

## SAFETY DATA SHEET

**PACER<sup>®</sup>**  
**TECHNOLOGY**

INDUSTRIAL • PRIVATE LABEL

Date Prepared : 10/10/2014  
 MSDS No : ZAP-A-GAP-GHS  
 Date-Revised : 10/17/2016  
 Revision No : 10

**1. PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT DESCRIPTION: ZAP-A-GAP/CA+ (PT-01, PT-02, PT-03, PT-04, PT-05, PT-80)

**MANUFACTURER**

Pacer Technology  
 3281 E. Guasti Rd., Suite 260  
 Ontario, CA 91761  
 Emergency Contact: CHEMTREC  
 Emergency Phone: 800-424-9300  
 Alternate Emergency Phone: 703-527-3887  
 Product Stewardship: 909-987-0550

**2. HAZARDS IDENTIFICATION**

**GHS CLASSIFICATIONS**

**Health:**

Eye Irritation, Category 2A  
 Skin Irritation, Category 2  
 Target Organ Toxicity (Single exposure), Category 3  
 Skin Sensitization, Category 1

**Physical:**

Flammable Liquids, Category 4

**GHS LABEL ELEMENTS**



Exclamation  
 mark

**SIGNAL WORD: WARNING**

**HAZARD STATEMENTS**

H227: Combustible liquid.  
 H315: Causes skin irritation.  
 H317: May cause an allergic skin reaction.  
 H319: Causes serious eye irritation.  
 H335: May cause respiratory irritation.

**PRECAUTIONARY STATEMENT(S)**

**Prevention:**

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
 P261: Avoid breathing dust/fume/gas/mist/vapours/spray.  
 P264: Wash skin and hands thoroughly after handling.  
 P271: Use only outdoors or in a well-ventilated area.

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P280: Wear protective gloves/protective clothing/eye protection/face protection.

**Response:**

- P302+P352: IF ON SKIN: Wash with plenty of soap and water.  
 P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
 P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P312: Call a POISON CENTER or doctor/physician if you feel unwell.  
 P313: Get medical advice/attention.  
 P333+P313: If skin irritation or rash occurs: Get medical advice/attention.  
 P337+P313: If eye irritation persists: Get medical advice/attention.  
 P362: Take off contaminated clothing.  
 P370: In case of fire: Use dry chemical, foam or carbon dioxide to extinguish.

**Storage:**

- P403+P233: Store in a well-ventilated place. Keep container tightly closed.  
 P403+P235: Store in a well-ventilated place. Keep cool.  
 P405: Store locked up.

**Disposal:**

- P501: Dispose of in a manner consistent with federal, state, and local regulations.

**HAZARDS NOT OTHERWISE CLASSIFIED:** Contact through clothing may cause burns. (Especially cotton)

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Chemical Name	Wt.%	CAS
ETHYL-2-CYANOACRYLATE	85 - 100	7085-85-0
Polymethyl methacrylate	10 - 30	9011-14-7

**4. FIRST AID MEASURES**

**EYES:** Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.

**SKIN:** Wash with soap and water. Peel or roll skin apart.

**INGESTION:** Peel or roll skin apart. Adhesive becomes solid in contact with saliva and may adhere to inside of mouth. Saliva will lift adhesive in 1-2 days. Avoid swallowing solid adhesive after detachment. Not a toxic product.

**INHALATION:** Remove to fresh air. Prolonged or repeated elevated exposure may cause allergic reactions with asthma-like symptoms in sensitive individuals.

**SIGNS AND SYMPTOMS OF OVEREXPOSURE**

**EYES:** Causes serious eye irritation. Will bond eyelids. Will cause excessive tearing.

**SKIN:** Bonds skin in seconds. May cause skin irritation. May cause sensitization by skin contact. Cyanoacrylates generate heat on polymerization, so very large amounts will burn the skin.

**INGESTION:** Adhesive becomes solid in contact with saliva and may adhere to inside of mouth. Saliva will lift adhesive in 1-2 days. Not a toxic product.

**INHALATION:** Prolonged or excessive inhalation may cause respiratory tract irritation.

**ACUTE EFFECTS:** Avoid exposure to vapor concentration in confined areas.

**CHRONIC EFFECTS:** Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).

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Revision No : 10**5. FIRE FIGHTING MEASURES**

**GENERAL HAZARD:** Combustible liquid and vapor. Product polymerized to solid by water.

**EXTINGUISHING MEDIA:** Use dry chemical extinguisher or flush with large amounts of water.

**HAZARDOUS COMBUSTION PRODUCTS:** Can burn in fire, releasing irritating vapors

**EXPLOSION HAZARDS:** None known.

**FIRE FIGHTING PROCEDURES:** Evacuate area and fight fire from a safe distance.

**FIRE FIGHTING EQUIPMENT:** As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.

**FIRE EXPLOSION:** None known.

**SENSITIVE TO STATIC DISCHARGE:** None known.

**SENSITIVITY TO IMPACT:** None known.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Combustible by-products of carbon monoxide/dioxide.

**6. ACCIDENTAL RELEASE MEASURES**

**SMALL SPILL:** Polymerize with water. Solid material may be scraped from surface.

**LARGE SPILL:** Polymerize with water. Increase ventilation to area. Solid material may be scraped from surface.

**ENVIRONMENTAL PRECAUTIONS**

**WATER SPILL:** This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water.

**7. HANDLING AND STORAGE**

**GENERAL PROCEDURES:** Use with adequate ventilation. Avoid contact with eyes, skin and clothing.

**HANDLING:** Avoid breathing (dust, vapor, mist, gas). Avoid contact with skin, eyes and clothing. Keep container closed when not in use.

**STORAGE:** Store in a cool place in original container and protect from sunlight. Keep away from sources of ignition.

**STORAGE TEMPERATURE:** Ideal storage: 41 -50F (5-10C)

**SHELF LIFE:** One year from the date of shipment from Pacer Technology, unless otherwise noted.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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## EXPOSURE GUIDELINES

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)			
Chemical Name	Type	EXPOSURE LIMITS	
		ppm	mg/m <sup>3</sup>
ETHYL-2-CYANOACRYLATE	OSHA PEL	TWA	[1]
	ACGIH TLV	TWA	0.2
	Supplier OEL	TWA	0.2 ppm

## OSHA TABLE COMMENTS:

1. NL = Not Listed

**ENGINEERING CONTROLS:** Use only in a well ventilated area. Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

## PERSONAL PROTECTIVE EQUIPMENT

**EYES AND FACE:** For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear splash-proof goggles.

**SKIN:** Use Nitrile gloves and aprons to prevent contact. Do not use PVC, Nylon or Cotton materials.

**RESPIRATORY:** Use only in a well-ventilated area. In case of insufficient ventilation, wear suitable respiratory equipment. Recommended: Full-face NIOSH-approved respirator with organic vapor cartridge.

**WORK HYGIENIC PRACTICES:** Avoid direct contact and breathing vapor. Use with adequate ventilation. Wash hands with soap and water after use.

**OTHER USE PRECAUTIONS:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL STATE:** Liquid

**ODOR:** Characteristic odor, intensely irritating.

**ODOR THRESHOLD:** Odor Threshold = 1 ppm

**APPEARANCE:** Transparent, colorless liquid.

**pH:** Not Applicable.

**PERCENT VOLATILE:** Not Available

**FLASHPOINT AND METHOD:** 80°C (176°F) to 93.4°C (200°F) TAG CC

**FLAMMABLE LIMITS:** Not Available

**AUTOIGNITION TEMPERATURE:** 485°C (905°F)

**VAPOR PRESSURE:** < 0.2 mm Hg

**VAPOR DENSITY:** Not Available

**BOILING POINT:** > 149°C (300°F)

**FREEZING POINT:** Not Available

**MELTING POINT:** Not Determined

**THERMAL DECOMPOSITION:** Not Available

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**SOLUBILITY IN WATER:** Insoluble

**PARTITION COEFFICIENT: N-OCTANOL/WATER:** Partition coefficient (octanol/water): Not applicable.

**EVAPORATION RATE:** Not Established

**DENSITY:** Not Available

**SPECIFIC GRAVITY:** 1.07 g/mL at 25°C

**VISCOSITY #1:** 80 to 120 Centipoise at 22°C (72°F)

**MOLECULAR WEIGHT:** Not Available

**(VOC):** < 20.00 g/L Per SCAQMD Method 316B.

#### 10. STABILITY AND REACTIVITY

**HAZARDOUS POLYMERIZATION:** No

**CONDITIONS TO AVOID:** Avoid temperatures above 176 °F (80 °C), moisture and alkalines.

**POSSIBILITY OF HAZARDOUS REACTIONS:** Possible polymerization reaction in the presence of water, amines, alkalis and alcohols.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Carbon Dioxide, Carbon Monoxide and other toxic or irritating compounds may form when heated to decomposition. Oxides of nitrogen and probably hydrogen cyanide are also possible.

**INCOMPATIBLE MATERIALS:** Polymerized by water, alcohol, amines, alkaline materials.

**COMMENTS: REACTIVITY:** Rapid exothermic polymerization will occur in the presence of water, amines, alkalis and alcohols.

#### 11. TOXICOLOGICAL INFORMATION

##### ACUTE TOXICITY

Chemical Name	ORAL LD <sub>50</sub> (rat)	DERMAL LD <sub>50</sub> (rabbit)
ETHYL-2-CYANOACRYLATE	> 5000 mg/kg	> 2000 mg/kg

**DERMAL LD<sub>50</sub>:** > 2000 mg/kg

**Notes:** (Estimated)

**ORAL LD<sub>50</sub>:** > 5000 mg/kg

**Notes:** (Estimated)

**INHALATION LC<sub>50</sub>:** Vapors may be irritating. Recommended TWA 0.2ppm.

**RESPIRATORY OR SKIN SENSITISATION:** Possible skin sensitizer.

##### CARCINOGENICITY

**IARC:** None known

**NTP:** None known

**OSHA:** None known

#### 12. ECOLOGICAL INFORMATION

##### ENVIRONMENTAL DATA:

This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water.

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**13. DISPOSAL CONSIDERATIONS**

DISPOSAL METHOD: Dispose of in a manner consistent with federal, state, and local regulations.

**14. TRANSPORT INFORMATION****DOT (DEPARTMENT OF TRANSPORTATION)**

PROPER SHIPPING NAME: Not restricted

ROAD AND RAIL (ADR/RID)

PROPER SHIPPING NAME: Not restricted

AIR (ICAO/IATA)

SHIPPING NAME: UN3334, AVIATION REGULATED LIQUID, N.O.S. (ethyl cyanoacrylate), 9, III, EXCEPTED QUANTITY (IP VOL less than or equal to 30mL, PKG less than or equal to 1 L)

VESSEL (IMO/IMDG)

SHIPPING NAME: Not restricted

**15. REGULATORY INFORMATION****UNITED STATES****SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)**

311/312 HAZARD CATEGORIES: Immediate Health, Delayed Health, Fire, Reactive.

313 REPORTABLE INGREDIENTS: None above reporting de minimus.

**302/304 EMERGENCY PLANNING**

EMERGENCY PLAN: None above reporting de minimus.

**TSCA (TOXIC SUBSTANCE CONTROL ACT)**

Chemical Name	CAS
ETHYL-2-CYANOACRYLATE	7085-85-0
Polymethyl methacrylate	9011-14-7

**TSCA STATUS:** All components are listed on or are exempt from listing on the Toxic Substances Control Act.  
**CLEAN AIR ACT**

**40 CFR PART 68---RISK MANAGEMENT FOR CHEMICAL ACCIDENT RELEASE PREVENTION:** Not applicable.

**CALIFORNIA PROPOSITION 65:** No California Proposition 65 ingredients are known to be in this product.

**16. OTHER INFORMATION**

**APPROVED BY:** Pacer Technology Regulatory Department

**PREPARED BY:** Pacer Technology Regulatory Department

**Date-Revised:** 10/17/2016

**REVISION SUMMARY:** This MSDS replaces the 10/05/2016 MSDS.



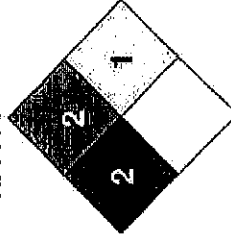
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### HMIS RATING

HEALTH	<input type="checkbox"/>	2
FLAMMABILITY	<input type="checkbox"/>	2
PHYSICAL HAZARD	<input type="checkbox"/>	1
PERSONAL PROTECTION	<input type="checkbox"/>	

### NFPA CODES



### MANUFACTURER DISCLAIMER:

To the best of our knowledge, the information contained herein is accurate. However, Pacer Technology does not assume any liability for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.

# **Terminal Box Wire Connectors/All Models**

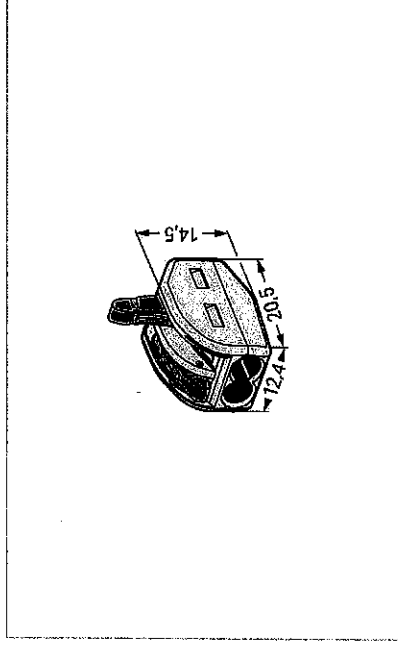
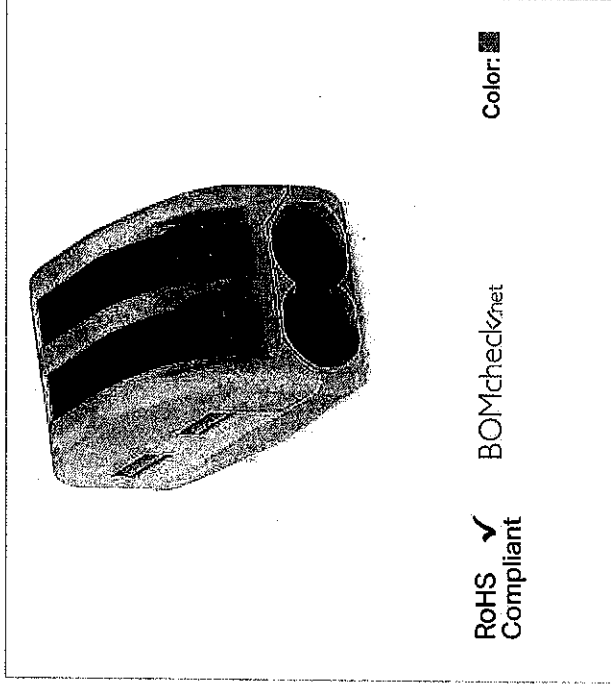


Data sheet | Item number: 222-412

CLASSIC Splicing Connector; for all conductor types; max. 4 mm<sup>2</sup>; 2-conductor; with levers; gray housing; Surrounding air temperature: max 40°C; 2,50 mm<sup>2</sup>; gray

[www.wago.com/222-412](http://www.wago.com/222-412)

**WAGO**



#### Item description

Safety information 1:  
in grounded power lines

#### Data

##### Electrical data

#### Ratings per IEC/EN 60664-1

Ratings per	EN 60664
Nominal voltage (III/2)	400 V
Rated surge voltage (III/2)	4 kV
Rated current	32 A
Legend (ratings)	(II / 2) Δ Overvoltage category II / Pollution degree 2

#### Connection data

Connection technology

CAGE CLAMP®

Subject to changes. Please also observe the further product documentation!

WAGO Kontakttechnik GmbH & Co. KG  
Hansastr. 27

32423 Minden

Phone: +49571 887-0 | Fax: +49571 887-169

Email: [info.de@wago.com](mailto:info.de@wago.com) | Web: [www.wago.com](http://www.wago.com)

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Actuation type	Lever
Connectable conductor materials	Copper
Solid conductor	0.08 ... 2.5 mm <sup>2</sup> / 28 ... 12 AWG
Stranded conductor	0.08 ... 2.5 mm <sup>2</sup> / 28 ... 12 AWG
Fine-stranded conductor	0.08 ... 4 mm <sup>2</sup> / 28 ... 12 AWG
Strip length	9 ... 10 mm / 0.35 ... 0.39 inch
Total number of connection points	2
Total number of potentials	1
Wiring type	Side-entry wiring

### Physical data

Width	12.4 mm / 0.488 inch
Height	14.5 mm / 0.571 inch
Depth	20.5 mm / 0.807 inch

### Material Data

Color	gray
Flammability class per UL94	V0
Fire load	0.067 MJ
Color of actuator	orange
Weight	3.1 g

### Environmental Requirements

Surrounding air temperature (operation)	40 ... 40 °C
Continuous operating temperature	85 ... 85 °C

### Commercial data

Packaging type	BOX
Country of origin	DE
GTIN	4050821346470
Customs tariff number	85369010000

### Approvals / Certificates

#### Country specific Approvals

Logo	Approval	Additional Approval Text	Certificate name
	ENEC 15	EN 60998	ENEC-




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32423 Minden  
Phone: +49571 887-0 | Fax: +49571 887-169  
Email: [info.de@wago.com](mailto:info.de@wago.com) | Web: [www.wago.com](http://www.wago.com)



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## Ship Approvals

Logo	Approval	Additional Approval Text	Certificate name
	ABS American Bureau of Shipping	-	18- HG1755093- PDA
	DNV GL Det Norske Veritas, Germanischer Lloyd	EN 60998	TAE000015T
	LR Lloyds Register	EN 60998	04/20013 (E8)

## UL-Approvals

Logo	Approval	Additional Approval Text	Certificate name
	UL UL International Germany GmbH	UL 486C	E69654
	UL Underwriters Laboratories Inc.	UL 467	E201573

## Counterpart

## Compatible products

## Mounting adapter



Item no.: 222-500

Mounting carrier, 222 Series; for DIN-35 rail mounting/screw mounting; orange

[www.wago.com/222-500](http://www.wago.com/222-500)

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 32423 Minden  
 Phone: +49571 887-0 | Fax: +49571 887-169  
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### Downloads Documentation

#### Bid Text

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#### Additional Information Technical explanations

Apr 3, 2019 pdf 2.2 MB Download

### CAD/CAE-Data

#### CAD data

2D/3D Models 222-412 URL Download

#### CAE data

EPLAN Data Portal 222-412 URL Download

WSCAD Universe 222-412 URL Download

ZUKEN Portal 222-412 URL Download

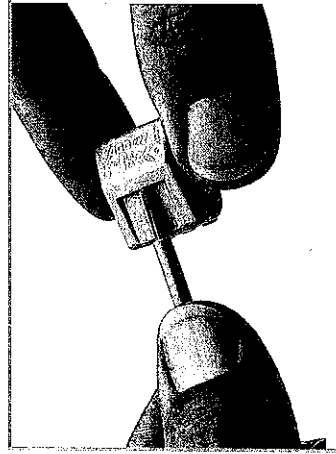
### Installation Notes

#### Conductor termination

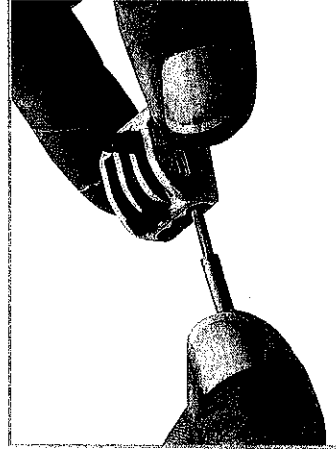
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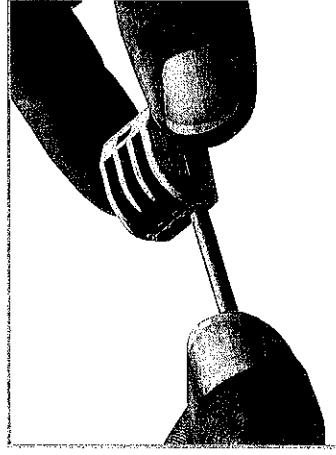
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Strip conductor to 9 ... 10 mm (0.35 ... 0.39 inch).

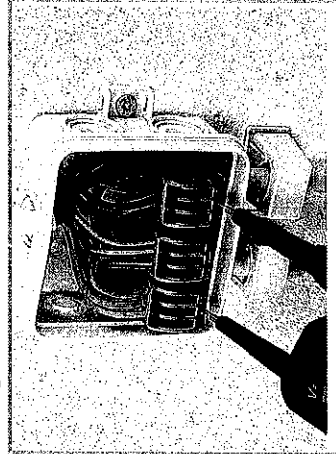


Termination: Lift the lever to open the clamping unit and insert a stripped conductor.



Then, lower the lever to close the clamp.

## Testing



Testing via Profi-LED+ voltage tester (206-806).

## Application

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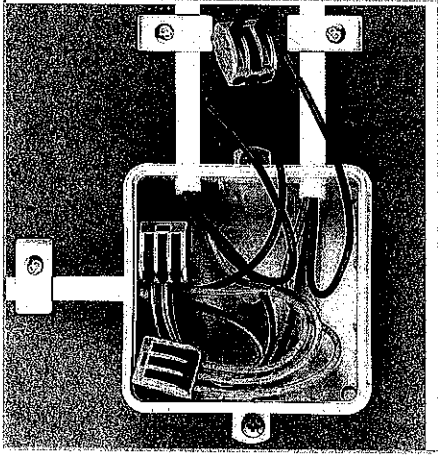
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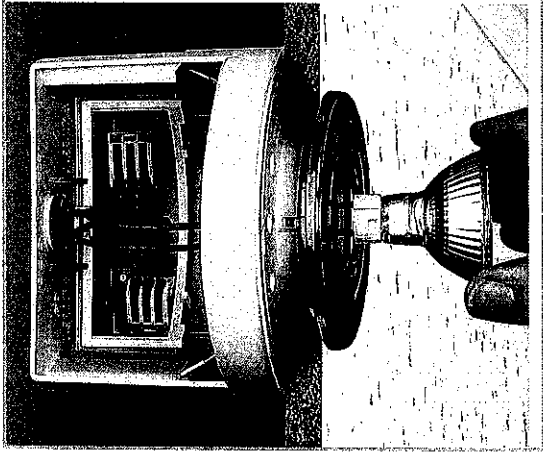
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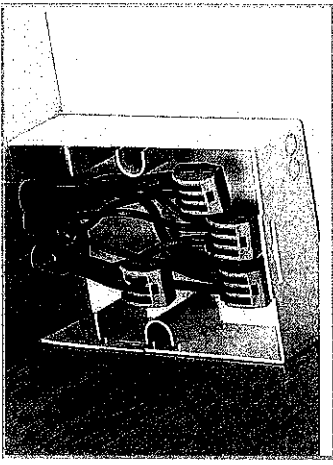
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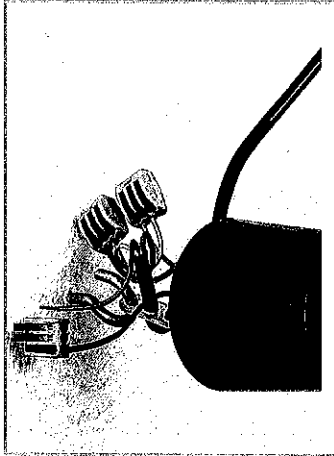
Wiring fine-stranded conductors in a junction box.



Custom low-voltage lighting system



Connecting pre-wired and pre-fabricated components (e.g. in mobile homes).

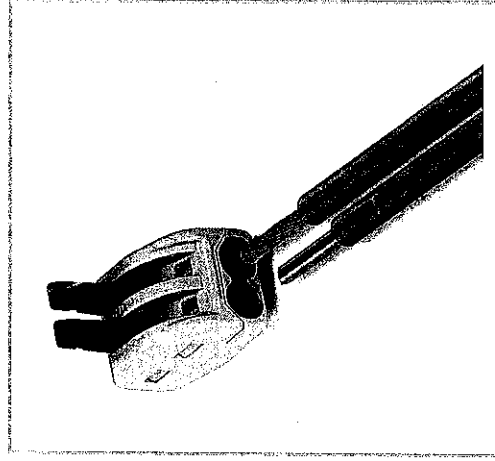


Lighting fixture connection with fine-stranded wires and power feed

Subject to changes. Please also observe the further product documentation!

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**Compact, lever-operated splicing connectors:**

Tool-free connection of up to five stripped, fine-stranded conductors from 0.08 ... 4 mm<sup>2</sup> (28 ... 12 AWG), as well as solid or stranded conductors up to 2.5 mm<sup>2</sup> (12 AWG).

**This is how it works:**

Pull up one of the orange operating levers to open the clamping unit so that the lever engages and keeps the clamp in its opened position. Then insert the conductor and push the lever back down, flush with the connector housing.

**Safety:**

The specially designed rest position of the lever reliably prevents accidental unclamping of a connected conductor.

Subject to changes. Please also observe the further product documentation!

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Data sheet | Item number: 222-412

[www.wago.com/222-412](http://www.wago.com/222-412)

The WAGO logo is positioned in the top right corner of the page. It consists of the word "WAGO" in a bold, black, sans-serif font. The letter "W" is stylized with a diagonal slash through it, and the letters "A", "G", and "O" are also bold and blocky.

Application safety, for any type of conductor (solid, stranded, fine-stranded), is confirmed by approvals like ENEC or UL.

ENEC is the European mark for electrical products that demonstrates compliance with European safety standards. The ENEC mark is subjected to the same EN standards as the VDE mark.

While the VDE mark is only permitted in Germany, the ENEC mark is accepted in more than 20 European countries.

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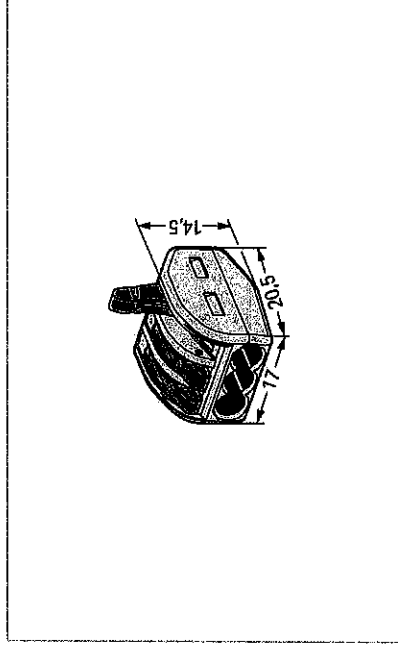
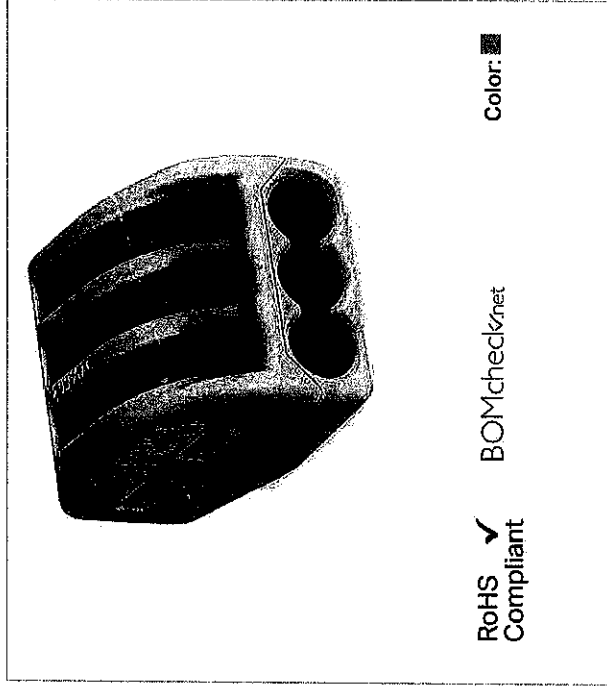
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**Item description**

**Safety information 1:**  
in grounded power lines

**Data****Electrical data****Ratings per IEC/EN 60664-1**

Ratings per	EN 60664
Nominal voltage (II/2)	400 V
Rated surge voltage (II/2)	4 kV
Rated current	32 A
Legend (ratings)	(II / 2) $\Delta$ Overvoltage category II / Pollution degree 2

**Connection data**

Connection technology

CAGE CLAMP®

Subject to changes. Please also observe the further product documentation!

WAGO Corporation  
 Germantown, WI 53022  
 Phone: 1-800-DIN-RAIL (346-7245) | Fax: (262) 255-6222  
 Email: [info.us@wago.com](mailto:info.us@wago.com) | Web: [www.wago.us](http://www.wago.us)

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Actuation type	Lever
Connectable conductor materials	Copper
Solid conductor	0.08 ... 2.5 mm <sup>2</sup> / 28 ... 12 AWG
Stranded conductor	0.08 ... 2.5 mm <sup>2</sup> / 28 ... 12 AWG
Fine-stranded conductor	0.08 ... 4 mm <sup>2</sup> / 28 ... 12 AWG
Strip length	9 ... 10 mm / 0.35 ... 0.39 inch
Total number of connection points	3
Total number of potentials	1
Wiring type	Side-entry wiring

### Physical data

Width	17 mm / 0.669 inch
Height	14.5 mm / 0.571 inch
Depth	20.5 mm / 0.807 inch

### Material Data

Color	gray
Flammability class per UL94	V0
Fire load	0.088 MJ
Color of actuator	orange
Weight	4.3 g

### Environmental Requirements

Surrounding air temperature (operation)	40 ... 40 °C
Continuous operating temperature	85 ... 85 °C

### Commercial data

Product Group	7 (Push Wire Conn.)
Packaging type	BOX
Country of origin	DE
GTIN	4017332955676
Customs tariff number	85369010000

### Approvals / Certificates

#### Country specific Approvals

Logo	Approval	Additional Approval Text	Certificate name
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Subject to changes. Please also observe the further product documentation!

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ENEC 15  
UL International Demko A/SENEC-  
01360

## Ship Approvals

Logo	Approval	Additional Approval Text	Certificate name
	ABS American Bureau of Shipping		18- HG1755093- PDA
	DNV GL Det Norske Veritas, Germanischer Lloyd	EN 60998	TAE000015T
	LR Lloyds Register	EN 60998	04/20013 (E8)

## UL-Approvals

Logo	Approval	Additional Approval Text	Certificate name
	UL UL International Germany GmbH	UL 486C	E69654
	UL Underwriters Laboratories Inc.	UL 467	E201573

## Counterpart

## Compatible products

## Mounting adapter

Item no.: 222-500  
Mounting carrier, for 222 series splicing connectors; orange[www.wago.com/222-500](http://www.wago.com/222-500)

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## Downloads

### Documentation

#### Bid Text

222-413	19.02.2019	xml 3.5 kB	Download
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#### GAEB X81 - Datei

222-413	23.01.2019	docx 15.8 kB	Download
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#### GAEB docx - Datei

### Additional Information

#### Technical explanations

	03.04.2019	pdf 2.2 MB	Download
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## CAD files

### CAD data

2D/3D Models 222-413		URL	Download
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### CAE data

#### EPLAN Data Portal 222-413

		URL	Download
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#### WSCAD Universe 222-413

		URL	Download
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#### ZUKEN Portal 222-413

		URL	Download
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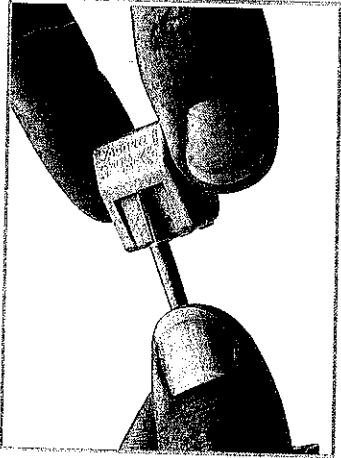
## Installation Notes

### Conductor termination

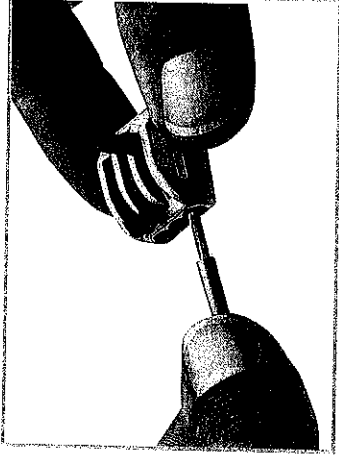
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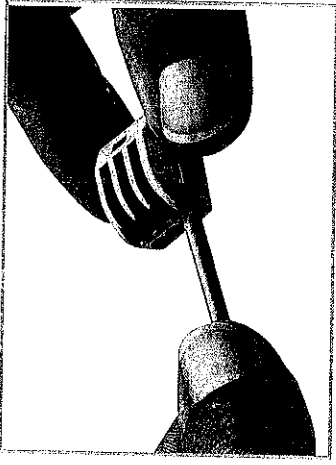
Do you have any questions about our products?  
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Strip conductor to 9 ... 10 mm (0.35 ... 0.39 inch).

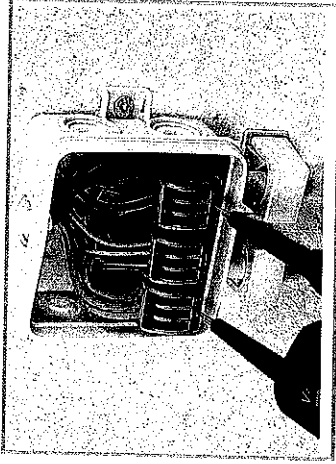


Termination: Lift the lever to open the clamping unit and insert a stripped conductor.



Then, lower the lever to close the clamp.

## Testing



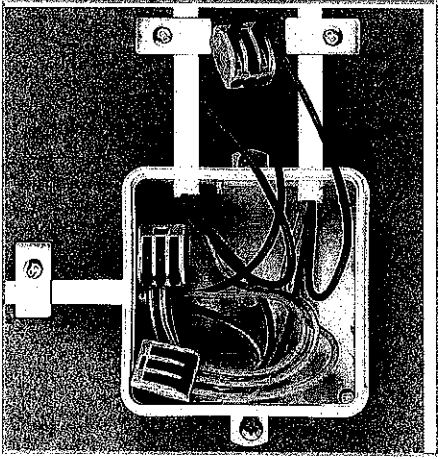
Testing via Profi-LED+ voltage tester (206-806).

## Application

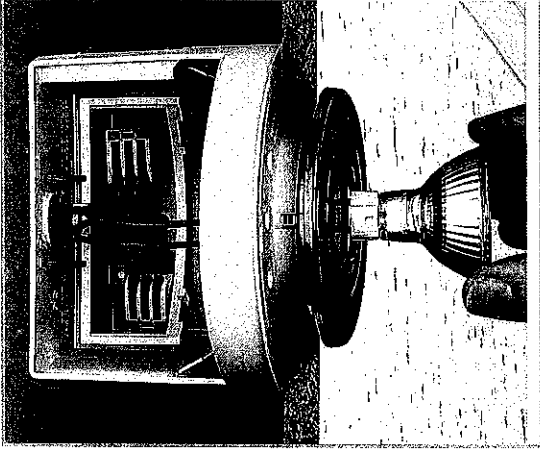
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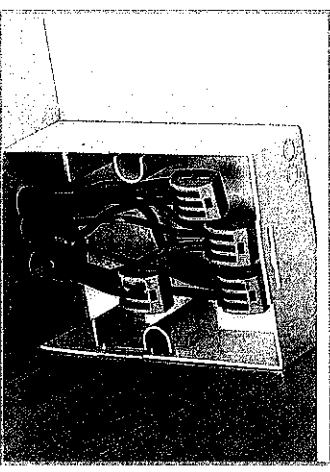
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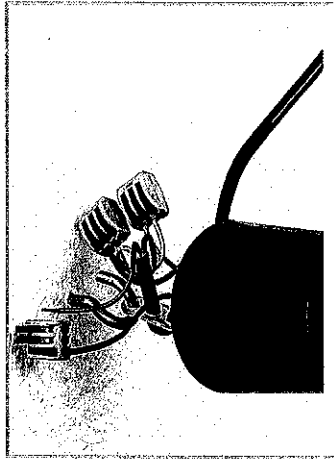
Wiring fine-stranded conductors in a junction box.



Custom low-voltage lighting system



Connecting pre-wired and pre-fabricated components (e.g., in mobile homes).

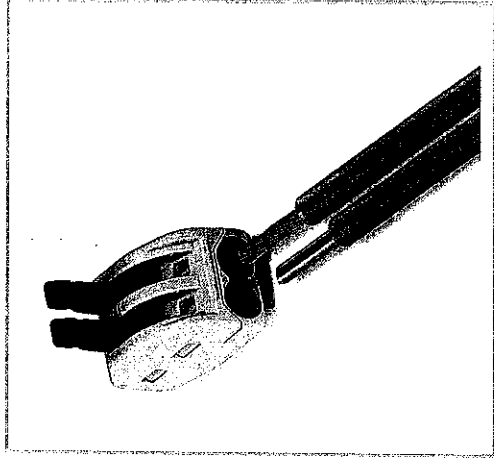


Lighting fixture connection with fine-stranded wires and power feed

Subject to changes. Please also observe the further product documentation!

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**Compact, lever-operated splicing connectors:**

Tool-free connection of up to five stripped, fine-stranded conductors from 0.08 ... 4 mm<sup>2</sup> (28 ... 12 AWG), as well as solid or stranded conductors up to 2.5 mm<sup>2</sup> (12 AWG).

**This is how it works:**

Pull up one of the orange operating levers to open the clamping unit so that the lever engages and keeps the clamp in its opened position. Then insert the conductor and push the lever back down, flush with the connector housing.

**Safety:**

The specially designed rest position of the lever reliably prevents accidental unclamping of a connected conductor.

Subject to changes. Please also observe the further product documentation!

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**PRODUCT DESCRIPTION**  
LOCTITE® 272™ provides the following product characteristics:

<b>Technology</b>	Acrylic
<b>Chemical Type</b>	Dimethacrylate ester
<b>Appearance (uncured)</b>	Red-orange liquid <sup>LMS</sup>
<b>Components</b>	One component - requires no mixing
<b>Viscosity</b>	Medium
<b>Cure</b>	Anaerobic
<b>Secondary Cure</b>	Activator
<b>Application</b>	Threadlocking
<b>Strength</b>	High

LOCTITE® 272™ is designed for the permanent locking and sealing of threaded fasteners. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. Typical applications include the locking and sealing of large bolts and studs (M25 and larger).

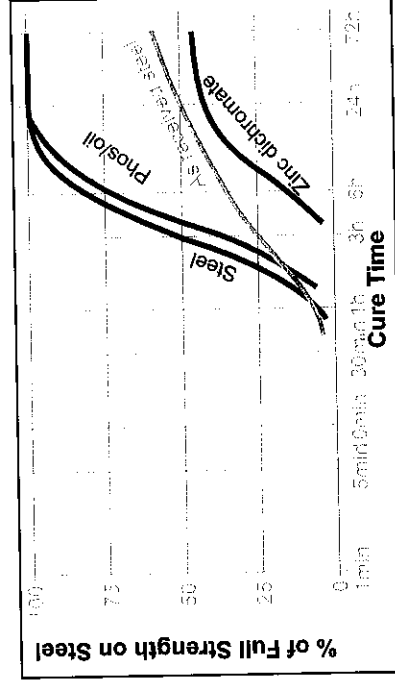
**TYPICAL PROPERTIES OF UNCURED MATERIAL**

Specific Gravity @ 25 °C 1.11  
Flash Point - See SDS  
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP): 4,000 to 15,000<sup>LMS</sup>  
Spindle 4, speed 20 rpm,

**TYPICAL CURING PERFORMANCE**

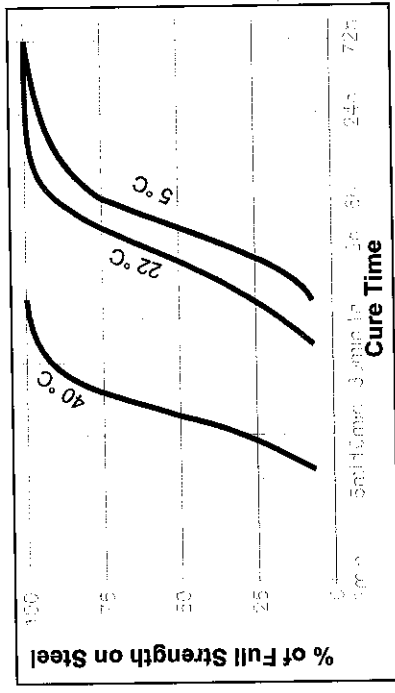
**Cure Speed vs. Substrate**

The rate of cure will depend on the substrate used. The graph below shows the breakthrough strength developed with time on M10 steel nuts and bolts compared to different materials and tested according to ISO 10964.



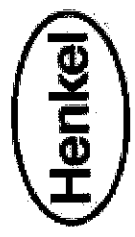
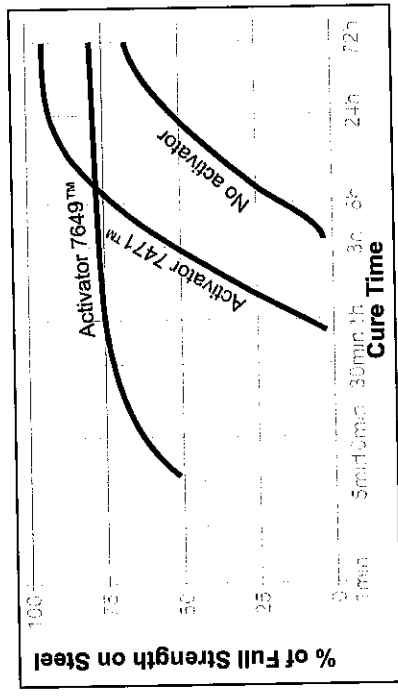
**Cure Speed vs. Temperature**

The rate of cure will depend on the temperature. The graph below shows the breakthrough strength developed with time at different temperatures on M10 steel nuts and bolts and tested according to ISO 10964.



**Cure Speed vs. Activator**

Where cure speed is unacceptably long, or large gaps are present, applying activator to the surface will improve cure speed. The graph below shows the breakthrough strength developed with time on M10 zinc dichromate steel nuts and bolts using Activator 7471™ and 7649™ and tested according to ISO 10964.





# **Sealant Used to Seal Two Housing Halves Together**

# Novagard® 400 Series 400-150 Specification Data



## DESCRIPTION

Novagard 400 Series 400-150 is a single-component, oxime silicone sealant and/or adhesive. A non-flowable, paste product Novagard 400 Series 400-150 presents an excellent balance between rate of cure, adhesion, and physical properties. It has a lower odor than conventional acetoxy-cured silicones.

## APPLICATIONS

Novagard 400 Series 400-150 functions as an adhesive sealant, which develops a bond to most common substrates without the use of a primer. This ready-to-use, single-component compound is typically used as an adhesive to bond dissimilar materials, as a sealant for creating formed-in-place gaskets, or a multitude of other applications. The service temperature is -40°C to 205°C.

## INSTALLATION

As with all single component materials, work life and cure times of Novagard 400 Series 400-150 are dependent upon environmental conditions such as temperature, humidity, and application thickness. Adhesion should be checked on small samples prior to full-scale production.

## AVAILABILITY

Novagard 400 Series 400-150 is available in 3 ounce tubes, 10.3 ounce cartridges, 5 gallon pails, and 55 gallon drums.

## STORAGE

Novagard 400 Series 400-150 has a shelf life of eighteen (18) months from the date of manufacture, as indicated by the lot number, when stored in the original, unopened container at, or below, 75°F.

## PRECAUTIONS / LIMITATIONS

Consult and obey all applicable local, state, and federal regulations for disposal of solvent and silicone waste. For additional information consult product S.D.S.

Do not use in or around highly oxidative chemicals such as liquid oxygen, chlorine, or peroxides. Not recommended for surfaces that are to be painted.

In confined cure conditions, 400 Series 400-150 may discolor brass, copper, or other sensitive metals. It may stress craze molded polycarbonate.

## PRODUCT SPECIFICATIONS

Physical Property	Test Method	Performance Range
Appearance		Translucent Paste
Viscosity	Brookfield #7 @ 10 rpm	350,000 – 700,000 cPs
Skin Over Time	3/8" @ 50% RH & 77°F	5-10 minutes
Through Cure	3/8" @ 50% RH & 77°F	24 hours

## TYPICAL PROPERTIES\*

Physical Property	Test Method	Typical Value
Specific Gravity		1.00 – 1.05
Tensile Strength	ASTM D412	140 - 180 psi
Elongation	ASTM D412	500 - 600%
Tear Resistance	ASTM D624	30 – 35 pli
Shore Hardness	ASTM D2240	20 ± 5
Adhesion Glass Aluminum Wood	ASTM D903	12 – 15 pli 10 – 14 pli 12 – 15 pli

\*The values outlined reflect testing that was conducted under laboratory conditions, actual results may vary. The information provided in the above table is not intended for use in preparing specifications. Please consult manufacturer for additional information.

## ADDITIONAL INFORMATION

Novagard believes that the information provided is a true and accurate description of the typical characteristics of the aforementioned product, however, it is the responsibility of the individual user to thoroughly test the product in their specific application to determine performance, efficacy, and safety.