3M™ Polyurethane and Hybrid Adhesives & Sealants

The POWER Line

Bonding Dampening Glazing Water Proofing
Sealing Filling Insulating
Strengthening

550 Polyurethane Adhesive Sealant Fast Cure

3M
Now, advanced chemistries from 3M, a world leader in adhesive technology, give you powerful alternatives for bonding, filling, sealing, waterproofing and more.

3M™ Polyurethane and Hybrid Adhesives & Sealants are advanced, one-part formulations that require no mixing or special application tools. 3M’s POWER Line products cure with atmospheric moisture to form durable, resilient, long-lasting bonds ideal for:

- Truck, trailer, bus and other vehicle panel mounting
- Marine OEM deck-to-hull joining, through-hull fastening, deck fitting and more
- Roof flashings, through-wall pipe and cable sealing and other construction applications
- Concrete sealing and expansion joint filling
- Marine and specialty vehicle window bonding and glazing
- Many other applications in a wide range of industries

Easy to use. Tough to beat.
Some industries still rely on rivets, screws, bolts and welds for the majority of their fastening. But mechanical fasteners are often limited to heavier materials of similar construction, and create stress points and areas where corrosion can form. In addition, low-tech adhesives simply aren’t designed for tough industrial applications. 3M’s POWER Line adhesives and sealants can actually out-perform mechanical fasteners— with none of the drawbacks you may have experienced with other adhesives.
A Superior, Flexible Bond

Mechanical Fasteners | Low-tech and General Adhesives | 3M™ Polyurethane and Hybrid Adhesives & Sealants
---|---|---
May require significant training and expertise (welds) or require multiple steps (drilling, fastening, finishing, sealing, etc.). | Often require mixing, special application techniques or equipment. | Easy to apply. Help increase productivity, simplify operations and cut costs.
Stress failure can be the ultimate result for many riveted joints. Welds are vulnerable to uneven heating and may become brittle. | Bonds can become brittle and joints rigid. | Stay flexible after cure. Result in durable, long-lasting bonds AND help joints or bonded areas resist vibration fatigue.
Screws and rivets mean surface holes, gaps and the chance for distortion, splitting or crazing at the fastener site, as well as opportunities for rust and corrosion. | Some low-tech adhesives expand or drip out from the joints or bonded areas, yet often leave gaps. Cleanup and refinishing can be a costly headache and, worse, joints can pop apart. | Offer “invisible” fastening that fills gaps and expands and contracts with heat and cold. Surfaces stay smooth and clean. Your product looks great with less surface refinishing.
Many mechanically fastened joints and bonds also require sealing against dirt, dust, water, etc., which adds production time and material costs. | Not all low-tech adhesives sold for industrial use can stand up to harsh outdoor environments or the fuels and chemicals of many industrial applications. | Bond AND seal in one step.

The POWER Line design advantage

3M™ Polyurethane and Hybrid Adhesives & Sealants offer more versatile fastening and sealing solutions, greatly expanding your product or project design alternatives. Now you can:

- Match the bond strength to the job at hand
- Use thinner, lighter, even dissimilar materials as design and cost-saving solutions
- Produce bond lines that can bend and flex
- Assemble large, lower tolerance parts as well as bond complex parts to close tolerances
- Reduce vibration and noise
- Seal out corrosive elements; eliminate or minimize leaks
As a world leader in adhesive technologies and a pioneer of polyurethane chemistry in the 1960s, 3M is uniquely positioned to offer a comprehensive line of adhesives and sealants. These products are specifically designed for industrial markets and offer significant advantages over currently available products, including:

- Higher quality formulations that resist yellowing, cracking, chalking and UV degradation
- High performance hybrid products with superior environmental characteristics and other unique attributes
- Many of our products are certified to industry specifications (flame & smoke, marine, etc.)

**Advanced 3M hybrid technologies**

3M’s hybrid polyurethanes are the most recent development in elastomeric adhesive sealants. These exciting products offer all the advantages of 3M’s polyurethane adhesives and sealants, PLUS:

- Faster skin time
- No isocyanates or solvents, for a better environmental profile
- Improved UV resistance—less “chalking” and staining over time
- Broader adhesion to a variety of substrates, with less need for primers
- No bubbling—even under high temperature or humidity
- Greater short-term heat resistance
- Excellent color stability
- Paintable, even when wet

**Applications**

**For 3M hybrid adhesives and sealants**
- cosmetic skinning on boats, buses, trailers
- any application where Environmental Health and Safety (EHS) is critical
- bonding high-performance applications, such as marine windshields
- waterproofing joints without primers in concrete, glass, marble, granite and brick
- bonding and waterproofing modular building panels or bathroom units
- structural bonding in industrial bodywork
- domestic appliances and electrical equipment

**For 3M polyurethane adhesives and sealants**
- concrete expansion gaps
- waterproofing joints and seals without primers
- windshield applications
- panel bonding
- gasket sealing
- parquet floors
- household appliances
- electrical equipment
- industrial bodywork
- outdoor woodwork
- shipbuilding

**Competitive Products**

- Lower grade adhesive/sealants can crack, yellow and turn chalky over time
- Competitive adhesives can foam and create messy expansion problems
- Competitive sealant formulations can compromise performance and cause bubbling or cracking
- Competitive products can bleed into porous substrates, staining the finish

**3M’s POWER Line Products**

- Advanced chemistries resist cracking, yellowing, chalking and UV degradation
- 3M’s proprietary formulations can eliminate foaming
- Unique 3M formulas offer consistency that maximizes performance
- 3M hybrids and polyurethanes resist bleeding and staining

**Innovative products ...**

... Superior results
Innovative packaging

Sturdy aluminum cartridges with pull-tab end caps resist denting and keep adhesive/sealant from curing.

Competitive cartridges are often easier to dent and deform, increasing waste, reload time and exposure to ambient moisture.

Interchangeable, removable tips allow rapid cleaning and easy reuse of open packages, reducing waste.

Clipped-on tip helps prevent damage during shipping, reducing product waste.

Crimped ends on 3M sausage packs (versus wire clips on other brands) help extend shelf life by sealing out moisture, which can cause premature curing and wasted product.

400ml and 600ml sausage packs cost less per ounce and boost productivity by reducing cartridge reload time.

3M sausage packs create far less waste to handle and dispose of when empty.

A formulation for virtually every application

No two industrial bonding or sealing applications are exactly the same. That’s why 3M has a complete range of options from which to choose, including products with slow to rapid cure rates and skin times; a wide variety of packaging choices and sizes, from traditional cartridges and economical sausage packs to drums; and several color choices. A 3M adhesive/sealant technical specialist can help you select the right products for your specific applications.
Exceptional performance in the harshest environments

Extreme flexibility and toughness are key for both marine repair and OEM construction. Constant pounding by waves, salt spray, intense sunlight and potential exposure to fuels and oils all require exceptionally strong, flexible bonds and seals. 3M set the performance standards 40 years ago with industry leading 3M™ 5200 Polyurethane Adhesive & Sealant. Now 3M’s POWER Line offers marine OEM and repair professionals a complete selection of innovative bonding and sealing formulations. Count on 3M™ Polyurethane and Hybrid Adhesives & Sealants to help you withstand whatever nature throws at you.

**POWER Line Products for Marine—Application Summary**

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<th>590</th>
<th>5200</th>
<th>5200FC</th>
<th>740</th>
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<th>4000UV</th>
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<td>x</td>
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<td>x</td>
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<td>x</td>
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**APPLICATIONS**

- **Deck-to-Hull Bonding**: xx xx xx xx xx xx xx x
- **Keel Bonding**: xx xx
- **General Interior Sealing**: xx xx xx xx xx
- **Glass Window Bonding**: xx xx xx xx
- **Fritted Glass Window Bonding**: xx xx xx xx
- **Plastic (PMMA) Window Bonding/Poly carbonate**: xx xx xx
- **Window Glazing****: xx xx xx
- **Sealing Exterior (Strong UV Radiation Zones)**: xx xx xx
- **Bonding Deck Fittings**: xx xx xx xx xx xx
- **Bonding Through Hull**: xx xx xx xx xx xx
- **Bonding Fiberglass to Fiberglass**: xx xx xx xx xx xx xx
- **Bonding Wood to Wood**: xx xx xx xx xx xx xx

**Power Specs**

- Chemical resistant
- Salt water resistant
- Non-yellowing
- UV resistant
- Above and below the waterline
- Varying open times

PLEASE NOTE: The technical information and data on these pages should be considered representative or typical only and should not be used for specification purposes. Properties are measured at 20°C and 50% humidity. Cure time can vary greatly on the substrates bonded.

†Ratings, Certifications: 1=IMO; 2=Surface Flame Spread (ASTM E 162); 3=Smoke Generation (ASTM E 662); 4=Bombardier Toxic Gas (SP 800-C); 5=Crash Tested (FMVSS 212); 6=C920; 7=NSF R2

*Refer to appropriate primers

**Not to be used over uncured polyurethane
Driven to perform

Light weight. Flexibility. Bonding power with dissimilar materials (metal to glass, fiberglass to metal). Ability to seal out water, dust and noise. Smoke and flame resistance. Sound absorption. These are some of the key characteristics specialty vehicle manufacturers need from a bonding and sealing system. 3M™ Polyurethane and Hybrid Adhesives & Sealants deliver. They allow you to structurally bond and seal a wide range of materials, both similar and dissimilar—often replacing rivets, screws, bolts or even welds. The results? Quieter, lighter weight products with superior performance characteristics, often at lower costs.

### POWER Line Products for Specialty Vehicle Manufacturing—Application Summary

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<tbody>
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<td>PU</td>
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<td>PU</td>
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<td>2,3,4,6</td>
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<td>24 hr</td>
<td>9-24 hr</td>
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<td>xx forms</td>
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<td>xx forms</td>
<td>Even when wet</td>
<td>Even when wet</td>
<td>Even when wet</td>
</tr>
</tbody>
</table>

#### APPLICATIONS

**Interior Sealing**
- x
- x
- x
- x
- x

**Exterior Sealing**
- x
- x
- xx
- xx
- xx

**Panel Attaching**
- x
- x
- xx
- xx

**Floor/Sub Floor Bonding**
- x
- x
- xx
- xx

**Roof Bonding**
- x
- x
- xx
- xx

**Superior Long Term UV Resistance**
- xx
- xx
- xx

**Glass Installation**
- xx

**Through-Wall Fire Proofing**
- xx

**Wood**
- x
- x
- xx
- xx
- x

**Glass**
- x
- x
- xx
- xx
- x

**Fiberglass**
- x
- x
- xx
- xx
- x

**Steel, Anodized Aluminum, Galvanized Metal**
- x
- x
- xx
- xx
- xx

**ABS**
- x
- x
- x
- x
- x

**PVC**
- x
- x
- x
- x
- x

**Concrete/Stone**
- x
- x
- x
- x
- x

PLEASE NOTE: The technical information and data on these pages should be considered representative or typical only and should not be used for specification purposes.

Properties are measured at 20°C and 50% humidity. Cure time can vary greatly on the substrates bonded.

†Ratings, Certifications: 1=IMO; 2=Surface Flame Spread (ASTM E 162); 3=Smoke Generation (ASTM E 662); 4=Bombardier Toxic Gas (SP 800-C); 5=Crash Tested (FMVSS 212); 6=C920; 7=NSF R2

*Refer to appropriate primers

**A powerful combination**

Easy-to-use, instant-bonding 3M™ VHB™ Tapes and 3M™ Polyurethane and Hybrid Adhesives & Sealants can make the ideal combination for many vehicle applications. 3M™ VHB™ Tapes bond on contact and feature viscoelastic properties that dampen noise and vibration, resulting in a quieter ride.
A difference you can see

It takes a special polyurethane to form the bonds and seals around windows and glass. Moisture must be sealed out completely, yet flexibility is paramount to ensure a seal that won't dry out, withstands pounding and vibrations, and protects the glass. 3M™ Polyurethane and Hybrid Adhesives & Sealants and 3M™ Primers and Cleaners for windows and glass are specifically formulated for the unique characteristics and requirements of structural glass bonding and window glazing. Strong yet flexible. Crack resistant. They’re ideal for structural windshield installations, PMMA windshield applications, hard-to-bond polycarbonates and acrylics, and flush-mounted glass for both marine and automotive use.

**POWER Line Products for Glass Bonding and Sealing—Application Summary**

<table>
<thead>
<tr>
<th>SEALANTS</th>
<th>PRIMERS/CLEANERS</th>
</tr>
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<tbody>
<tr>
<td>590*</td>
<td>4000UV*</td>
</tr>
<tr>
<td>Sealing</td>
<td>xx</td>
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<tr>
<td>Bonding</td>
<td>xx</td>
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<tr>
<td>Primer/Cleaner**</td>
<td>N/A</td>
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<tr>
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<td>PU</td>
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<td>Ratings, Certifications†</td>
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<tr>
<td>Skin Time</td>
<td>30 min</td>
</tr>
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</table>

**GLASS APPLICATIONS**

- Tinted Glass Bonding: xx
- Fitted Glass Bonding: xx
- Polycarbonate: xx
- PMMA: xx
- Window Glazing**: xx

**PRIMING SUGGESTIONS**

- Concrete/Stone/Marble/Brick: N/A
- Steel, Anodized Aluminum, Galvanized Metal: N/A
- PVC: N/A
- Polyester: N/A
- Wood/Teak: N/A
- Porosity Sealing: N/A

**Power Specs**

- UV resistant
- Crack resistant
- Crash tested
- Permanent flexibility
- Hybrid technology for glazing and bonding

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†Ratings, Certifications: 5=Crash Tested (FMVSS 212)
‡Refer to appropriate primers
**P=Primer  C=Cleaner
**Not to be used over uncured polyurethane
Building better bonds

From sealing the sedimentation tanks of sewage treatment plants to filling expansion gaps in concrete, 3M’s POWER Line has the ideal product for sealing and bonding. Besides a broad selection of polyurethane and high performance hybrid adhesives and sealants, there are primers, boosters, cleaners and applicator guns to help cut your costs, improve productivity and get the job done right. Construction applications include expansion, paver and slab control joints; cast-in-place, pre-fab and stamped concrete; brickwork, marble and granite; parking ramps, septic sealing, flashing and roof assembly; gap-filling on facades; and HVAC ductwork. Industrial applications include spas, appliances and anywhere else high humidity is a concern; metal fabrication and products that need to be hermetically sealed; as well as products that need to work in totally submerged environments.

POWER Line Products for General Industry and Construction—Application Summary

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<thead>
<tr>
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<th>525</th>
<th>535</th>
<th>540</th>
<th>550</th>
<th>560</th>
<th>5010</th>
<th>740</th>
<th>760</th>
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<td>xx</td>
<td>xx</td>
<td>xx</td>
<td>xx</td>
<td>xx</td>
<td>x</td>
<td>x</td>
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<tr>
<td><strong>Bonding</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>24 hr</td>
<td>1 hr</td>
<td>1 hr</td>
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<td>24 hr</td>
<td>24 hr</td>
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<tr>
<td><strong>Paintable</strong></td>
<td>After skin forms</td>
<td>After skin forms</td>
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<td>After skin forms</td>
<td>After skin forms</td>
<td>Even when wet</td>
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**APPLICATIONS**

- Superior Long Term UV Resistance
- Wood
- Glass
- Fiberglass
- Steel, Anodized Aluminum, Galvanized Metal
- ABS
- PVC
- Concrete/Stone/Marble/Brick
- Roof Tile
- Mineral Wool
- PVC/Aluminum Flashing
- Sealing
- Expansion Joints
- EPS
- Through-Wall Fire Proofing
- Thin Bond Lines, Fast Setting

PLEASE NOTE: The technical information and data on these pages should be considered representative or typical only and should not be used for specification purposes. Properties are measured at 20°C and 50% humidity. Cure time can vary greatly on the substrates bonded.

*1: Ratings, Certifications: 1=IMO; 2=Surface Flame Spread (ASTM E 162); 3=Smoke Generation (ASTM E 662); 4=Bombardier Toxic Gas (SP 800-C); 6=C920; 7=NSF R2
This chart graphically shows the depth and breadth of 3M™ Polyurethane and Hybrid Adhesives & Sealants. An important note to remember is that higher temperature and humidity will accelerate the cure rate of most adhesives and sealants. Because of this, 3M’s POWER Line includes similar products with varying skin times—to help you maintain your production processes whatever the climate in your area.

In addition, as temperature and relative humidity increase, polyurethanes develop stronger holding power faster. So to achieve the results you’re looking for, you can either change the adhesive or the ambient conditions. 3M technicians can help you find the best combinations for your needs.

The Importance of “Shore A Hardness”

The Shore A Hardness number of a polyurethane adhesive or sealant can be the predictor of many properties. Products with lower Shore A numbers are more pliable and elastic with good recovery properties; this makes them excellent sealers. Products with higher Shore A numbers are firmer; this makes them better suited for creating permanent, secure bonds. Generally speaking, products with higher Shore A numbers have shorter skin times and cure faster. However, our technical expertise and years of adhesive experience have allowed 3M to develop products with high Shore A’s and long open times for the assembly of complex parts. Please consult with your 3M representative to help you choose the best products for your needs.
## Product Specifications

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<th>Industry</th>
<th>Skin Time (mins)</th>
<th>Cure Rate</th>
<th>Shore A Hardness</th>
<th>Elongation %</th>
<th>Modulus at 100% (psi)</th>
<th>Tensile Strength (psi)</th>
<th>Density</th>
<th>VOC g/L</th>
<th>Paintability</th>
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<td>525</td>
<td>C</td>
<td>90 - 150</td>
<td>3mm/24hr</td>
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<td>600%</td>
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<td>82.6</td>
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<tr>
<td>535</td>
<td>C</td>
<td>60 - 90</td>
<td>3mm/24hr</td>
<td>40</td>
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<td>1.17</td>
<td>94.3</td>
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<td>5010</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>2.1</td>
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<td>540</td>
<td>Gl, C, SV, M</td>
<td>60 - 90</td>
<td>3mm/24hr</td>
<td>40</td>
<td>600%</td>
<td>58</td>
<td>1.17</td>
<td>94.3</td>
<td></td>
<td></td>
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<tr>
<td>550</td>
<td>Gl, C, SV, M</td>
<td>60 - 90</td>
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<td>45</td>
<td>&gt;600%</td>
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<td>less than 24 hr for total cure</td>
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<td>590 OEM Glass</td>
<td>M, SV, W</td>
<td>25 - 40</td>
<td>&gt;3.5mm/24hr</td>
<td>60 - 65</td>
<td>&gt;700%</td>
<td>&gt;870</td>
<td>1,000</td>
<td>1.2</td>
<td>34.7</td>
<td></td>
</tr>
<tr>
<td>4200</td>
<td>M</td>
<td>60 - 90</td>
<td>4mm/24hr</td>
<td>45</td>
<td>&gt;600%</td>
<td>87</td>
<td>300</td>
<td>1.17</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>5200</td>
<td>M</td>
<td>&gt;48 hrs</td>
<td>&lt;1mm/24hr</td>
<td>68</td>
<td>&gt;800%</td>
<td>N/A</td>
<td>700</td>
<td>1.36</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>5200FC</td>
<td>M</td>
<td>60 - 120</td>
<td>3mm/24hr</td>
<td>60</td>
<td>925%</td>
<td>N/A</td>
<td>600</td>
<td>1.21</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>740</td>
<td>M, Gl, C, SV</td>
<td>40 - 60</td>
<td>&gt;3mm/24hr</td>
<td>&gt;30</td>
<td>&gt;300%</td>
<td>&gt;140</td>
<td>N/A</td>
<td>1.65</td>
<td>22.0</td>
<td></td>
</tr>
<tr>
<td>760</td>
<td>M, Gl, C, SV</td>
<td>10 - 30</td>
<td>&gt;3mm/24hr</td>
<td>55</td>
<td>&gt;100%</td>
<td>&gt;145</td>
<td>N/A</td>
<td>1.61</td>
<td>29.1</td>
<td></td>
</tr>
<tr>
<td>4000UV</td>
<td>M, SV, W</td>
<td>20 - 60</td>
<td>3mm/24hr</td>
<td>45</td>
<td>800%</td>
<td>N/A</td>
<td>300</td>
<td>1.4</td>
<td>16</td>
<td>Yes - Even when wet</td>
</tr>
</tbody>
</table>

### Polyurethanes (PU)

**Properties are measured at 20°C and 50% humidity. Cure time can vary greatly on the substrates bonded.**

### Cleaners, primers, applicators

Besides a complete selection of polyurethane and high performance hybrid adhesives and sealants as well as primers, boosters and cleaners, 3M’s POWER Line also includes a wide range of applicator guns—both powered and manual—designed to handle the most common cartridge and sausage pack sizes. Your 3M representative can help you select the right guns for your products and applications.

### Industry Index: C = Construction, CWW = Custom Woodworking, GI = General Industrial, M = Marine, SV = Specialty Vehicle, W = Window

### P590 Fritted Glass Primer
- Color: Black
- Viscosity: 12-15 sec (DIN cup)
- Solids (%): 28.5
- VOC g/L: 687
- Active Ingredient: NCO/MEK

### P591 Plastic Primer
- Color: Black
- Viscosity: 12-15 sec (Ford Cup)
- Solids (%): 36.5
- VOC g/L: 613
- Active Ingredient: NCO/MEK

### P592 Metal Primer
- Color: Clear
- Viscosity: Extremely low
- Solids (%): 1.5
- VOC g/L: 790
- Active Ingredient: Silane/Ethanol

### P595 Teak & Glass Primer
- Color: Black
- Viscosity: 50 mPa*s
- Solids (%): 29.5
- VOC g/L: 793
- Active Ingredient: NCO/MEK

### C596 Cleaner
- Color: Clear
- Viscosity: Extremely low
- Solids (%): 3
- VOC g/L: 798
- Active Ingredient: Silane/Ethanol

**PLEASE NOTE:** The technical information and data on these pages should be considered representative or typical only and should not be used for specification purposes.
Onsite testing
To help you find the right product to meet your exact job specifications and work environment, 3M offers comprehensive onsite testing. 3M technicians will visit your factory or production facility—virtually anywhere in the world—to make sure you not only select the product that matches your job specs and work conditions, but also optimize your results through proper product use. In addition, the 3M national authorized distributor network can provide sales assistance and local product availability.

Color matching
If your application requires unique colors, 3M’s POWER Line products can be customized to match. Consult your local 3M sales representative for program specifics.

GENERAL GUIDELINES
New color: Minimum Annual Volume 15,000 cartridges, contact marketing for more information;
Existing colors: non-standard MOQ 3,000 cartridge.

A commitment to sustainability
3M has made a long-term commitment to continuously improve the environmental, health and safety impact of our products and processes. 3M’s POWER Line already includes examples of this environmental leadership. Our non-isocyanate, low-VOC hybrid products are not only superior performing products, but can help you meet your organizational goals for a healthier and safer workplace and better environment.

For more information on 3M™ Polyurethane and Hybrid Adhesives & Sealants, go to www.3M.com/adhesives or call 1-800-362-3550.