Obsidian® Frac Plug

SUPERIOR ISOLATION AND DRILLABILITY

OVERVIEW
The Obsidian® frac plug is a field-proven composite product that provides superior zonal isolation across perforated intervals during wellbore stimulation, but with the added benefit of exceptional drillability during wellbore cleanouts. The unique composite material and its efficiency during drillout, makes the Obsidian frac plug ideal for horizontal applications. These plugs are available in 4 ½-in. through 5 ½-in. casing sizes for well conditions up to 250° F and rated to 10,000 psi differential pressure.

FEATURES
» Composites and a rubber packer set, with no metal parts
» High-performance slip design for running reliability
» Lower pin design to prevent plug off from below
» Balls can be dropped from surface or run in place
» Can be run with Halliburton RapidBall™ self-removing balls
» Drilled out using coiled or jointed tubing with sealed roller cone bits, mills, or PDC bits

BENEFITS
» Running speeds in excess of 250 ft/min in horizontal sections and 500 ft/min in vertical sections
» Allows flow back from below the plug
» Saves completion time and reduces casing damage caused by long drillout processes
» Light weight composite allows for optimal flow back and wellbore cleanup of drilled plug material
CASE HISTORY NORTH AMERICA LAND - ROCKIES

A customer ran Halliburton’s Obsidian frac plugs on one of their development wells. A total of nine zones were stimulated, requiring eight Obsidian frac plugs. Zonal isolation and effective stimulation were completed successfully on all zones. A workover rig was mobilized to location and a standard tricone drill bit was used to drill the plugs. All plugs were drilled up with an average drill time of only 11 minutes per plug. Ten barrels of water (no foam or gel) were circulated between each plug drillout stage. The picture illustrates the returns from drilling Obsidian frac plugs out of the well.

Example of Obsidian® plug cuttings from millout testing

Obsidian® Frac Plug Specifications

<table>
<thead>
<tr>
<th>Casing</th>
<th>Max Casing ID</th>
<th>Min Casing ID</th>
<th>Length</th>
<th>Max Tool OD</th>
<th>Tool Rating</th>
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</thead>
<tbody>
<tr>
<td>Size</td>
<td>in. (cm)</td>
<td>in. (cm)</td>
<td>in. (cm)</td>
<td>in. (cm)</td>
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</tr>
<tr>
<td>4 1/2</td>
<td>11.6 - 13.5</td>
<td>4.00 (10.16)</td>
<td>3.92 (9.96)</td>
<td>28.93 (73.48)</td>
<td>3.66 (9.30)</td>
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<tr>
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<td>23 - 29.7</td>
<td>4.67 (11.86)</td>
<td>4.376 (11.11)</td>
<td>31.07 (78.91)</td>
<td>4.15 (10.54)</td>
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<tr>
<td>5 1/2</td>
<td>17-23</td>
<td>4.892 (12.43)</td>
<td>4.67 (11.86)</td>
<td>30.36 (77.11)</td>
<td>4.37 (11.10)</td>
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<td></td>
<td></td>
<td></td>
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<td>10K 220˚F</td>
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For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com