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Specifier Note: This guide specification has been prepared using the CSI® (Construction Specification Institute) MASTERFORMAT® 2018 Edition.

The purpose of this guide specification is to assist the specifier in correctly specifying construction adhesive products and execution. The specifier needs to edit the guide specifications to fit the needs of specific projects. Editable text fields are highlighted in orange for visibility. Contact a Henkel LEPAGE® Specialist to assist in appropriate product selections.

This guide provides for a high performing, single component, polyurethane based, moisture curing, construction adhesive; LEPAGE® PL® PREMIUM®. It is VOC compliant and contains no chlorinated solvents or water. LEPAGE® PL® PREMIUM® provides superior adhesion to most common construction materials. Since the bonding strength of LEPAGE® PL® PREMIUM® is so strong, it offers twice the coverage of conventional adhesives therefore much less adhesive is required to complete projects. LEPAGE® PL® PREMIUM® can be used for interior or exterior projects and is 3 times stronger than ordinary solvent-based construction adhesives during initial 24-hour cure. It is also water resistant, paintable and cures even in cold temperatures. Ideal for sub floor installations.

DISCLAIMER: This Henkel Corporation Guide Specifications has been written as an aid to the professionally qualified specifier and design professional. The use of this guideline specification requires the sole professional judgment and expertise of the qualified specifier and design professional to adapt the information to the specific needs for the building owner and the project, to coordinate with their construction document process, and to meet all the applicable building codes, regulations, and laws. HENKEL EXPRESSLY DISCLAIMS ANY WARRANTY, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OF THIS PRODUCT FOR THE PROJECT.

## LEPAGE® PL® PREMIUM® Construction Adhesive

# SECTION 06 05 23 – Wood, Plastic, and Composite Fastenings

## PART 1 GENERAL

**1.01 SUMMARY** (Specifier Note: edit the following [A. This section includes the following] to meet project specific project applications and conditions.)

A. This section includes the following:

1. LEPAGE® PL® PREMIUM® Construction Adhesive: Application of polyurethane adhesive for the bonding/fastening of one material to another for construction applications.

B. RELATED SECTIONS: (Specifier Note: edit the following [B. RELATED SECTIONS] to meet project specific applications and conditions. Specify section numbers in accordance with CSI MASTER FORMAT and section titles referenced. Remove any of the following that do not apply.)

1. 01 00 00 General Requirement
2. 03 00 00 Concrete
3. 04 00 00 Masonry
4. 05 00 00 Metals

- 5. 06 00 00 Wood, Plastics, and Composites
- 6. 09 00 00 Finishes
- 7. 10 00 00 Specialties
- 8. 13 00 00 Special Construction

C. Recommended applications:

- 1. LEPAGE® PL® PREMIUM® Construction Adhesive bonds to most common construction materials such as:
  - a. Wood:
    - i) Plywood, osb, mdf, treated wood, hardwood flooring
  - b. Concrete
  - c. Masonry
  - d. Brick
  - e. Stone:
    - i) Granite, marble, slate
  - f. Cement-based products
  - g. Fiber cement panels
  - h. Ceramic
  - i. Foamboard insulation including:
    - i) Eps (expanded polystyrene foam)
    - ii) Xps (extruded polystyrene foam)
    - iii) Polyiso(urethane) foam
    - iv) Carpets
  - j. Metal:
    - i) Stainless steel
    - ii) Galvanized metal
    - iii) Lead
  - k. Rigid fiberglass
  - l. Drywall
  - m. Rigid and cellular vinyl/pvc trim and molding and polyash trim.
- 2. Refer to LEPAGE® PL® PREMIUM® Technical Data Sheets (TDS) available at <http://www.lepage.ca/> for list of recommended substrates.
  - a. Contact manufacturer for any additional questions or concerns regarding suitable substrates.

D. Limitations:

- 1. LEPAGE® PL® PREMIUM® Construction Adhesive product application limitations:
  - a. Marine Applications.
  - b. Water submersion applications.
  - c. Tub surrounds and other solid sheet goods made from rigid polystyrene.
  - d. Polyethylene, polypropylene, polytetrafluoroethylene (PTFE), and flexible vinyl (FPVC).
  - e. Polyethylene (PE) films that cover certain XPS or EPS foam insulation boards.
  - f. Bitumen coated surfaces.
  - g. Certain natural stone\* such as limestone, travertine, sandstone will have bonding difficulties.
  - h. Some materials such as rubbers and plastics may have bonding difficulties. Test before use.
  - i. Composite decking and lpe wood materials.

- j. Flexible sheet goods.
- k. Areas of high heat such as around fireplace openings or for fire pit construction.
- l. Pressure treated lumber must be well seasoned for at least 6 months in weather exposure.
- 2. Refer to LEPAGE® PL® PREMIUM® Technical Data Sheets (TDS) available at <http://www.lepage.ca/> for list of substrate and environmental limitations.
  - a. Contact manufacturer for any additional questions or concerns regarding substrate and environmental limitations.

## 1.02 REFERENCES

- A. ASTM International (ASTM)
  - 1. ASTM D3498 – Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing
  - 2. ASTM C557 – Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing
- B. APA – The Engineered Wood Association
  - 1. AFG-01 – Adhesives for Field-Gluing Plywood to Wood Framing
- C. Underwriter Laboratories, Inc. (UL)
  - 1. UL *GREENGUARD*® certified – UL 2818 - 2013 Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings
  - 2. UL *GREENGUARD*® GOLD certified – UL 2818 - 2013 Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings
- D. California Air Resources Board (CARB)
- E. South Coast Air Quality Management District (SCAQMD)

## 1.03 SUBMITTALS

- A. Refer to section 01 33 00 – Submittal Procedures (*Specifier Note: Delete all that do not apply or have not been submitted.*)
  - 1. 01 33 13 – Certificates
  - 2. 01 33 16 – Design Data
  - 3. 01 33 19 – Field Test Reporting
  - 4. 01 33 23 – Shop Drawings, Product Data, and Samples
  - 5. 01 33 26 – Source Quality Control Reporting
  - 6. 01 33 29 – Sustainable Design Reporting
- B. Product Technical Data: Submit most current manufacturer technical literature for each type of product used including the following, but not limited to:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Samples: All products specified. Verify performance criteria and installation procedure.

D. Quality Assurance Submittals

1. Manufacturer Instructions: Provide manufacturer's written installation instructions.

#### 1.04 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer to comply with quality assurance articles referenced in ASTM D3498 & ASTM C557 for installation of LEPAGE® PL® PREMIUM® construction adhesives.
2. Installation shall be in accordance with manufacturer's installation guidelines and recommendations. Installer shall refer to manufacturer approved preparation instructions and individual product Technical Data Sheets (TDS) for required environmental installation conditions and surface/substrate preparation at <http://www.lepage.ca/>.
3. Installer shall have documented history of successful project execution and installation of said product.

B. Pre-Construction Mock-Up: (Specifier Note: Mock-ups are recommended for all projects using the LEPAGE® PL® PREMIUM® . Mock-up requirement may be included in the specification section for the work results of wood, plastics, and composites. Include LEPAGE® PL® PREMIUM® as part of the required mock-up.)

1. Construct mock-up prior to installation using LEPAGE® PL® PREMIUM® Construction Adhesive including surface preparation per adhesive manufacturer's instructions. Obtain Architect/Engineer/Consultant or Owner's approval of material fastening/bond strength, appearance, and workmanship standard.
  - a. Mock-Up Size: **insert mock up dimensions**
  - b. Mock-Up Substrate: **insert substrate** vertical surfaces as agreed to prior to Mock-up installation.
  - c. Maintain mock-up during construction for workmanship standard.
  - d. Mock-up to be incorporated into final construction upon Architect/Engineer/Consultant/Owner's written approval.

#### 1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, handle, and protect all products in accordance with Section 01 60 00, Product Requirements. (Specifier Note: Review the following. Delete all that do not apply.)

1. 01 61 00 – Common Product Requirements
2. 01 64 00 – Owner-Furnished Products.
3. 01 65 00 – Product Delivery Requirements
4. 01 66 00 – Product Storage and Handling Requirements
  - a. 01 66 13 – Product Storage and Handling Requirements for Hazardous Materials
  - b. 01 66 16 – Product Storage and Handling Requirements for Toxic Materials

B. Store LEPAGE® PL® PREMIUM® materials as recommended by manufacturer. Refer to manufacturer Technical Data Sheet (TDS) available at <http://www.lepage.ca/>.

1. Not damaged by freezing.

2. Store product at standard conditions which are defined as 72°F ± 4°F (22°C ± 2°C) and <50% relative humidity.
  3. After completion of work, seal cartridge nozzle tightly with aluminum foil. Wrap the foil tightly around the nozzle and seal it with tape.
    - a. Applying petroleum jelly around the opening before sealing with aluminum foil can create a more airtight seal.
  4. Product cures with exposure to moisture. Do not expose to excessive moisture.
- C. Use an approved hazardous waste facility for disposal.
- D. Comply with manufacturer's ordering instructions and lead-time(s) required to avoid construction delays.
- E. Deliver all LEPAGE® PL® PREMIUM® materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.

## 1.06 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Verify substrates and ambient air temperature at project site before, during, and after application to assure compliance with manufacturer's recommendations.
    - a. Weather Conditions:
      - i) Apply in accordance with manufacturer's instructions. Refer to product Technical Data Sheets (TDS) available at <http://www.lepage.ca/>.
      - ii) Compliance: Follow manufacturer's specific safety, health and environmental recommendations per most recent Safety Data Sheets, technical bulletins, and instructions. Handle all solvents in compliance with applicable EPA, OSHA, and VOC requirements regarding health/safety standards.

## 1.07 WARRANTY

- A. LEPAGE® Limited Warranty:
1. LEPAGE® products are warranted by Henkel Corporation to be free from defects in materials when used as directed. Henkel's sole obligation shall be, at its option, to replace or refund the purchase price of product proven to be defective. Henkel makes no other warranty – express or implied – including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE and will not be liable for consequential or incidental damages. This Limited Warranty gives you specific legal rights, which vary from state to state.
    - a. For warranty assistance, contact Henkel at 1.800.624.7767 M-F 9:00 AM to 4:00 PM ET.

**PART 2 PRODUCTS** (Specifier Note: Product Information is proprietary to the LEPAGE® PL® PREMIUM®. If additional products are required for competitive procurement, contact the Henkel Corporation for assistance – 1-800-624-7767, Mon. – Fri. 9:00AM – 4:00PM ET)

## 2.01 MANUFACTURERS

- A. Approved Manufacturer:
1. Henkel Corporation:
    - a. Address: 26235 First Street, Westlake, OH 44145
    - b. Phone: 1-866-591-2178
    - c. Web Address: <http://www.lepage.ca/>

## 2.02 MATERIALS

- A. Uncured Physical Properties:
1. Specified Cartridge: Carded Squeeze Tube
    - a. Cartridge Size: 118 mL (4 oz.)
    - b. Item No.: 1584230
  2. Color: Tan
  3. Appearance: Thick Paste
  4. Composition: Polyurethane (Formaldehyde & Asbestos Free)
  5. Viscosity: 555,000 cps
  6. VOC Content: (CARB) <3% by weight (Delete #6 if CA Product used)
    - a. (SCAQMD) 76 g/L
  7. VOC Content: (CARB) 2.3% by weight (Delete #7 if outside of CA)
    - a. (SCAQMD) 65 g/L
    - b. CALIFORNIA ONLY
  8. Shelf Life: 12 months from date of manufacture (unopened)
  9. Lot Code Explanation: HE9038R302
    - a. 9 = Last Digit of Year of Manufacture
    - b. 038 = Day of Manufacture based on 365 days per year
    - c. For example: 9038 = February 7, 2019

- B. Application Properties:
1. Adhesive application temperature for optimal performance:
    - a. Above: 41°F (5°C)
    - b. Below: 95°F (35°C)
      - i) Time is dependent upon temperature, humidity, porosity of substrate and amount of adhesive used
      - ii) Cure time is significantly increased in cold temperatures and/or low humidity conditions
  2. Adhesive application in cold weather:
    - a. Ambient temperature: 19°F (-7°C) minimum.
    - b. Adhesive temperature: > 45°F (7°C) at all times during application.
      - i) all bonding surfaces must be free of snow, ice, and frost prior to use.
      - ii) Cold weather conditions will slow cure times.
  3. Odor: Aromatic / Minimal
  4. Open Time: 15-20 minutes
  5. Repositioning Time: 30-45 minutes
  6. Clamping Time: 24 hours
  7. Cure Time: 24 to 48 hours at 78°F (25°C) and 50% RH
    - a. Time is dependent upon temperature, humidity, porosity of substrate and amount of adhesive used
    - b. Cure time is significantly increased in cold temperatures and/or low humidity conditions
  8. Clean Up: Clean up uncured adhesive residue with mineral spirits. Scrape away cured adhesive using a

sharp-edged tool.

C. Cured Performance Properties:

1. Color: Tan
2. Cured Form: Non-flammable, rubbery solid
3. Service Temperature: -40°F (-40°C) to 160°F (71°C)
4. Water Resistance: Yes
5. Compression Shear Strength, ASTM D3498
  - a. Dry Lumber 638 PSI (4.4 N/mm<sup>2</sup>)
  - b. Wet Lumber 404 psi (2.8 N/mm<sup>2</sup>)
  - c. Frozen Lumber 773 psi (5.3 N/mm<sup>2</sup>)
  - d. Gap Filling 468 psi (3.2 N/mm<sup>2</sup>)
  - e. Moisture Resistance 585 psi (4.0 N/mm<sup>2</sup>) no delamination
6. Compression Shear Strength to Various Substrates:
  - a. OSB to expanded cellular PVC (24-hour cure)
    - i) 263 psi (1.8 N/mm<sup>2</sup>) wood failure
  - b. PVC trim molding to pine (24-hour cure):
    - i) 305 psi (2.1 N/mm<sup>2</sup>)
  - c. Fiber cement to Douglas Fir plywood (7-day cure):
    - i) 305 psi (2.1 N/mm<sup>2</sup>) substrate failure
  - d. Fiber cement to Douglas Fir plywood (14-day cure followed by water immersion and drying):
    - i) 377 psi (2.6 N/mm<sup>2</sup>) wood failure
7. Bond Strength Development\* @ 73°F (23°C):  
Douglas Fir to Douglas Fir plywood
  - a. 6 hours cure: 208 psi (1.4 N/mm<sup>2</sup>)
  - b. 8 hours cure: 279 psi (1.9 N/mm<sup>2</sup>)
  - c. 16 hours cure: 450 psi (3.1 N/mm<sup>2</sup>)
  - d. 24 hours cure: 542 psi (3.6 N/mm<sup>2</sup>)
8. Stone Bonding: Compression Shear Strength:
  - a. Granite (unpolished) to Douglas fir plywood (7-day cure):
    - i) 467 psi (3.2 N/mm<sup>2</sup>)
  - b. Marble (unpolished) to Douglas fir plywood (7-day cure):
    - i) 542 psi (3.7 N/mm<sup>2</sup>)
  - c. Granite to Granite (unpolished), 7-day cure followed by 24 hours water immersion:
    - i) 371 psi (2.6 N/mm<sup>2</sup>)
  - d. Marble to Marble (unpolished), 7-day cure followed by 24 hours water immersion:
    - i) 305 psi (2.1 N/mm<sup>2</sup>)
9. Tensile Shear Strength (Lap Shear Strength):
  - a. Douglas Fir Plywood to stainless steel:
    - i) 590 psi (4.1 N/mm<sup>2</sup>) - wood failure
  - b. Douglas Fir Plywood to hot galvanized steel:
    - i) 512 psi (3.5 N/mm<sup>2</sup>) - wood failure
10. Compression Shear Strength. APA AFG-01: (Bond area = 1.5 in 2)



a. Table 10a:

	Douglas Fir to Douglas Fir plywood	Southern Yellow Pine to Southern Yellow Pine
Dry Lumber Bonding	890 lbs.	No data
Wet Lumber Bonding	785 lbs.	593 lbs.
Frozen Lumber Bonding	837 lbs.	762 lbs.
Moisture Resistance	911 lbs.	No data
Oxidation Resistance	Passed	Passed

## 2.03 ACCESSORIES:

### A. General:

1. Verify compatibility of any product that makes physical contact with or is used in combination with LEPAGE® PL® PREMIUM® Construction Adhesive

### B. Required Safety Equipment:

1. Eye protection
  - a. Avoid contact with eyes
2. Gloves
  - a. Avoid contact with skin.
3. Proper work clothes
4. Appropriate respiratory protection
  - a. Avoid breathing vapors. Vapors may cause headaches, dizziness and nausea.
  - b. Open windows and doors to ensure cross ventilation during application and until all odors are gone.

### C. Product specific application equipment & tools

1. Spray Bottle containing water
  - a. For misting product

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify substrate and surface conditions are in accordance with LEPAGE® PL® PREMIUM® Construction Adhesive manufacturer recommended tolerances prior to installation
  1. Refer to section **1.01, B & C** to review suitable substrates and product limitations.
    - a. Refer to product Technical Data Sheets (TDS) available at <http://www.lepage.ca/>.
    - b. Contact manufacturer with any additional questions or concerns regarding suitable substrates and product limitations

### B. REVIEW ALL SAFETY PRECAUTIONS BEFORE HANDLING THIS PRODUCT:

1. Refer to LEPAGE® PL® PREMIUM® Construction Adhesive Technical Data Sheet (TDS) available at <http://www.lepage.ca/>. Refer to Safety Data Sheet (SDS) for additional information.
2. **WARNING:**
  - a. **HARMFUL IF INHALED.**
  - b. **EYE, SKIN AND RESPIRATORY IRRITANT.**



- c. **MAY CAUSE SKIN AND RESPIRATORY SENSITIZATION.**
- 3. **WARNING:**
  - a. Contains petroleum distillates and methylene diisocyanate (MDI).
  - b. Individuals with lung or breathing problems or prior sensitization to isocyanates should not use this product.
  - c. Avoid breathing vapors.
    - i) Vapors may cause headaches, dizziness, and nausea.
    - ii) Open windows and doors to ensure cross ventilation during application and until all odors are gone.
  - d. Avoid contact with eyes and skin.
    - i) Prolonged or repeated exposure may cause dermal or respiratory sensitization, effects may be permanent.
    - ii) Gloves recommended.
- 4. **FIRST AID:**
  - a. **If swallowed:** call a physician or Poison Control Center immediately. Do not induce vomiting.
    - i) **For eye contact:** flush with water for 15 minutes, call a physician.
    - ii) **For skin contact:** wash thoroughly with soap and water.
    - iii) **If inhaled:** move to fresh air. If symptoms develop or persist get immediate medical attention.
- 5. **INTENTIONAL MISUSE BY DELIBERATELY INHALING CONTENTS MAY BE HARMFUL OR FATAL.**
- 6. **DO NOT TAKE INTERNALLY.**
- 7. **KEEP OUT OF REACH OF CHILDREN.**

**C. RECOMMENDED METHOD OF DISPOSAL FOR UNUSED PRODUCT:**

- 1. Use an approved hazardous waste facility for disposal.

**3.02 PREPARATION**

- A. Installer shall refer to LEPAGE® PL® PREMIUM® Technical Data Sheet (TDS) for additional product installation instructions and conditions. TDS accessible through <http://www.lepage.ca/>
- B. General Preparation:
  - 1. Read all operating instructions packaged with the dispensing unit before using.
  - 2. Adhesive to be above 41°F (5°C) to ensure positive adhesion
  - 3. Adhesive to be 59°F (15°C) or higher for easier application
  - 4. Cut nozzle at a 45° angle to required opening, usually ¼ inch or wider.
  - 5. Puncture the inner seal of the cartridge.
    - a. The foil seal must be completely opened using a tool of similar size as the opening. Be very careful not to allow PL Premium to cure on a finished surface.
- C. Surface Preparation:
  - 1. Surfaces must be clean and free of frost, standing water, grease, dust, and other contaminants.
  - 2. Pre-fit all materials and protect finished surfaces.
- D. Cold Weather Use:
  - 1. All bonding surfaces must be free of snow, ice and frost prior to use.

2. Cold Weather application is possible down to 19°F (-7°C) ambient conditions.
3. Adhesive product must be kept above 45°F (7°C) during application
  - a. Cold weather conditions will slow cure times.

### **3.03 INSTALLATION** (Specifier note: carefully review the following and delete non relevant installation instructions.)

- A. Installer shall refer to LEPAGE® PL® PREMIUM® Technical Data Sheet (TDS) for additional product installation instructions and conditions. TDS accessible through <http://www.lepage.ca/>
- B. General Application:
  1. Apply adhesive to one surface of the material being bonded.
  2. Press the surfaces firmly together within 15 to 20 minutes.
  3. Materials may be repositioned within 30 to 45 minutes after applying the adhesive.
  4. If bonding two non-porous surfaces (such as foam, metal or rigid fiberglass) or under very dry conditions (less than 30% relative humidity), add water in the form of a very light or atomized spray from a plant mister bottle/spray bottle to the extruded adhesive.
    - a. Follow same procedure if bonding large size sheet goods.
    - b. The repositioning time will then be reduced to less than 15 minutes.
  5. Use mechanical support for 24 hours while the adhesive cures.
  6. Cure time is dependent upon temperature, humidity, porosity of substrate and amount of adhesive used.
    - a. Low temperature and humidity will slow cure time.
  7. When bonding EPS and XPS foam insulation, avoid cure and surface temperatures above 90°F (32°C) as this may cause cavitation of the foam.
  8. User is responsible for determining suitable and acceptable results for their intended project.
  9. Test before use.
- C. Sub Floor Installation
  1. Apply a continuous line of adhesive (1/4" thickness minimum but not greater than 3/8") to joists/framing members, or a serpentine pattern to wide
  2. areas; and a continuous or spaced line of adhesive (1/8" thick minimum) in grove of tongue-and-groove panels.
  3. Apply enough adhesive to install ONLY one or two panels at a time depending upon prevailing conditions.
  4. Each panel must be positioned and fastened in place within 15 minutes of applying adhesive to ensure maximum bond before proceeding to the next.
  5. Follow APA Glued Floor System guide for detailed gluing and fastening schedules for the type of floor being installed.

### **3.04 FIELD QUALITY CONTROL**

- A. Installer shall refer to LEPAGE® PL® PREMIUM® Technical Data Sheet (TDS) for additional product installation instructions and conditions. TDS accessible through <http://www.lepage.ca/>

- B. Notify manufacturer's designated representative to obtain periodic observations of elastomeric joint sealant installation.
- C. Field Adhesion testing is recommended for unverified or unapproved substrates. Contact designated manufacturer representative for consultation.

### **3.05 CLEANING AND PROTECTION**

- A. Installer shall refer to LEPAGE® PL® PREMIUM® Technical Data Sheet (TDS) for additional product installation instructions and conditions. TDS accessible through <http://www.lepage.ca/>
- B. Recommended Method of Disposal for Unused Product:
  - 1. Use an approved hazardous waste facility for disposal.
- C. Cleaning:
  - 1. Clean tools and adhesive residue immediately with mineral spirits.
  - 2. LEPAGE® PL® PREMIUM® can be removed mechanically once cured.
  - 3. Solvents have little to no effect on cured adhesive.

**END OF SECTION**