1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name: S BOND W4

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

One component, silane-based, adhesive for various industrial applications.

1.3 Details of the supplier of the safety data sheet

Name: N.P.T. S.r.l.
Full address: Via Guido Rossa,n. 2 – CAP: 40056 – Crespellano (BO)
Telephone number: ++39 051 969109
Fax : ++39 051 969837
E-mail address of the competent person responsible for the SDS: infoSDS@nptsrl.com

1.4 Emergency telephone number:

Telephone number of N.P.T. – Laboratories and manufacturing plant, Gropello Cairoli (PV):
+ +39 0382 815132 (available from Monday to Friday, only in the following office hours: 08:30 to 12:30, 13:30 to 17:00).

2. HAZARDS IDENTIFICATION

2.1 Classification of the mixture

This mixture is not classified as dangerous according to EC Directive 1999/45/EC.
Major adverse effects: see sections 9 to 12.

2.2 Label elements

- Risk symbol(s):

- Hazards : irritating
- R-phrases: R36/37/38, R43, R52/53
- S-phrases: S23, S24, S25, S26, S37, S60.
- Additional phrases: It contains N-[3-(Trimethoxysilyl)propyl]ethylenediamine: may cause an allergic reaction.

2.3 Other hazards

During the application methyl alcohol is released by reaction with water/moisture.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

N.AP.

3.2 Mixtures

Substances presenting a health or environmental hazard within the meaning of the Dangerous Substances Directive 67/548/EEC or Regulation (EC) No. 1272/2008, assigned a Community workplace exposure limit, classified as PBT/vPvB or included in the Candidate List:

Nome	Registration No	CAS No	EINECS No	Class.67/548/CE (*)	Class. CLP (*)	Conc.%
N-[3-(Trimethoxysilyl) propyl]ethylenediamine [1]	N.D.	1760-24-3	217-164-6	Xn, Xi, N, R20, R41, R43, R51/53.	H317, H318, H332, H411.	5,0 - <10,0
(3-Glycidyloxypropyl) trimethoxysilane	01-2119513212-58	2530-83-8	219-784-2	Xi, R41	H318	< 5,0
Titanium butoxide [1]	N.D.	5593-70-4	227-006-8	Xi, R10	H226, H315, H319, H335	< 2,0
1,8-Diazabicyclo[5.4.0]undec-7-ene	N.D.	6674-22-2	229-713-7	C, Xn, R22, R34, R52/53	H302, H314, H412	< 2,0
Trimethoxyvinylsilane [1] [2]	01-2119513215-52-0002	2768-02-7	220-449-8	Xn, R10, R20.	H226, H332.	0,1- 1,0

[1] Substance that presents a danger to the environment or health
[2] Substance with a workplace exposure limit (as methanol)
[3] PBT-Substance
[4] vPvB-Substance
(*)See Section 16 for full text of R-phrases and H-statements.

4. FIRST AID MEASURES

4.1 Description of first aid measures

In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person. If unconscious place in recovery position and seek medical advice.
Routes of exposure:
- Skin contact: remove with a cloth or paper and wash with soap and water.
- Eye contact: remove with a clean cloth and rinse with water.
- Ingestion: in case of accidental contact with the mouth, expelling and rinse. If ingested in large quantities obtain medical attention.
- Inhalation: in case of symptoms remove to fresh air; if symptoms persist attain medical attention.

4.2 Most important symptoms and effects, both acute and delayed
- Skin contact: N.AV.
- Eye contact: may cause irritation and reversible damage.
- Ingestion: N.AV.
- Inhalation: N.AV.

It contains N-[3-(Trimethoxysilyl)propyl]ethylenediamine: may cause an allergic reaction.

4.3 Indication of any immediate medical attention and special treatment needed
Comply with the provisions of the doctor. See section 4.1.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media
- Appropriate extinguishing media: Water, CO_2, foam, chemical powders, depending on the materials involved in fire.
- Information about suitable extinguishing media: not relevant.
- Extinguishing inappropriate: no one in particular.
- Indicate whether certain methods of extinction are inadequate in a specific situation related to substance: None in particular.

5.2 Special hazards arising from the substance or mixture
The fire will produce dense black smoke. Exposure to decomposition products may be harmful to health. You may need to use the breathing apparatus.

5.3 Advice for fire-fighters
Cool containers exposed to flames with water. Do not allow water runoff to enter drains or watercourses.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Personal precautions: Avoid breathing vapors. Refer to protective measures listed in sections 7 and 8. Wear protective gloves.

6.2 Environmental precautions
Do not discharge into drains or watercourses.

6.3 Methods and material for containment and cleaning up
- Recommendations on how to contain a spill: Contain material with barriers, including non-absorbent.
- Recommendations on how to clean a spill: Collect mechanically; reintroduce in the packaging for reuse or in other useful containers for disposal.

6.4 Reference to other sections
Once collected and contained, treat material as prescribed in section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapor and spray mist arising from the application of this mixture. Smoking, eating and drinking should be prohibited in scope. Comply with the health and safety at work laws. Do not allow to enter drains or watercourses. See also section 8.
The product can liberate methanol. In enclosed spaces vapors may form explosive mixtures with air, in the presence of ignition sources, can cause explosions also inside of empty uncleaned. Therefore, keep away from ignition sources and take precautionary measures against static discharges.

7.2 Conditions for safe storage, including any incompatibilities
Keep containers closed. Protect from water/moisture.

7.3 Specific end use(s)
None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with exposure limits
- **Methanol** (CAS-N°: 67-56-1; EC-N°: 200-659-6) - reaction product
  - Limit values for occupational exposure:
    National (ITA):
    TLV-TWA = 200 ppm (260 mg/m^3);
    TLV-STEL = N.AV.
    EU:

TLV-TWA = 200 ppm (260 mg/m^3);
TLV-STEL/C = N.AV

ACGIH 2009:
TLV-TWA = 200 ppm;
TLV-STEL/C = 250 ppm.

- **Trimethoxyvinylsilane** (CAS-N°: 2768-02-7; EC-N°: 220-449-8)
  - Biological limit values: N.AV.

DNEL:

Workers (short-term):
Dermal DNEL - systemic effects: 0,69 mg/kg body weight/day.
Inhalation DNEL - systemic effects: 4,9 mg/m^3 air.
Workers (long-term):
Dermal DNEL - systemic effects: 0,69 mg/kg body weight/day.
Inhalation DNEL - systemic effects: 4,9 mg/m^3 air.

PNEC:

Fresh water: 0,34 mg/l.
Sea water:> 0,034 mg/l.

8.2 Exposure controls

Avoid contact with eyes and skin. Provide adequate ventilation: this may be achieved through the use of local exhaust ventilation. In unventilated/closed spaces could be necessary the respiratory protection.
Individual protection measures, such as personal protective equipment:
Eye protection /face: no special precautions must be adopted for normal use. If there is a risk of splashing/spraying of material wear safety glasses for liquids.
Skin protection: No special precaution must be adopted for normal use, use appropriate clothing.
Hand Protection: use gloves made of nitrile or other gloves recommended by the supplier.
Respiratory protection: If exposed to concentrations above the exposure limit, use a full face mask equipped with filter for low boiling organic compounds - type AX (organic gases and vapours with boiling point ≤ 65 °C). Reuse and use against gascompounds is absolutely impermissible.

9. PHYSICAL AND CHEMICAL PROPERTIES

General information

- Appearance:	paste
- Odour:	Light Typical
- Odour threshold:	N.AV.

9.1 Information on basic physical and chemical properties

- pH:	N.AP. (undiluted)
- Melting point/freezing point (92/69/EEC, A1):	N.AP.
- Initial boiling point and boiling range (92/69/EEC, A2):	N.AP.
- Flash point:	N.AV.
- Evaporation rate:	N.AV.
- Flammability (solid, gas):	N.AV.
- Upper/lower flammability or explosive limits:	N.AV.
- Vapour tension:	N.AV.
- Vapour density (aria=1):	N.AV.
- Relative density (92/69/EEC, A3):	1,03 g/ml (20°C) [Method: immersed body]
- Solubility in water (92/69/EEC, A6):	Insoluble [Method: preliminary test]
- Solubility in organic solvents:	Partial
- Partition coefficient: n-octanol/water:	N.AV.
- Auto-ignition temperature:	N.AV.
- Decomposition temperature:	N.AV.
- Viscosity:	3000-9000 cps (23°C) [Method: plate/cone]
- Explosive properties:	no
- Oxidising properties:	no

9.2 Other information:

- VOC	0 g/l (0%)

10. STABILITY AND REACTIVITY

10.1 Reactivity

Reacts slowly with water (ambient humidity) turning into a rubbery solid.

10.2 Chemical stability

Stable under normal conditions and in the absence of water/moisture.

10.3 Possibility of hazardous reactions

None.

10.4 Conditions to avoid

Umidity.

10.5 Incompatible materials

Water

10.6 Hazardous decomposition products

Methanol, carbon monoxide and dioxide, smoke, oxides of nitrogen.

11. TOXICOLOGICAL INFORMATION

There are no data available on the mixture itself. Set out below is the toxicological information relating to the main substances in the mixture.
Hazardous effects to health from exposure to the mixture: see Sections 2 and 4.

11.1 Information on toxicological effects

- *Trimethoxyvinylsilane:*

- Acute toxicity, by oral route: LD50 rat = 7120 mg/Kg. Directive 84/449/EEC method B.1.
- Acute inhalation toxicity: LC50 rat = 16,8 mg/l, 4 h (Atm. dust / mist). Method OECD TG 403.
- Acute toxicity, dermal toxicity: LD50 rabbit => 3540 mg/kg. (literature value) RTECS.
- Primary skin irritation: rabbit = not irritating. Method OECD TG 404.
- Primary irritation of the mucous membranes: rabbit = not irritating. Method OECD TG 405.
- Sensibilization (Magnusson-Kligman): rabbit: not sensitizing effects. Method OECD TG 406.
- Repeated dose toxicity,oral: rat NOAEL = < 62,5 mg / kg, 28d. Method OECD TG 422.
- Repeated dose toxicity, inhalation toxicity: rat NOAEL = < 0,058 mg/kg, 98d.

- *(3-Glycidyloxypropyl) trimethoxysilane*:

- Acute toxicity, by oral route: LD50 rat = 8025 mg/Kg. Directive 84/449/EEC method B.1.
- Acute inhalation toxicity: LC50 rat = = 5,3 mg/l, 4h (Atm. dust / mist). Method OECD TG 403.
- Acute toxicity, dermal toxicity: LD50 rabbit = 4250 mg/kg. Method OECD TG 402.
- Primary skin irritation: rabbit = not irritating. Method OECD TG 406.
- Primary irritation of the mucous membranes: rabbit = irritating. Method OECD TG 405.
- Sensibilization (Buehler): guinea pig: not sensitizing effects. Method OECD TG 406.
- Repeated dose toxicity,oral: rat NOAEL = 500 mg/kg, 28d. Method OECD TG 407.
- Repeated dose toxicity, inhalation toxicity: rat NOAEL 0,225 mg/kg, 14d. Metodo OECD TG 412

CMR rating:
Carcinogenicity: no evidence
Mutagenicità: N.AV.
Teratogenicità: N.AV.
Toxicity to reproduction/fertility: Based on the available data, the classification criteria are not satisfied.

- *1,8-Diazabicyclo[5.4.0]undec-7-ene*:

- Acute toxicity, by oral route: LD50 rat 681 mg/Kg. Directive 84/449/EEC method B.1.

Additional information:
Strong corrosive effect on the eyes, corrosive to skin and mucous membranes.
With nitrosating agents (nitrites, nitrogen oxides ...) can be under certain conditions, formation of nitrosamines, found to be carcinogenic in animal experiments.

- *N-[3-(Trimethoxysilyl)propyl]ethylenediamine:*

- Acute toxicity, by oral route: LD50 rat = 2400 mg/Kg. Directive 84/449/EEC method B.1.
- Primary skin irritation: rabbit = not irritating. Method OECD TG 404.
- Primary irritation of the mucous membranes: rabbit = strongly irritating for eyes. Method OECD TG 405.

CMR rating:
Carcinogenicity: no evidence
Mutagenicity: In vitro and in vivo studies showed no mutagenic effects. Based on the data available data, the classification criteria are not met.
Teratogenicity: Did not show teratogenic effects in animal experiments. On the basis ofavailable data, the classification criteria are not met.
Toxicity to reproduction/fertility: Based on the available data, the classification criteria are not satisfied.

- *Methanol:*

Additional information:
As products of hydrolysis: according to the literature methanol (CAS: 67-56-1) degrease the skin, irritates the mucous membranes, have narcotic effect that can even lead to coma or death. Dermal absorption possible. If the rescue slow, it may cause cardiac, kidney, liver and optic nerves lesions.

12. ECOLOGICAL INFORMATION

Use according to standards of good practice and avoid release to the environment (see also sections 6,7,13,14, 15).
There are no ecotoxicological data on the mixture itself. Set out below is the toxicological information relating to the main substances in the mixture.

12.1 Toxicity

- *Trimethoxyvinylsilane:*

- Acute toxicity to fish (LC50): Oncorhynchus mykiss (rainbow trout), 96h. = 191 mg/l. Method OECD TG 203.

- Acute toxicity for daphnia (EC50): daphnia, 48h. = 168,7 mg/l. Directive 92/69/CEE C.2.
- Acute toxicity to algae (ErC50): algae, 7d. = 210 mg/l . OECD TG 201.
- Acute bacterial toxicity (EC10): Pseudomonas putida, 5h. = 1000 mg/l. Method Bringmann und Kühn, Z. Wasser Abwasser Forsch. 10, 87-98 (1977).

• *(3-Glycidyloxypropyl) trimethoxysilane*

- Acute toxicity to fish (LC50): Cyprinus carpio, 96h. = 55 mg/l. Method OECD TG 203.
- Acute toxicity for daphnia (EC50): Daphnia, 48h. = 324 mg/l. Method OECD TG 202.
- Acute toxicity to algae (ErC50): algae,d. (growth inhibitor) = 210 mg/l. Method OECD TG 201.

• *1,8-Diazabicyclo[5.4.0]undec-7-ene*:

- Acute toxicity to fish (LC50): Leuciscus idus, 96h. = 110-220 mg/l. Method OECD TG 203.
- Acute toxicity for daphnia (EC50): Daphnia, 48h. = 50 mg/l. Method OECD TG 202.
- Acute toxicity to algae (ErC50): Scenedesmus subspicatus (growth inhibitor) = >100 mg/l. Method OECD TG 201.
- Acute bacterial toxicity (CE10): Pseudomonas putida, 17h. = 210 mg/l. Method Bringmann und Kühn, Z. Wasser Abwasser Forsch. 10, 87-98 (1977).

• *N-[3-(Trimethoxysilyl)propyl]ethylenediamine:*

- Acute toxicity to fish (LC50): Oncorhynchus, 96h. = 597 mg/l. Method OECD TG 203.
- Acute toxicity for daphnia (EC50): daphnia, 48h. = 81 mg/l. Method OECD TG 202.
- Acute toxicity to algae (ErC50): algae, 7d. = 126 mg/l . OECD TG 201.

12.2 Persistence and degradability

• *Trimethoxyvinylsilane:*

-Biodegradation: 51%, 28d, not immediately biodegradable.
-Persistence (Half-life period): 2,4 h

• *(3-Glycidyloxypropyl) trimethoxysilane*

- Biodegradation: 37%, 28d, not immediately biodegradable.
-Persistence (Half-life period): 2,4 h

• *N-[3-(Trimethoxysilyl)propyl]ethylenediamine:*

-Biodegradability: Exposition time = N.AV., CE92/69, Result =50% (not immediately biodegradable)
-Persistence: N.AV.

The hydrolysis product (methanol) is readily biodegradable.

12.3 Bioaccumulative potential

- *Trimethoxyvinylsilane:* not bioaccumulative
- *(3-Glycidyloxypropyl) trimethoxysilane:* not bioaccumulative
- *N-[3-(Trimethoxysilyl)propyl]ethylenediamine:* N.AV.

12.4 Mobility in soil

The mobility is limited by the transformation into an insoluble solid by reaction with moisture.

12.5 Results of PBT and vPvB assessment

The components of the mixture, based on available information, do not meet the vPvB and PBT criteria.

12.6 Other adverse effects

None.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Recover if possible. Operate according to local and national regulations: 91/156/EEC, 91/689/EEC, 94/62/EEC.
Uncured product disposal (according to Directive 2000/532/EC):
waste code EWC 080409* – Waste adhesives and sealants containing organic solvents or other dangerous substances;
Hardened product disposal (according to Directive 2000/532/EC):
waste code EWC 080410 – Waste adhesives and sealants other than those mentioned in 080409.
Packaging: The packaging steel (pail with lid) should not be discarded, but recycled delivering it for free at one point for recycling (according to the local collection system). Before that, make sure the bucket is empty and dry, with the minimum possible residual product.

14. TRANSPORT INFORMATION

Transport within the user's premises:

Always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.1 UN number

N.AP.

14.2 UN proper shipping name

N.AP.

14.3 Transport hazard class(es)

N.AP.

14.4 Packing group

N.AP.

14.5 Environmental hazards

N.AP.

14.6 Special precautions for user

N.AP.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

N.AP.

Additional information for Transport in accordance with IMDG, ADR/RID and ICAO/IATA

This mixture is not classified as dangerous according to international transport regulations (ADR/RID, IMDG, ICAO/IATA)

15. REGULATORY INFORMATION

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

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH); Directive 67/548/EEC (Classification, packaging and labelling of dangerous substances) and subsequent amendments; Directive 1999/45/EC (Classification, packaging and labelling of dangerous preparations) and subsequent amendments; Regulation (EC) No 1907/2006 (Reach); Regulation (EC) No 1272/2008 (CLP); Regulation (EC) No 790/2009 of 10 August 2009 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures. Commission Directive 92/69/EEC of 31 July 1992 adapting to technical progress for the seventeenth time Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances

The "Threshold Limit Values"of the substances are taken from: a) Italian legislation: Decree 9 April 2008, n. 81 - Appendix XXXVIII and XLIII, 3 August 2009 Legislative Decree no. 106 - Annex XXXVIII; b) EU Legislation: Directive of 2009/161/CE 17dec. 2009; c) the substances not listed by the National legislation and by the EU Legislation are taken from the volume A.C.G.I.H 2009 *"Threshold Limit Value (TLV's) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs)* "[Source Federchimica - Italian National Association of Chemical Industry : "*Threshold limit values and biological indices of exposure to the Risks related to chemicals in the workplace "2010 edition]*.

Other requirements, restrictions and ban regulations: none

15.2 Chemical Safety Assessment

N.AV.

16. OTHER INFORMATION

Full text of R-phrases and Hazard Statements appearing in section 3:

R10 . Flammable.
R20 - Harmful by inhalation.
R22 - Harmful if swallowed.
R34 - Causes burns.
R36/37/38 - Irritating to eyes, respiratory system and skin.
R41 - Risk of serious damage to eyes.
R43 - May cause sensitisation by skin contact.
R51/53 -Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
H226 - Flammable liquid and vapour.
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage.
H315 - Causes skin irritation.
H317- May cause an allergic skin reaction.
H318 - Causes serious eye damage.
H319 - Causes serious eye irritation.
H332 - Harmful if inhaled.
H335 - May cause respiratory irritation.
H411 - Toxic to aquatic life with long lasting effects.
H412 - Harmful to aquatic life with long lasting effects.
S23 - Do not breathe gas/fumes/vapour/spray.
S24 - Avoid contact with skin.
S25 - Avoid contact with eyes.
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37 - Wear suitable gloves.
S60 - This material and its container must be disposed of as hazardous waste.

The information contained in this Safety Data Sheet is based on the present state of knowledge and current national legislation.

It provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

The product should not be used for purposes other than those shown in Section 1 without first referring to the supplier and obtaining written handling instructions.
As the specific conditions of use of the product are outside the supplier's control, the user is responsible for ensuring that the requirements of relevant legislation are complied with.
The information contained in this safety data sheet does not constitute the user's own assessment of workplace risks, as required by other health and safety legislation.

This sheet replaces all previous versions.

Bibliography

ESIS – European chemical Substances Information System - Joint Research Centre;
Federchimica – Book series of the Committee for Substances Safety , No. 2 "THE MSDS Part 2 - Examples of Safety Data Sheet of a substance and a mixture prepared according to Regulation (EU) 453/2010, July 2010".

Acronyms

ACGIH: American Conference of Governmental Industrial Hygienists.
ADR: Agreement concerning the international carriage of Dangerous goods by Road
CLP: Classification, Labelling and Packaging.
CMR: Cancérogène (ou cancérigène), Mutagène et Reprotoxique (Carcinogenic, mutagenic and toxic).
DNEL: Derived No Effect Level.
EC50 or EC10: half maximal effective concentration (concentration of a compound where 50% or 10% of its maximal effect is observed)
ErC50: Effective Concentration of a substance that causes a 50% reduction in the growth rate.
EWC: European Waste Catalogue.
IATA: international air transport association.
IBC Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk.
IMDG: International maritime dangerous goods.
LC 50: Lethal Concentration 50 (Lethal concentration for 50% of individuals).
LD 50: Lethal Dose 50 (Lethal Dose for 50% of individuals).
OECD: Organisation for Economic Co-operation and Development: Guideline for Testing of Chemicals.
MARPOL73/78: International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978.
NOAEL: No Observed Adverse Effect Level.
PBT: Persistent, bioaccumulative and toxic.
PNEC: Predicted no effect concentration.
RID: Règlement concernent le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International Carriage of Dangerous Goods).
RTECS: Registry of Toxic Effects of Chemical Substances.
STEL: short term exposure limit.
TLV: threshold limit value.
TWA: time weighted average concentration (occupational exposure limit value on the basis of a 8h/day, 40h/week work schedule).
EU: European Union.
vPvB: Very persistent very bioaccumulative .

Decoding:
(#) = This symbol indicates that the information has been updated to the review date.
N.AV. = Not available.
N.AP = Not applicable .
[…] = Bibliographic reference.

This safety data sheet was reviewed in all its sections in accordance to the Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

All subsequent updates will be marked with #.