

TAKPOXY-219

HARDENER – PART B

Modified Aromatic Polyamine Curing Agent — Part B

Companion hardener for DGEBA / 20% Epoxy Novolac Resin (Part A) — mix ratio 100 : 43 phr

SECTION 1: Identification

Product Name	Modified Aromatic Polyamine Curing Agent (Part B)
Product Code	[TAKPOXY-219-H]
Recommended Use	Curing agent (hardener) for two-component epoxy resin systems. Industrial use only. Use in combination with corresponding Part A epoxy resin at the specified mix ratio.
Restrictions on Use	Not for consumer use. Not for food-contact applications.
Manufacturer/Supplier	TAKAMOL Engineering Industries Factory # 301, South West 6A Industrial Area, 10 th of Ramadan, Ash-Sharqia Government, Egypt. (Postal Code: 44916) Phone: [+201066677258] Email: [info@takamol.com.eg]
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SECTION 2: Hazard(s) Identification

GHS Classification

- Acute Toxicity, Oral — Category 4 (H302)
- Skin Corrosion/Irritation — Category 2 (H315)
- Serious Eye Damage — Category 1 (H318)
- Skin Sensitization — Category 1 (H317)
- Specific Target Organ Toxicity, Single Exposure (Respiratory Irritation) — Category 3 (H335)
- Hazardous to the Aquatic Environment, Chronic — Category 2 (H411)

GHS Label Elements

Signal Word: DANGER

Hazard Statements:

- H302 — Harmful if swallowed
- H315 — Causes skin irritation
- H317 — May cause an allergic skin reaction
- H318 — Causes serious eye damage
- H335 — May cause respiratory irritation
- H411 — Toxic to aquatic life with long lasting effects

Precautionary Statements:

- P261 — Avoid breathing vapor/mist
- P264 — Wash exposed skin thoroughly after handling
- P270 — Do not eat, drink, or smoke when using this product
- P271 — Use only outdoors or in a well-ventilated area

- P272 — Contaminated work clothing should not be allowed out of the workplace
- P280 — Wear protective gloves/eye protection/face protection
- P301+P312 — IF SWALLOWED: Call a poison center/doctor if you feel unwell
- 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
- P310 — Immediately call a poison center/doctor (for eye contact/serious exposure)
- P333+P313 — If skin irritation or rash occurs: Get medical advice/attention
- P342+P311 — If experiencing respiratory symptoms: Call a poison center/doctor
- P273 — Avoid release to the environment
- P501 — Dispose of contents/container in accordance with local/regional/national/international regulations

Other Hazards

This is a modified (adducted) aromatic polyamine formulated to reduce free monomeric amine content relative to the unreacted aromatic amine starting material; however, trace residual free amine (e.g., MDA-type or similar) may be present. If residual free aromatic amine exceeds regulatory disclosure thresholds (typically 0.1% by weight), additional hazard statements — including carcinogenicity, mutagenicity, and/or reproductive toxicity classifications applicable to the specific free amine — may apply. Confirm actual free-amine content with the raw material supplier and update this section accordingly. Reacts exothermically with epoxy resins; uncontrolled mixing of large masses can generate hazardous heat, fume, and pressure.

SECTION 3: Composition / Information on Ingredients

Chemical Name	CAS No.	EC No.	wt %
Modified aromatic polyamine adduct (proprietary reaction product)	Mixture / Proprietary	—	80 – 95%
Residual free aromatic amine (e.g., MDA or similar, if present)	101-77-9*	202-974-4*	< 1% (verify)
Diluent / accelerator (proprietary)	Mixture	—	5 – 15%

*CAS 101-77-9 (4,4'-methylenedianiline, MDA) is shown as an illustrative example of a free aromatic amine that may be present as residual monomer in some modified aromatic polyamine adducts; it is classified by IARC/EU CLP as a suspected carcinogen and mutagen. This must be verified against the actual raw material used — if the true free-amine content is below the applicable disclosure/classification threshold, the associated hazard statements do not apply and this row should be removed or the classification updated accordingly.

SECTION 4: First-Aid Measures

- Inhalation: Remove to fresh air immediately. If breathing is difficult, give oxygen. Seek medical attention if symptoms persist or occur.
- Skin Contact: Remove contaminated clothing immediately. Wash skin thoroughly with soap and water for at least 15 minutes. Seek medical attention if irritation, redness, or rash develops or persists.
- Eye Contact: Rinse immediately and continuously with water for at least 15–20 minutes, including under eyelids. Remove contact lenses if present and easy to do. Seek immediate medical attention — this product may cause serious eye damage.
- Ingestion: Do not induce vomiting. Rinse mouth with water. Never give anything by mouth to an unconscious person. Seek immediate medical attention/call a poison center.
- Most Important Symptoms/Effects: Skin and eye irritation/damage; possible allergic skin reaction; respiratory irritation from vapor/mist; harmful if swallowed.
- Notes to Physician: Treat symptomatically. This product is corrosive/irritating to eyes and skin; individuals sensitized to amine curing agents may react to low-level exposure.

SECTION 5: Fire-Fighting Measures

- Suitable Extinguishing Media: Dry chemical, carbon dioxide, foam, or water fog.
- Unsuitable Extinguishing Media: Do not use a direct/solid water stream.
- Specific Hazards: Combustible liquid. Thermal decomposition may generate nitrogen oxides, carbon monoxide, carbon dioxide, and toxic amine-containing fumes. Reaction with epoxy resin is exothermic and, in large confined masses, can generate enough heat to ignite combustible materials nearby.
- Special Protective Equipment: Wear self-contained breathing apparatus (SCBA) and full protective equipment for fires involving this product.

SECTION 6: Accidental Release Measures

- Personal Precautions: Wear appropriate PPE (see Section 8). Avoid skin, eye, and respiratory contact. Ensure adequate ventilation. Evacuate non-essential personnel.
- Environmental Precautions: Prevent entry into drains, waterways, or soil. Toxic to aquatic organisms — contain spill.
- Containment/Cleanup: Contain spill with inert absorbent material (sand, vermiculite, clay). Do not allow spilled material to contact epoxy resin in bulk (exotherm risk). Collect into suitable, labeled containers for disposal. Wash residual area with large amounts of water.

SECTION 7: Handling and Storage

Handling

- Avoid contact with skin, eyes, and clothing. Avoid breathing vapor or mist.
- Use only with adequate ventilation or local exhaust ventilation.
- Wash hands and exposed skin thoroughly after handling and before eating, drinking, or smoking.
- Mix with epoxy resin (Part A) only in the quantities and ratios needed for immediate use; large confined masses of mixed resin/hardener generate significant exothermic heat.
- Keep away from strong oxidizers, strong acids, isocyanates, and acid anhydrides.

Storage

- Store in tightly closed, labeled containers in a cool, dry, well-ventilated area, between 15 °C and 30 °C, away from Part A epoxy resin and other incompatible materials.
- Protect from moisture — this product may react with atmospheric CO₂/moisture over time (carbamation), forming a surface film.
- Keep container tightly closed when not in use.

SECTION 8: Exposure Controls / Personal Protection

Occupational Exposure Limits

No specific OSHA PEL or ACGIH TLV is established for this mixture as a whole. If the product contains residual free aromatic amine (e.g., MDA, OSHA PEL (skin) 0.01 ppm 8-hr TWA under 29 CFR 1910.1050 if applicable), that component-specific exposure limit governs and must be evaluated for the actual formulation.

Engineering Controls

- Use local exhaust ventilation where vapor or mist may be generated (e.g., spray application, heating, large-batch mixing).

Personal Protective Equipment

- Eye/Face Protection: Chemical safety goggles plus face shield — this product may cause serious eye damage.
- Skin Protection: Chemical-resistant gloves (butyl or nitrile rubber recommended; verify breakthrough time with glove manufacturer for aromatic amines); long sleeves; chemical-resistant apron for bulk handling.
- Respiratory Protection: Use a NIOSH-approved organic vapor/particulate respirator where ventilation is inadequate or vapor/mist exposure may exceed exposure limits.

- General Hygiene: Eyewash station and safety shower must be readily available in the work area. Launder contaminated clothing before reuse; discard heavily contaminated leather goods (shoes, belts).

SECTION 9: Physical and Chemical Properties

Appearance	Viscous liquid, amber to dark brown
Odor	Ammoniacal / amine-like
Amine Hydrogen Equivalent Weight (AHEW)	~90 g/eq (typical for this formulation)
pH (1% aqueous)	10 – 12 (alkaline)
Melting/Freezing Point	Not applicable / not determined
Flash Point (Closed Cup)	> 150 °C (ASTM D93, typical)
Flammability	Combustible liquid; not classified as flammable
Vapor Pressure	Low at room temperature
Density	0.98 – 1.05 g/cm ³ @ 25 °C
Solubility in Water	Partially soluble / dispersible
Viscosity	8,000 – 10,000 mPa·s @ 25 °C (typical)

SECTION 10: Stability and Reactivity

- Reactivity: Reacts exothermically with epoxy resins (including DGEBA and epoxy novolac resins) — this is the intended curing reaction. Reacts with acids, acid anhydrides, and isocyanates.
- Chemical Stability: Stable under recommended storage and handling conditions. May slowly absorb atmospheric CO₂ and moisture (carbamation), forming a surface crust on prolonged open-container exposure.
- Possibility of Hazardous Reactions: Mixing with epoxy resin in large, confined, or poorly ventilated masses can generate high exotherm, smoke, and fume; runaway reaction is possible if mix ratio, batch size, or heat dissipation is not controlled.
- Conditions to Avoid: Excessive heat, open flame, contamination with strong acids or oxidizers.
- Incompatible Materials: Strong acids, acid anhydrides, isocyanates, strong oxidizers.
- Hazardous Decomposition Products: Thermal decomposition may produce carbon monoxide, carbon dioxide, nitrogen oxides, and amine-containing fumes.

SECTION 11: Toxicological Information

- Acute Oral Toxicity: LD₅₀ (rat) 300 – 2,000 mg/kg (typical literature range for modified aromatic polyamine adducts) — Category 4.
- Acute Dermal Toxicity: LD₅₀ (rabbit) > 1,000 mg/kg (typical literature range).
- Skin Corrosion/Irritation: Causes skin irritation (Category 2); may cause chemical burns with prolonged or repeated contact.
- Serious Eye Damage/Irritation: Causes serious eye damage (Category 1).
- Respiratory or Skin Sensitization: Known skin sensitizer (Category 1); amine curing agents are a well-documented cause of allergic contact dermatitis and, less commonly, respiratory sensitization in occupational settings.
- Germ Cell Mutagenicity: Not classified for the adduct itself based on available data; verify status of any residual free aromatic amine component.
- Carcinogenicity: Not classified as a carcinogen for the modified adduct based on available data; certain free aromatic amines (e.g., MDA) used as raw materials are classified by IARC (Group 2B/3, varies by substance) and EU CLP — verify residual free-amine content against classification thresholds.

- Reproductive Toxicity: Not classified for the adduct based on available data; verify raw material data.
- Specific Target Organ Toxicity (STOT): May cause respiratory irritation (Category 3, single exposure) via vapor/mist inhalation.
- Aspiration Hazard: Not classified.

SECTION 12: Ecological Information

- Toxicity: Toxic to aquatic life with long-lasting effects (Category Chronic 2, H411). Fish/aquatic invertebrate LC50/EC50 values in the 1–10 mg/L range are reported in the literature for aromatic amine-based curing agents.
- Persistence and Degradability: Expected to be poorly to moderately biodegradable; not confirmed as readily biodegradable under standard test conditions.
- Bioaccumulative Potential: Low to moderate bioaccumulation potential expected; not classified as PBT/vPvB based on available data.
- Mobility in Soil: Moderate; partial water solubility may increase soil/groundwater mobility relative to the epoxy resin component.
- Other Adverse Effects: Avoid release to the environment; elevated pH may affect aquatic organisms independent of inherent toxicity.

SECTION 13: Disposal Considerations

- Dispose of in accordance with applicable local, regional, national, and international regulations.
- Do not discharge to drains, waterways, or soil.
- This product, and containers with residue, may be regulated as hazardous waste depending on jurisdiction (e.g., US RCRA characteristic or listed waste, EU Waste Framework Directive) — confirm classification with the appropriate regulatory body before disposal.
- Fully reacted (cured) resin/hardener mixture is generally non-hazardous and may be disposed of as solid waste, subject to local regulation.

SECTION 14: Transport Information

UN Number	UN2735 (Amines, liquid, corrosive, n.o.s.) may apply depending on final classification — verify against actual product data
UN Proper Shipping Name	AMINES, LIQUID, CORROSIVE, N.O.S. (verify) or Not Restricted, depending on final corrosivity/irritancy classification
Transport Hazard Class(es)	Class 8 (Corrosive) if Skin Corr. 1B applies to the actual product; Class 9 or Not Restricted if only Skin Irrit. 2 — confirm with qualified DG professional
Packing Group	II or III (verify)
Environmental Hazards	Marine pollutant status should be confirmed based on final packaged quantity and concentration

This product's actual corrosivity (Skin Corr. 1B vs. Irrit. 2) depends on the specific adduct chemistry and must be confirmed by measured/validated data — this determines whether DOT/IATA/IMDG Class 8 applies. Transport classification must be confirmed by a qualified DG/hazmat professional before shipment.

SECTION 15: Regulatory Information

- US TSCA: Components are expected to be listed on the TSCA Inventory — verify against the current EPA TSCA Inventory for the exact substances used.
- US OSHA HazCom 2012 (29 CFR 1910.1200): Classified per GHS as described in Section 2.
- US OSHA MDA Standard (29 CFR 1910.1050): Applicable if residual free 4,4'-methylenedianiline is present above the trigger level — verify and comply if applicable.

- EU REACH: Aromatic polyamine curing agents are registered substances under REACH — verify registration/authorization status (e.g., candidate list, SVHC status, Annex XVII restrictions on certain aromatic amines) for the specific grade supplied.
- EU CLP Regulation (EC 1272/2008): Classification and labeling should align with the harmonized/self-classification for the specific product grade, including any applicable free-amine carcinogen/mutagen classification.
- Other Inventories: Verify listing status on other applicable national chemical inventories (DSL/NDSL Canada, China IECSC, Korea K-REACH, Australia AICS) prior to sale/use in those jurisdictions.

SECTION 16: Other Information

Revision Date: [16 August 2026] Supersedes: ['None'] Revision No.: 1

Companion Documents: This SDS covers Part B (curing agent) only. Refer to the separate SDS for Part A (DGEBA / 20% Epoxy Novolac Resin) and the Cured System Data Sheet for properties of the fully reacted product.

Key to Abbreviations: GHS = Globally Harmonized System; AHEW = Amine Hydrogen Equivalent Weight; MDA = 4,4'-methylenedianiline; PBT = Persistent, Bioaccumulative, Toxic; vPvB = very Persistent, very Bioaccumulative; STOT = Specific Target Organ Toxicity; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value.

Disclaimer: The information in this Safety Data Sheet is representative of modified aromatic polyamine curing agent chemistry generally and is provided for guidance only, based on data believed to be reliable at the time of preparation. It does not constitute a warranty of any kind. It is the responsibility of the user to determine the suitability of this information for their own particular use and to comply with all applicable laws and regulations. This document must be reviewed and validated by a qualified EHS/regulatory professional using actual product- and batch-specific data — particularly residual free-amine content and measured corrosivity — before use as an official Safety Data Sheet.