SHADOW Series Frac Plug
Eliminate post-frac intervention and accelerate ROI

The SHADOW™ series frac plug is a permanent millable plug designed to be left downhole during production, completely eliminating the plug drillout phase of plug-and-perf completions. The plug features a large flow-through inside diameter (ID) and uses Baker Hughes IN-Tallic™ disintegrating frac balls so production can flow with the plugs in place, shaving days off of completion times, and eliminating the cost and risk associated with coiled tubing (CT) intervention.

IN-Tallic disintegrating frac balls are made of controlled electrolytic metallic (CEM) nanoconstructed material—a technology pioneered by Baker Hughes. IN-Tallic balls hold pressure during fracturing operations, then completely disintegrate in the well when exposed to produced fluids to prevent production blockages and eliminate debris. IN-Tallic balls are stronger than composite frac balls and can withstand higher pressures without deformation, enabling a larger ID through the plug.

SHADOW frac plugs are run in hole on wireline and are set in sequence along the lateral section of the wellbore to isolate zones for treatment, just like composite plugs. The plugs can be set with our field-proven E-4™ setting tool, which has been deployed in thousands of wells. Initial access to the reservoir is created using our Alpha™ sleeve pressure-actuated valve, rather than a perforating gun run in on coiled tubing.

Zones can be independently treated after dropping an IN-Tallic frac ball to seal off the plug. Multiple plugs can be run to isolate multiple zones, and commingled testing and production of zones both above and below the plug can occur once a higher pressure differential from below is established. Flowing back after treatment is not hindered due to the SHADOW plug’s enlarged ID.

Applications
- Unconventional oil and gas wells
- Staged plug-and-perf completions
- Horizontal wellbores
- Extended-reach wellbores

Features and Benefits
- Large flow-through ID
  - Allows production without post-frac intervention
  - Permits flowback after zone treatment
- No coiled tubing intervention
  - Lessens the amount of time spent on location
  - Reduces completion costs
  - Allows plugs to be set deeper in horizontal sections
  - Lets operators develop remote reservoirs where it may be difficult to procure a CT unit
- IN-Tallic disintegrating frac balls
  - Assure flow before or shortly after the well is put on production
  - Enable fracturing of more stages at higher pressures
  - Allow a larger ID through the plug
- Antirotation clutching feature
  - Maximizes removal efficiency if milling is required
Because the plugs stay in the well, they are ideal for extended wellbores and for developments in remote locations where it may be difficult to procure a CT unit. And SHADOW plugs can be set in horizontal sections deeper than the reach of CT, allowing operators to expose more of the reservoir to the wellbore and maximize access to their pay zones.

Contact your local Baker Hughes representative today or visit bakerhughes.com/SHADOW to learn more about how our SHADOW frac plug can eliminate intervention and save you USD 150,000 on your next plug-and-perf well.

<table>
<thead>
<tr>
<th>Material Number</th>
<th>Casing</th>
<th>Tool</th>
<th>Differential Pressure</th>
<th>Temperature Range</th>
<th>Frac Ball Size (in.)</th>
<th>Setting Tool Size</th>
<th>Shear Force</th>
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*To be commercialized in late Q2 2014

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