Clean Annular Perforating System
A flexible solution that penetrates one or more casings without damaging the outer pipe

Applications
- Plug and abandonment (P&A) wells
- Single and multiple† casings
- Perforate, wash, and cement (PWC) operations with single or dual cups or jet-based technology

Benefits
- Improved PWC effectiveness and efficiency
- Reduced mobilization times
- Optimized entrance holes
- High shot density

Features
- Fully disposable system
- Modular centralization system

Flexibility for entrance holes and area open to flow
The clean annular perforating (CAP) system is a flexible solution for single- and multicaasing applications. By controlling standoff and charge selection, the disposable perforating system enables you to penetrate one or more casings without damaging the outside pipe. With the system’s range of entrance hole and shot density options, you can tailor the system design to your objectives, including washing cups or jetting.

Efficiency driven by a single trip in the well
The CAP system can be combined with the Schlumberger explosive automatic gun release (SXAR) system to drop tubing-conveyed perforating guns in the well immediately after firing. This ensures operations can continue without the need to retrieve guns to surface.

Performance assured with unique fin modularity
The CAP system utilizes a modular fin that ensures centralization of the 7-in guns in any casing size from 9% in to 13¾ in. This enables hole uniformity even in deviated wells to ensure a more effective and efficient wash and cementing operation.

Reduced no-shot interval between guns
The CAP system provides a single adapter connection between guns to minimize the shot distance from gun to gun. This increases the efficiency of wash operations and enables uniform washing speed even when crossing blank casing spaces in the well.

Perforating system deliverability
The CAP system uses charges with 1.4D hazard classification, reducing mobilization times by utilizing air transportation.

† Contact Schlumberger for more information on multiple casing applications.
**CAP System**

### Single Casing: 4.5- to 4.72-in-OD CAP System Specifications

<table>
<thead>
<tr>
<th>Charge</th>
<th>S3106 RDX</th>
<th>PF4621 RDX</th>
<th>CPM 4718 HMX</th>
<th>PFM 4718 HMX</th>
<th>PF4621 RDX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gun OD, in [mm]</td>
<td>4.5 [114.3]</td>
<td>4.5 [114.3]</td>
<td>4.72 [119.89]</td>
<td>4.72 [119.89]</td>
<td>4.5–4.72 [114.3–119.89]</td>
</tr>
<tr>
<td>Shot density, shots per foot (spf)</td>
<td>12</td>
<td>12</td>
<td>18</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>Phasing, °</td>
<td>135/45</td>
<td>135/45</td>
<td>120/60</td>
<td>120/60</td>
<td>120/60</td>
</tr>
<tr>
<td>Entrance hole, in [mm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-in casing</td>
<td>0.4 [10.2]</td>
<td>0.83 [21.1]</td>
<td>0.86 [21.4]</td>
<td>0.93 [23.6]</td>
<td>0.83 [21.1]</td>
</tr>
<tr>
<td>7 5/8-in casing</td>
<td>-</td>
<td>0.5 [12.7]</td>
<td>0.75 [19.1]</td>
<td>0.8 [20.3]</td>
<td>0.5 [12.7]</td>
</tr>
<tr>
<td>Pressure rating, psi (MPa)</td>
<td>11,000 [75.8]</td>
<td>11,000 [75.8]</td>
<td>18,000 [124]</td>
<td>18,000 [124]</td>
<td>11,000–12,000 [75.8–117]</td>
</tr>
<tr>
<td>Temperature rating at 1 h, degF (degC)</td>
<td>340 [171]</td>
<td>340 [171]</td>
<td>400 [204]</td>
<td>400 [204]</td>
<td>340 [171]</td>
</tr>
</tbody>
</table>

*All specifications are subject to change without notice.*

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*Shot patterns for the 4.5- to 4.72-in-OD perforating systems.*
Shot patterns for the 7-in-OD and 14-, 15-, and 18-spf perforating systems.

### Single Casing: 7-in-OD and 14-, 15-, and 18-spf CAP System Specifications

<table>
<thead>
<tr>
<th>Charge</th>
<th>58C UP RDX</th>
<th>64C UP RDX</th>
<th>PFM 7015 RDX</th>
<th>CP 7018 RDX</th>
<th>PF 7018 RDX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gun OD, in [mm]</td>
<td>7 [177.8]</td>
<td>7 [177.8]</td>
<td>7 [177.8]</td>
<td>7 [177.8]</td>
<td>7 [177.8]</td>
</tr>
<tr>
<td>Shot density, shots per foot (spf)</td>
<td>14</td>
<td>14</td>
<td>15</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Phasing, °</td>
<td>140/20</td>
<td>140/20</td>
<td>120/60</td>
<td>120/60</td>
<td>120/60</td>
</tr>
<tr>
<td>Entrance hole, in [mm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10¾-in casing</td>
<td>0.78 [19.81]</td>
<td>1.03 [26.16]</td>
<td>–</td>
<td>0.96 [24.38]</td>
<td>0.95 [24.13]</td>
</tr>
<tr>
<td>13¼-in casing</td>
<td>0.52 [13.21]</td>
<td>0.48 [12.19]</td>
<td>–</td>
<td>0.54 [13.72]</td>
<td>0.52 [13.21]</td>
</tr>
<tr>
<td>Pressure rating, psi [MPa]</td>
<td>10,000 [68.9]</td>
<td>10,000 [68.9]</td>
<td>15,000 [103.4]</td>
<td>10,000 [68.9]</td>
<td>10,000 [68.9]</td>
</tr>
</tbody>
</table>

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Shot patterns for the 7-in-OD and 14-, 15-, and 18-spf perforating systems.
Single Casing: 7-in-OD and 12-spf CAP System Specifications

<table>
<thead>
<tr>
<th>Charge</th>
<th>PJ4505 RDX</th>
<th>HJ4505 RDX</th>
<th>58C UP RDX</th>
<th>64C UP RDX</th>
<th>64C CP RDX</th>
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</thead>
<tbody>
<tr>
<td>Gun OD, in [mm]</td>
<td>7 [177.8]</td>
<td>7 [177.8]</td>
<td>7 [177.8]</td>
<td>7 [177.8]</td>
<td>7 [177.8]</td>
</tr>
<tr>
<td>Shot density, shots per foot (spf)</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Phasing, °</td>
<td>135/45</td>
<td>135/45</td>
<td>135/45</td>
<td>135/45</td>
<td>135/45</td>
</tr>
<tr>
<td>Entrance hole, in [mm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10¾-in casing</td>
<td>0.32 [8.13]</td>
<td>0.45 [11.43]</td>
<td>0.77 [19.56]</td>
<td>1.06 [26.92]</td>
<td>0.92 [23.37]</td>
</tr>
<tr>
<td>13¼-in casing</td>
<td>0.26 [6.6]</td>
<td>0.34 [8.64]</td>
<td>0.52 [13.21]</td>
<td>0.51 [12.95]</td>
<td>0.47 [11.94]</td>
</tr>
</tbody>
</table>

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Shot pattern for the 7-in-OD and 12-spf perforating systems.