Roth Elektronik® FR4 Boards – Safety Information Sheet

Trade Name: Epoxy Resin FR4
DIN IEC 249 Copper-clad Epoxy Resin Glass Fibre Boards

This information sheet compiles some data from the safety data sheets of the base materials manufacturers. Should you require further information, please contact the respective manufacturer.
All base materials used comply with the relevant DIN standards and are UL-listed.
For its products, Roth Elektronik® uses base materials provided by various manufacturers, but all made to the same standards.

Here is a list of some base materials manufacturers:

Company	Manufacturers of Board Base Materials	
1	ISOLA AG D-52348 Düren / Germany	http://www.isola.de
2	DOOSAN ELECTRO - MATERIALS Korea	http://www.dse.co.kr
3	Matsushita Electric Works Deutschland GmbH Japan	http://www.matsushita.de

Subject	Description
1. Chemical composition	Laminated fabric made of glass fabric and cured, brominated epoxy resin, one or boths sides clad with copper foil
2. Composition/ components	Glass fabric: E-glass Resin matrix: Brominated epoxy resin based on tetrabromobisphenol (TBBA)#TBBPA
3. Hazards	No personal or environmental hazards need be feared if used and stored in accordance with the regulations.
4. First-aid measures	If cuts or scratches are caused by the material, thoroughly clean the wound with water and soap and disinfect it. If in doubt about how to treat the wound, consult a doctor.
5. Fire-fighting measures	Extinguishing agents: suitable: any, if possible, don't use water Dangerous conflagration gases: depending on the fire conditions, the following may be generated: carbon monoxide, carbon dioxide, hydrogen bromide and organic bromine compounds
6. Measures in case of unintentional release	n/a

Subject	Description
7. Handling and storage	Store in a dry place; take precautions against dust explosion if processed mechanically in an extraction system processing.
8. Exposure limitation and personal protective equipment	**Limit values:** CAS number Substance Kind Value Unit n/a Personal protective equipment: recommended for mechanical treatment - Respiratory equipment: extraction - Hand protection: protective skin ointment - Eye protection: advisable - Body protection: n/a - Hygiene precautions: Cleanness required, don't smoke eat or drink at the working place.
9. Physical and chemical properties	Form: boards Colour/smell: yellowish (resin matrix) / none Change of state: - Boiling point: (C°) n/a - Melting point: (C°) n/a Glass transition temperature: (C°) approx. >130°C (DSC method 20°C/min heating-up rate) Flash point: (C°) n/a Inflammation temperature: (C°) n/a Explosibility limit: (% by vol.) lower not determined, dust explosion hazard upper not determined Pyrolysis: (C°) from approx. 300°C thermogravimetry (10°C/min heating-up rate) Vapour pressure: (mbar) n/a at 20°C Density: (g/cm^3) approx. 1.8 at 20°C Bulk density: (kg/m^3) n/a Viscosity: (mPa*s) n/a Solubility in water: insoluble
10. Stability and reactivity	Conditions to be avoided: Dust formation at the working place Substances to be avoided: Material is destroyed under non-controlled influence of high oxidising acids
11. Toxicity	Dust formed during mechanical processing is basjcally not toxic. However, beginners may experience skin irritation, but will quickly get accustomed. In rare cases, skin allergies may occur. If it does, the affected worker needs to be employed in another place.

Subject	Description
12. Environmental information	No pertinent information available.
13. Disposal requirements	Normal commercial waste; waste key 571 (23) or (07); observe regulations of local dumping ground. Please dispose as electrical scrap metal. Information applies to the delivered product in unprocessed condition.
14. Transport information	Land carriage: Not classified as dangerous goods Inland water transport: Not classified as dangerous goods Sea transport: Not classified as dangerous goods Air transport: Not classified as dangerous goods
15. Regulations	Identification in acc. with EC directives: R phrases: n/a S phrases: n/a National regulations: Classification in acc. with VbF: n/a Technical Instruction Air: n/a Water hazard class: not hazardous to water
16. Other data	The above data are based on the current state of our knowledge and do not represent any warranty of product attributes. The recipient of our product is responsible for observing relevant applicable laws and regulations.
17. Hole diameter	The following standard tolerances apply to holes: (mm) +/-0.1 The tolerances apply to boards with non-plated-through bored or punched holes and to boards with metallised zinc-plated, hot-air tinned, nickel-plated or gold-plated holes.
18. Electrical test	On delivery, some boards show the stamps of the electrical testers on the solder pads. This does not effect the quality of the board.
19. Solder resist	Solder resist is used on some boards.
20. Handling	Avoid touching the board's copper surface with your skin, as the surface will slightly change its colour or even corrode. Avoid twisting the board.
21. Storage	Avoid exposure to direct sunlight. Do not store the boards outdoors, but in a dry and clean storage room. In extreme cases, storage under heavily fluctuating environmental conditions may have an adverse effect on the goods.
22. International standards	Compliance with most relevant international standards such as: IPC-4101, EN60249-2-5/12, EN60065, UL 94, IPC-MF-150F, UL 746, NemaLI-1