

MEDIUM-TEMPERATURE-CURING ADHESIVES

AD-36 ADHESIVE FILM

Features: High strength, high toughness, excellent durability and processability, and a broad range of applications.

AD-36 is an elastomer-modified epoxy structural adhesive film cured at medium temperature (120°C). It provides high bond strength, good fracture toughness, resistance to hygrothermal aging and fatigue, and good processability. It is suitable for load-bearing structures made from aluminum, steel, titanium and resin-matrix composites, particularly for panel-to-panel and panel-to-core bonding. Service temperature: -55 to 82°C. Current uses include civil honeycomb sandwich structures such as aluminum curtain walls and metro-car doors. Material standard: Q/6S1428-2011.

KEY PROPERTIES

1. Typical mechanical properties

Property	Test condition	Typical 120°C/1 h	Typical 150°C/15 min
Lap shear strength, MPa	R.T.	36.6	38.7
Lap shear strength, MPa	-55°C	31.0	—
Lap shear strength, MPa	80°C	25.0	26.8
Lap shear strength after hygrothermal aging, MPa	R.T.	27.5	—
Floating-roller peel strength, kN/m	R.T.	9.7	10.2
Honeycomb climbing-drum peel, N-mm/mm	R.T.	Upper 88.7 Lower 95.6	Upper 66.5 Lower 67
Shelf-life test: 40 d at R.T. (Feb–Apr 1998); lap shear, MPa	R.T.	41.1	—
Shelf-life test: 40 d at R.T. (Feb–Apr 1998); floating-roller peel, kN/m	R.T.	8.5	—

2. Environmental performance

Property	Test temperature	Typical value
Lap shear after 500 h hygrothermal aging, MPa	R.T.	25.9
Lap shear after 1,000 h hygrothermal aging, MPa	R.T.	28.9
Lap shear after 3 months in hydraulic oil, MPa	R.T.	41.7
Lap shear after 3 months in engine oil, MPa	R.T.	40.8
Lap shear after 3 months in artificial seawater, MPa	R.T.	37.5

Notes: Aluminum coupons were treated by phosphoric acid anodizing. Honeycomb climbing-drum specimens were vacuum-bag processed; autoclave specimens perform somewhat better. For the 150°C/15 min cure, specimens were removed immediately after the hold. Hygrothermal aging: 70°C, 95–100% R.H., 500 h.

3. Physical properties

Areal weight: 300 ± 30 g/m² (customizable). Volatile content: <1% (weight change before and after cure).

4. Cure conditions

Cure at 120–125°C under 0.07–0.30 MPa for 1–2 h. Cool below 60°C before releasing pressure and removing the part. Alternatively, cure at 150°C under 0.07–0.30 MPa for 15 min and remove immediately; climbing-drum peel performance will be somewhat lower than after a 120°C cure (see table). Vacuum-bag pressure aids air removal and initial positioning, but continued vacuum during pressure cure can produce a porous part; continued evacuation is therefore not recommended. Use an autoclave or press for pressure cure.

PRODUCT DESCRIPTION

This product is a modified-epoxy, medium-temperature (120°C) curing structural adhesive film with high bond strength, toughness, durability and good processability. It is suitable for panel-to-panel and panel-to-core bonding of metallic and non-metallic materials.

Note: A panel-to-core structure consists of a skin bonded to a honeycomb core.

PRODUCT SAFETY

This product contains no organic solvents, is neither self-igniting nor explosive, and is classified as a general chemical product.

FLAMMABLE MATERIALS THAT MAY BE ENCOUNTERED

Potentially encountered flammables: acetone, methyl ethyl ketone (MEK), and ethanol.

REACTIVITY INFORMATION

Materials to avoid during storage and use: strong oxidizers, alkalis, and acids.

Toxic decomposition products: Thermal decomposition may generate CO₂, CO, or various hydrocarbon and nitrogen oxide fumes.

FIRE-FIGHTING MEASURES

Extinguishing media: carbon dioxide, dry chemical powder, or sand.

PACKAGING AND TRANSPORT

Supply form: Adhesive film on a polyester nonwoven carrier, 1 m wide and 100 m per roll (custom sizes available).

Packaging: Wind into rolls with release paper or colored plastic film as the separator; seal in plastic film and place in rigid cartons. Do not apply heavy loads that may deform the cartons.

Storage: Keep in a low-temperature cold room or refrigerator. Shelf life is 9 months at -18°C and 3 months at 0–5°C. The allowable out-time at 26°C is 30 days.

Transport: Transport as a general chemical product, under refrigeration where necessary. Protect against inversion, crushing, rain, sun exposure, dropping and impact. Ship as non-dangerous goods; transport for no more than 10 days below 4°C or 5 days at room temperature.

OCCUPATIONAL SAFETY AND HYGIENE

Operators shall receive technical training and obtain the required operator certification before commencing work. Respirators, safety glasses and protective gloves shall be available.

Application area: 18–28°C and <65% R.H. Keep the area clean and orderly, with measures against dust and oil contamination. Handle organic solvents with fire and toxicity precautions and keep them in covered containers.

Wash hands with soap or equivalent hygiene products after contact.

FIRST-AID MEASURES

Skin contact: Remove contaminated clothing and headwear, then wash the skin with soap and water.

Eye contact: Lift the eyelids and flush with running water or saline; seek medical attention.

Ingestion: Drink plenty of warm water and induce vomiting; seek medical attention.