

Chemical Cutter

Chemical cutters eject a circular stream of bromine trifluoride (BrF₃) to dissolve pipe with a clean cut that leaves no debris and does not require milling prior to pipe retrieval. Built-in flexibility allows the tool to be adapted for many special cutting applications where other cutting methods may be ineffective or undesirable.

Chemical cutters provide a clean pipe cut. Chemical cutters can also shorten operating time and reduce rig costs by eliminating the flare associated with explosive cutters and the related need to dress flares with a mill run before fishing operations can start.

Additionally, chemical cutters can be used to release specially designed permanent packers such as Halliburton's AHR™ cut-to-release packer. They can be used to cut pipe and casing during plug and abandonment operations, sever duplex-22 nickel/chromium tubing or other high-grade tubulars for salvage or reuse, and replace or retrieve old or deteriorating pipe in environmentally sensitive areas.

Applications

- Re-establishing circulation during drilling operations by chemically punching drill collars or heavy weight pipe
- Removing metal restrictions blocking the well in open or cased holes with downward chemical junk shot

- Cutting drillpipe after freepoint and backoff operations when sensitive washover and fishing operations are anticipated
- Cutting large pipe (7-in. or larger OD) utilizing a special wagon wheel configuration
- Using chemical cutter/tubing hanger combination in high pressure situations when normal operations may cause pipe to drop after being cut
- Cutting standard-diameter pipe through normal restrictions
- Shooting large holes in tubulars for gravel pack production
- Can pass through normal restrictions and still make a clean cut on standard size tubulars below the restriction
- Performs under a wide range of temperatures, pressures, and depths
- Produces no debris or drillpipe deformation which might require milling
- Does not damage adjacent string during cutting
- Severs pipe flare-free for retrieval through a packer or other restriction
- Does not change ID or OD of the cut

Chemical cutters require the following inputs or samples to perform properly:

- Well sketch
- Type of pipe to be cut (ID, OD, metal composition, any plastic coatings)
- Any other restrictions or problems
- Temperature and pressure at cutting depth
- Type of fluid in the well, including any solvents or paraffins in the well
- Any other ID restrictions above the depth to be cut
- Capable of cutting high-grade tubulars
- Specially designed slip assembly maintains mechanical tool stability and helps ensure that pieces of metal are not ejected from the tool in case of accidental firing
- Manufacture from high-grade, heat treated steel that will not rupture even if tool is accidentally fired at the surface
- Unique safety sleeve that virtually eliminates possibility of exposing the cutting head to operators and equipment

Features

- Standard cutting head sizes from 0.75-in. to 5.5-in. OD
- Unique holddown system to centralize the tool for even cuts without damaging pipe
- Deployment via electric wireline, coiled tubing, rigid tubing, or slickline
- Guiding rope system that helps ensure personnel are always at a safe distance from the tool when it is being placed into or removed from the well
- Safety features based on worst-case scenarios and tested under actual conditions to help provide quick responses to any situation

Caution: Prior to every chemical cutter job, Halliburton strongly recommends checking for restrictions in the well by performing a gauge run and string shot.

Halliburton's chemical cutter supplier is Pipe Recovery Systems Inc. (PRS).

Selection Guide for Coiled Tubing Chemical Cutter

Tool Specifications		Coiled Tubing Specifications		
Tool Size in. (Anchor And Sev Head)	Max. Extension of Wedges/Slips in.	OD in.	ID in.	Weight lb/ft
*11/16	0.92	1	0.782 - 0.810	0.918 - 1.037
*3/4	1.05	1	0.826 - 0.866	0.688 - 0.848
*13/16	1.09	1 1/4	0.938 - 1.076	1.081 - 1.823
*7/8	1.11	1 1/4	1.032 - 1.076	1.081 - 1.328
*15/16	1.15	1 1/4	1.100 - 1.116	0.840 - 0.941
*1	1.33	1 1/2	1.188 - 1.282	1.619 - 2.239
*1 1/16	1.35	1 1/2	1.188 - 1.282	1.619 - 2.239
*1 1/8	1.42	1 1/2	1.282 - 1.334	1.256 - 1.619
*1 3/16	1.51	1 3/4	1.374 - 1.500	2.169 - 3.136
*1 1/4	1.61	1-3/4	1.400 - 1.532	1.910 - 2.944
1 3/8	1.80	2	1.594 - 1.688	3.072 - 3.896
1 1/2	2.04	2	1.732 - 1.782	2.201 - 2.671
1 11/16	2.20	2 3/8	1.969 - 2.025	4.112 - 4.709
1 7/8	2.55	2 3/8	2.063 - 2.157	2.638 - 4.709
2 1/8	2.60	2 7/8	2.469 - 2.563	4.530 - 5.793
2 5/8	3.35	3 1/2	3.094 - 3.150	6.215 - 7.148

* Denotes wedge type anchor

Selection Guide for CS Hydril Tubing 1.050 - 1.660 OD

Tool Specifications in.		Tubing Specifications		
Tool Size (Anchor And Sev Head)	Max. Extension of Wedges/Slips	OD in.	ID in.	Weight lb/ft
*11/16	0.92	1.05	0.824	1.200
*3/4	1.05	1.315	0.957	2.250
*13/16	1.09	1.315	1.049	1.800
*1 1/16	1.35	1.660	1.278	3.020
*1 3/16	1.51	1.660	1.380 - 1.410	2.100 - 2.400

* Denotes wedge type anchor

Selection Guide — Tubing for D/A Chemical Cutter

Tool Specifications		Tubing Specifications		
Tool Size (Anchor And Sev Head) in.	Max. Extension of Wedges/Slips in.	OD in.	ID in.	Weight lb/ft
1 3/8	1.80	1.90	1.500 - 1.650	2.40 - 3.64
1 1/2	2.04	2 1/16	1.670 - 1.751	3.25 - 3.40
		2 3/8	1.703 - 1.995	4.70 - 7.70
1 9/16	2.10	2 3/8	1.853 - 1.995	4.70 - 6.20
1 11/16	2.20	2 3/8	1.939 - 1.995	4.70 - 5.30
1 3/4	2.50	2 7/8	2.059 - 2.441	6.50 - 10.70
1 7/8	2.55	2 7/8	2.059 - 2.441	6.50 - 10.70
2	2.58	2 7/8	2.195 - 2.441	6.50 - 9.50
2 1/8	2.60	2 7/8	2.323 - 2.441	6.50 - 7.90
2 E.R.	2.85	3 1/2	2.480 - 2.750	12.95 - 16.70
2 1/8 E.R.	3.10	3 1/2	2.480 - 2.992	9.30 - 16.70
2 3/16	3.10	3 1/2	2.480 - 2.992	9.30 - 16.70
2 1/4	3.15	3 1/2	2.602 - 2.992	9.30 - 15.50
2 3/8	3.25	3 1/2	2.602 - 3.068	7.70 - 15.50
*2 5/8	3.35	3 1/2	2.922 - 3.068	7.70 - 10.30
*2 7/8	3.65	4	3.240 - 3.476	11.00 - 15.70
*3 1/8	3.92	4	3.340 - 3.548	9.50 - 14.00
*3 1/4	4.04	4 1/2	3.640 - 3.958	12.60 - 20.00
*3 3/8	4.16	4 1/2	3.697 - 4.000	11.60 - 17.70
*3 1/2	4.28	4 1/2	3.826 - 4.090	9.50 - 15.50
*3 5/8	4.40	4 1/2	3.920 - 4.090	9.50 - 13.50
*3 7/8	4.68	5	4.154 - 4.408	15.00 - 21.00
*4	4.80	5	4.276 - 4.560	11.50 - 19.50
*4 3/16	4.92	5 1/2	4.548 - 4.778	20.00 - 26.00
*4 7/16	5.14	5 1/2	4.670 - 4.950	15.50 - 23.00
*4 9/16	5.14	5 1/2	4.892 - 5.044	13.00 - 17.00
5 1/2	6.50	7	6.004 - 6.214	28.00 - 35.00
5 3/4	6.50	7	6.276 - 6.456	20.00 - 26.00
6 3/8	7.37	7 5/8	6.765 - 7.125	20.00 - 33.70

* 6-slip anchor only