

KnockOut® Circulation Charges

Titan Division | Energetics

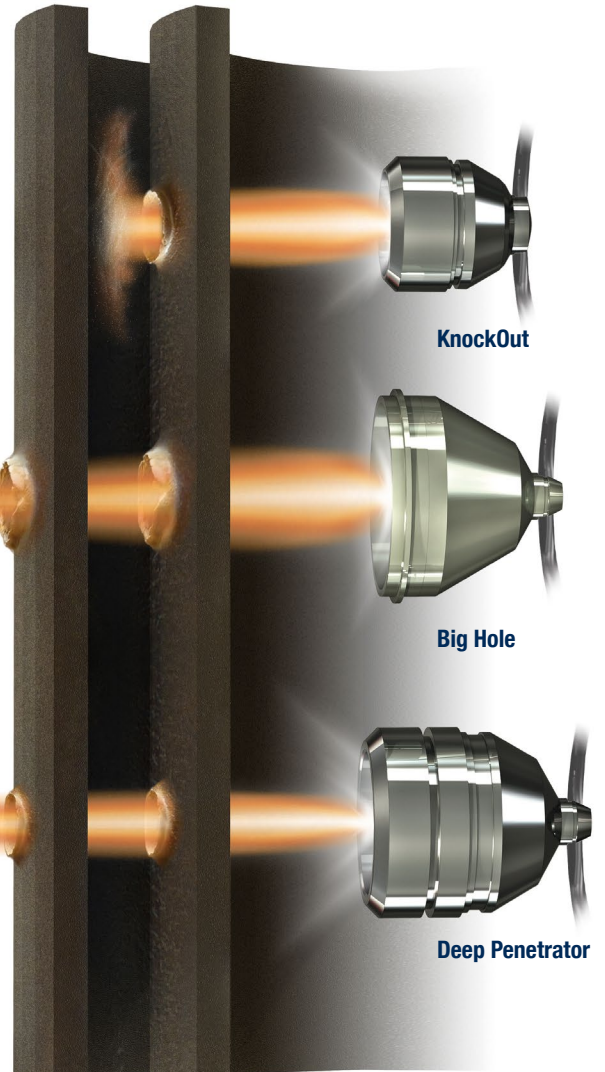
Hunting’s KnockOut® Circulation Charges minimize the collateral impact on the secondary string while maximizing hole size in the primary string. KnockOut Circulation Charges provide flow between two strings of tubing pipe.

Applications

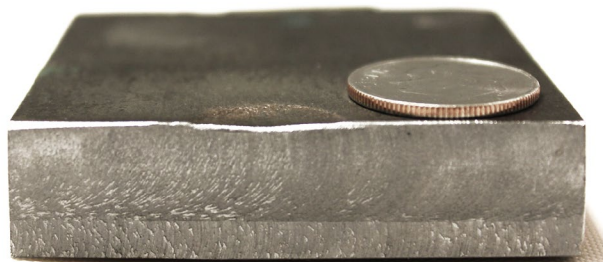
- Establish circulation within annulus
- Cement squeeze operations

Features and Benefits

- Maximized exit hole diameter
 - Minimal casing integrity loss from colateral impact
- Variety of perforating gun sizes
 - Good communication and ease of fluid/ cement circulation



60% improvement over previous circulating charges



Tested for minimal impact at 0.25 in. (6.35 mm) standoff

Maximize your flow. Minimize collateral impact.

Specifications

Charge Part Number	Explosive Weight (g)	Explosive Type	Shot Density (SPF)[SPM], Phasing	Exit Hole (in)[mm]	L-80 Wall Thickness (in)[mm]	Impact to Secondary String with 0.25" Water Clearance (in)[mm]
KnockOut® Circulating Charge Performance						
1-3/8 in. (35 mm) Scalloped Hollow Carrier Gun, 4 SPF (13 SPM)						
CIR-1302-3T251	1.8	RDX	4 [13], 0°	0.30 [7.6]	0.25 [6.35]	0.01 [0.25]
CIR-1302-4T251	1.8	HMX	4 [13], 0°	0.30 [7.6]	0.25 [6.35]	0.01 [0.25]
CIR-1302-3T381	1.8	RDX	4 [13], 0°	0.25 [6.4]	0.38 [9.53]	0.01 [0.25]
CIR-1302-4T381	1.8	HMX	4 [13], 0°	0.25 [6.4]	0.38 [9.53]	0.01 [0.25]
1-9/16 in. (40 mm) Scalloped Hollow Carrier Gun, 4 SPF (13 SPM)						
CIR-1603-3T251	3.0	RDX	4 [13] or 6 [20], 0°	0.43 [10.9]	0.25 [6.35]	0.02 [0.51]
CIR-1603-4T251	3.0	HMX	4 [13] or 6 [20], 0°	0.43 [10.9]	0.25 [6.35]	0.02 [0.51]
CIR-1603-3T381	3.5	RDX	4 [13] or 6 [20], 0°	0.37 [9.4]	0.38 [9.53]	0.02 [0.51]
CIR-1603-4T381	3.5	HMX	4 [13] or 6 [20], 0°	0.37 [9.4]	0.38 [9.53]	0.02 [0.51]
CIR-1603-3C501	3.2	RDX	4 [13] or 6 [20], 0°	0.33 [8.4]	0.50 [12.7]	0.04 [1.01]
CIR-1603-4C501	3.2	HMX	4 [13] or 6 [20], 0°	0.33 [8.4]	0.50 [12.7]	0.04 [1.01]
CIR-1603-3C631	3.5	RDX	4 [13] or 6 [20], 0°	0.22 [5.6]	0.63 [15.9]	0.03 [0.76]
CIR-1603-4C631	3.5	HMX	4 [13] or 6 [20], 0°	0.22 [5.6]	0.63 [15.9]	0.03 [0.76]
2 in. (51 mm) Scalloped Hollow Carrier Gun, 4 SPF (13 SPM)						
CIR-2107-3T251	7.0	RDX	4 [13] or 6 [20], 0°	0.62 [15.7]	0.25 [6.35]	0.07 [1.78]
CIR-2107-4T251	7.0	HMX	4 [13] or 6 [20], 0°	0.62 [15.7]	0.25 [6.35]	0.07 [1.78]
CIR-2107-3T381	7.0	RDX	4 [13] or 6 [20], 0°	0.61 [15.5]	0.38 [9.53]	0.04 [1.01]
CIR-2107-4T381	7.0	HMX	4 [13] or 6 [20], 0°	0.61 [15.5]	0.38 [9.53]	0.04 [1.01]
CIR-2107-3C501	7.0	RDX	4 [13] or 6 [20], 0°	0.45 [11.4]	0.50 [12.7]	0.02 [0.51]
CIR-2107-4C501	7.0	HMX	4 [13] or 6 [20], 0°	0.45 [11.4]	0.50 [12.7]	0.02 [0.51]
CIR-2107-3C631	7.0	RDX	4 [13] or 6 [20], 0°	0.35 [8.9]	0.63 [15.9]	0.05 [1.27]
CIR-2107-4C631	7.0	HMX	4 [13] or 6 [20], 0°	0.35 [8.9]	0.63 [15.9]	0.05 [1.27]

All KnockOut Circulating Charges are manufactured with RDX or HMX explosives.
HNS available upon request.

**For more information contact your Titan Division sales representative today!
Or visit us at: www.hunting-intl.com/titan**

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