

Safety Data Sheet

KERALASTIC T comp.A

Safety Data Sheet dated: 14/03/2023 - version 6

Date of first edition: 03/05/2017



Section 1: Identification

GHS Product identifier

Mixture identification:

Trade name: KERALASTIC T comp.A

Trade code: 901035

Recommended use of the chemical and restrictions on use

Recommended use: Epoxy-polyurethane adhesive

Uses advised against: Data not available.

Supplier's details

Company: MAPEI AUSTRALIA Pty Ltd

180 Viking Drive Wacol QLD 4076 Australia

T. +61 7 32765000 (Mon-Fri 8am to 4.30pm)

F. +61 7 32765076

Responsible: sales@mapei.com.au

Emergency phone number

Australian Poisons Information Centre 24 Hour Service 13 11 26

Police or Fire Brigade 000

Section 2: Hazard(s) identification



Classification of the Hazardous chemical

Skin irritation, Category 2

Causes skin irritation.

Eye irritation, Category 2A

Causes serious eye irritation.

Skin Sensitisation, Category 1

May cause an allergic skin reaction.

Short-term (acute) aquatic hazard - Category 3

Harmful to aquatic life

Long-term (chronic) aquatic hazard - Category 3

Harmful to aquatic life with long lasting effects.

Adverse physicochemical, human health and environmental effects:

No other hazards

GHS label elements, including precautionary statements

Pictograms and Signal Words



Warning

Hazard statements

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

P261 Avoid breathing mist/vapours/spray.

P264 Wash hands thoroughly after handling.

P273 Avoid release to the environment.

P280 Wear protective gloves/clothing and eye/face protection.

P302+P352 IF ON SKIN: Wash with plenty of water.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P321 Specific treatment (see supplementary instructions on this label)

P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P337+P313 If eye irritation persists: Get medical advice/attention.

P362+P364 Take off contaminated clothing and wash it before reuse.
P501 Dispose of contents/container in accordance with applicable regulations.

Other hazards which do not result in a classification

Other Hazards: No other hazards

This preparation contains low molecular weight epoxy resins. Cross sensitisation to other epoxies is possible. Avoid also exposure to spray mist and vapour.

Section 3: Composition and information on ingredients

Substances

no data available

Mixtures

Mixture identification: KERALASTIC T comp.A

Hazardous components within the meaning of the "Australian Work Health and Safety (WHS)" regulation and related classification:

Qty	Name	Ident. Numb.	Classification	Registration Number
≥25 - <50 %	calcium carbonate	CAS:1317-65-3 EC:215-279-6		
≥5 - <10 %	bis-[4-(2,3-epoxipropoxy)phenyl]propane	CAS:1675-54-3, 25085-99-8 EC:216-823-5 Index:603-073-00-2	Skin Irrit. 2, H315 Skin Sens. 1, H317 Eye Irrit. 2A, H319 Aquatic Chronic 2, H411 Specific Concentration Limits: C ≥ 5%: Skin Irrit. 2 H315 C ≥ 5%: Eye Irrit. 2A H319	01-2119456619-26
≥2.5 - <5 %	2-(2-butoxyethoxy)ethyl acetate	CAS:124-17-4 EC:204-685-9	Aquatic Acute 3, H402	01-2119475110-51-XXXX
≥0.25 - <0.49 %	4-nonylphenol, branched	CAS:84852-15-3 EC:284-325-5 Index:601-053-00-8	Repr. 2, H361fd; Skin Corr. 1B, H314; Aquatic Acute 1, H400; Aquatic Chronic 1, H410; Acute Tox. 4, H302	01-2119510715-45-XXXX

Section 4: First-aid measures

Description of necessary first-aid measures

In case of skin contact:

Immediately take off all contaminated clothing.
Remove contaminated clothing immediately and dispose of safely.
After contact with skin, wash immediately with soap and plenty of water.

In case of eyes contact:

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.
Protect uninjured eye.

In case of Ingestion:

Do not induce vomiting, get medical attention showing the SDS and the hazard label.

In case of Inhalation:

Remove casualty to fresh air and keep warm and at rest.

Symptoms caused by exposure

Eye irritation
Eye damages
Skin Irritation
Erythema

Medical attention and special treatment

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Section 5: Firefighting measures

Suitable extinguishing media

None in particular.
Water.
Carbon dioxide (CO₂).

Extinguishing media which must not be used for safety reasons:

None in particular.

Specific hazards arising from the chemical

Do not inhale explosion and combustion gases.
Burning produces heavy smoke.
Hazardous combustion products: no data available
Explosive properties: ==
Oxidizing properties: no data available

Special protective equipment and precautions for fire-fighters

Use suitable breathing apparatus.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Move undamaged containers from immediate hazard area if it can be done safely.

HazChem Code/Emergency Action code

N.A.

Section 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear personal protection equipment.
Remove persons to safety.

Environmental precautions

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.
Limit leakages with earth or sand.

Methods and material for containment and cleaning up

Suitable material for taking up: absorbing material, organic, sand
Wash with plenty of water.
Retain contaminated washing water and dispose it.

Section 7: Handling and storage

Precautions for safe handling

Avoid contact with skin and eyes, inhalation of vapours and mists.
Don't use empty container before they have been cleaned.
Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.
Contaminated clothing should be changed before entering eating areas.
Do not eat or drink while working.
See also section 8 for recommended protective equipment.

Conditions for safe storage, including any incompatibilities

Keep away from food, drink and feed.

Incompatible materials:

None in particular.

Instructions as regards storage premises:

Adequately ventilated premises.

Section 8: Exposure controls and personal protection

Control parameters – exposure standards, biological monitoring

Community Occupational Exposure Limits (OEL)

	OEL Type	Country	Occupational Exposure Limit
calcium carbonate CAS: 1317-65-3	OSHA		Long Term: 15 mg/m ³
	OSHA		Long Term: 5 mg/m ³
	National GREECE		Long Term: 10 mg/m ³
	National GREECE		Long Term: 5 mg/m ³
	National BELGIUM		Long Term: 10 mg/m ³
	National CZECH REPUBLIC		Long Term: 10 mg/m ³
	National HUNGARY		Long Term: 10 mg/m ³
	National ESTONIA		Long Term: 10 mg/m ³
	National ESTONIA		Long Term: 5 mg/m ³
	National SLOVAKIA		Long Term: 10 mg/m ³

National UNITED KINGDOM	Long Term: 10 mg/m ³ ; Short Term: 30 mg/m ³
National UNITED KINGDOM	Long Term: 10 mg/m ³ ; Short Term: 12 mg/m ³
National UNITED KINGDOM	Long Term: 4 mg/m ³ ; Short Term: 30 mg/m ³
National BULGARIA	Long Term: 10 mg/m ³
National ROMANIA	Long Term: 10 mg/m ³
National CROATIA	Long Term: 4 mg/m ³
National CROATIA	Long Term: 10 mg/m ³
National FRANCE	Long Term: 10 mg/m ³
2-(2-butoxyethoxy)ethyl acetate CAS: 124-17-4	National SWEDEN Long Term: 130 mg/m ³ - 15 ppm; Short Term: 250 mg/m ³ - 30 ppm
	National SWITZERLAND Long Term: 85 mg/m ³ - 10 ppm; Short Term: 127,5 mg/m ³ - 15 ppm
	National SWEDEN Long Term: 130 mg/m ³ - 15 ppm
	National GERMANY Long Term: 67 mg/m ³ - 10 ppm
	National LITHUANIA Long Term: 130 mg/m ³ - 15 ppm; Short Term: 250 mg/m ³ - 30 ppm
	National SLOVENIA Long Term: 67,5 mg/m ³ - 10 ppm; Short Term: 101,2 mg/m ³ - 15 ppm

Predicted No Effect Concentration (PNEC) values

2-(2-butoxyethoxy)ethyl acetate
CAS: 124-17-4 Exposure Route: Fresh Water; PNEC Limit: 0,108 mg/l

Exposure Route: Marine water; PNEC Limit: 0,011 mg/l

Exposure Route: Freshwater sediments; PNEC Limit: 0,8 mg/kg

Exposure Route: Marine water sediments; PNEC Limit: 0,08 mg/kg

Exposure Route: Soil; PNEC Limit: 0,29 mg/kg

Exposure Route: Oral; PNEC Limit: 70 mg/kg

Exposure Route: Microorganisms in sewage treatments; PNEC Limit: 100 mg/l

4-nonylphenol, branched
CAS: 84852-15-3 Exposure Route: Fresh Water; PNEC Limit: 0,000614 mg/l

Exposure Route: Marine water; PNEC Limit: 0,000527 mg/l

Exposure Route: Freshwater sediments; PNEC Limit: 4,62 mg/kg

Exposure Route: Marine water sediments; PNEC Limit: 1,23 mg/kg

Derived No Effect Level (DNEL) values

2-(2-butoxyethoxy)ethyl acetate
CAS: 124-17-4 Exposure Route: Human Dermal; Exposure Frequency: Long Term (repeated)
Worker Industry: 100 mg/kg; Consumer: 60 mg/kg

Exposure Route: Human Oral; Exposure Frequency: Long Term (repeated)
Consumer: 7,9 mg/kg

Exposure Route: Human Inhalation; Exposure Frequency: Long Term, systemic effects
Worker Industry: 85 mg/m³

4-nonylphenol, branched
CAS: 84852-15-3 Exposure Route: Human Inhalation; Exposure Frequency: Long Term, systemic effects
Worker Industry: 0,5 mg/m³; Consumer: 0,4 mg/m³

Exposure Route: Human Inhalation; Exposure Frequency: Short Term, systemic effects
Worker Industry: 1 mg/m³; Consumer: 0,8 mg/m³

Exposure Route: Human Dermal; Exposure Frequency: Long Term, systemic effects
Worker Industry: 7,5 mg/kg; Consumer: 3,8 mg/kg

Exposure Route: Human Dermal; Exposure Frequency: Short Term, systemic effects
Worker Industry: 15 mg/kg; Consumer: 7,6 mg/kg

Exposure Route: Human Oral; Exposure Frequency: Long Term, systemic effects
Consumer: 0,08 mg/kg

Exposure Route: Human Oral; Exposure Frequency: Short Term, systemic effects
Consumer: 0,4 mg/kg

Appropriate engineering controls

no data available

Individual protection measures, such as personal protective equipment (PPE)

Eye protection:

Use close fitting safety goggles, don't use eye lens.

Protection for skin:

Use clothing that provides comprehensive protection to the skin, e.g. cotton, rubber, PVC or viton.

Protection for hands:

Suitable materials for safety gloves; AS/NZS 2161.10:

Polychloroprene - CR: thickness $\geq 0,5\text{mm}$; breakthrough time $\geq 480\text{min}$.

Nitrile rubber - NBR: thickness $\geq 0,35\text{mm}$; breakthrough time $\geq 480\text{min}$.

Butyl rubber - IIR: thickness $\geq 0,5\text{mm}$; breakthrough time $\geq 480\text{min}$.

Fluorinated rubber - FKM: thickness $\geq 0,4\text{mm}$; breakthrough time $\geq 480\text{min}$.

Use protective gloves that provides comprehensive protection, e.g. P.V.C., neoprene or rubber.

Respiratory protection:

Respiratory protection must be used where exposure levels exceed workplace exposure limits. Refer to AS/NZS 1715-1716 for information on selection and use of appropriate respiratory protection equipment.

no data available

Section 9: Physical and chemical properties

Physical state: Liquid

Appearance: paste

Color: various

Odour: Characteristic

pH: no data available

Melting point / freezing point: no data available

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

Lower and upper explosion limit/flammability limits: no data available

Vapour pressure: no data available

Vapour density: ==

Relative density: 1.70 g/cm³

Solubility in water: Insoluble

Solubility in oil: soluble

Partition coefficient (n-octanol/water): no data available

Auto-ignition temperature: no data available

Decomposition temperature: no data available

Kinematic viscosity: no data available

VOC % (Volatile Organic Compound) : 33,7 (A+B) (Rule 1168) g/l

Particle characteristics:

Particle size: no data available

Particle size distribution: no data available

Shape and aspect ratio: no data available

Specific surface area: no data available

Section 10: Stability and reactivity

Reactivity

Stable under normal conditions

Chemical stability

no data available

Possibility of hazardous reactions

None.

Conditions to avoid

Stable under normal conditions.

Incompatible materials

None in particular.

Hazardous decomposition products

None.

Section 11: Toxicological information

Information on toxicological effects

Toxicological Information of the Preparation

a) acute toxicity	Not classified Based on available data, the classification criteria are not met
b) skin corrosion/irritation	The product is classified: Skin irritation, Category 2(H315)
c) serious eye damage/irritation	The product is classified: Eye irritation, Category 2A(H319)
d) respiratory or skin sensitisation	The product is classified: Skin Sensitisation, Category 1(H317)
e) germ cell mutagenicity	Not classified Based on available data, the classification criteria are not met
f) carcinogenicity	Not classified Based on available data, the classification criteria are not met
g) reproductive toxicity	Not classified Based on available data, the classification criteria are not met
h) STOT-single exposure	Not classified Based on available data, the classification criteria are not met
i) STOT-repeated exposure	Not classified Based on available data, the classification criteria are not met
j) aspiration hazard	Not classified Based on available data, the classification criteria are not met

Toxicological information on main components of the mixture:

calcium carbonate	a) acute toxicity	LD50 Oral Rat > 5000 mg/kg	
bis-[4-(2,3-epoxipropoxy)phenyl]propane	a) acute toxicity	LD50 Skin Rabbit = 20 mg/kg	
		LD50 Oral Rat = 11300 µL/kg	
		LD50 Skin Rabbit = 20000 mg/kg	
2-(2-butoxyethoxy)ethyl acetate	a) acute toxicity	LD50 Oral Rat = 11920 mg/kg	
		LD50 Skin Rabbit = 5400 mg/kg	
		LD50 Skin Rabbit = 14500 mg/kg	
		LC50 Inhalation Rat = 72500 mg/m ³ 4h	
		LD50 Oral Rat = 6500 mg/kg	
	i) STOT-repeated exposure	NOAEL Oral Rat = 315 mg/kg	90 d
	NOAEL Skin Rat = 2400 mg/kg	13 w	
	NOAEL Inhalation Rat = 118 mg/m ³	90 d	
4-nonylphenol, branched	a) acute toxicity	LD50 Oral Rat = 1246, mg/kg	
		LD50 Skin Rabbit = 2031, mg/kg	
	b) skin corrosion/irritation	Skin Irritant Rabbit Negative	
	d) respiratory or skin sensitisation	Skin Sensitization Rat Negative	

Section 12: Ecological information

Ecotoxicity

Adopt good working practices, so that the product is not released into the environment.

Eco-Toxicological Information:

Harmful to aquatic life

Harmful to aquatic life with long lasting effects.

List of Eco-Toxicological properties of the product

The product is classified: Short-term (acute) aquatic hazard - Category 3(H402), Long-term (chronic) aquatic hazard - Category 3(H412)

a) Aquatic acute toxicity : - Based on available data, the classification criteria are not met

List of Eco-Toxicological properties of the components

Component	Ident. Numb.	Ecotox Data
calcium carbonate	CAS: 1317-65-3 - EINECS: 215-279-6	a) Aquatic acute toxicity : LC50 Fish > 10000 mg/L 96
		a) Aquatic acute toxicity : EC50 Daphnia > 1000 mg/L 48
		a) Aquatic acute toxicity : EC50 Algae > 200 mg/L 72
2-(2-butoxyethoxy)ethyl acetate	CAS: 124-17-4 - EINECS: 204-685-9	a) Aquatic acute toxicity : EC50 Algae = 1570 mg/L 72h
		a) Aquatic acute toxicity : LC50 Fish Brachydanio rerio 50 mg/L 96h IUCLID
		a) Aquatic acute toxicity : LC50 Daphnia Daphnia magna = 665 mg/L 48h IUCLID
4-nonylphenol, branched	CAS: 84852-15-3 - EINECS: 284-325-5 - INDEX: 601-053-00-8	a) Aquatic acute toxicity : LC50 Fish Pimephales promelas = 0,135 mg/L 96h IUCLID
		a) Aquatic acute toxicity : LC50 Fish Lepomis macrochirus = 0,1351 mg/L 96h EPA
		a) Aquatic acute toxicity : EC50 Daphnia Daphnia magna = 0,14 mg/L 48h IUCLID
		a) Aquatic acute toxicity : EC50 Algae Pseudokirchneriella subcapitata 0,36 mg/L 96h EPA
		a) Aquatic acute toxicity : EC50 Algae Pseudokirchneriella subcapitata 0,16 mg/L 72h EPA
		a) Aquatic acute toxicity : EC50 Algae Desmodesmus subspicatus = 1,3 mg/L 72h IUCLID

Persistence and degradability

no data available

Bioaccumulative potential

Component	Bioaccumulation	Test	Duration	Value
4-nonylphenol, branched	Not bioaccumulative	BCF - Bioconcentration factor	28 d	740

Mobility in soil

no data available

Other adverse effects

no data available

Section 13: Disposal considerations

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Recover if possible.

no data available

Disposal of this product, solutions, packaging and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Dispose of surplus and nonrecyclable products via a licensed waste disposal contractor.

Do not dispose of waste into sewers.

Disposal considerations:

Do not allow to enter drains or watercourses.

Dispose of product according to all federal, state and local applicable regulations.

If this product is mixed with other wastes, the original waste product code may no longer apply and the appropriate code should be assigned.

Dispose of containers contaminated by the product in accordance with local or national legal provisions. For further information, contact your local waste authority.

Special precautions:

This material and its container must be disposed of in a safe way. Care should be taken when handling untreated empty containers. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Do not re-use empty containers.

Section 14: Transport information

Not classified as dangerous in the meaning of transport regulations.

UN number

no data available

UN proper shipping name

no data available

Transport hazard class(es)

no data available

Packing group, if applicable

no data available

Environmental hazards

no data available

Special precautions for user

ADG-Subsidiary hazards no data available

ADG-S.P.: no data available

Road and Rail (ADR-RID):

no data available

Air (IATA):

no data available

Sea (IMDG):

no data available

Additional Information

no data available

HazChem Code/Emergency Action code

•3Z

Section 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

This Safety Data Sheet has been prepared according to the Australian Work Health and Safety (WHS) act and the Code of Practice on preparation of safety data sheets for Hazardous Chemicals.

AICIS: all components are listed

Section 16: Any other relevant information

Code	Description
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H400	Very toxic to aquatic life.
H402	Harmful to aquatic life
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Code	Hazard class and hazard category	Description
3.1/4/Oral	Acute Tox. 4	Acute toxicity (oral), Category 4
3.2/1B	Skin Corr. 1B	Skin corrosion, Category 1B
3.2/2	Skin Irrit. 2	Skin irritation, Category 2
3.3/2A	Eye Irrit. 2A	Eye irritation, Category 2A
3.4.2/1	Skin Sens. 1	Skin Sensitisation, Category 1
3.7/2	Repr. 2	Reproductive toxicity, Category 2
AUS-HAE/A1	Aquatic Acute 1	Short-term (acute) aquatic hazard - Category 1

AUS-HAE/A3	Aquatic Acute 3	Short-term (acute) aquatic hazard - Category 3
AUS-HAE/C1	Aquatic Chronic 1	Long-term (chronic) aquatic hazard - Category 1
AUS-HAE/C2	Aquatic Chronic 2	Long-term (chronic) aquatic hazard - Category 2

This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This SDS cancels and replaces any preceding release.

Legend to abbreviations and acronyms used in the safety data sheet:

ACGIH: American Conference of Governmental Industrial Hygienists

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

AND: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

ATE: Acute Toxicity Estimate

ATEmix: Acute toxicity Estimate (Mixtures)

BCF: Biological Concentration Factor

BEI: Biological Exposure Index

BOD: Biochemical Oxygen Demand

CAS: Chemical Abstracts Service (division of the American Chemical Society).

CAV: Poison Center

CE: European Community

CLP: Classification, Labeling, Packaging.

CMR: Carcinogenic, Mutagenic and Reprotoxic

COD: Chemical Oxygen Demand

COV: Volatile Organic Compound

CSA: Chemical Safety Assessment

CSR: Chemical Safety Report

DMEL: Derived Minimal Effect Level

DNEL: Derived No Effect Level.

DPD: Dangerous Preparations Directive

DSD: Dangerous Substances Directive

EC50: Half Maximal Effective Concentration

ECHA: European Chemicals Agency

EINECS: European Inventory of Existing Commercial Chemical Substances.

ES: Exposure Scenario

GefStoffVO: Ordinance on Hazardous Substances, Germany.

GHS: Globally Harmonized System of Classification and Labeling of Chemicals.

IARC: International Agency for Research on Cancer

IATA: International Air Transport Association.

IATA-DGR: Dangerous Goods Regulation by the "International Air Transport Association" (IATA).

IC50: half maximal inhibitory concentration

ICAO: International Civil Aviation Organization.

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO).

IMDG: International Maritime Code for Dangerous Goods.

INCI: International Nomenclature of Cosmetic Ingredients.

IRCCS: Scientific Institute for Research, Hospitalization and Health Care

KAFH: KAFH

KSt: Explosion coefficient.

LC50: Lethal concentration, for 50 percent of test population.

LD50: Lethal dose, for 50 percent of test population.

LDLo: Leathal Dose Low

N.A.: Not Applicable

N/A: Not Applicable

N/D: Not defined/ Not available

NA: Not available

NIOSH: National Institute for Occupational Safety and Health

NOAEL: No Observed Adverse Effect Level

OSHA: Occupational Safety and Health Administration.

PBT: Persistent, Bioaccumulative and Toxic

PGK: Packaging Instruction

PNEC: Predicted No Effect Concentration.

PSG: Passengers

RID: Regulation Concerning the International Transport of Dangerous Goods by Rail.

STEL: Short Term Exposure limit.

STOT: Specific Target Organ Toxicity.

TLV: Threshold Limiting Value.

TWATLV: Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).

vPvB: Very Persistent, Very Bioaccumulative.

WGK: German Water Hazard Class.

Paragraphs modified from the previous revision:

- 2. HAZARDS IDENTIFICATION
- 3. COMPOSITION/INFORMATION ON INGREDIENTS
- 8. EXPOSURE CONTROLS/PERSONAL PROTECTION
- 11. TOXICOLOGICAL INFORMATION
- 12. ECOLOGICAL INFORMATION
- 16. OTHER INFORMATION