



GasGun™ News

J Integral Engineering, Inc.

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Thank You...

We would like to offer our sincere thanks to the many well owners who have stuck with us over the years, even when GasGun treatments did not always go perfectly, and who have shared their production results and ideas for improvements. We also owe a debt of gratitude to the many individuals at our wireline partners who have worked many hours under tough field conditions to bring the GasGun technology to this industry. Their persistence, feedback, and suggestions on our various designs have proved essential in perfecting this device. We couldn't have done this without their help.

New GasGun™ Design Solves Debris Problems

Additional benefits include more consistent results, higher pressure and temperature specs, and improved fielding accuracy and efficiency

After two years of research, design, and testing, we are proud to announce that the GasGun has been totally redesigned. The new design has eliminated debris problems associated with the old expendable rubber-canister, has nearly eliminated all wireline damage and cases of being stuck in the well, improves the propellant burning process for a more uniform stimulation, and provides greater pressure and temperature capabilities.

Over the last few years, we have had extensive feedback from operators who are very pleased with the performance of the GasGun and its ability to stimulate their production and injection wells but who have often struggled with the rubber and plastic debris left downhole after the treatment. The challenge was to find a way to enclose the same highly energetic solid propellant in a sealed carrier that does not impede the rapid expansion of the propellant gases and is completely retrievable.

The schematic shows how this feat was accomplished. The new design uses a custom ported 3³/₈" O.D. high-strength hollow-steel carrier. The ports are sealed with thin plastic port plugs which provide pressure and temperature ratings of up to 4000 psi and 280 °F. When the tool is ignited, the port plugs blow out and the propellant gases exit the portholes. The plastic plugs break apart in the wellbore preventing them from getting stuck around the carrier. The entire carrier is retrieved from the well and is reusable. U.S. and Canadian patents on this design are pending.

Since the new design is based on a standard 3³/₈" perforating gun carrier, it is completely compatible with standard casing collar locators (CCL) and other typical oil field equipment. The ability to use a CCL with the GasGun makes it easy to locate the tool precisely, which is essential to a successful stimulation. This also means that the new design can be tubing conveyed when necessary, and plans are being made to stimulate two horizontal wells using a standard pressure-activated firing head.

We have fielded over two hundred of these new tools over the last few months with outstanding results. We have run junk baskets with gage rings to look for debris, but have found none. Wireline operators love the new design; they tell us that it is very easy to run and that they almost never have any damage to wireline or other equipment. As a result, on-site efficiency has been greatly improved, and operators are able to get their wells on production quickly, saving both time and money. Best of all, operators are reporting production increases that are better than ever. This is likely a result of improvements we made to the ignition system that produces a more uniform and consistent propellant burn.

If you have not yet tried the new GasGun, or if you had problems in the past, you owe it to yourself to take another look at this innovative and economical stimulation method. Our prices have not changed. Please call us to discuss your particular needs.



GasGun™ Being Used As Formation Evaluation Tool

Most operators use the GasGun as a direct stimulation tool for their production and injection wells. It has been used to stimulate low permeability reservoirs and to overcome wellbore damage caused by cement, acids, drilling fines, and perforators. In many cases, operators follow a GasGun treatment with acid, using the fractures created as a pathway to get the acid into the zone of interest. In some cases, operators use the GasGun as a pre-treatment for hydraulic fracturing since treating pressure are often dramatically reduced.

Recently, some operators have been reporting that they are using a GasGun stimulation as a tool for evaluating the potential production of a particular formation. Since GasGun fractures are known to reach out past near-bore damage, production data after stimulation can tell the operator if

further treatments are justified. If significant production increases are achieved after a GasGun stimulation, some operators will decide to invest in, say, a hydraulic fracture treatment or possibly in horizontal drilling. If, on the other hand, production does not increase significantly, they may decide not to spend additional money on that formation.

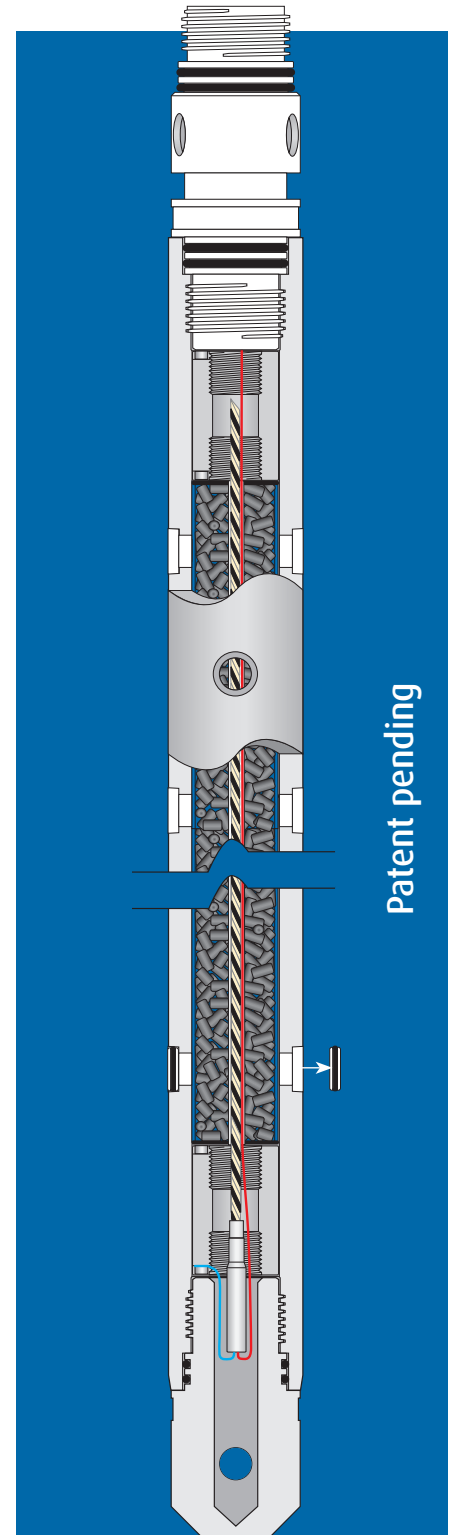
The GasGun is an economical stimulation method, and operators continue to demonstrate great creativity in its applications. We are indebted to the many operators who have shared this kind of information with us and have allowed us to pass the ideas along to our other customers.



Not All Propellant Stimulations Are Created Equal

An operator who has fielded 27 of our new GasGun tools in 14 wells in East Texas this year decided to try using another propellant stimulation device for comparison purposes. Even though their success rate with the GasGun was 70%, by their estimation, they were planning on treating a great many more wells and felt that the information was worth the price for future planning. The competitor's product that was selected is marketed and fielded by a major wireline service company. After stimulating four wells

with the competitor's device with no success, the operator decided that all remaining wells in this field would be stimulated with the GasGun. For more detailed information on these stimulations, look in the "Recent Field Results" section of this newsletter for the Woodbine sandstone.



TOOL SPECS:

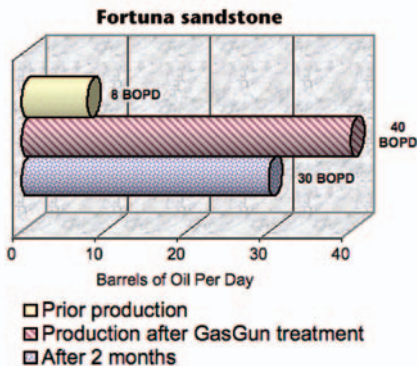
Diameter: 3³/₈ inches (86 mm)
 Length:* 1 - 20 feet (0.5-6 meters)
 Max Temperature: 280 °F (138 °C)
 Max Pressure: 4000 psi (276 bars)

* 20 feet is the maximum length that can be fielded in a single run.

Recent Field Results

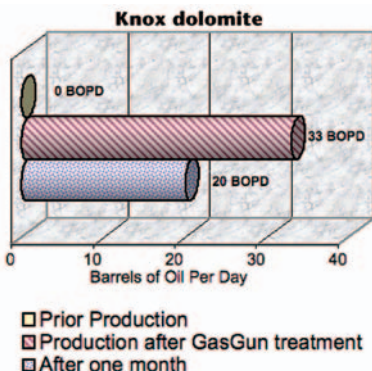
State: Oklahoma
Formation: Fortuna sandstone
Prior Production: 8 BOPD
After Stimulation: 40 BOPD
After 2 months: 30 BOPD

In December 2004, an oil well in Caddo County, Oklahoma, was stimulated with a 4 foot GasGun. This well is a cased hole completion in the Fortuna sandstone formation at a depth of 2042 feet. Oil production immediately increased from 8 to 40 BOPD and continued at that level for 30 days. Production decreased to 30 BOPD for the next 60 days and has leveled off at 10 BOPD.



State: Kentucky
Formation: Knox dolomite
Prior Production: 0 BOPD
After Stimulation: 33 BOPD
After one month: 20 BOPD

In October 2004, a well in Adair County, Kentucky, was stimulated with a 12 foot GasGun. This well was completed open hole in the Knox dolomite formation at a depth of 1388 feet. The well was drilled in 1994 and originally produced 90 BOPD, but then went to water. The operator did a cement squeeze to shut off the water, but was unable to get the well to produce again. They decided to try a GasGun to help them break past the suspected cement invasion into the formation. Immediately after the GasGun treatment the well went from 0 to 33 BOPD. After one month, production leveled off at 20 BOPD.



State: Ohio
Formation: Rose Run sandstone
Prior Production: 0.75 BOPD
After Stimulation: 8 BOPD

In April 2005, a well in Perry County, Ohio, was stimulated with a 10 foot GasGun. This well is a cased hole completion in the Rose Run sandstone formation at a depth of 5297 feet. The operator suspected the formation was glazed due to a downhole fire and was producing just ¾ BOPD. After the GasGun stimulation the well produced 8 BOPD.

State: Texas
Formation: Woodbine sandstone
Prior Production: 0 (wells pump off)
After Stimulation: 9 of 13 are now able to produce

Starting in March 2005, a series of 13 wells in Titus County, Texas, were stimulated with the GasGun. These wells are all cased hole completions in the Woodbine sandstone formation at an average depth of 3500 feet. The operator has more than 100 wells in the area, most of which have been shut-in since the mid-1990's. The operator chose to make the GasGun and another competing propellant stimulation tool a part of their recompletion program. Prior to any stimulation the wells would just pump-off very quickly making them uneconomical to operate. 9 of the 13 wells treated with the GasGun have allowed the operator to keep the wells on pump and they are "very pleased" with the wells' level of production. The operator also tried a competing propellant stimulation tool in 4 wells out of the same field and had no improvement in production from any of those treatments.

State: Oklahoma
Formation: Bartlesville sandstone
Prior Production: 3 BOPD & 25 MCF/D
After Stimulation: 15 BOPD & 100 MCF/D

In July 2004, a well in Creek County, Oklahoma, was stimulated with a 2 foot GasGun. This well is a cased hole completion in the Bartlesville sandstone formation at a depth of 2310 feet. After the GasGun stimulation and a small 4000 lb frac, the well's production increased from 3 BOPD and 25 MCF to 15 BOPD and 100 MCF.

State: Kansas
Formation: Arbuckle dolomite
Prior Production: 1-2 BOPD
After Stimulation: 40 BOPD
Sustained: 8 BOPD

In May 2004, a well in Barber County, Kansas, was stimulated with a 10 foot GasGun. This well is a cased hole completion in the Arbuckle dolomite formation at a depth of 3369 feet. Prior oil production was 1-2 BOPD. For a few days after the GasGun stimulation the well had some flush production of 40 BOPD. The well then leveled off at 8 BOPD.

Country: Croatia, Europe
Formation: Sandstone
Formation Depth: 1539-1559 Meters
Prior Production: 1 m³/d (6.3 BOPD)
After Stimulation: 4.2 m³/d (26.4 BOPD)
After two months: 2.9 m³/d (18 BOPD)

In October 2004, a well located in Croatia was stimulated with multiple GasGuns. This well is a cased hole completion with 3 sandstone intervals that were re-perforated and stimulated with the GasGun. A 2 meter (6.6 feet) GasGun was shot at a depth of 1559 meters (5115 feet), a second 2 meter was shot at 1555.5 meters (5103 feet), and finally a 3 meter (10 feet) was shot at 1539 meters (5049 feet). Prior to the GasGun stimulations the well was producing approximately 1 m³/day (6.3 BOPD). Immediately after the stimulation, the well produced 4.2 m³/day (26.4 BOPD). The well's production stabilized at 2.9 m³/day (18 BOPD). Analysis showed that total remaining recoverable oil prior to the GasGun would have been approximately 400 m³ (2516 bbl). After the GasGun, remaining recoverable oil is expected to be 3800 m³ (23,900 bbl).

State: Oklahoma
Formation: Dutcher sandstone
Prior Production: 3 BOPD @ 150psi
After Stimulation: 13 BOPD @ 600psi

In June 2005, a new well in Seminole County, Oklahoma, was stimulated with a 4 foot GasGun. This well is a cased hole completion in the Dutcher sandstone formation at a depth of 2686 feet. The initial production of 3 BOPD at 150 psi was unsatisfactory to the operator. They decided to try a GasGun followed by a small acid job. After the treatment the well came in at 13 BOPD at 600 psi.

More results available at www.TheGasGun.com.



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