



Improving Perforating Gun Reliability

HOW FACTORY ASSEMBLY REDUCES WELLSITE FAILURES

Equipment failures at the wellsite are costly—in terms of dollars, lost time and reputation. Assembling perforating guns onsite creates an environment fraught with opportunities for failure. Whether it's time pressure from the operator to run in hole, bad weather, middle-of-the-night operations, or a novice crew, these complicating factors can create a loss of control, resulting in mistakes that impact job performance.

The DynaStage™ perforating gun system is designed to minimize the amount of assembly, configuration, and testing on location. The system—from the gun carrier to the detonator, to the shaped charges and everything in between—is designed and quality controlled by DynaEnergetics.



PROVEN MANUFACTURING PROCESSES HELP MINIMIZE OPERATIONAL HEADACHES

Excellence in perforating system manufacturing requires:

- A purposefully designed, tested, verified, and qualified perforating system down to each component
- A well-designed supply chain
- Certified assembly personnel
- Dedicated gun loading and quality control facilities
- Warehousing and explosive storage facility
- Dedicated transport logistics for moving explosives and delivering loaded guns to the wellsite

Assembled and tested by certified technicians at DynaEnergetics' ISO 9001-compliant facilities, each DynaStage system is factory-assembled, rigorously inspected, and function-tested before it is delivered to the wellsite. The result is a highly controlled process that produces a superior perforating gun with unmatched performance, component compatibility, and system reliability.

This approach removes the need for wireline companies to build expensive manufacturing facilities and complex processes and logistics networks, allowing them to put the focus back where it should be—reducing costs, maximizing resources, and improving wellsite results.

SIMPLIFYING WELLSITE PROCEDURES

Knowing that each touchpoint introduces more opportunity for error, the DynaStage system is designed to minimize the amount of assembly, configuration, and testing that is required on location. With factory-assembled guns, wellsite procedures are as simple as installing the intrinsically safe plug-and-go detonator, testing the system, and running downhole.

This seamless installation eliminates the risk of human error from a pinched or poorly crimped wire. DynaStage's simple design delivers performance benefits by reducing the chance of a misfire and drastically lowers gun failure rates downhole.

The truly modular design allows each component, as well as the entire detonation system, to be tested to ensure optimal reliability. Since assembly and testing averages one minute per cluster, invisible lost time is drastically reduced on surface and more fracturing stages can be completed each day. Achieving greater efficiency in perforating systems can also lower overall completion costs—particularly in long, horizontal wellbores in unconventional plays.

RELIABILITY DRIVES WELLSITE PERFORMANCE

With a lower rate of wellsite failures, the DynaStage system has been shown to reduce completion times by an average of 32 minutes per stage compared to conventional perforating systems. Perforating systems using resistorized detonators have failure rates as high as 2%, meaning that a wireline misrun or misfire can occur at an unacceptable rate of once every 50 runs. The DynaStage system, leveraging the factory-assembled approach, has a field efficiency rate in excess of 99.9% that continues to increase.

SUMMARY

DynaStage factory-assembled, performance-assured™ perforating guns are designed for wireline operators who want to deliver the best possible wellsite experience to operators. We have designed a tightly controlled, efficient manufacturing process for building a high-quality perforating system. These benefits are realized every day as wireline operators deliver simple, safe, and reliable perforations shot by shot, stage by stage, and well by well.