Technical Data Sheet

AA H3405

Known as LOCTITE® H3405
August 2024

PRODUCT DESCRIPTION

AA H3405 provides the following product characteristics:

Technology	Acrylic
Chemical Type	Methacrylate base
Appearance, (component A)	Amber
Appearance, (component B)	Black
Appearance, (Mixed)	Gray
Components	Two component – requires mixing
Mix Ratio, by volume (component A : B)	4 : 1
Cure	Room temperature cure
Application	Bonding
Specific Benefits	• Superior impact and peel strength • Little or no surface preparation • Rapid room temperature cure. • Excellent environmental resistance • Compatible with metal pretreatment and paint bake cycles • Contains 10 mil (.25 mm) spacer beads

AA H3405 is a two component, room temperature curing methacrylate adhesive system. The product is designed to have excellent bond strength on multiple substrates, including various metals, including galvanized steel, plastics and composites. AA H3405 offers superior peel and impact resistance.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Component A:

Viscosity, Physica Cone & Plate @ 25°C, mPa-s (cP): 28,400
PP25, Shear Rate: 20 s^{-1}

Component B:

Viscosity, Physica Cone & Plate @ 25°C, mPa-s (cP): 25,300
PP25, Shear Rate: 20 s^{-1}

Mixed:

Specific Gravity @ 23 °C 1.08
Working time @23°C, minutes (Maximum time before assembly):
HDPE 3
Steel 3
Aluminum 3

TYPICAL CURING PERFORMANCE

Fixture time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm^2. (Adhesive temperature is 23°C. Substrates at indicated temperature.)

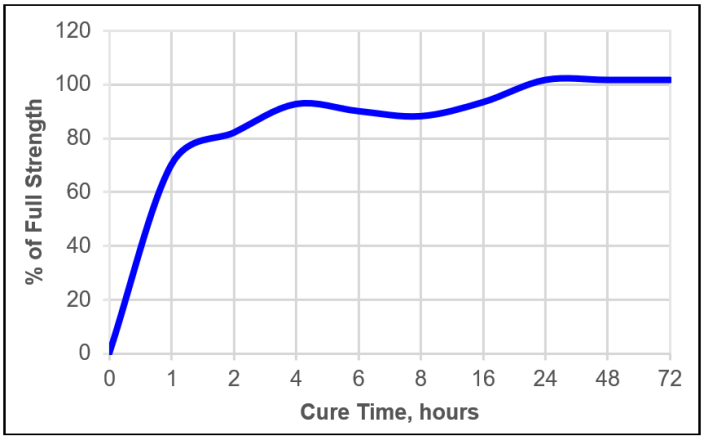
Fixture Time, ISO 4587, minutes:
Galvanized Steel @ 23 °C 13
Grit Blasted Mild Steel @ 23 °C 11
Aluminum 2024 T3 @ 23 °C 13
Mild Steel @ 23 °C 12
HDPE @ 23 °C 15

Peak Exotherm Temperature

Peak Exotherm Temperature @ 23 °C, 20 gram mass:
Peak Temperature Time, minutes 8
Peak Exotherm Temperature, °C 113

Cure Speed vs. Substrate

The graph below shows the shear strength developed with time @ 23°C on grit blasted steel lap shears and tested according to ISO 4587.



TYPICAL PERFORMANCE OF CURED MATERIAL

Physical Properties

Cured for 7 days @ 23°C
Glass Transition Temperature (Tg), °C 69
Shore Hardness, ISO 868, Durometer D @ 23°C 70
Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:
Pre Tg $129x10^{-6}$
Post Tg $140x10^{-6}$

Linear shrinkage, %		3.9
Volume shrinkage, %		11
Elongation, at break, ISO 527-3, %		3.1
Tensile Strength, at break, ISO 527-3	N/mm^2 (psi)	19 (2,780)

Adhesive Properties

Cured for 24 hours @ 23°C, followed by 25 minutes @ 85°C:
Lap Shear Strength, ISO 4587:

Galvanized Steel	N/mm^2 (psi)	20 (2,900)

Cured for 7 days @ 23°C,
Lap Shear Strength, ISO 4587:

Steel	N/mm^2 (psi)	23 (3,340)
Aluminum (abraded)	N/mm^2 (psi)	21 (3,050)
Stainless Steel	N/mm^2 (psi)	25 (3,630)
Galvanized Steel	N/mm^2 (psi)	19 (2,760)
Zinc Dichromate	N/mm^2 (psi)	16 (2,320)

Block Shear Strength, ISO 13445:

PVC	N/mm^2 (psi)	9.9 (1,439)
ABS	N/mm^2 (psi)	7.0 (1,019)
Acrylic	N/mm^2 (psi)	4.2 (607)
Glass	N/mm^2 (psi)	7.7 (1,121)

Cured for 5 days @ 23°C,
Instrumented Lap Shear Side Impact, modified GM 9751P, J:

Galvanized Steel (thickness 3 mm)	4.6
Aluminum (thickness 3 mm)	9.9
FRP	7.2
Gelcoat	3.8

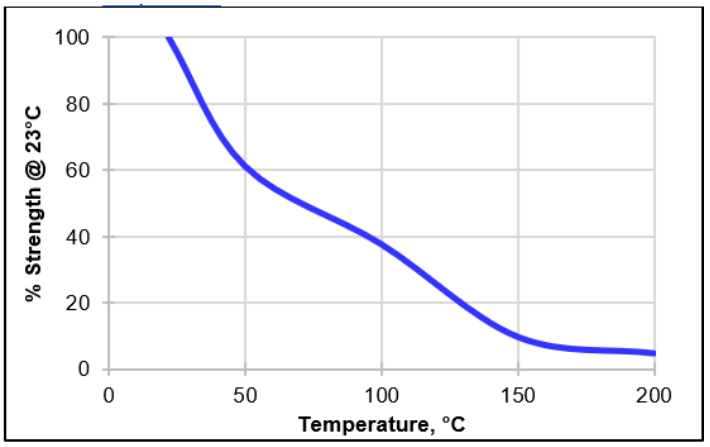
"T" Peel Strength, ISO 11339:

Aluminum 2024 T3	N/mm (lb/in)	2.1 (12)
Steel	N/mm (lb/in)	2.7 (15)

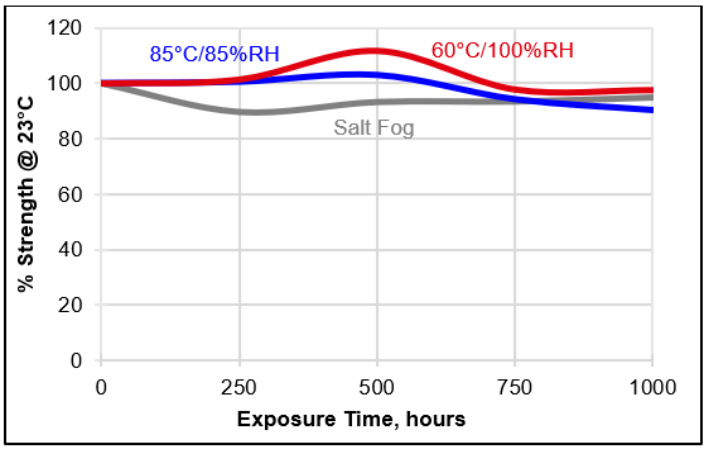
TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 7 days @ 23°C,
Lap Shear Strength, ISO 4587:
Grit Blasted Mild Steel

Hot Strength
Tested at temperature



Environmental Aging
Aged at temperature / humidity / condition indicated and tested @ 22°C



GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Safety Data Sheet (SDS).

Directions for use

Mixing:

1. It is recommended that either meter mix equipment or cartridges with static mix nozzles be used to properly ratio and dispense the adhesive.
2. For hand mixing, combine component A and component B in the correct ratio and mix thoroughly.
3. **Dual cartridges:** To begin using a new cartridge, remove cartridge cap and dispense a small amount of adhesive, making sure both parts A&B are extruding. Attach nozzle and dispense approximately 25 to 50mm, before applying onto part to be bonded. Partially used cartridges can be stored with the mixing nozzle attached. To reuse, remove and discard old nozzle, attach the new nozzle, dispense approximately 25 to 50mm, before applying onto part to be bonded. **Bulk containers:** Normally material is dispensed through volumetric metered mixing equipment, attached to static mix nozzles.
4. Once mixed, AA H3405 should achieve a uniform color. This is important!
5. Heat buildup during and after mixing is normal. To reduce the likelihood of exothermic reaction or excessive heat buildup, mix less than 100 grams at a time. Mixing smaller amounts will minimize heat buildup.

Applying:

1. For high strength structural bonds, remove surface contaminants such as paint, oxide films, oils, dust, mold release agents and all other surface contaminants.
2. Galvanized steel surface should be free from excessive oxidation (white flake). If oxidation is present, removal is required.
3. Extensive surface preparation is not required for AA H3405, and good bonds can be formed on most substrates after a solvent wipe.
4. To assure maximum bond strength, surfaces must be mated within the adhesive's open time.
5. Use enough material to completely fill the joint when parts are clamped.

Curing:

1. Cure speeds may vary based on adhesive and substrate temperatures. Reference the peak exotherm and tack free times to better understand curing time trends.
2. After the fixture time is achieved the material usually has reached handling strength. For heavy parts handling strength can take longer.
3. Parts should be fixed for a minimum period of 24 hours prior to applying a load.

Clean-up:

1. It is important to clean up excess adhesive from the work area and application equipment before it hardens.
2. Denatured alcohol and many common industrial solvents are suitable for removing uncured adhesive.

Storage:
Store product in an unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage: 8°C to 21°C. Storage below 8°C or greater than 28°C can adversely affect product properties. Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Henkel representative.

Product Specification
The technical data contained herein are intended as reference only and are not considered specifications for the product.
Product specifications are located on the Certificate of Analysis or please contact Henkel representative.

Approval and Certificate
Please contact a Henkel representative for related approval or certificate of this product.

Data Ranges
The data contained herein may be reported as a typical value. Values are based on actual test data and are verified on a periodic basis.

Temperature/Humidity Ranges: 23°C / 50% RH = 23±2°C / 50±5% RH

Conversions
(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Disclaimer
The information provided in this Technical data sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product. Any liability in respect of the information in the Technical data sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:
In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:
The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Corporation, or Henkel Canada Corporation, the following disclaimer is applicable:
The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Trademark usage
Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.