

# TrueStage power charges

## Enable simple, reliable, and consistent plug setting

For over 70 years, Baker Hughes set the standard on setting tools and power charges. Our technology was the foundational system on which all others were based largely because of our reliability for setting packers and plugs via wireline.

Now, Baker Hughes introduces a range of **TrueStage™ power charges**, the next-generation technology engineered to facilitate a simplified solution for reliable initiations with easy clean-up, and is compatible in multiple sizes.

Often times, conventional power charges can misfire and discharge inconsistently, requiring additional intervention operations to remove the malfunctioning or stuck components. TrueStage power charges include a secondary, embedded igniter that eliminates misfires and ensures reliable initiation. The main load compound generates enough gas force to fully set plugs and shear tools, reducing the need for wireline intervention. In addition, centralizers placed on the housing ensure consistent alignment and placement.

When deployed in horizontal laterals, traditional power charges face unique challenges. Certain compounds melt at high temperatures, leaving voids or coving the top of the secondary, both of which can result in the power charge burning inconsistently or not at all. Baker Hughes's proprietary compound cures into a solid which remains fully stable and stays hard, even at temperatures up to 400°F (204°C), delivering dependable initiations and avoiding issues associated with high temperature seepage. The uniform, high-energy formulation generates accurate, consistent burn rates for reliable set and shear times, eliminating potential errors from wireline companies such as premature pull-out or costly nonproductive time (NPT) spent looking for a burn event that has already happened.

With a universal compound, TrueStage power charges are designed for reliable and consistent burning in a full range of setting tools. The standard charge can be deployed in both #10 and #20 **E-4™ setting tools**. This feature reduces

### Application

Setting frac plugs in plug-and-perf operations

### Benefits

- Provides consistent burn times for reliable setting and shearing
- Maximizes the complete burn and provides reliable initiation with embedded secondary igniters
- Universal compound provides consistent burning across all standard, compact, disposable and shorty TrueStage charges
- The standard charge serves as a direct replacement for both #10 and #20 standard power charges in frac applications
- Reduces field errors and minimizes inventory with a standardized tube size
- Retains excellent thermal stability up to 400°F

inventory and clean-up requirements. The combustible tube burns neatly, reducing downtime, and increasing crew efficiency associated with cleaning. The single-sized tube also mitigates field errors to help further reduce NPT.

Contact your Baker Hughes representative today or visit [bakerhughes.com](http://bakerhughes.com) to find out how TrueStage power charges can simplify your operations for reliable and consistent plug setting.

## Preliminary performance

<b>Maximum Output</b>	60,000 lb force at 7-in. stroke in #20 E-4 at 15,000 psi (103 MPa) hydrostatic
	35,000 lb force at 6.2-in. stroke in #10 E-4 at 15,000 psi (103 MPa) hydrostatic
	55,000 lb force at 10-in. stroke in 3 <sup>5</sup> / <sub>8</sub> -in. Compact at 15,000 psi (103 MPa) hydrostatic
	55,000 lb force at 9.6-in. stroke in 3.5-in. Shorty Setting Tool at 15,000 psi (103 MPa) hydrostatic
<b>Temperature rating</b>	400°F (204°C)
<b>Lab Testing</b>	50+ tests
	5 second standard deviation on ignition/build times, <5% variance on peak pressures
<b>Field Testing</b>	Significant field history with no failures 23-second average set time with 6 seconds standard deviation
<b>UN Classification Code</b>	1.4S – EX2018112015, UN 6d



TrueStage power charges deliver a cleaner burning formula, resulting in a fine powder residue that is easier to clean and omits the need for harsh solvents, reducing health, safety and environmental risks.

**Baker Hughes** 