NEOGEN® develops, manufactures, and markets food and animal safety solutions

Founded in 1982, NEOGEN (NASDAQ: NEOG) now operates out of multiple U.S. and international locations, and has a worldwide presence. With corporate headquarters in Lansing, Michigan, NEOGEN has additional facilities in Lexington, Kentucky; Randolph, Wisconsin; Lincoln, Nebraska; and other U.S. locations; and Mexico, Brazil, Scotland, England, India, Australia, and China. For more information, please visit NEOGEN.com.

**NEOGEN Divisions**

Food Safety: Our Food Safety Division markets dehydrated culture media and diagnostic test kits to detect foodborne bacteria, natural toxins, food allergens, drug residues, plant diseases, and sanitation concerns. For more information, please visit NEOGEN.com.

Animal Safety: Our Animal Safety Division is a leader in worldwide biosecurity products, animal genomics testing, and the manufacturing and distribution of a variety of animal healthcare products, including diagnostics, pharmaceuticals, and veterinary instruments. For more information, please visit NEOGEN.com.
Substrates and Reagents

**Complete Substrate and Reagent Solutions**
NEOGEN manufactures an expanding range of substrates and reagents designed for horseradish peroxidase (HRP) and alkaline phosphatase (AP) based microwell and membrane assays. NEOGEN's substrates offer excellent sensitivity, stability, and lot-to-lot consistency, featuring linear kinetic response across a range of analyte concentrations.

### Safety
- Adaptable to changing regulatory requirements
- 100% solvent-free TMB formula
- Formulas to meet strict regulatory environments

### Sensitivity
- Multiple formulas offer a range of kinetic rates and sensitivity levels, allowing manufacturers to select the most appropriate formula for their application
- High signal-to-noise ratio, minimizing unwanted background interference

### Stability
- Shelf life up to 48 months
- Stability is monitored in real-time with stringent quality control standards
- Minimal activity loss over the course of the shelf-life

### Quality
- ISO 9001:2015 certified, NEOGEN’s quality management system improves our efficiency and effectiveness, ensuring our customers receive consistent high-quality products
- Each batch requires a minimum 6 hours of quality control testing
- Newly manufactured substrate performance is compared with aged lots to ensure lot-to-lot consistency

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**About K-Blue® TMB Substrate**
K-Blue substrate got its name from Kentucky Blue, specifically Pantone 286, because the substrate turns a deep blue in the presence of peroxidase. Today K-Blue is used by NEOGEN to manufacture thousands of in-house assays for forensic toxicology, therapeutic drug monitoring, food safety testing applications, and life science research. K-Blue substrate has been employed by end users for assays to screen for drugs of abuse, foodborne pathogens, food allergens, mycotoxins, hormones, steroids, and many other analytes of interest.

NEOGEN continues to meet the ever-changing requirements of immunoassay manufacturers all over the world. Currently we offer K-Blue Advanced, Enhanced K-Blue, K-Blue Aqueous, and our newest formulas K-Blue Select and K-Blue Advanced Plus.
# Colorimetric Substrates

## HRP Substrates

NEOGEN recognizes that one TMB microwell substrate formulation will not meet the specifications of all HRP-based immunoassays. Therefore, we offer multiple unique one-bottle TMB microwell colorimetric substrate formulations to meet specific requirements for different assay systems.

NEOGEN substrates have common characteristics of low background, long-term stability, and excellent lot-to-lot consistency.

### Microwell HRP Substrates

<table>
<thead>
<tr>
<th>Product</th>
<th>Activity</th>
<th>Shelf Life</th>
<th>Available Sizes</th>
<th>Product Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K-Blue Advanced Plus</strong></td>
<td>High activity</td>
<td>24 months when stored at 2–8°C</td>
<td>200 mL, 500 mL, 1 L, 20 L (1 x 20 L)</td>
<td>379175, 379176, 379177, 379257</td>
</tr>
<tr>
<td><strong>K-Blue Advanced</strong></td>
<td>High activity</td>
<td>36 months when stored at 2–8°C</td>
<td>200 mL, 500 mL, 1 L, 20 L (1 x 20 L)</td>
<td>319175, 319176, 319177, 319257</td>
</tr>
<tr>
<td><strong>Enhanced K-Blue</strong></td>
<td>High activity</td>
<td>48 months when stored at 2–8°C</td>
<td>200 mL, 500 mL, 1 L, 20 L (1 x 20 L)</td>
<td>308175, 308176, 308177, 308257</td>
</tr>
<tr>
<td><strong>K-Blue Select</strong></td>
<td>Mid-level activity</td>
<td>24 months when stored at 2–8°C</td>
<td>200 mL, 500 mL, 1 L, 20 L (1 x 20 L)</td>
<td>382175, 382176, 382177, 382257</td>
</tr>
<tr>
<td><strong>Custom TMB</strong></td>
<td>Mid-level activity</td>
<td>36 months when stored at 2–8°C</td>
<td>200 mL, 500 mL, 1 L, 20 L (1 x 20 L)</td>
<td>309175, 309176, 309177, 309257</td>
</tr>
<tr>
<td><strong>K-Blue Aqueous</strong></td>
<td>Mid-level activity</td>
<td>36 months when stored at 2–8°C</td>
<td>200 mL, 500 mL, 1 L, 20 L (1 x 20 L)</td>
<td>331175, 331176, 331177, 331257</td>
</tr>
<tr>
<td><strong>Alert K-Blue Aqueous</strong></td>
<td>Kinetics similar to K-Blue Aqueous</td>
<td>36 months when stored at 2–8°C</td>
<td>200 mL, 500 mL, 1 L, 20 L (1 x 20 L)</td>
<td>334175, 334176, 334177, 334257</td>
</tr>
</tbody>
</table>
Additional HRP Substrates

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Shelf Life</th>
<th>Product Features</th>
<th>Available Sizes</th>
<th>Product Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABTS</td>
<td>HRP-Microwell</td>
<td>36 months when stored at 2–8°C</td>
<td>• Produces a soluble blue-green reaction</td>
<td>100 mL</td>
<td>310247</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Results are read at 405/410 nm</td>
<td>1 L</td>
<td>310177</td>
</tr>
<tr>
<td>TMB Membrane</td>
<td>HRP-Membrane</td>
<td>48 months when stored at 2–8°C</td>
<td>• Produces an insoluble, permanent dark blue reaction</td>
<td>100 mL</td>
<td>311247</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 months when stored at 15–25°C</td>
<td></td>
<td>1 L</td>
<td>311177</td>
</tr>
<tr>
<td>TMB Membrane Plus</td>
<td>HRP-Membrane</td>
<td>48 months when stored at 2–8°C</td>
<td>• Produces an insoluble, permanent dark blue reaction</td>
<td>100 mL</td>
<td>337247</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 months when stored at 15–25°C</td>
<td></td>
<td>1 L</td>
<td>337177</td>
</tr>
</tbody>
</table>

AP Substrates
Microwell Substrates
NEOGEN offers K-Gold and K-Gold Plus, PNPP-based substrates, for ELISA applications. The ready-to-use formulas do not require mixing of additional ingredients or stabilizing agents, making them ideal for assay manufacturers.

NEOGEN substrates have common characteristics of low background, long-term stability, and excellent lot-to-lot consistency.

Microwell AP Substrates

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Shelf Life</th>
<th>Product Features</th>
<th>Available Sizes</th>
<th>Product Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-Gold Plus</td>
<td>AP-Microwell</td>
<td>24 months when stored at 2–8°C</td>
<td>• Improved activity</td>
<td>200 mL</td>
<td>339175</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• RTU (Ready-to-use)</td>
<td>500 mL</td>
<td>339176</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Low Background</td>
<td>1 L</td>
<td>339177</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20 L (1 x 20 L)</td>
<td>339257</td>
</tr>
<tr>
<td>K-Gold</td>
<td>AP-Microwell</td>
<td>30 months when stored at 2–8°C</td>
<td>• High Activity</td>
<td>200 mL</td>
<td>303175</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• RTU (Ready-to-use)</td>
<td>500 mL</td>
<td>303176</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Low Background</td>
<td>1 L</td>
<td>303177</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20 L (1 x 20 L)</td>
<td>303257</td>
</tr>
</tbody>
</table>

Reagents for Immunoassays

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Shelf Life</th>
<th>Product Features</th>
<th>Available Sizes</th>
<th>Product Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Stop Solution</td>
<td>HRP-Microwell</td>
<td>12 months when stored at 2–8°C</td>
<td>• Produces a dark purple-pink color for a minimum</td>
<td>200 mL</td>
<td>301474</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>of two hours when added to the wells</td>
<td>500 mL</td>
<td>301475</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Non-acidic solution</td>
<td>1 L</td>
<td>301476</td>
</tr>
<tr>
<td>EIA Buffer</td>
<td>HRP-Microwell</td>
<td>12 months when stored at 2–8°C</td>
<td>• Dilutes enzyme conjugates, standards and samples</td>
<td>500 mL</td>
<td>301276</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 L</td>
<td>301277</td>
</tr>
<tr>
<td>Wash Buffer</td>
<td>HRP-Microwell</td>
<td>12 months when stored at 2–8°C</td>
<td>• Washes all unbound enzyme conjugate, samples and</td>
<td>500 mL</td>
<td>301176</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>standards from microplates</td>
<td>1 L</td>
<td>301177</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Concentrated (10x) buffer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Chemiluminescent Substrates

Microwell and Membrane HRP Applications
NEOGEN offers multiple luminol-based chemiluminescent substrate formulations for microwell and membrane applications for the ultimate detection of horseradish peroxidase. NEOGEN's substrates offer sensitivity capabilities from picogram to femtogram.

### Chemiluminescent HRP Substrates

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Shelf Life</th>
<th>Product Features</th>
<th>Available Sizes</th>
<th>Product Numbers</th>
</tr>
</thead>
</table>
| Chemiluminescent Ultra | HRP Microwell and Membrane   | 18 months when stored at 2–8°C     | • Maximum sensitivity, femtogram \((10^{-15} \text{ g})\)  
• Luminol-based chemistry  
• Two component system       | 200 mL kit (2 x 100 mL)  
500 mL kit (2 x 250 mL)  
1 L kit (2 x 500 mL)         | 325175  
325176  
325177                        |
| Chemiluminescent Elite Plus | HRP Microwell and Membrane   | 18 months when stored at 2–8°C     | • High sensitivity, picogram \((10^{-12} \text{ g})\) higher range  
• Luminol-based chemistry  
• Two component system       | 200 mL kit (2 x 100 mL)  
500 mL kit (2 x 250 mL)  
1 L kit (2 x 500 mL)         | 324175  
324176  
324177                        |
| Chemiluminescent Elite | HRP Microwell and Membrane   | 18 months when stored at 2–8°C     | • High sensitivity, picogram \((10^{-12} \text{ g})\) lower range  
• Luminol-based chemistry  
• Two component system       | 200 mL kit (2 x 100 mL)  
500 mL kit (2 x 250 mL)  
1 L kit (2 x 500 mL)         | 323175  
323176  
323177                        |

Microwell and Membrane AP Applications
NEOGEN also offers ultra-sensitive 1,2-dioxetane-based chemiluminescent formulations for the detection of alkaline phosphatase in microwell and membrane applications. NEOGEN's substrates offer sensitivity capabilities to the attogram level.

### Chemiluminescent AP Substrates

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Shelf Life</th>
<th>Product Features</th>
<th>Available Sizes</th>
<th>Product Numbers</th>
</tr>
</thead>
</table>
| Chemiluminescent AP Select Plus 450 | AP Microwell and Membrane | 24 months when stored at 2–8°C     | • Most sensitive formula, attogram \((10^{-18} \text{ g})\) higher range  
• Dioxetane-based chemistry  
• RTU (Ready to use)        | 200 mL  
500 mL  
1 L                        | 326175  
326176  
326177                        |
| Chemiluminescent AP Select Plus 540 | AP Microwell and Membrane | 24 months when stored at 2–8°C     | • Excellent sensitivity, attogram \((10^{-18} \text{ g})\) higher range  
• Dioxetane-based chemistry  
• RTU (Ready to use)        | 200 mL  
500 mL  
1 L                        | 327175  
327176  
327177                        |
| Chemiluminescent AP Select 540 | AP Microwell and Membrane   | 24 months when stored at 2–8°C     | • High sensitivity, attogram \((10^{-18} \text{ g})\) lower range  
• Dioxetane-based chemistry  
• RTU (Ready to use)        | 200 mL  
500 mL  
1 L                        | 329175  
329176  
329177                        |
| Chemiluminescent AP Select 450 | AP Microwell and Membrane   | 24 months when stored at 2–8°C     | • Least sensitive formula, attogram \((10^{-18} \text{ g})\) lower range  
• Dioxetane-based chemistry  
• RTU (Ready to use)        | 200 mL  
500 mL  
1 L                        | 328175  
328176  
328177                        |
Packaging Simplified
NEOGEN can package substrates and reagents in custom bottle sizes and volumes fills to meet your specific packaging requirements. We utilize a fully automated system for substrates and reagents that offers multiple benefits compared to manual bottle filling processes.

Custom-filling capabilities:
• Fill volumes 6 mL to 55 L
• Bottle sizes from 15 mL bottles to 55 L containers
• Tailored labeling options

Custom-filling benefits:
• Reduces risk of substrate contamination
• Minimizes exposure to light and air
• Ensures long-term stability of the substrate
• Precise volume fill per bottle reduces volume variability bottle-to-bottle
• Reduced cost from over filling