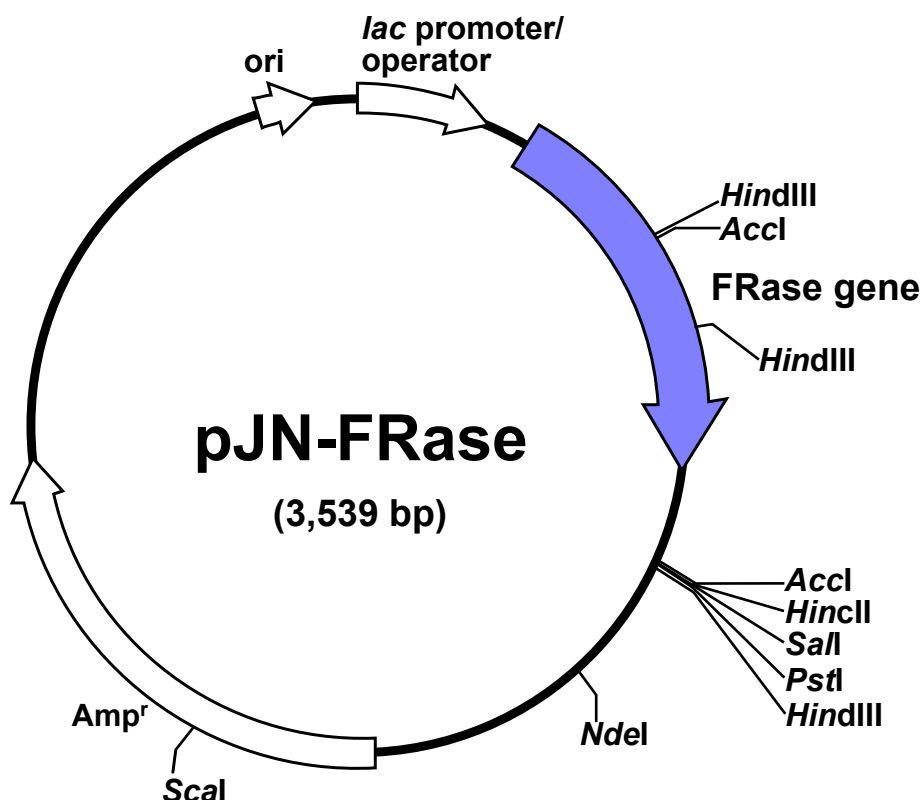


pJN-FRase	
Cat. No.	P-006
Gene/Insert name:	NAD(P)H-flavin oxidoreductase of <i>Vibrio fischeri</i> (FRase)
Vector backbone:	pUC8
Vector type:	<i>E. coli</i>
Backbone size w/o insert (bp):	2,650
Bacterial resistance:	Ampicillin
Growth strain:	JM83
Growth temperature (°C):	37
Growth instructions:	pJN-FRase is resistant to ampicillin (50 µg/mL)
High or low copy:	High copy
Vector map:	pJN-FRase
Coding sequence:	Nucleotide sequence & Amino acid sequence
Plasmid sequence:	pJN-FRase (3,539 bp)
Restriction enzyme list:	Restriction enzyme sites of pJN-FRase
GenBank Accession No.:	D17743
Size:	10 µg
Constituents:	10 mM Tris-HCl (pH 7.6) – 1 mM EDTA
Terms and Licenses:	MTA
Laboratory Reagent For Research Use Only	

NAD(P)H-flavin oxidoreductase, FRase

Cat. No. P-006

Name: pJN-FRase
Insert: NAD(P)H-flavin oxidoreductase gene of *Vibrio fischeri* (FRase)
Vector: pUC8



• DNA fragment:

M T H P --- T I L ***
 ATG-ACG-CAT-CCA-.....-ACC-ATC-CTT-TAG

• Feature for pJN-FRase:

Residue	Source	Comments
1-232	1-232	pUC8 backbone
1-230	1-230	<i>lac</i> promoter/operator
304-957	1-654	FRase ORF
1,120-3,539	246-2,665	pUC8 backbone
3,366	2,492	ori: Origin of replication
1,738-2,598	864-1,724	Amp ^r : Ampicillin resistance gene

Ref.

- 1) FRase amino acid seq. & DNA seq.: GenBank Accession No. D17743
 Zenno, S. *et al. J. Bacteriol.* (1994) 176: 3536-3543.
- 2) FRase expression and purification:
 Inouye, S. *FEBS Lett.* (1994) 347:163-168.

Gene coding region (ORF: Flavin oxidoreductase)**Nucleotide sequence**

ATTCCCGACATCATAAGTTGTGCAGACAAGAATGTCTGTGGATTAATAATTTACAAGTAAGGTTTATTAT
T**ATGACGCATCCAATTATTCATGATCTTGAAAATCGTTATACATCAAAAAAATATGACCCATCAAAGAAA**
GTATCTCAAGAAGATTTAGCGGTTTTGCTTGAGGCTCTGCGTTTATCTGCTTCTTCAATTAATTCACAGC
CTTGAAATTCATTGTTATTGAATCCGATGCAGCGAAGCAACGTATGCATGATTCGTTTGCAAATATGCA
TCAGTTTAATCAACCTCACATCAAAGCGTGTTCATGTGATTTTATTTGCAAATAAGCTTTCGTATACA
CGAGATGATTATGATGTGGTTTTATCTAAAGCGGTTGCTGACAAGCGTATTACTGAAGAGCAAAAAGAAG
CTGCTTTTGCTTCGTTTAAGTTTGTAGAATTGAACTGTGATGAAAATGGTGAGCATAAAGCATGGACTAA
GCCTCAAGCTTATTTAGCTCTTGTAATGCTCTGCATACATTAGCTAGACTGAACATTGACTCAACAACA
ATGGAAGGCATTGATCCTGAATTATTGAGTGAAATTTTTGCTGATGAATTAAGGGTATGAATGTCATG
TTGCTTTAGCCATTGGTTATCATCATCCAAGCGAAGATTATAATGCCTCTTTGCCTAAGTCTCGTAAGGC
ATTTGAAGACGTAATTACCATCCTTT**AG**ATTCTTAATGTTTGAGATGAAGAAAAGCCAGCGATTTAGCTG
GCTTTTGTGTGCAAAATGTTCTAATGGCGTATTACTACGGTAGGAAGTCTATTTAAAGTTTCTTTTA
CTCTTTGGTAATTATTGTCAATTACGCGGAAATCATTATCTAAGTAGGTCGAC

Amino acid sequence

MTHPIIHDLNRYTSKKYDPSKKVSQEDLAVLLEALRLSASSINSQPWKFIVIESDAAKQRMHDSFANMH
QFNQPHIKACSHVILFANKLSYTRDDYDVVLSKAVADKRITTEEQKEAAFASFKEVFNCDENGEHKAWTK
PQAYLALGNALHTLARLNIDSTMEGIDPELLSEIFADELKGYECHVALAIGYHHPSSEDYNASLPKSRKA
FEDVITIL★

pJN-FRase (3,539 bp)

GCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATTTCATTAATGCAGCTGGCAGCAGGTTTCCCG
 ACTGGAAAGCGGGCAGTGAGCGCAACGCAATTAATGTGAGTTAGCTCACTCATTAGGCACCCAGGCTTTACAC
 TTTATGCTTCCGGCTCGTATGTTGTGTGGAATTGTGAGCGGATAACAATTTACACACAGGAAACAGCTATGACCA
 TGATTACGAAATTCCTCGACATCATAAGTTGTGCAGACAAGAATGTCTGTGGATTAATAATTTACAAAGTAAGGTT
 TATTATT**ATGACGCATCCAATTATTCATGATCTTGAAAAATCGTTATACATCAAAAAAATATGACCCCATCAAAGA**
AAGTATCTCAAGAAGATTTAGCGGTTTTGCTTGAGGCTCTGCGTTTATCTGCTTCTTCAATTAATTCACAGCCT
TGGAAATTCATTGTTATGAATCCGATGCAGCGAAGCAACGTATGCATGATTCTGTTGCAAATATGCATCAGTT
TAATCAACCTCACATCAAAGCGTGTTCTCATGTGATTTTATTTGCAAATAAGCTTTCGTATACACGAGATGATT
ATGATGTGGTTTTATCTAAAGCGGTTGCTGACAGCGTATTACTGAAGAGCAAAAAGAAGCTGCTTTTGCTTCG
TTTAAGTTTGTAGAATTGAACCTGTGATGAAAATGGTGAGCATAAAGCATGGACTAAGCCTCAAGCTTATTTAGC
TCTTGGAATGCTCTGCATACATTAGCTAGACTGAACATTGACTCAACAACAATGGAAGGCATTGATCCTGAAT
TATTGAGTGAAATTTTTGCTGATGAATTAAGGGTATGAATGTCATGTTGCTTTAGCCATTGGTTATCATCAT
CCAAGCGAAGATTATAATGCCTCTTTGCCTAAGTCTCGTAAGGCATTTGAAGACGTAATTACCATCCTTTAGAT
 TCTTAATGTTTGGAGATGAAGAAAAGCCAGCGATTATAGCTGGCTTTTGTGTTGTGCAAAATGTTCCTAATGGCGTA
 TTACTACGGTAGGAAGTCTATTTAAAGTTTCTTTTACTCTTTGGTAATTATTGTCAATTACGCGGAAATCATT
 TCTAAGTAGGTCGACCTGCAGCCAAGCTTGGCACTGGCCGTCGTTTACAACGTCGTGACTGGGAAAACCTGG
 CGTTACCCAACTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCG
 ATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCCTGATGCGGTATTTCTCCTTACGCATCTG
 TGCGGTATTTACACCCGATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGATAGTTAAGCCAGCCCCG
 ACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGACAAGCTGTGA
 CCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTG
 ATACGCCTATTTTTATAGGTTAATGTGATGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAA
 TGTGCGCGGAACCCCTATTTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCCT
 GATAAATGCTTCAATAATATTTGAAAAAGGAAGAGT**ATGAGTATTCAAACATTTCCGTGTCGCCCTTATTCCTTT**
TTTGCGGCATTTTGCTTCTGTTTTGCTCACCCAGAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTT
GGGTGCACGAGTGGGTTACATCGAAGTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAAC
GTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAG
CAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTAC
GGATGGCATGACAGTAAGAGAATTATGCAAGTCTGCCATAACCATGAGTGATAACACTGCCGCCAACTTACTTTC
TGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACCTGCCTTGAT
CGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAAC
AACGTTGCGCAAACCTATTAAGTGGCGAACTACTTCTAGCTTCCCGGCAACAATTAAGACTGGATGGAGG
CGGATAAAGTTGACGAGCACTTCTGCGCTCGGCCCTTCGGCTGGCTGTTTATTGCTGATAAATCTGGAGCC
GGTGAGCGTGGGTCTCGCGGTATCATTCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTA
CACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGC
ATTGGTAACCTGTGACACCAAGTTTACTCATATATACCTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGG
 ATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTC
 AGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTTGCAAAACAA
 AAAAACCACCGCTACCAGCGGTGGTTTGTGTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGC
 TTCAGCAGAGCGCAGATACCAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGT
 AGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTA
 CCGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGTGGGCTGAACGGGGGGTTCTGTGCACACAG
 CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCC
 CGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAG
 GGGGAAACGCCTGGTATCTTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGC
 TCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAG**CAACGCGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCC**
 TTTTGCTCACATGTTCTTCTGCGTTATCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTG
 ATACCGCTCGCCGACCGAACGACCGAGCGCAGCGAGTCACTGAGCGAGGAAGCGGAAGA

Residue	Source	Comments
1-232	1-232	pUC8 backbone
1-230	1-230	lac promoter/operator
304-957	1-654	Flavin reductase ORF
1,120-3,539	246-2,665	pUC8 backbone
3,366	2,492	ori: Origin of replication
1,738-2,598	864-1,724	Amp ^r : Ampicillin resistance gene

Restriction enzyme sites of pJN-FRase

Indication Mode: 5'Terminal of the Site

Enzyme Name	Sequence	Count	Start	Position
AccI	GT!MKAC	2	576	1120
ApaI	GGGCC!C	0		
Asp718I	G!GTACC	0		
BamHI	G!GATCC	0		
BclI	T!GATCA	0		
BglII	A!GATCT	0		
EcoRI	G!AATTC	0		
EcoRV	GAT!ATC	0		
HincII	GTY!RAC	1	1120	
HindIII	A!AGCTT	3	568	728 1134
KpnI	GGTAC!C	0		
MluI	A!CGCGT	0		
NcoI	C!CATGG	0		
NdeI	CA!TATG	1	1350	
NheI	G!CTAGC	0		
NotI	GC!GGCCGC	0		
PstI	CTGCA!G	1	1126	
SacI	GAGCT!C	0		
SalI	G!TCGAC	1	1120	
ScaI	AGT!ACT	1	2042	
SmaI	CCC!GGG	0		
StuI	AGG!CCT	0		
XbaI	T!CTAGA	0		
XhoI	C!TCGAG	0		

Supplier	Contact us
JNC CORPORATION Shin Otemachi Bldg. 9F 2-2-1 Otemachi, Chiyoda-ku, Tokyo 100-8105 URL http://www.jnc-corp.co.jp	JNC Corporation, Yokohama Research Center 5-1 Okawa, Kanazawa-ku, Yokohama, Japan 236-8605 Tel: 045-786-5501 Fax: 045-786-5511 E-mail: jphoton@jnc-corp.co.jp

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product name	pJN-FRase
Product code	P-006

Recommended uses and restrictions on use	For research purposes
Manufacturer	JNC CORPORATION, Yokohama research Center 5-1, Okawa, Kanazawa-ku, Yokohama 236-8605, Japan Phone: +81-45-786-5501 Fax: +81-45-786-5511
Supplier	JNC CORPORATION Shin Otemachi Bldg., 2-2-1 Otemachi, Chiyoda-ku, Tokyo 100-8105 Phone: +81-3-3243-6330 Fax: +81-3-3243-6363
Emergency telephone number	+81-45-786-5501

Section 2: HAZARDS IDENTIFICATION

GHS classification

Classification of the substance or mixture

- Not a hazardous substance or mixture according to the Globally Harmonized System (GHS)

Pictograms

- none

Signal word

- none

Hazard statements

- Not a hazardous substance or mixture according to the Globally Harmonized System (GHS)

Precautionary statements-(Prevention)

- Not applicable

Precautionary statements-(Response)

- Not applicable

Precautionary statements-(Storage)

- Not applicable

Precautionary statements-(Disposal)

- Not applicable

Others

Other hazards

- Not available

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Chemical Name	Weight-%	Molecular weight	EC No.	ISHL No.	CAS No.
EDTA	<0.1%	292.24	200-449-4	N/A	60-00-4

Section 4: FIRST AID MEASURES

Inhalation

Remove to fresh air. If symptoms persist, call a physician.

Skin contact

Wash off immediately with soap and plenty of water. If symptoms persist, call a physician.

Eye contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediate medical attention is required.

Ingestion

Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. Do not induce vomiting without medical advice.

Protection of first-aiders

Use personal protective equipment as required.

Section 5: FIRE FIGHTING MEASURES

Suitable extinguishing media

Water spray (fog), carbon dioxide (CO₂), Foam, Extinguishing powder, Sand

Unsuitable extinguishing media

No information available

Special extinguishing method

No information available

Specific hazards arising from the chemical product

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Protection of fire-fighters

Use personal protective equipment as required. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For indoor, provide adequate ventilation process until the end of working. Deny unnecessary entry other than the people involved by, for example, using a rope. While working, wear appropriate protective equipments to avoid adhering it on skin, or inhaling the gas. Work from windward, and retract the people downwind.

Environmental precautions

To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for contaminant and methods and materials for cleaning up

Do not touch spilled material without suitable protection(See section 8). After material is completely picked up, wash the spill site with soap and water and ventilate the area. Put all wastes in a plastic bag for disposal and seal it tightly. Remove, clean, or dispose of contaminated clothing.

Recovery, neutralization

No information available

Secondary disaster prevention measures

Clean contaminated objects and areas thoroughly observing environmental regulations.

Section 7: HANDLING AND STORAGE

Handling

Technical measures

Avoid contact with strong oxidizing agents. Use with local exhaust ventilation.

Precautions

Do not rough handling containers, such as upsetting, falling, giving a shock, and dragging. Prevent leakage, overflow, and scattering. Not to generate steam and dust in vain. Seal the container after use. After handling, wash hands and face, and then gargle. In places other than those specified, should not be smoking or eating and drinking. Should not be brought contaminated protective equipment and gloves to rest stops. Deny unnecessary entry of non-emergency personnel to the handling area.

Safety handling precautions

Avoid contact with skin, eyes or clothing. Use personal protective equipment as required.

Storage
Safe storage conditions

Storage conditions Container protected from light, and store tightly closed in freezer (-20°C).

Safe packaging material

Glass or Plastic container

Incompatible substances

Strong oxidizing agents

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

In case of indoor workplace, seal the source or use a local exhaust system. Provide the safety shower facility, and hand- and eye-wash facility. And display their position clearly.

Exposure limits

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Personal protective equipment
Respiratory protection

Dust mask

Hand protection

Protection gloves

Eye protection

protective eyeglasses or chemical safety goggles

Skin and body protection

Long-sleeved work clothes

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Form
Color

Colorless

Appearance

No data available

Odor

No data available

pH

No data available

Melting point/freezing point

No data available

Boiling point, initial boiling point and boiling range

No data available

Flash point

No data available

Evaporation rate:

No data available

Flammability (solid, gas):

No data available

Upper/lower flammability or explosive limits

No data available

Lower :

No data available

Vapour pressure

No data available

Vapour density

No data available

Specific Gravity / Relative density

No data available

Solubilities

Water: soluble

n-Octanol/water partition coefficient:(log Pow)

No data available

Auto-ignition temperature:

No data available

Decomposition temperature:

No data available

Viscosity (coefficient of viscosity)

No data available

Dynamic viscosity

No data available

Section 10: STABILITY AND REACTIVITY

Stability

Stability

Stable under the recommended storage condition

Reactivity

No data available

Hazardous reactions

None under normal processing

Conditions to avoid

Extremes of temperature and direct sunlight

Incompatible materials

Strong oxidizing agents

Hazardous decomposition productsCarbon monoxide (CO), carbon dioxide (CO₂), Nitrogen oxides (NO_x)

Section 11: TOXICOLOGICAL INFORMATION

Acute toxicity

No data available

Skin irritation/corrosion

No data available

Serious eye damage/ irritation

No data available

Respiratory or skin sensitization

No data available

Reproductive cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

STOT-single exposure

No data available

STOT-repeated exposure

No data available

Aspiration hazard

No data available

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity

No information available

Other data

No data available

Persistence and degradability

No information available

Bioaccumulative potential

No information available

Mobility in soil

No information available

Hazard to the ozone layer

No information available

Section 13: DISPOSAL CONSIDERATIONS

Waste from residues

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated container and contaminated packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14: TRANSPORT INFORMATION

ADR/RID	Not regulated
UN number	-
Proper shipping name:	
UN classification	
Subsidiary hazard class	
Packing group	
Marine pollutant	Not applicable
IMDG	Not regulated
UN number	-
Proper shipping name:	
UN classification	
Subsidiary hazard class	
Packing group	
Marine pollutant (Sea)	Not applicable
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available
IATA	Not regulated
UN number	-
Proper shipping name:	
UN classification	
Subsidiary hazard class	
Packing group	
Environmentally Hazardous Substance	Not applicable

Section 15: REGULATORY INFORMATION

International Inventories

EINECS/ELINCS	-
TSCA	-

Japanese regulations

Fire Service Act	Not applicable
Poisonous and Deleterious Substances Control Law	Not applicable
Industrial Safety and Health Act	Not applicable
Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc	Not applicable
Regulations for the carriage and storage of dangerous goods in ship	Not applicable
Civil Aeronautics Law	Not applicable
Pollutant Release and Transfer Register Law	Not applicable
Export Trade Control Order	Not applicable

Section 16: OTHER INFORMATION

Literature and references

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

GHS Classification is according to JIS Z7252(2010). *JIS: Japanese Industrial Standards

End of Safety Data Sheet