SAFETY DATA SHEET

Based on Directive 2001/58/EC of the Commission of the European Communities

FLAME RETARDANT ZERO HALOGEN HEAT-SHRINKABLE POLYMERIC PRODUCTS

1. Identification of the substance/preparation and of the company/undertaking

1.1 Identification of the substance or preparation:

Synonyms: XFFR, ZH-100, ZH-SCE, ZHS, ZHTM

Moulded Parts Type: -100

CAS no.	: N.A.	**Reference**	: RAY/3146
EC index No.	: N.A.	**NFPA code**	: N.D.
EINECS No.	: N.A.	**Molecular weight**	: N.A.
RTECS No.	: N.A.	**Formula**	: N.A.

1.2 Use of the substance or the preparation:
Heat shrinkable polymeric products

1.3 Company/undertaking identification:
TYCO Electronics
Cheney Manor Industrial Estate
SN2 2QE Swindon, United Kingdom
Tel. : +44 1793 57 38 24
Fax : +44 1793 57 39 53

1.4 Telephone number for emergency:
+32 14 58 45 45
Brandweerinformatiecentrum voor gevaarlijke stoffen (B.I.G.)
Technische Schoolstraat 43A, B-2440 Geel

2. Composition/information on ingredients

- Plastic materials may be based on polyethylene and olefin copolymers, polyamides, polyesters and silicones. Products may be coated with, or used in conjunction with adhesives/mastics based on polyamides and/or olefin copolymer

3. Hazards identification

- These products are not hazardous as supplied in accordance with EC-directives 67/548/EEC and 1999/45/EEC
- Products may emit hazardous thermal decomposition products if overheated or burnt (see section 10.3)

4. First aid measures

4.1 Eye contact:
- If molten material contacts the eye:
  Rinse immediately with plenty of water for 15 minutes
- Consult a doctor/medical service if irritation persists

4.2 Skin contact:
- If molten material contacts the skin:
- Immediately flush with cold water for 15 minutes
- Do not attempt to remove material stuck to the skin
- Treat as a burn
- Consult a doctor/medical service

4.3 After inhalation:
- If exposed to fumes from overheated or burnt material:
- Remove the victim into fresh air
- Keep warm and at rest
- Oxygen may be administered by trained personnel
- Administer artificial respiration if breathing stops
- Consult a doctor/medical service if breathing problems develop

4.4 After ingestion:
- Not applicable

5. Fire-fighting measures

5.1 Suitable extinguishing media:
- Water spray
- Polyvalent foam
- ABC powder
- Carbon dioxide

5.2 Unsuitable extinguishing media:
- No data available

5.3 Special exposure hazards:
- Toxic decomposition products may be evolved in a fire (see section 10.3)

5.4 Instructions:
- Not applicable

5.5 Special protective equipment for firefighters:
- Self-contained breathing apparatus with full face piece
- Protective clothing for exposure to chemicals

6. Accidental release measures

6.1 Personal protection/precautions: see heading 8.1/8.3/10.3

6.2 Environmental precautions:
- Not applicable

6.3 Clean-up:
- Pick up for continued use or disposal

7. Handling and storage

7.1 Handling:
- Refer to Tyco Electronics product installation instructions

- Avoid overheating the product after shrinkage has occurred
- Stop heating immediately if the product blisters, chars or shows other signs of degradation
- Avoid inhaling fumes which may be released and ventilate the area thoroughly before resuming work

- Avoid contact with molten material
- Wash hands before eating, drinking or smoking
- Practice good standards of personal and industrial hygiene

7.2 Storage:

- Store in a dry area
- Store in a cool area
- Product should be stored at temperatures below 40°C to avoid prerecovery of expanded product
- Store in the original packaging
- Keep away from: heat sources

Storage temperature	:	< 40	**°C**
Quantity limits	:	N.D.	**kg**
Storage life	:	< 1825	**days**
Materials for packaging	:		

- suitable : polyethylene
- to avoid : no data available

7.3 Specific uses:

- See information supplied by the manufacturer

8. Exposure controls/Personal protection

8.1 Exposure limit values:

- Not applicable

Sampling methods:

- No data available

8.2 Exposure controls:

8.2.1 Occupational exposure controls:

- Work under local exhaust/ventilation
- When using gas torches in confined spaces ensure an adequate supply of fresh air to avoid oxygen depletion

8.2.2 Environmental exposure controls: see heading 13

8.3 Personal protection:

8.3.1 respiratory protection:

- Not required for normal conditions of use
- Approved respirator or self contained breathing apparatus for installations in confined/unventilated areas

8.3.2 hand protection:

- Heat resistant gloves if handling hot products after installation
  Suitable materials: No data available
- Breakthrough time: N.D.

8.3.3 eye protection:

- Safety glasses with side shield, goggles or face shield depending on application

8.3.4 skin protection:

- Protective clothing
  Suitable materials: No data available

9. Physical and chemical properties

9.1 General information:

Appearance (at 20°C)	:	Plastic tubing and moulded parts
Odour	:	Odourless
Colour	:	Variable in colour

9.2 Important health, safety and environmental information:

pH value	:	N.D.	
Boiling point/boiling range	:	N.D.	**°C**
Flashpoint	:	N.D.	**°C**
Explosion limits	:	N.D.	**vol%** (**°C**)
Vapour pressure (at 20°C)	:	N.D.	**hPa**
Vapour pressure (at 50°C)	:	N.D.	**hPa**
Relative density (at 20°C)	:	1.3/1.7	
Water solubility	:	Insoluble	
Soluble in	:	N.D.	
Relative vapour density	:	N.D.	
Viscosity	:	N.D.	**Pa.s**
Partition coëfficient n-octanol/water	:	N.D.	
Evaporation rate			
ratio to butyl acetate	:	N.D.	
ratio to ether	:	N.D.	

9.3 Other information:

Melting point/melting range	:	N.D.	**°C**
Auto-ignition point	:	N.D.	**°C**
Saturation concentration	:	N.D.	**g/m^3**

10. Stability and reactivity

10.1 Conditions to avoid/reactivity:
- Stable under normal conditions

10.2 Materials to avoid:
- Keep away from: heat sources

10.3 Hazardous decomposition products:
- Thermal decomposition is not significant when products are used in accordance with Tyco Electronics product installation instructions

- At higher temperatures and if materials burn, thermal decomposition products will depend on the base polymer used and may include, but are not limited to : acetic acid, aldehydes (including formaldehyde), carbon monoxide, carbon dioxide, low molecular weight hydrocarbons, silicon dioxide and oxides of sulfur.

11. Toxicological information

11.1 Acute toxicity:

LD50 oral rat	:	N.D.	**mg/kg**
LD50 dermal rat	:	N.D.	**mg/kg**
LD50 dermal rabbit	:	N.D.	**mg/kg**
LC50 inhalation rat	:	N.D.	**mg/l/4 h**
LC50 inhalation rat	:	N.D.	**ppm/4 h**

11.2 Chronic toxicity:

EC carc. cat.	:	not listed
EC muta. cat.	:	not listed
EC repr. cat.	:	not listed
Carcinogenicity (TLV)	:	not listed
IARC classification	:	not listed

11.3 Routes of exposure: inhalation of thermal decomposition products

11.4 Acute effects/symptoms:

- **AFTER INHALATION**
- Overheating products during installation may produce vapours/fumes that can cause irritation of the respiratory tract

- **AFTER SKIN CONTACT**
- This product is not expected to be a skin irritant
- Contact with molten material may cause thermal burns
- No harmful effects are expected from skin absorption of this product

- **AFTER EYE CONTACT**
- Contact with molten material may cause thermal burns

- **AFTER INGESTION**
- Not a normal route of exposure
- There is insufficient information available on this material to predict the effects from ingestion

11.5 Chronic effects:

- None known

12. Ecological information

12.1 Ecotoxicity:

- No data available

12.2 Mobility:

- **Volatile organic compounds (VOC):** N.D.%
- Insoluble in water

For other physicochemical properties see heading 9.

12.3 Persistence and degradability:

- biodegradation BOD_5	:	N.D.	**% ThOD**
- water	:	- Not readily biodegradable in water - test: OECD	
- soil	:	**T ½:** N.D.	**days**

12.4 Bioaccumulative potential:

- log P_{ow}	:	N.D.
- BCF	:	N.D.

12.5 Other adverse effects:

- **WGK**	:	N.D.
- **Effect on the ozone layer**	:	Not dangerous for the ozone layer (1999/45/EC)
- **Greenhouse effect**	:	no data available
- **Effect on waste water purification**	:	no data available

13. Disposal considerations

13.1 Provisions relating to waste:
- Waste material code (75/442/EEC, Council Decision 2001/118/EC, O.J. L47 of 16/2/2001): 07 02 13 (waste plastic)
- Waste material code (Flanders): 551, 567

13.2 Disposal methods:
- Landfill or incinerate at an approved site in accordance with national and local regulations
- Recycle/reuse
- Remove to an authorized dump (Class II)
- For incineration use a high temperature incinerator equipped with secondary combustion chamber and acid gas scrubber
- Do not discharge to wastewater treatment installation

13.3 Packaging/Container:
- Waste material code packaging (75/442/EEC, Council Decision 2001/118/EC, O.J. L47 of 16/2/2001): 15 01 02 (plastic packaging)

14. Transport information

14.1 Classification of the substance in compliance with UN Recommendations

UN number	:
CLASS	:
SUB RISKS	:
PACKING	:
PROPER SHIPPING NAME	:

14.2 ADR (transport by road)

CLASS	: NOT SUBJECT
PACKING or CLASSIFICATION CODE	:
DANGER LABEL TANKS	:
DANGER LABEL PACKAGES	:

14.3 RID (transport by rail)

CLASS	:
PACKING or CLASSIFICATION CODE	:
DANGER LABEL TANKS	:
DANGER LABEL PACKAGES	:

14.4 ADNR (transport by inland waterways)

CLASS	: NOT SUBJECT
PACKING or CLASSIFICATION CODE	:
DANGER LABEL TANKS	:
DANGER LABEL PACKAGES	:

14.5 IMDG (maritime transport)

CLASS	: NOT SUBJECT
SUB RISKS	:
PACKING	:
MFAG	:
EMS	:
MARINE POLLUTANT	:

14.6 ICAO (air transport)

CLASS	: NOT SUBJECT
SUB RISKS	:
PACKING	:
PACKING INSTRUCTIONS PASSENGER AIRCRAFT	:
PACKING INSTRUCTIONS CARGO AIRCRAFT	:

14.7 Special precautions in connection with transport	: not restricted for any mode of international transport
14.8 Limited quantities (LQ)	:

15. Regulatory information

Classification according to directives 67/548/EEC and 1999/45/EC (**: see heading 16)

NOT APPLICABLE

16. Other information

Users are advised that they may have additional disclosure obligations under other national and local laws. Users are advised to ensure that this information is brought to the attention of all employees, agents, and contractors handling this product. Users of Tyco Electronics products should make their own evaluation to determine the suitability of each such product for the specific application and to establish safe handling and installation procedures. Distributors of this product are advised to forward this document, or the information contained herein, to every purchaser of this product.

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N.A. = NOT APPLICABLE
N.D. = NOT DETERMINED
***** = INTERNAL CLASSIFICATION

(****) Labelling:**
The labelling of the substance described in this MSDS complies with the provisions of Directive 1999/45/EC of 31 May 2001, published in the Official Journal of the European Communities L 200 of 30/07/1999. This Directive replaces Directive 88/379/EEC of 7 June 1988, published in the Official Journal of the European Communities L 187 of 16/07/1988.
Member States shall apply the laws, regulations and administrative provisions referred to in article 22 of this Directive:
(a) to preparations not within the scope of Directive 91/414/EEC or Directive 98/8/EC as from 30 July 2002; and
(b) to preparations within the scope of Directive 91/414/EEC or Directive 98/8/EC as from 30 July 2004.

Exposure limits:
TLV : Threshold Limit Value - ACGIH USA 2000
OES : Occupational Exposure Standards - United Kingdom 1999
MEL : Maximum Exposure Limits - United Kingdom 1999
MAK : Maximale Arbeitsplatzkonzentrationen - Germany 2001
TRK : Technische Richtkonzentrationen - Germany 2001
MAC : Maximale aanvaarde concentratie - The Netherlands 2002
VME : Valeurs limites de Moyenne d'Exposition - France 1999
VLE : Valeurs limites d'Exposition à court terme - France 1999
GWBB : Grenswaarde beroepsmatige blootstelling - Belgium 1998
GWK : Grenswaarde kortstondige blootstelling - Belgium 1998
EC : Indicative occupational exposure limit values - directive 2000/39/EC