

Frac Optimized Perforating Shaped Charges

PERFORATE WITH THE ORIGINAL CONSISTENT HOLE SIZE CHARGE DESIGNED FOR FRACTURING

ACHIEVING STRONG PERFORMANCE WITH MAXFORCE®-FRAC AND FRACJET RANGES OF PERFORATING CHARGES

The Halliburton portfolio of frac optimized shaped charges deliver superior consistent holes by providing reduced variance from shot to shot, regardless of fluid clearance and decentralization. Fracture initiation is dominated in the near-wellbore region by localized stress fields. Achieving consistent holes on both the upper and lower sides of the well ensures that the initial reservoir breakdown has the greatest chance of creating the most efficient, evenly distributed fractures.

FEATURES

- » Unparalleled experience backed by the industry-leading testing and research team at the Jet Research Center's (JRC's) Perforating Center of Excellence
- » Qualification testing to the most rigorous standard in the industry
- » Field-confirmed results, using downhole camera studies of actual onshore hydraulic fracturing wells in the U.S.

BENEFITS

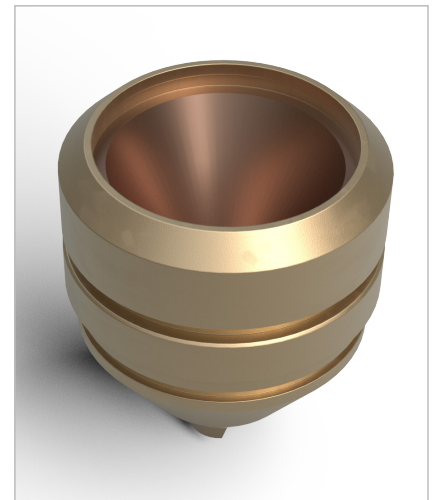
- » Improved fluid and proppant distribution
- » Increased likelihood of efficient fracture initiation
- » Reduced near-wellbore tortuosity
- » More effective diversion during stimulation
- » Greater stimulated reservoir volume

Charge Performance Verified by Operator's Downhole Camera Studies*

	Gun System	Casing	Dataset	Results (Average)
Horizontal Well, Permian Basin Downhole Camera Data	3½-inch 6spf c/w 230 MaxForce®-FRAC RDX	5½-inch 23ppf P-110 Casing	6x Clusters 36 Shots Total	EHD: 0.39 in. EHV: 5.5%
JRC "Barrel" Test Results			Cement-Backed Barrel Test 18 Shots Total	EHD: 0.40 in. EHV: 5.9%

* Downhole camera study data shown at bottom of the next page

<2.4%
VARIANCE
IN CASING
Entrance Hole



FracJET Perforating Charges

Gun Size (in.)	Charge Name	Explosive Load (g)	Explosive Type PN	Target Casing Specifications	EHD	EHV
3 3/8-inch 6spf 60°	FracJET 35	21	RDX-103002358	4 1/2-inch 13.5ppf P-110	0.37	7.1%
				5 1/2-inch 20ppf P-110	0.35	2.55%
				5 1/2-inch 23ppf P-110	0.35	3.37%
	FracJET 36	21	HMX-103002357	5 1/2-inch 20ppf P-110	0.35	3.3%
				5 1/2-inch 23ppf P-110	0.36	5.3%
				FracJET 39	21	PETN-102771488
FracJET 39	21	PETN-102771488	5 1/2-inch 23ppf P-110	0.39	10.8%	
			FracJET 39	21	PETN-102771488	5 1/2-inch 23ppf P-110

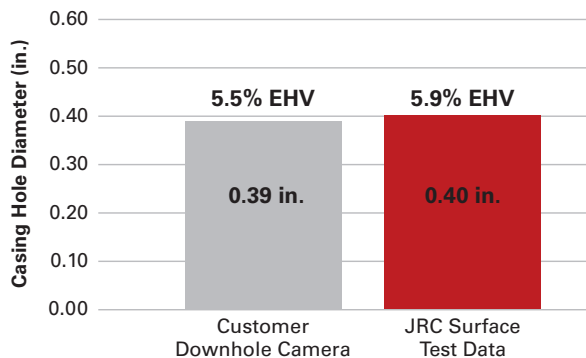
Available for select VELOCITY™ modular gun systems and conventional gun systems

MaxForce®-FRAC Perforating Charges

Gun Size (in.)	Charge Name	Explosive Load (g)	Explosive Type PN	Target Casing Specifications	EHD (in.)	EHV
2 3/4-inch 6spf 60°	150 MaxForce®-FRAC	15	RDX-102745134	4 1/2-inch 13.5ppf P-110	0.35	2.4%
			HMX-102740045	4 1/2-inch 13.5ppf P-110	0.35	2.4%
3 1/8-inch 6spf 60°	230 MaxForce®-FRAC	23	RDX-102736069	4 1/2-inch 13.5ppf P-110	0.41	2.3%
			HMX-102732983	5 1/2-inch 23ppf P-110	0.40	5.9%
				4 1/2-inch 13.5ppf P-110	0.42	3.0%
	210 MaxForce®-FRAC	21	RDX-102045430	4 1/2-inch 11.7 L-80	0.46	4.7%
			HMX-102127122	5 1/2-inch 23ppf P-110	0.43	11.7%
				4 1/2-inch 11.7 L-80	0.49	5.8%
3 3/8-inch 6spf 60°	230 MaxForce®-FRAC	23	RDX-102736069	5 1/2-inch 23ppf P-110	0.40	3.5%
			HMX-102732983	5 1/2-inch 23ppf P-110	0.40	4.3%
	210 MaxForce®-FRAC	21	RDX-102045430	5 1/2-inch 17ppf L-80	0.43	13.1%
			HMX-102127122	5 1/2-inch 17ppf L-80	0.45	11.7%

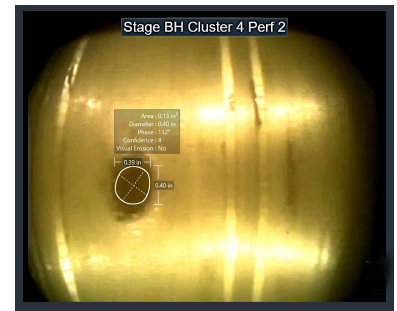
Available for select VELOCITY™ modular gun systems and conventional gun systems

Downhole Camera Study*



Surface Testing Represents Downhole Results

- » EHD within 2.5% of Surface Test
- » Better entrance hole variance (EHV) downhole compared to surface



PRODUCT SALES, RESEARCH, TESTING, AND MANUFACTURING FACILITY



JET RESEARCH CENTER®

8432 South I-35W, Alvarado, Texas 76009-9775 USA | +1.800.451.5403 | +1.817.761.2000 | jetresearch.com

Sales of Jet Research products will be in accord solely with the terms and conditions contained in the contract between Jet Research and the customer that is applicable to the sale. H012794 JRC 03/2021 © 2021 Jet Research Center. All Rights Reserved.