Blue Tetrazolium (NBT)

(Contd. of page 4)

8.2 Exposure controls
Personal protective equipment:
General protective and hygienic measures:
Ensure that washing facilities are available at the work place.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Pregnant women should strictly avoid inhalation or skin contact.
Do not eat or drink while working.
Clean skin thoroughly immediately after handling the product.
Breathing equipment:
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
Protection of hands:
Protective gloves
Select the glove material considering penetration time, rate of diffusion and degradation time.
It is recommended that the selected protective gloves be tested and approved under NIOSH or EU Directive 89/686/EEC and the standard EN 374 derived from it.
Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
Eye protection:
Safety glasses
Use equipment for eye protection tested and approved under government NIOSH standards.

*
9: Physical and chemical properties

9.1 Information on basic physical and chemical properties
General Information
Appearance:

Form:	Fluid
Color:	Colorless
Odor:	Not determined
Odor threshold:	Not determined.
Change in condition	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
Flash point:	> 55 °C (> 131 °F)
Flammability (solid, gaseous):	Not applicable.
Ignition temperature:	440 °C (824 °F)
Decomposition temperature:	Not determined.
Auto igniting:	Product is not selfigniting.
Danger of explosion:	Product does not present an explosion hazard.
Explosion limits:	
Lower:	2.2 Vol %

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

Printing date 02/03/2016 Reviewed on 02/02/2016

Trade name: Nitro-Blue Tetrazolium (NBT)

(Contd. of page 5)

Upper:	16.0 Vol %
Vapor pressure at 20 °C (68 °F):	3.5 hPa (3 mm Hg)
Density:	Not determined.
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Fully miscible.
Partition coefficient (n-octanol/water):	Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	70.0 %
Water:	25.0 %
Solids content:	5.0 %
9.2 Other information	No further relevant information available.

*
10: Stability and reactivity

10.1 Reactivity No further relevant information available.
10.2 Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
10.3 Possibility of hazardous reactions No dangerous reactions known.
10.4 Conditions to avoid No further relevant information available.
10.5 Incompatible materials: Oxidizing agents
10.6 Hazardous decomposition products: No dangerous decomposition products known.

*
11: Toxicological information

11.1 Information on toxicological effects
Acute toxicity:
Harmful in contact with skin or if inhaled.

LD/LC50 values that are relevant for classification:		
68-12-2 N,N-dimethylformamide		
Oral	LD50	7600 mg/kg (Rat)
Dermal	LD50	5000 mg/kg (Rabbit)
Inhalative	LC50/4 h	9400 mg/l (Mouse)

Primary irritant effect:
on the skin: Based on available data, the classification criteria are not met.
on the eye:
Causes serious eye irritation.
Sensitization: Based on available data, the classification criteria are not met.
Additional toxicological information:

Carcinogenic categories

IARC (International Agency for Research on Cancer)		
68-12-2	N,N-dimethylformamide	3

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NTP (National Toxicology Program)		
298-83-9	Nitro Blue Tetrazolium	K

OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients are listed.

*
12: Ecological information

12.1 Toxicity
Aquatic toxicity: Not harmful to the aquatic environment
12.2 Persistence and degradability Not available
12.3 Bioaccumulative potential Not known
12.4 Mobility in soil No further relevant information available.
Ecotoxical effects:
Remark: Not available
Additional ecological information:
General notes:
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
12.5 Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
12.6 Other adverse effects No further relevant information available.

*
13: Disposal considerations

13.1 Waste treatment methods
Recommendation:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

*
14: Transport information

14.1 UN-Number	
DOT, ADR, IMDG, IATA	UN2265
14.2 UN proper shipping name	
DOT, IATA	N,N-Dimethylformamide solution
ADR	2265 N,N-Dimethylformamide solution
IMDG	N,N-DIMETHYLFORMAMIDE solution

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14.3 Transport hazard class(es)

DOT

Class	3 Flammable liquids
Label	3

ADR

Class	3 (F1) Flammable liquids
Label	3

IMDG, IATA

Class	3 Flammable liquids
Label	3

14.4 Packing group	
DOT, ADR, IMDG, IATA	III
14.5 Environmental hazards:	
Marine pollutant:	No
14.6 Special precautions for user	Warning: Flammable liquids
Danger code (Kemler):	30
EMS Number:	F-E,S-D
Stowage Category	A
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
Transport/Additional information:	
ADR	
Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
IMDG	
Limited quantities (LQ)	5L
Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml

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UN "Model Regulation":	UN 2265 N,N-DIMETHYLFORMAMIDE SOLUTION, 3, III

*
15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Sara

Section 355 (extremely hazardous substances):
None of the ingredients are listed.

Section 313 (Specific toxic chemical listings):

68-12-2	N,N-dimethylformamide

TSCA (Toxic Substances Control Act):
All ingredients are listed.

Proposition 65

Chemicals known to cause cancer:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:
None of the ingredients are listed.

Chemicals known to cause developmental toxicity:
None of the ingredients are listed.

Cancerogenity categories

EPA (Environmental Protection Agency)
None of the ingredients are listed.

TLV (Threshold Limit Value established by ACGIH)

68-12-2	N,N-dimethylformamide	A4

NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients are listed.

National regulations:

Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph:(608)274-4330

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Abbreviations and acronyms:
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: Internation Civil Aviation Organization
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labeling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 3: Flammable liquids, Hazard Category 3
Acute Tox. 4: Acute toxicity, Hazard Category 4
Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2
Repr. 1B: Reproductive toxicity, Hazard Category 1B
STOT SE 1: Specific target organ toxicity - Single exposure, Hazard Category 1
STOT SE 2: Specific target organ toxicity - Single exposure, Hazard Category 2
**** Data compared to the previous version altered.***