DOOSAN PLASTIC MOLD STEEL
DP10
GLOBAL LEADER IN POWER & WATER

We are helping to drive economic development around the world by supplying the basic materials and building the facilities needed by industry. Our product portfolio includes castings and forgings, nuclear power plants, thermal power plants, water desalination plants, environmental plants, and material handling systems.
Superior mirror polishability and high rust resistivity

DP10 has a superior cleanliness by using the special technology for refining and electro slag remelting, which is required in plastic mold steel. It also has outstanding properties such as resistance to rust, corrosion, erosion and good weldability. Especially, it offers superior mirror polishability. DP10 is supplied in free hardened condition.

**DP10 product characteristics marks and applications**

- **Although high hardness, DP10 has the excellent machinability, especially in gun drill work.**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Hardness (HRc)</th>
<th>Machinability</th>
<th>Rust-resistivity</th>
<th>Mirror-polishability</th>
<th>Gun Drill workability</th>
<th>Repair-weldability</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP10</td>
<td>38~42</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
</tr>
<tr>
<td>HP70</td>
<td>37~42</td>
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</tbody>
</table>

**Characteristic**

- Applied to superior mirror polishability from #8,000 to #14,000 of lapping grade with excellent cleanliness
- Excellent Gun Drill workability (flatness and straightness)
- Suitable for precision mold steel
- Long fatigue life
- Minimization in the increase of hardness during the machining and welding process

**Application** : Plastic Injection mold steels for superior mirror polishability

- TV part : LCD/LED TV front panel and stand
- Premier home appliances : advanced audio, front cover of air conditioner and refrigerator
- High class automobiles : Lamp, Head Light, Audio Frame etc.
Mechanical Properties

- Uniform hardness distribution and excellent mechanical properties

<table>
<thead>
<tr>
<th>Yield Strength (MPa)</th>
<th>Tensile Strength (MPa)</th>
<th>Elongation (%)</th>
<th>Hardness (HRc)</th>
<th>Impact Absorbed Energy (J/cm²), 2mm-U notch</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1092</td>
<td>&gt;1200</td>
<td>17</td>
<td>40 ± 2</td>
<td>12.7</td>
</tr>
</tbody>
</table>

![Graphs showing hardness, tensile strength, and impact energy](image)

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION
**Index of Cleanliness / Mirror Polishability**

- Outstanding cleanliness properties, it can be applied to maximum #14,000 of lapping grade

**Rust Resistivity**

- Excellent corrosion resistance

<table>
<thead>
<tr>
<th></th>
<th>DP10</th>
<th>Typical material of precipitation hardening steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dipped in water</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>for 82hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprayed in 5% NaCl for 65hrs</td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>Sprayed</td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>1㎛ -polished(3')</td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
</tbody>
</table>

* Tess-over photography after sprayed salt water and dipped in water (×1.1)
Gun Drill Workability

- Gun drill working time is short. Tools wear is small. DP10 product has a flatness and straightness (within 1m/m/1,000m/m, surface roughness more than 2.5S)

as - 6.0

- Gun Drill size: 6.0mm
- Intermittent: 1,170mmL
- Continuous: 1,000mmL x 5 = 5,000mmL

Physical and Thermal Properties

- Specific Gravity 7.82
- Young’s Modulus 217GPa
- Thermal Conductivity
- Thermal Expansion Coefficient
Weldability Characteristics

- Minimized hardness variation depending on location (WM*/HAZ**/BM***) after repair welded
- No appearance of yellowing phenomenon, gas bubble and weld line after re-lapped with GTAW/Laser weld

GTAW / Laser Weld Cycle

- GTAW (Pre Heat), (Inter-pass Heat) : 250 ~ 330 ± 30°C
- GTAW (Post Heating) : 300 ~ 350°C

- GTAW PWHT

- Laser Weld : Not apply to heat

Building your tomorrow today
DP10 Product Applications

- premier automobile
- water softener
- smart phone
- air conditioner
- refrigerator
- water purifier
- LCD/LED TV front panel
- LCD/LED TV stand
- premuim automobile
- water softener
- smart phone
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