Superior diamond slurries, suspensions, and compounds
HYPERION COMPOUNDS, SLURRIES, AND SUSPENSIONS

QUALITY STARTS WITH THE DIAMOND IN THE FORMULATION

Hyperion Materials & Technologies is the leader in the manufacturing of diamond micron powders. Hyperion invented the process to make synthetic diamonds over 60 years ago, and we continue to develop new micron powders, compounds, slurries, and suspensions to solve our customers’ needs.

Hyperion’s micron powders (diamond and cubic boron nitride (CBN)) can be formulated into compounds, slurries, and suspensions. The information contained in this brochure will allow you to choose the best solution for your polishing needs. Hyperion defines our offerings as shown below:

**COMPOUND** = Powder (diamond or CBN) + Carrier (paste)
**SLURRY** = Powder (diamond or CBN) + Carrier (liquid)
**SUSPENSION** = Powder (diamond or CBN) + Carrier with Stabilizer (liquid)
HYPERION COMPOUND OVERVIEW

COMPOUND FORMULATIONS

<table>
<thead>
<tr>
<th>COMPOUND IDENTIFICATION</th>
<th>COMPOUND FORMULATIONS (SOLUBILITIES)</th>
<th>RECOMMENDED USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>K700</td>
<td>Water soluble (WS products) For use where exceptional cleaning is required and where petroleum contamination is prohibited. Specimen prep applications command this product.</td>
<td>Used in specimen preparation and cross section analysis</td>
</tr>
<tr>
<td>K210</td>
<td>Oil soluble (OS products) Recommended for controlled lapping of carbide drawing dies, cold heading dies, and other polishing applications.</td>
<td>Primarily used in mold and die polishing</td>
</tr>
<tr>
<td>G400</td>
<td>Water/Oil soluble (WOS Products) Complements the use of oil as well as water for achieving more productive results and facilitating cleaning.</td>
<td>Used where corrosion must be minimized but where oil cannot be tolerated</td>
</tr>
</tbody>
</table>

COMPOUND CONCENTRATIONS

<table>
<thead>
<tr>
<th>LIGHT CONCENTRATION</th>
<th>MEDIUM CONCENTRATION</th>
<th>HEAVY CONCENTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finishing</td>
<td></td>
<td>Removal</td>
</tr>
</tbody>
</table>

COMPOUND DIAMOND SIZE

COMPOUND PACKAGING

<table>
<thead>
<tr>
<th>SYRINGE/TUBE SIZES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5 gram</td>
<td></td>
</tr>
<tr>
<td>10 gram</td>
<td></td>
</tr>
<tr>
<td>18 gram</td>
<td></td>
</tr>
<tr>
<td>25 gram</td>
<td></td>
</tr>
<tr>
<td>50 gram</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JAR SIZES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5 gram</td>
<td></td>
</tr>
<tr>
<td>25 gram</td>
<td></td>
</tr>
<tr>
<td>50 gram</td>
<td></td>
</tr>
<tr>
<td>100 gram</td>
<td></td>
</tr>
<tr>
<td>200 gram</td>
<td></td>
</tr>
</tbody>
</table>

Standard diamond sizes from 1/4 to 60 µm | Color coded for easy size recognition
## Hyperion Slurry/Suspension Overview

### Slurry and Suspension Formulations

<table>
<thead>
<tr>
<th>Slurry/Suspension Identification</th>
<th>Slurry/Suspension Formulations</th>
<th>Slurry</th>
<th>Suspension</th>
</tr>
</thead>
<tbody>
<tr>
<td>K400 Oil-Based</td>
<td>Straight oil with petroleum base and additives</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>K285T Water-Based</td>
<td>Straight water, for use where exceptional cleaning is required and where petroleum contamination is prohibited</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>K450, K1500 Water-/Oil-Based</td>
<td>Compliments the use of oil as well as water for achieving more productive results</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>LDP Water-/Oil-Based</td>
<td>Diamond is dispersed in ultra-pure deionized water to eliminate agglomerates that can occur in submicron powders</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

### Diamond Powders

<table>
<thead>
<tr>
<th>Diamond Powder Grade</th>
<th>Description</th>
<th>Suggested Application</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJK-5</td>
<td>Monocrystal diamond powder - used in slurries and suspensions</td>
<td>Lapping</td>
<td>Aerospace, Ceramics, Glass, Lenses, Optics, Sapphire, Semi-conductor, Silicon carbide, Tungsten carbide</td>
</tr>
<tr>
<td>RJK-1</td>
<td>Multi-crystal diamond powder - more friable than a monocrystal</td>
<td>Lapping/Polishing</td>
<td></td>
</tr>
<tr>
<td>POLY</td>
<td>Polycrystalline diamond powder - available in sizes &lt;10 microns (µm)</td>
<td>Polishing</td>
<td></td>
</tr>
<tr>
<td>NATURAL</td>
<td>Natural diamond powder - available in a variety of sizes</td>
<td>Gem Polishing</td>
<td></td>
</tr>
</tbody>
</table>

### Slurry/Suspension Concentrations

- **Light Concentration**: Finishing
- **Medium Concentration**: Polishing
- **Heavy Concentration**: Removal
HYPERION SLURRY/SUSPENSION OVERVIEW

SLURRY/SUSPENSION DIAMOND SIZE

SLURRY/SUSPENSION PACKAGING

<table>
<thead>
<tr>
<th>BOTTLE/BUCKET SIZES</th>
<th>PUMP BOTTLE OR SPRAY BOTTLE SIZES</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 mL</td>
<td>4 oz. pump bottle</td>
</tr>
<tr>
<td>250 mL</td>
<td></td>
</tr>
<tr>
<td>500 mL</td>
<td>8 oz. spray bottle</td>
</tr>
<tr>
<td>1,000 mL</td>
<td></td>
</tr>
<tr>
<td>1 gallon</td>
<td></td>
</tr>
<tr>
<td>5 gallon bucket</td>
<td></td>
</tr>
</tbody>
</table>

CUSTOM FORMULATIONS AVAILABLE TO MEET YOUR REQUIREMENTS
HOW TO SELECT THE SOLUTION FOR YOUR NEED - 5 CRITERIA MUST BE KNOWN

When selecting a Hyperion compound, slurry, or suspension, 5 criteria must be known:

1 - DIAMOND TYPE
Determine what type of diamond is needed in the application:
- SJK-5 (most popular diamond type used in compounds)
- RJK-1
- NAT
- Also available in cubic boron nitride (CBN) grades

2 - DIAMOND SIZE
Example: 8-16 microns

3 - DIAMOND CONCENTRATION (how much diamond is needed in the formulation?)
- L = Light concentration
- M = Medium concentration
- H = Heavy concentration (used for maximum stock removal)

4 - FORMULATION
COMPOUND
OS = oil-based formula (K210)
WS = water-based formula (K700)
WOS = water-/oil-based (also called universal, G400)

SLURRY/SUSPENSION
K400 = oil-based formula
K285T = water-based formula
K450, K1500 = water-/oil-based
LDP = liquid diamond powder

5 - CONTAINER TYPE AND SIZE
COMPOUND
Syringe:  Jar:
- 5 gm       - 5 gm
- 10 gm      - 25 gm
- 18 gm      - 50 gm
- 25 gm      - 100 gm
- 50 gm      - 200 gm

SLURRY/SUSPENSION
DMS:  DMT:
- 125 mL     - 4 oz. pump bottle
- 250 mL     - 8 oz. spray bottle
- 500 mL
- 1,000 mL
- 1 gallon
- 5 gallon bucket

OTHER SIZES ARE AVAILABLE TO MEET YOUR NEEDS
Hyperion Materials & Technologies’ compounds, slurries, and suspensions are used to lap, polish, and super-finish:

- Compound syringe
- Slurry or suspension bottle
- Diamond size
- Oil-based formula
- Concentration
- Formula

Our compounds, slurries, and suspensions are also used in the following:

- Ceramics
- Electro-optics
- Semiconductors
- Metalwork
- Hard disk drives
- Metallurgical

APPLICATIONS FOR COMPOUNDS, SLURRIES, AND SUSPENSIONS

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- Metalwork
- Hard disk drives
- Metallurgical

Our compounds, slurries, and suspensions are also used in the following:

MOLD AND DIE POLISHING
- Mold and die shops
- Polishing houses
- Injection molding facilities

SPECIMEN PREPARATION
- Metallurgical manufacturers
- Universities
- R&D laboratories

GENERAL POLISHING
- Ball valves
- Wire dies
- Stone polishers

POLISHING IS AN ART

There are many ways to achieve the desired results. Although techniques vary, using a consistent, high quality diamond paste ensures consistent results.

FUNDAMENTAL RULES OF POLISHING

1 - Keep polishing area clean.
2 - Dedicate a polishing tool for each grade size. Each tool should be stored in a separate container.
3 - Polishing tools gradually become impregnated and improve with use.
4 - Clean hands and workpiece carefully between grades.
5 - Apply diamond paste to tool when manual polishing. Apply paste to workpiece when machine polishing.
6 - Polish existing scratch marks at a 90-degree angle. This helps increase stock removal and shows when old marks are gone.
7 - High material removal requires high pressure and coarse grits. Finish polishing requires low pressure and finest grits.

TROUBLESHOOTING TIPS

SCRATCHING
- Contamination in tooling
- Work area and/or workpiece not thoroughly cleaned from previous grade size (grit)

WAVINESS
- Too big of a jump between grade sizes (grit)
- Uneven pressure on polishing tool

PITTING
- Slag inclusions in steel
- Pressure too high on polishing tool

ORANGE PEEL
- Over polishing with machine results in overheating a small area
- Reduce pressure for softer steels.