AMEK 220 A – resin component (component A) of the two-component adhesive AMEK 220. The separate safety data sheet **AMEK 220 B** applies to the hardener component. Mixing ratio A : B = 1 : 1 (by volume and weight).
Emergency: Tox Info Suisse, telephone 145 (from abroad +41 44 251 51 51), 24 hours.

1 Identification of the mixture and of the company

1.1 Product identifier

Trade name	AMEK 220 A
Product type	Mixture – resin component (component A)
UFI	6Y26-S0WS-A00D-TQEH

1.2 Relevant identified uses and uses advised against

Use	Adhesive (2-component methacrylate), binder
Users	For professional and industrial use only
Uses advised against	no further information available

1.3 Details of the supplier of the safety data sheet

Company	Ameba AG
Address	Stieracker 20, CH-5070 Frick, Switzerland
Telephone	+41 61 322 42 24
E-mail	info@ameba.ch
Website	www.ameba.ch
Information on the safety data sheet	B. Schirmer, info@ameba.ch

1.4 Emergency telephone number

Tox Info Suisse	Emergency number **145** (from abroad +41 44 251 51 51), 24 hours a day

2 Hazards identification

2.1 Classification of the mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS], applicable in Switzerland under the Chemicals Ordinance (ChemO, SR 813.11):

HAZARD CLASS AND CATEGORY	HAZARD STATEMENT
Flammable liquids, category 2 (Flam. Liq. 2)	H225
Skin corrosion/irritation, category 1A (Skin Corr. 1A)	H314
Serious eye damage, category 1 (Eye Dam. 1)	H318
Skin sensitisation, category 1 (Skin Sens. 1)	H317
Specific target organ toxicity (single exposure), category 3 (STOT SE 3)	H335
Hazardous to the aquatic environment (chronic), category 3 (Aquatic Chronic 3)	H412

2.2 Label elements



Signal word	**Danger**
Hazard-determining components	methyl methacrylate; 2-methylpropenoic acid (methacrylic acid); 2-hydroxyethyl methacrylate; bis(methacryloyloxyethyl) hydrogen phosphate; 4-toluenesulfonyl chloride; cumene hydroperoxide

HAZARD STATEMENTS	
H225	Highly flammable liquid and vapour.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H335	May cause respiratory irritation.

HAZARD STATEMENTS	
H412	Harmful to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS	
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	Avoid breathing vapours.
P264	Wash hands, forearms and face thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with 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.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.

Supplemental information EUH210 Safety data sheet available on request.

2.3 Other hazards

Contains no PBT or vPvB substances ≥ 0.1 %. The mixture contains no substances with endocrine-disrupting properties at a concentration of ≥ 0.1 %.

3 Composition / information on ingredients

3.2 Mixtures

COMPONENT	CAS NO. EC NO. REACH NO.	WT. %	CLASSIFICATION (EC) NO 1272/2008
Methyl methacrylate	80-62-6 201-297-1 01-2119452498-28	≥ 20 – < 50	Flam. Liq. 2, H225; Skin Irrit. 2, H315; Skin Sens. 1, H317; STOT SE 3, H335
Acrylic copolymer	–	≥ 10	not classified
2-Methylpropenoic acid (methacrylic acid)	79-41-4 201-204-4 01-2119463884-26	≥ 5 – < 10	Acute Tox. 4 (oral), H302; Acute Tox. 4 (dermal), H312; Skin Corr. 1A, H314 SCL: STOT SE 3, H335: C ≥ 1 %
4-Toluenesulfonyl chloride	98-59-9 202-684-8	≥ 2 – < 5	Met. Corr. 1, H290; Skin Irrit. 2, H315; Eye Dam. 1, H318; Skin Sens. 1, H317; Aquatic Chronic 3, H412
2,6-Di-tert-butyl-p-cresol (BHT)	128-37-0 204-881-4 01-2119565113-46	≥ 1 – < 2	Aquatic Chronic 1, H410
Cumene hydroperoxide	80-15-9 201-254-7	≥ 1 – < 2	Org. Perox. E, H242; Acute Tox. 4 (oral), H302; Acute Tox. 4 (dermal), H312; Acute Tox. 3 (inhalation), H331; Skin Corr. 1B, H314; STOT RE 2, H373; Aquatic Chronic 2, H411 SCL: STOT SE 3, H335: 0 < C < 10 %; Eye Irrit. 2, H319: 1 ≤ C < 3 %; Skin Irrit. 2, H315 and Eye Dam. 1, H318: 3 ≤ C < 10 %; Skin Corr. 1B, H314: C ≥ 10 %
2-Hydroxyethyl methacrylate	868-77-9 212-782-2 01-2119490169-29	< 1	Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317
Bis(methacryloyloxyethyl) hydrogen phosphate	32435-46-4 251-040-2	< 1	Eye Dam. 1, H318; Skin Sens. 1B, H317
Ethylene glycol (ethanediol)	107-21-1 203-473-3 01-2119456816-28	< 1	Acute Tox. 4 (oral), H302
Cumene (isopropylbenzene)	98-82-8 202-704-5	< 1	Flam. Liq. 3, H226; Carc. 1B, H350; Asp. Tox. 1, H304; STOT SE 3, H335; Aquatic Chronic 2, H411
Mixture of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1)	55965-84-9 911-418-6	< 1	Acute Tox. 3 (oral), H301; Acute Tox. 2 (dermal), H310; Acute Tox. 2 (inhalation), H330; Skin Corr. 1C, H314; Eye Dam. 1, H318; Skin Sens. 1A, H317; STOT RE 1, H372; Aquatic Acute 1, H400; Aquatic Chronic 1, H410

Full text of hazard statements and hazard classes: see section 16. SCL = specific concentration limit.

4 First aid measures

4.1 Description of first aid measures

General	If you feel unwell, get medical advice. If in doubt, call Tox Info Suisse (145).
After inhalation	Remove person to fresh air and keep comfortable for breathing. Get medical advice.
After skin contact	Take off contaminated clothing immediately. Wash skin with plenty of soap and water. If skin irritation occurs, get medical advice.
After eye contact	Rinse immediately with plenty of water and see a doctor. If eye irritation persists, get medical advice.
After ingestion	Rinse mouth with water. Get medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Inhalation	Irritation (coughing, shortness of breath, breathing difficulties), chest tightness, sore throat.
Skin contact	Irritation (itching, redness, blistering).
Eye contact	Redness, itching, watering of the eyes.
Ingestion	Chemical burns or irritation of the mucous membranes of the mouth, throat and digestive tract.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5 Firefighting measures

5.1 Suitable extinguishing media	Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO_2)
Unsuitable extinguishing media	No full water jet
5.2 Special hazards	Flammable liquid and vapour. In case of fire, carbon dioxide and carbon monoxide are formed; toxic fumes may be released.
5.3 Advice for firefighters	Remove all ignition sources if safe to do so. Enter the fire area only with protective equipment including respiratory protection. Cool endangered containers with water spray. Wear self-contained breathing apparatus and a chemical protective suit.

6 Accidental release measures

6.1 Personal precautions	Wear recommended personal protective equipment. Keep unprotected persons away, approach from upwind. Remove ignition sources. Only trained personnel with protective equipment may intervene; emergency responders with self-contained breathing apparatus and chemical protective suit.
6.2 Environmental precautions	Do not allow to enter drains, watercourses or soil.
6.3 Containment and cleaning up	Cover and absorb with non-combustible material (e.g. sand, earth). Collect mechanically in suitable, labelled containers for disposal (see section 13).
6.4 Reference to other sections	Personal protective equipment: section 8. Disposal: section 13.

7 Handling and storage

7.1 Precautions for safe handling	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid contact with skin, eyes and clothing. Ensure good ventilation of the workplace. Processing temperature 13 – 27 °C.
Hygiene measures	Take off contaminated clothing immediately and wash it before reuse. Wash hands before breaks and after work. Do not eat, drink or smoke.
7.2 Conditions for safe storage	Store only in the tightly closed original container in a cool, well-ventilated place, away from ignition sources and combustible materials. Protect from heat and light. Storage temperature 13 – 27 °C. Store in accordance with the VKF/AEAI fire protection directives for flammable liquids.
Incompatible with	oxidising agents, strong acids
7.3 Specific end uses	Adhesives, sealants

8 Exposure controls / personal protection

8.1 Control parameters – occupational exposure limits, Switzerland (Suva, 2026)

SUBSTANCE	CAS NO.	MAK (TWA)	STEL	NOTATIONS
Methyl methacrylate	80-62-6	50 ppm 210 mg/m³	100 ppm 420 mg/m³	S, SS_C
Methacrylic acid	79-41-4	50 ppm 180 mg/m³	100 ppm 360 mg/m³	SS_C
Isopropylbenzene (cumene)	98-82-8	20 ppm 100 mg/m³	80 ppm 400 mg/m³	B, SS_C, H, C2
Ethylene glycol	107-21-1	10 ppm 26 mg/m³	20 ppm 52 mg/m³	SS_C, H
Butylated hydroxytoluene (BHT)	128-37-0	10 mg/m³ e	40 mg/m³ e	$C1_B^{\#}$, SS_C
Chloromethyl-/methylisothiazolinone (3:1)	55965-84-9	0.2 mg/m³ e	0.4 mg/m³ e	S, SS_C

Cumene hydroperoxide (80-15-9), 2-hydroxyethyl methacrylate (868-77-9) and 4-toluenesulfonyl chloride (98-59-9): no MAK value set by Suva.

MAK = maximum workplace concentration (8 h TWA), STEL = short-term exposure limit, e = inhalable fraction. Notations according to the Suva limit value list: S = sensitising, H = skin absorption, B = BAT value set, SS_C = no risk of foetal damage if the MAK value is observed, C1/C2 = carcinogenic category 1/2, M2 = germ cell mutagenic category 2.

8.2 Exposure controls

Engineering controls	Ensure adequate ventilation or extraction at the workplace.
Eye/face protection	Tightly fitting safety goggles with side shields (EN 166)
Hand protection	Disposable nitrile rubber gloves (EN ISO 374); change immediately if contaminated
Body protection	Protective clothing, disposable protective suit
Respiratory protection	If inhalation exposure is possible: full face mask with filter for organic vapours (type A, EN 14387)
Environmental exposure	Avoid release to the environment.

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid (paste)
Colour	beige
Odour	characteristic
Odour threshold	not available
Melting point	−48 °C (based on methyl methacrylate)
Boiling point	100.5 °C (based on methyl methacrylate)
Flammability / explosive limits	not available
Flash point	15 °C
Auto-ignition temperature	421 °C (based on methyl methacrylate)
Decomposition temperature	not available
pH	not available
Kinematic viscosity	not available
Solubility	not available
Partition coefficient n-octanol/water	not available
Vapour pressure	53 hPa at 20 °C
Relative density	0.97
Relative vapour density	not available
Particle characteristics	not applicable
VOC content	55 – 57 %

9.2 Other information

No further information available.

10 Stability and reactivity

10.1 Reactivity	Not reactive under normal conditions of use, storage and transport.
10.2 Chemical stability	Stable under normal conditions.
10.3 Hazardous reactions	None known under normal conditions.
10.4 Conditions to avoid	Heat, hot surfaces, sparks, open flames and other ignition sources.
10.5 Incompatible materials	Strong acids, oxidising agents
10.6 Hazardous decomposition products	May release toxic gases.

11 Toxicological information

11.1 Information on hazard classes (mixture)

Acute toxicity (oral, dermal, inhalation)	not classified
Skin corrosion/irritation	Causes severe skin burns.
Serious eye damage/irritation	Causes serious eye damage.
Respiratory/skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	not classified
Carcinogenicity	not classified
Reproductive toxicity	not classified
Specific target organ toxicity, single exposure	May cause respiratory irritation.
Specific target organ toxicity, repeated exposure	not classified
Aspiration hazard	not classified

Information on components

COMPONENT	DATA
Methyl methacrylate	LD50 oral, rat: > 5000 mg/kg LC50 inhalation: 29.8 mg/l/4 h LD50 dermal, rabbit: > 5000 mg/kg
Methacrylic acid	LD50 oral, rat: 1320 mg/kg LD50 dermal, rabbit: 500 – 1000 mg/kg LC50 inhalation, rat: 7.1 mg/l NOAEC inhalation, rat (90 d): 100 ppm; LOAEC: 350 ppm
Cumene	LD50 oral, rat: > 2000 mg/kg LD50 dermal, rabbit: > 3160 mg/kg IARC group 2B
Cumene hydroperoxide	LC50 inhalation, rat: 220 ppm
2-Hydroxyethyl methacrylate	LD50 oral, rat: 5564 mg/kg LD50 dermal, rabbit: > 5000 mg/kg NOAEC inhalation, rat (90 d): 100 ppm; LOAEC: 350 ppm
BHT	LD50 oral, rat: > 2930 mg/kg LD50 dermal, rat: > 2000 mg/kg NOAEL oral, rat (90 d): 25 mg/kg; LOAEL: 100 mg/kg
Ethylene glycol	LD50 oral, rat: 7712 mg/kg LD50 dermal, rabbit: 10600 mg/kg LC50 inhalation, rat: 2.5 mg/l/4 h
Bis(methacryloyloxyethyl) hydrogen phosphate	LD50 oral, rat: > 5000 mg/kg
4-Toluenesulfonyl chloride	LD50 oral, rat: 4680 mg/kg LOAEL oral, rat (90 d): 150 mg/kg
Acrylic copolymer	LD50 oral, rat: > 5000 mg/kg
Isothiazolinone mixture (55965-84-9)	LD50 dermal, rat: > 1008 mg/kg LOAEL dermal, rat (90 d): 0.525 mg/kg

11.2 Information on other hazards

No further information available.

12 Ecological information

12.1 Toxicity

Mixture: not classified for acute toxicity. Chronic: harmful to aquatic life with long lasting effects. Not rapidly degradable.

COMPONENT	DATA
Isothiazolinone mixture (55965-84-9)	LC50 fish (O. mykiss): 0.19 mg/l; (L. macrochirus): 0.28 mg/l EC50 Daphnia magna: 0.16 mg/l NOEC chronic Daphnia (21 d): 0.1 mg/l; fish (28 d): 0.098 mg/l
Cumene	LC50 fish: 4.7 mg/l (C. variegatus); 4.8 mg/l (O. mykiss) EC50 Daphnia magna: 2.14 mg/l EC50 algae (72 h): 2.01 mg/l / 1.29 mg/l NOEC chronic Daphnia (21 d): 0.35 mg/l; fish (28 d): 0.38 mg/l
Methyl methacrylate	LC50 fish (O. mykiss): > 79 mg/l EC50 Daphnia magna: 69 mg/l EC50 algae (72 h): > 110 mg/l NOEC chronic Daphnia (21 d): 37 mg/l; fish (35 d): 9.4 mg/l
Methacrylic acid	LC50 fish (O. mykiss): 85 mg/l EC50 Daphnia magna: > 130 mg/l EC50 algae (72 h): 45 mg/l / 20 mg/l NOEC chronic Daphnia (21 d): 53 mg/l; fish (35 d): 10 mg/l
2-Hydroxyethyl methacrylate	LC50 fish (O. latipes): > 100 mg/l EC50 Daphnia magna: 380 mg/l EC50 algae (72 h): 836 mg/l / 345 mg/l NOEC chronic Daphnia (21 d): 24.1 mg/l
BHT	LC50 fish (D. rerio): > 0.57 mg/l EC50 Daphnia magna: 0.48 mg/l EC50 algae (72 h): > 0.4 mg/l; ErC50: 0.758 mg/l NOEC chronic Daphnia (21 d): 0.023 mg/l; fish (42 d): 0.053 mg/l
Ethylene glycol	LC50 fish (P. promelas): 72860 mg/l EC50 Daphnia magna: > 100 mg/l EC50 algae (96 h): 3536 mg/l; 6500 – 13000 mg/l
4-Toluenesulfonyl chloride	LC50 fish (O. latipes): 55 mg/l; > 100 mg/l EC50 Daphnia magna: 70 mg/l; > 334 mg/l EC50 algae (72 h): > 100 mg/l
Cumene hydroperoxide	LC50 fish (O. mykiss): 3.9 mg/l EC50 Daphnia magna: 18.84 mg/l

12.2 Persistence and degradability

No further information available.

12.3 Bioaccumulative potential

COMPONENT	DATA
BHT	BCF: 598; log Pow: 5.2

12.4 Mobility in soil

No further information available.

12.5 – 12.7 PBT/vPvB, endocrine-disrupting properties, other effects

No PBT/vPvB substances ≥ 0.1 %. No further information available.

13 Disposal considerations

13.1 Waste treatment methods	Dispose of via an authorised disposal company in accordance with the Ordinance on Movements of Waste (VeVA, SR 814.610) and cantonal regulations. Do not empty into drains or household waste.
Waste code (LVA)	08 04 09 ds waste adhesives and sealants containing organic solvents or other hazardous substances (special waste, ds = consignment note required)
Packaging	Dispose of completely emptied packaging in accordance with cantonal regulations; packaging that is not empty must be disposed of like the product.

14 Transport information

According to ADR/SDR (road), RID/RSD (rail), IMDG (sea) and IATA (air); the information applies to all modes of transport unless stated otherwise.

UN number	UN 2924
UN proper shipping name	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (methyl methacrylate, methacrylic acid)
Transport hazard class(es)	3 (8)
Packing group	II
Environmental hazards	no; not a marine pollutant

14.6 Special precautions – ADR/SDR, RID

Classification code	FC
Special provisions	274
Limited quantities (LQ)	1 l
Excepted quantities	E2
Packing instructions	P001, IBC02
Mixed packing	MP19
Transport category	2
Hazard identification no. (Kemler)	338
Tunnel restriction code	D/E
Tank code	L4BH
IMDG	EmS F-E, S-C; stowage category B; SW2. Limited quantities 1 l.
IATA	PCA: Y340 (max. 0.5 l), 352 (max. 1 l); CAO: 363 (max. 5 l); A3, A803.
Transport document entry	UN 2924 FLAMMABLE LIQUID, CORROSIVE, N.O.S. (methyl methacrylate, methacrylic acid), 3 (8), II, (D/E)

14.7 Maritime transport in bulk

Not applicable.

15 Regulatory information

15.1 Swiss regulations

Chemicals legislation	Chemicals Act (ChemA, SR 813.1); Chemicals Ordinance (ChemO, SR 813.11); Chemical Risk Reduction Ordinance (ORRChem, SR 814.81)
Notification obligation	Mixture subject to notification under Art. 48 ChemO, Register of Chemical Products (RPC). UFI see section 1.1.
VOC	Ordinance on the Incentive Tax on Volatile Organic Compounds (VOCV, SR 814.018): VOC content 55 – 57 %
Worker protection	Observe Ordinance 1 to the Labour Act (ArGV 1), the Maternity Protection Ordinance (SR 822.111.52) and the Youth Employment Protection Ordinance (ArGV 5, SR 822.115). Occupational exposure limits according to Suva.
Waste	Ordinance on Movements of Waste (VeVA, SR 814.610)
Major Accidents Ordinance	StFV (SR 814.012): observe quantity thresholds according to Annex 1.1
Water protection	Observe the Water Protection Ordinance (GSchV, SR 814.201)
Transport	SDR (SR 741.621), RSD (SR 742.412)

International information

Contains no substances on the REACH candidate list (SVHC), the authorisation list (Annex XIV) or the restriction list (Annex XVII). Contains no substances subject to PIC, POP or ozone layer regulations.

15.2 Chemical safety assessment

No chemical safety assessment has been carried out for the mixture.

16 Other information

Edition	Version 1.0 CH, 14.11.2026 – Swiss edition by Ameba AG
Data sources	Manufacturer's safety data; Suva occupational exposure limits; ECHA database

Full text of hazard statements (sections 2 and 3)

CODE	TEXT
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H242	Heating may cause a fire.
H290	May be corrosive to metals.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H310	Fatal in contact with skin.
H312	Harmful in contact with skin.
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.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H350	May cause cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
EUH210	Safety data sheet available on request.

Hazard classes (section 3)

ABBREVIATION	MEANING
Acute Tox. 2	Acute toxicity, category 2
Acute Tox. 3	Acute toxicity, category 3
Acute Tox. 4	Acute toxicity, category 4
Aquatic Acute 1	Hazardous to the aquatic environment (acute), category 1
Aquatic Chronic 1	Hazardous to the aquatic environment (chronic), category 1
Aquatic Chronic 2	Hazardous to the aquatic environment (chronic), category 2
Aquatic Chronic 3	Hazardous to the aquatic environment (chronic), category 3
Asp. Tox. 1	Aspiration hazard, category 1
Carc. 1B	Carcinogenicity, category 1B
Eye Dam. 1	Serious eye damage, category 1
Eye Irrit. 2	Eye irritation, category 2
Flam. Liq. 2	Flammable liquids, category 2
Flam. Liq. 3	Flammable liquids, category 3
Met. Corr. 1	Corrosive to metals, category 1
Org. Perox. E	Organic peroxides, type E
STOT RE 1	Specific target organ toxicity (repeated exposure), category 1

ABBREVIATION	MEANING
STOT RE 2	Specific target organ toxicity (repeated exposure), category 2
STOT SE 3	Specific target organ toxicity (single exposure), category 3
Skin Corr. 1A	Skin corrosion/irritation, category 1A
Skin Corr. 1B	Skin corrosion/irritation, category 1B
Skin Corr. 1C	Skin corrosion/irritation, category 1C
Skin Irrit. 2	Skin corrosion/irritation, category 2
Skin Sens. 1	Skin sensitisation, category 1
Skin Sens. 1A	Skin sensitisation, category 1A
Skin Sens. 1B	Skin sensitisation, category 1B

Abbreviations

ADR/SDR: dangerous goods by road (international / Switzerland); RID/RSD: dangerous goods by rail; IMDG: maritime transport; IATA: air transport; CAS: Chemical Abstracts Service; EC No.: European Community number; LD50/LC50: lethal dose/ concentration for 50 % of the test population; EC50: median effective concentration; NOAEL/NOAEC/NOEC: no observed adverse effect level/concentration; LOAEL/LOAEC/LOEC: lowest observed (adverse) effect level/concentration; BCF: bioconcentration factor; PBT/vPvB: persistent, bioaccumulative, toxic / very persistent, very bioaccumulative; VOC: volatile organic compounds; UFI: unique formula identifier; LVA: Swiss list of wastes; VKF/AEAI: Association of Cantonal Fire Insurers.

The information in this safety data sheet reflects our knowledge at the time of revision. It describes the product with regard to safety requirements and does not constitute a guarantee of properties. If the product is mixed or processed with other materials, the information cannot automatically be applied to the new material.