Bakerline Series Completion Portfolio
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One-Trip Single-String Selective Completion
Reduce cost and time when running multizone selective completions

The Bakerline™ series one-trip single-string selective completion allows for a single-trip flanged-up completion using FH™ hydrostatic-set tubing retrievable packers along with sliding sleeves. The completion allows for commingling of zones or separate production, isolation, testing, or stimulation of individual zones. Selectivity is accomplished by opening and closing sliding sleeves between the packers. If hydrostatic-set packers are used, then each packer can be selectivity set and individually tested to ensure proper isolation between zones.

Contact your Baker Hughes representative today to learn more about using our Bakerline series one-trip single-string selective completion to reduce time and cost in your next multizone selective application.
Single-String Selective Completion

Reduce cost when running multizone selective completions

The Bakerline™ series single-string selective completion permits selective production, testing, stimulation, and isolation of various zones. The pictured hookup illustration to the left shows a completion using permanent or retrievable seal bore packers and locator tubing-seal assemblies. The use of seal bore packers is one method that allows perforating and testing of each zone as the well is completed progressively from the bottom up. Selectivity after completion is accomplished by opening and closing sliding sleeves between the packers. Blast joints located adjacent to producing zones resist the erosive forces of the produced fluids.

Contact your Baker Hughes representative today to learn more about using our Bakerline series single-string selective completion to reduce cost in your next multizone selective application.

Applications
- Multizone selective completions

Features and Benefits
- Seal bore packers are deployed sequentially on wireline or workstring in multiple trips
  - Allows individual packer testing and individual zone stimulation or testing
- Sliding sleeve
  - Allows selective production and zonal isolation

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The Bakerline™ series single-string seal bore packer completion is a common and simple means of completing a well with built-in versatility and flexibility. The tubing string can be positioned into the seal bore packer in two ways.

- A locator tubing-seal assembly provides a high-pressure seal between the packer and the tubing that allows upward movement of the seals during well operations. The inclusion of extra tubing-seal units below a locator, as shown in the hookup drawing to the left, compensates for tubing movement by traveling through the packer bore and the seal bore extension. The proper length of the seal bore extension required can be calculated using the TUBEMOVE™ program and considering all life-of-well activities.

- An anchor tubing-seal assembly can be used in place of the locator. The anchor attaches the tubing string to the packer, restricting motion of the seals and transmitting tubing forces through the packer to the casing. The anchor is released by right-hand rotation. The packer and tailpipe assembly are run in and set either on wireline or tubing with a setting tool. The use of a packer-attached tailpipe permits blanked-off retrieval of tubing (by blanking off at the nipple above perforated tube), eliminating possible formation damage due to kill fluids.

**Applications**
- Single-zone production

**Features and Benefits**
- Seating nipple
  - Prevents formation damage due to kill fluids by blanking off the tubing below the packer
- Locator seal assembly and seal bore extension
  - Reduces forces and stresses on the packer by allowing for tubing movement during stimulation or production phase
- Anchor tubing-seal assembly
  - Transfers the forces to the casing through the packer, reducing tubing forces and stresses
  - Eliminates tubing movement
- Sliding sleeve
  - Allows for fluid displacement and circulation above the packer
Both scenarios allow large, nonrestricted flow passages, through-tubing perforation under pressure for safety, and flanged-up displacement of well fluid through the sliding sleeve. Pressure and temperature recording instruments can be set in the lower seating nipple without restricting the flow path, at the same time protecting the instruments from flow turbulence and vibration. Flow couplings are recommended based on individual conditions.

Contact your Baker Hughes representative today to learn more about the reliable and flexible single-zone completion options offered by our Bakerline series seal bore packer completion.
Seal Bore Packer/Plug Completion
Protect your pay zone during workover operations

The Bakerline™ series seal bore packer/plug completion, featuring the L-10™ nipple and E-22™ anchor-system combination, used in conjunction with a seal bore packer, alleviates common problems associated with using blanking plugs in the tailpipe of packers.

This nipple/anchor combination converts a permanent or retrievable seal bore packer into a temporary bridge plug that is carried in and set on electric line or drillpipe in a single run. The system allows an operator a method of perforating and stimulating an upper zone while isolating a lower zone. The location of the setting nipple prevents the possibility of plugging the packer tailpipe with gun debris, stimulation settleings, or fill from upper zones.

Debris settling into the packer and tailpipe while the tubing is removed is a problem that is often encountered during workovers involving a seal bore packer. If using wireline-conveyed blanking plugs to control the well or protect the formation, recovery problems can be experienced due to the debris sticking or covering the plug. This results in lost productivity, added costs involved with removing the fill from above the plug, or extensive fishing operations to clear the wellbore.

Applications
■ Single-zone production

Features and Benefits
■ L-10 nipple and E-22 anchor system
  — Allow setting a wireline blanking plug in the L-10 nipple before removing the tubing, protecting the formation below
  — Ability to disconnect the tubing at the L-10 on-off tool
  — Facilitates workovers and completion changes above the packer
When a workover is required, a blanking plug is placed in the profile of the L-10 nipple to affect the well control before the tubing is removed. When the tubing is run back into the well, the sand can be washed away as the standard L-10 washover shoe is engaged, allowing the blanking plug to be easily removed with conventional methods.

Contact your Baker Hughes representative today to learn more about using our Bakerline series seal bore packer/plug completion to protect your pay zone during workover operations.
Economical Hydraulic-Set Liner Assembly
Minimize cost in less demanding applications

The Bakerline™ series economical, hydraulic-set liner hanger assembly is ideal for light to medium liner hanger applications in vertical to low deviation wells where reaming is not anticipated.

It features our Hyflo™ II hydraulic-set cone-type hanger with a multicone design that provides maximum bypass area while running in and circulating.

The C-2™ setting tool provides a reliable means of releasing from the liner after the hanger has been set. The C-2 tool incorporates packer setting dogs to set the packer when cementing operations are complete.

The setting tool is released after the hanger is set by rotating to the right, and then picking up to confirm release. Cement is pumped, followed by a pump-down plug which is displaced until it latches into the type 1 liner wiper plug attached to the bottom of the running string. Together, the pump-down plug and wiper plug continue to be displaced until reaching the type 2 landing collar. A double valve float collar provides a redundant set of check valves that prohibit fluid from re-entering the liner.

The Baker Hughes Hyflo™ III liner top packer provides a reliable seal at the liner top. It incorporates a one-piece seal element with bonded metal backups to prevent extrusion and provide protection from swab-off. This versatile, medium-duty, compression-set liner top packer is available with or without holddown slips.

Applications
- Conventional oil and gas
- Vertical wells
- Wells with low deviation

Features and Benefits
- Hyflo II liner hanger with multicone design
  - Provides maximum bypass area while running in and circulating
- C-2 liner setting tool with packer setting dogs
  - Provides means to run the liner to desired depth and apply set-down weight on the packer through simple operation
  - Ensures reliable operation with time-tested design
- Hyflo III liner top packer with one-piece seal and bonded metal backups
  - Provides protection from swab-off
  - Prevents extrusion
When the cement job is complete, the running string is picked up further to expose the spring loaded dogs on the C-2 setting tool. Set down weight is then applied to set the packer.

Contact your Baker Hughes representative to learn more about how our Bakerline series economical, hydraulic-set liner assembly can provide a reliable solution for light- to medium-duty applications.
The Bakerline™ series economical, hydraulic-set cemented liner hanger assembly is ideal for medium to heavy liner hanger applications in deep wells with medium to high deviation.

It features our HMC™ hydraulic-set cone-type hanger to provide dependable operation in scenarios where manipulation is not reliable. It has a staggered cone design which provides excellent bypass in set and run-in positions.

The C-2™ setting tool provides a reliable means of releasing from the liner after the hanger has been set. The C-2 tool incorporates packer-setting dogs to set the packer when cementing operations are complete.

Hydraulic pressure is applied to the cylinder by dropping a ball that lands in the type 2 landing collar, which sets the hanger. The baffle in the type 2 landing collar protects the float equipment from damage once the ball is expelled after hydraulically actuating the hanger. The setting tool is released after the hanger is set by rotating to the right, and it is picked up to confirm release.

Cement is pumped followed by a pump-down plug which is displaced until it latches into the type 1 liner wiper plug attached to the bottom of the running string. Together, the pump-down plug and wiper plug continue to be displaced until reaching the type 2 landing collar. A double-valve float collar provides a redundant set of check valves that prohibit fluid from re-entering the liner.

Applications
- Conventional oil and gas
- Deep liner applications
- Medium to highly deviated wells

Features and Benefits
- C-2 liner setting tool with packer-setting dogs
  - Provides means to run the liner to desired depth and apply set-down weight on the packer through simple operation
  - Ensures reliable operation with time-tested design
- HMC liner hanger with welded cone design
  - Provides excellent bypass in set and run-in positions
- Hyflo III liner top packer with one-piece seal and bonded metal backups
  - Provides protection from swab-off
  - Prevents extrusion
The Baker Hughes Hyflo™ III liner top packer provides a reliable seal at the liner top. It incorporates a one-piece seal element with bonded metal backups to prevent extrusion and provide protection from swab-off. This versatile, medium duty, compression-set liner top packer is available with or without holddown slips.

When the cement job is complete, the running string is picked up further to expose the spring loaded dogs on the C-2 setting tool. Set down weight is then applied to set the packer. With the PBR packoff still inside the extension, the liner top packer can be tested to verify seal integrity.

Contact your Baker Hughes representative to learn more about how our Bakerline series economical, hydraulic-set cemented liner assembly can provide a reliable operation in deep and deviated wells.
Economical Mechanical-Set Cemented Liner Assembly
Ensure reliable operation in medium- to heavy-duty applications

The Bakerline™ series economical cemented liner hanger assembly is ideal for use in medium- to heavy-duty liner hanger applications in vertical or low-deviation wells. It features our CMC™ mechanical-set, cone-type liner hanger, which has a staggered cone design to offer excellent bypass in set and run-in positions. The C-2™ setting tool provides a reliable means of releasing from the liner after the hanger has been set. The C-2 tool incorporates packer-setting dogs to set the packer when cementing operations are complete.

Rotating the string to the left and slacking off sets the hanger. The C-2 setting tool is released after the hanger is set by rotating to the right, and it is then picked up to confirm release.

Cement is pumped followed by a pump-down plug that is displaced until it latches into the type 1 liner wiper plug attached to the bottom of the running string. Together, the pump-down plug and wiper plug continue to be displaced until reaching the type 1 landing collar above the double valve float collar. The float collar provides a redundant set of check valves which prohibit fluid from re-entering the liner.

The Baker Hughes Hyflo™ III liner top packer provides a reliable seal at the liner top. It incorporates a one-piece seal element with bonded metal backups to prevent extrusion and provide protection from swab-off. This versatile, medium-duty, compression-set liner top packer is available with or without holddown slips.

Applications
- Conventional oil and gas
- Vertical and low-deviation wells

Features and Benefits
- C-2 liner setting tool with packer-setting dogs
  - Provides means to run the liner to desired depth and apply set-down weight on the packer through simple operation
  - Ensures reliable operation with time-tested design
- CMC liner hanger with welded cone design
  - Provides excellent bypass in set and run-in positions
- Hyflo III liner top packer with one-piece seal and bonded metal backups
  - Provides protection from swab-off
  - Prevents extrusion
When the cement job is complete, the inner string is picked up further to expose the spring loaded dogs on the C-2 setting tool. Set down weight is then applied to set the packer. With the PBR packoff still inside the extension, liner top seal integrity can be tested prior to pulling the running tool out of hole.

Contact your Baker Hughes representative to learn more about how our Bakerline series economical, mechanical-set cemented liner assembly can provide a reliable solution for medium- to heavy-duty applications.
The Bakerline™ series economical, hydraulic-set rotating liner hanger assembly is ideal for medium to heavy liner hanger applications in horizontal or deviated wells where cement integrity is a concern.

It features our HSR™ hydraulic-set rotating liner hanger, which is a light-to medium-duty cone-type hanger that allows rotation after the liner is hung. For improved cement bonding, the liner incorporates a tapered roller bearing assembly that allows it to be rotated at higher speeds than hangers using conventional ball or journal-type bearings. The hydraulic actuation provides a reliable means for setting the hanger in horizontal or deviated applications.

The 2RH™ setting tool allows the liner to be rotated while in tension to help work past tight spots or rotate off of ledges. A special rotating version of the 2RH liner setting tool is available to be used with rotating liner hangers for improved cementing operations. The polished bore receptacle (PBR) packoff is run above the 2RH liner setting tool and seals off inside the tieback extension to provide a high-pressure seal, and to prohibit debris from fouling up the liner setting tool.

The setting tool is released after the hanger is set by rotating to the right, and then picking up to confirm release. The liner can then be rotated through the hanger during the cement job, enhancing cement quality. The HSR liner hanger includes a one-piece mandrel for durability, and optimized slip-load distribution improves hanging capacity.
Cement is pumped followed by a pump-down plug which is displaced until it latches into the type 1 liner wiper plug attached to the bottom of the running string. Together, the pump-down plug and wiper plug continue to be displaced until reaching the type 2 landing collar right above the double valve float collar. Float collar provides a redundant set of check valves which prohibit fluid from re-entering the liner.

The Baker Hughes Hyflo™ III liner top packer provides a reliable seal at the liner top. It incorporates a one-piece seal element with bonded metal backups to prevent extrusion and provide protection from swab-off. This versatile, medium-duty, compression-set liner top packer is available with or without holddown slips.

When the cement job is complete, the inner string is picked up further to expose the spring-loaded dogs on the packer-setting dog sub, and the packer is activated by applying set down weight. The standard packer-setting dog sub provides a suitable method for setting the packer in vertical to moderate deviated wells when significant buckling of the drillstring is not expected. With the PBR packoff still inside the extension, liner top seal integrity can be tested prior to pulling the running tool out of hole.

Contact your Baker Hughes representative to learn more about how our Bakerline series economical, hydraulic-set rotating liner assembly can help you reach targets in horizontal and deviated wells.
The Bakerline™ series economical, mechanical-set rotating liner hanger assembly is ideal for light- to medium-duty liner hanger applications in straight wells or in wells with light to medium deviation.

It features our RCM 2™ mechanical-set rotating liner hanger, which is a light- to medium-duty cone-type hanger that allows rotation after the liner is hung. For improved cement bonding, the liner incorporates a tapered roller-bearing assembly that allows it to be rotated at higher speeds than hangers using conventional ball or journal-type bearings. The automatic J-cage allows it to be reset if required.

The 2RH™ setting tool allows the liner to be rotated while in tension to help work past tight spots or rotate off of ledges. A special rotating version of the 2RH liner setting tool is available to be used with rotating liner hangers for improved cementing operations. The polished bore receptacle (PBR) packoff is run above the 2RH liner setting tool and seals off inside the tieback extension to provide a high-pressure seal, and to prohibit debris from fouling up the liner setting tool.

The setting tool is released after the hanger is set by rotating to the right, and then picking up to confirm release. The liner can then be rotated through the hanger during the cement job, enhancing cement quality. The RCM 2 liner hanger includes a one-piece mandrel for durability, and optimized slip-load distribution optimizes hanging capacity.

Applications
- Conventional oil and gas
- Straight wells
- Wells with light to medium deviation

Features and Benefits
- RCM 2 liner hanger with tapered roller bearing
  - Allows the liner to be rotated during cementing after the liner is set
  - Improves cement integrity
- Automatic J-cage design
  - Allows reset of hanger in run-in position
- H2S-resistant material available upon request
  - Helps control corrosion
- 2RH running tool with clutched torque finger system
  - Allows rotation after hanger is set
  - Helps work the liner through tight spots
- Hyflo III liner top packer with one-piece seal and bonded metal backups
  - Provides protection from swab-off
  - Prevents extrusion
Cement is pumped followed by a pump-down plug which is displaced until it latches into the type 1 liner wiper plug attached to the bottom of the running string. Together, the pump-down plug and wiper plug continue to be displaced until reaching the type 2 landing collar right above the double valve float collar. The float collar provides a redundant set of check valves which prohibit fluid from re-entering the liner.

The Baker Hughes Hyflo™ III liner top packer provides a reliable seal at the liner top. It incorporates a one-piece seal element with bonded metal backups to prevent extrusion and provide protection from swab-off. This versatile, medium-duty, compression-set liner top packer is available with or without holddown slips.

When the cement job is complete, the inner string is picked up further to expose the spring-loaded dogs on the packer-setting dog sub, and the packer is activated by applying set down weight. The standard packer-setting dog sub provides a suitable method for setting the packer in vertical to moderate deviated wells when significant buckling of the drillstring is not expected. With the PBR packoff still inside the extension, the liner top packer can be tested to verify seal integrity.

Contact your Baker Hughes representative to learn more about how our Bakerline series economical, mechanical-set rotating liner assembly can help you improve cement jobs in straight to low deviation wells.
Hyflo III Liner-Top Packer
Increase reliability with an effective seal

The Bakerline™ series Hyflo™ III liner-top packer provides a reliable seal at the liner top in low- to moderate-duty applications. The packer incorporates a one-piece seal element with bonded metal backups to prevent extrusion and provide protection from swab-off. This versatile, medium duty, compression-set liner-top packer can be run on the primary liner run or on a second trip as a tieback packer.

Contact your Baker Hughes representative to learn how our Bakerline series Hyflo III liner packer can provide reliable sealing capabilities in your low- to moderate-duty applications.

Applications
- Low- to moderate-duty applications

Features and Benefits
- Effective annular sealing and holddown capabilities
  - Prevent formation breakdown, loss of cement slurry, and gas migration
- Internal body lock ring
  - Maintains positive set-in seal element
- Uses completion-type packer seal and backup
  - Offers field-proven, reliable seal
Bakerline Series Hyflo™ III Liner-Top Packer

<table>
<thead>
<tr>
<th>Liner Packer Size (Liner x Casing)</th>
<th>Casing Weight</th>
<th>Maximum OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in.</td>
<td>lb/ft</td>
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<tr>
<td>4.000 x 5.750</td>
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<td>25.4–33.6</td>
</tr>
<tr>
<td>4.500 x 7.000</td>
<td>17.0–23.0</td>
<td>25.4–34.3</td>
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<tr>
<td>5.000 x 7.000</td>
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<tr>
<td>7.000 x 9.625</td>
<td>36.0–47.0</td>
<td>53.7–70.1</td>
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Hyflo II Hydraulic-Set Liner Hanger

Save money on lighter-duty applications

The Bakerline™ series Hyflo™ II hydraulic-set liner hanger is an economical, light- to medium-duty hydraulic liner hanger suitable for short- to moderate-length liners. It is ideal for highly deviated/horizontal wells and some multilateral applications where downhole pipe manipulation is not desirable.

This hanger sets with applied hydraulic pressure and does not require pipe rotation for setting. A setting ball is dropped or circulated to a ball seat in the landing collar or running string. Differential pressure acts on the hydraulic cylinder and moves three slips up the cones to the set position. The multicone design provides maximum bypass area, while premium seals ensure high-pressure/high-temperature integrity.

Contact your Baker Hughes representative to learn how our Bakerline series Hyflo II hydraulic-set liner hanger can save you money in light- to medium-duty applications.

Applications
- Short- to moderate-length liners
- Deep- and high-angle wells

Features and Benefits
- Hanger sets with applied hydraulic pressure
  - Allows hanger to be set in situations where downhole pipe manipulation is not desirable
- Multicone design
  - Provides maximum bypass area
- Positive stop
  - Prevents over-travel of hydraulic cylinder
## Bakerline Series Hyflo™ II Hydraulic-Set Liner Hanger

<table>
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<tr>
<th>Liner Hanger Size (Liner x Casing)</th>
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Hyflo III Mechanical-Set Liner Hanger
Reduce cost with streamlined design

The Bakerline™ series Hyflo™ III mechanical-set liner hanger is an economical, light- to medium-duty hanger. It can be used in wells where mechanical hanger manipulation will be possible at depth and when rotation is not required while working the liner to depth. The hanger uses an open-bottom J-cage assembly, available for right- or left-hand setting.

The Bakerline series Hyflo III hanger uses T-slot bowsprings that eliminate the need for set screws, and its multicone design offers excellent bypass in both run-in and set positions. The hanger’s low profile design makes it ideal for use with tight-tolerance liner sizes, keeping costs low and appropriate for the application.

Contact your Baker Hughes representative to find out how our Bakerline series Hyflo III mechanical-set liner hanger provides a cost-effective solution for tight-tolerance liners.

Applications
- Light- to medium-liner loads
- Wells where reaming to depth is not anticipated
- Tight-tolerance liners

Features and Benefits
- Multicone design
  - Provides maximum bypass area
- Single slot J-cage
  - Available for right- or left-hand setting
- Streamlined design
  - Provides ideal profile for tight-tolerance liner sizes
- Double-grip slips (optional)
  - Prevent floating of very short, light liners
### Bakerline Series Hyflo™ III Mechanical-Set Liner Hanger

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HMC Hydraulic-Set Liner Hanger
Ensure downhole reliability when pipe manipulation is not dependable

The Bakerline™ series HMC™ hydraulic-set liner hanger is ideal for many wells where hydraulic actuation is desired because pipe manipulation is not reliable. The hanger is set by applied pressure through the run-in string and it supports medium to heavy liner loads.

The Bakerline series HMC hanger features a multicone design to provide maximum bypass area. This allows for better hole cleaning and improves cement integrity. The Bakerline HMC hanger is ideal for deep- and high-angle wells because no pipe rotation is required to set the hanger. A setting ball is dropped and circulated to a ball seat in the landing collar or running string. Differential pressure then acts on the hydraulic cylinder, moving the slips up the cones to the set position. The hydraulic setting mechanisms are factory tested to ensure downhole reliability.

Contact your Baker Hughes representative to find out how our versatile Bakerline series HMC hydraulic-set liner hanger can ensure reliability in wells where pipe manipulation is not dependable.

Applications
- Deep- and high-angle wells

Features and Benefits
- Hanger sets with applied hydraulic pressure
  - Allows hanger to be set in situations where downhole pipe manipulation is not reliable
- Factory-tested hydraulic setting mechanisms
  - Ensure downhole reliability
- Multicone design
  - Provides excellent fluid bypass and increased load capacity
### Bakerline Series HMC™ Hydraulic-Set Liner Hanger

<table>
<thead>
<tr>
<th>Liner Hanger Size (Liner x Casing)</th>
<th>Casing Weight</th>
<th>Maximum OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in.</td>
<td>lb/ft</td>
</tr>
<tr>
<td>4.500 x 7.000</td>
<td>23.0–26.0</td>
<td>34.3–38.8</td>
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<td>5.500 x 7.625</td>
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<td>7.000 x 9.625</td>
<td>47.0–53.5</td>
<td>70.1–79.8</td>
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</tbody>
</table>

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The Bakerline™ series HSR 2™ hydraulic-set rotating liner hanger is a light- to medium-duty cone-type hanger that allows rotation after the liner is hung, improving cement quality. Hydraulic setting makes the HSR 2 liner hanger ideal for horizontal or deviated liners when cement integrity is a concern.

A tapered roller bearing arrangement is used, permitting reliable rotation of the liner string during cementing. The HSR 2 liner hanger incorporates a one-piece mandrel for durability, and optimized slip load distribution provides increased hanging capacity.

Contact your Baker Hughes representative to learn more about how the Bakerline series HSR 2 hydraulic-set rotating liner hanger can help you improve your cement jobs with liner rotation.

**Applications**
- Horizontal or deviated liners
- When liner needs to be rotated during cementing after hanger is set

**Features and Benefits**
- Tapered roller bearing
  - Allows liner to be rotated during cementing after the liner is set, improving cement integrity
- Non-welded design
  - Produces robust construction and durability
  - Offers compatibility with liner string metallurgy, including corrosion resistant alloy (CRA) materials
- Liner hanger is set hydraulically
  - Provides advantage when pipe manipulation to set the liner hanger is not reliable
## Bakerline™ Series HSR 2™ Hydraulic-Set Rotating Liner Hanger

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<thead>
<tr>
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Certain size and weight ranges are available only in original HSR 2 hanger design.
The Bakerline™ series RCM™ 2 mechanical-set rotating liner hanger is a light- to medium-duty cone-type hanger that allows rotation after the liner is hung using a tapered roller bearing assembly. The liner can be rotated at higher speeds than liners using hangers with conventional ball or journal bearings, improving cement bonding.

The automatic J-cage allows the hanger to be reset if required. A rotating 2RH™ or HRD-E™ setting tool is used to set the hanger with right-hand rotation. The setting tool is released after the hanger is set, and the liner can then be rotated through the hanger during the cement job, enhancing cement quality. The RCM 2 liner hanger version includes a one-piece mandrel and optimized slip load distribution.

Contact your Baker Hughes representative to learn more about how the Bakerline series RCM 2 mechanical-set rotating liner hanger can offer higher rotation speeds and improve cement quality.

Applications
- Light- to medium-duty applications
- When rotation during cementing is desired to enhance cement quality

Features and Benefits
- Tapered roller bearing
  - Allows liner to be rotated during cementing, after the liner is set
- T-slot bowsprings
  - Increase reliability through elimination of set screws in the J-cage
- Automatic J-cage
  - Allows simple resetting of hanger to run-in position
**Bakerline™ Series RCM™ 2 Mechanical-Set Rotating Liner Hanger**

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<thead>
<tr>
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CMC Mechanical-Set Liner Hanger
Reduce cost when running medium to long liners

The economical Bakerline™ series CMC™ mechanical-set liner hanger handles medium to long liners. The liner hanger can be used in wells where mechanical hanger manipulation will be possible, and when rotation is not anticipated while working the liner to depth. It is built with a right- or left-hand, open-bottom, automatic J-cage to be run in the hole using a setting tool.

The CMC liner hanger uses a staggered cone design to increase the hanging capacity and effective bypass area. The low-profile slips help reduce the potential for damage while running in the hole.

Contact your Baker Hughes representative to learn how our economical Bakerline series CMC mechanical-set liner hanger can save you money when running medium to long liners.

Applications
- Medium to long liners
- Wells where no reaming is anticipated to get to depth

Features and Benefits
- Low-profile slips
  - Provide large supported slip area and reduce potential for damage while running in
- Staggered cone design
  - Provides maximum bypass area while running in and circulating
- T-slot bowsprings
  - Eliminate the use of set screws, increasing reliability
- Automatic J-cage
  - Allows hanger to return to run-in position if hanger presets while running in hole
Bakerline Series CMC™ Mechanical-Set Liner Hanger

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TORXS Expandable Liner Hanger System

Improve circulation and cementing operations

The Bakerline™ series TORXS™ liner hanger system is the only expandable liner hanger system that can be run and installed conventionally, without requiring a critically timed high-pressure plug bump as the primary activation method for the hanger or packer, or for release of the running tool.

The TORXS system eliminates dependence on a plug bump because all hydraulic activations, including tool release, occur with pressure acting on a positive seal in the running tool. This minimizes the risk of poor-quality liner-to-cement bonding that can occur when a liner is ballooned with a high-pressure plug bump.

Upon reaching setting depth, the liner can be circulated and conditioned. A setting ball is dropped from the surface and lands on the extrudable ball seat in the running tool. Applied pressure actuates the hydraulic anchor along with the swage mechanism on the running tool, causing the hanger body and slips to expand outward making permanent contact to the casing string. Circulation is reestablished and cementing of the liner can be performed.

After cementing, pressure applied against the flapper assembly in the running tool allows the swage to expand the ZX™ seal, making full permanent contact to the casing inside diameter. Once the packer is set, an increase in pressure bursts the rupture disk in the flapper seat, allowing the run-in string to be pulled from the liner top. If desired, a liner top test can be performed prior to coming out of the hole.

Applications
- Deviated, vertical, deep, shallow, or extended reach wells
- Frac, scab, drilldown or ream-down liners
- Liner tiebacks
- Monobore completions

Features and Benefits
- Can be run and set conventionally
  - Reduces liner cementing risks
- No requirement for plug bump to actuate hanger/packer and release liner running tool
  - Minimizes risk of poor-quality liner-to-cement bonding
- High-load capacity and seal pressure ratings
  - Ensure reliable operation and durability
- Enables circulation and rotation in reaming or drill-down operations
  - Provides flexibility
  - Reduces trips
- Circulation bypass area 40% greater than other expandable or conventional liner equipment
  - Improves circulation and cementing operations
  - Provides ideal solution for tight clearance liners
- Rugged, integrated design
  - Facilitates liner running and cementing
  - Enables heavy reaming or drilling applications
Contact your Baker Hughes representative to learn more about how the Bakerline series TORXS expandable liner hanger system can help you improve circulation and cementing operations.

### TORXS Expandable Liner Hanger System

<table>
<thead>
<tr>
<th>Liner Size</th>
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<td>in.</td>
<td>mm</td>
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Certain size and weight ranges are available only in original TORXS expandable liner hanger configuration.
Pump-Down Plug
Improve wellbore integrity with thorough cement and fluid separation

The Bakerline™ series pump-down plug, also referred to as the drillpipe dart, is used to wipe the running string behind (and sometimes in front of) the cement. The pump-down plug can be used to latch into a wiper plug, or can be used to wipe both the running string and the liner in small-diameter liner applications.

Multiple darts can be used to more effectively wipe the tubulars and reduce cement contamination. The pump-down plug is available in composite material for fast and efficient drillout.

Contact your Baker Hughes representative to learn how our Bakerline series pump-down plug can improve wellbore integrity with thorough cement and fluid separation.

### Applications
- Cement and wellbore fluid separation in the workstring and liner during cement displacement

### Features and Benefits
- Three-fin designs
  - Allows inside diameter transitions such as tool joints to be properly wiped
- Positive pressure indication
  - Allows displacement volumes of the workstring to be checked

### Bakerline Series Pump-Down Plug

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<td>Phenolic</td>
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<tr>
<td></td>
<td>2.280</td>
<td>6.250</td>
<td>Nitrile</td>
<td>Phenolic</td>
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</tbody>
</table>
Type I Wiper Plug
Ensure containment and improve wellbore integrity

The Bakerline™ series type I wiper plug separates cement from the displacement fluid during cementing operations. Separation of the slurry and displacement fluid ensures containment, and improves cement integrity.

The Bakerline series type I wiper plug is shear-pinned to the bottom of the running string below the liner setting tool. At the tail of the cement, a pump-down plug is released and follows the cement down the running string. When the pump-down plug lands in the wiper plug, pressure is increased, shearing the wiper plug free and providing a pressure indicator from the surface. Both plugs are displaced as a unit to the landing collar.

This plug is manufactured of drillable materials and is rotationally locked into the landing collar to prevent spinning during drillout.

Contact your Baker Hughes representative to learn how our Bakerline series type I wiper plug can improve your wellbore integrity.

Bakerline Series Type I Wiper Plug

<table>
<thead>
<tr>
<th>Liner Size (in.)</th>
<th>Weight Range (lb)</th>
<th>Nose OD (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.000 and 4.500</td>
<td>9.50–11.60</td>
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</tr>
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<td>4.500 and 5.000</td>
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<td>7.000 and 7.625</td>
<td>17.0–23.0</td>
<td>1.812</td>
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<td>7.625</td>
<td>39.0–47.1</td>
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<tr>
<td>7.625</td>
<td>24.0–33.7</td>
<td>2.250</td>
</tr>
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</table>
Type I Landing Collar

Ensure efficient drillout after proper landing of the wiper plug

Wiper plugs are used to separate cement from the displacement fluid during cementing operations. The type I landing collar is usually run in the casing or liner string, one or two joints above a float collar or shoe, and provides the seat and latch profile to catch the wiper plug at the completion of cement displacement. Landing collars and plugs are designed to ensure rapid and complete drillout.

Bakerline™ series type I landing collar bodies are available in various casing weights, 80 Ksi or 110 Ksi material, and VAM TOP, Butt, BRL, or blank threads.

Contact your Baker Hughes representative to learn how our type I landing collar ensures proper landing of the wiper plug, and reduces time with quick drillout after cement displacement is complete.

### Applications
- To ensure proper landing of the wiper plug

### Features and Benefits
- Aluminum construction
  - Allows for easy drillout
- Positive latch for liner wiper plug
  - Gives the operator pressure indication that the plug has bumped
  - Prevents the plug from spinning during drillout

### Bakerline Series Type I Landing Collar

<table>
<thead>
<tr>
<th>Liner Size</th>
<th>Casing Weight</th>
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<td>17–23</td>
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<tr>
<td>5.000</td>
<td>23.0–26.0</td>
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<tr>
<td>5.500</td>
<td>26–32</td>
</tr>
<tr>
<td>5.500</td>
<td>17–23</td>
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</tr>
<tr>
<td>5.500</td>
<td>26–32</td>
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<tr>
<td>7.000</td>
<td>26.4–29.7</td>
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<td>7.000</td>
<td>36–47</td>
</tr>
<tr>
<td>7.625</td>
<td>43.5–47</td>
</tr>
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<td>7.625</td>
<td>47–53.5</td>
</tr>
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</table>

Bakerline products are a select group of field-proven completions equipment in our most popular designs and sizes. Bakerline products provide optimized solutions for many applications and are produced in volume to assure prompt delivery. Only products with the specifications presented in this document are available through the Bakerline series program. If other product specifications are required, contact your Baker Hughes representative.
Type II Landing Collar
Enable actuation of hydraulic tools in the string and ensure efficient drillout

Wiper plugs are used to separate cement from the displacement fluid during cementing operations. The Bakerline™ series type II landing collar is typically run in the casing or liner string, one or two joints above a float collar or shoe. It provides the seat and latch profile to catch the wiper plug at the completion of cement displacement. The Bakerline series type II collar also includes an integral ball seat below the wiper plug to enable actuation of hydraulic tools in the string.

When a setting ball is dropped and seated, pressure can be applied to activate hydraulic devices such as hydraulic-set liner hangers and selective inflation packers. Further increase in pressure shears out the ball and seat, restoring full circulation through the shoe for cementing operations. The landing collars and plugs are constructed of aluminum and are designed to ensure easy and complete drillout.

Bakerline series type II landing collar bodies are available in various casing weights, 80 Ksi or 110 Ksi material, and VAM TOP, Butt, BRL, or blank threads.

Contact your Baker Hughes representative to learn more about how the Bakerline series type II landing collar can enable actuation of hydraulic tools and ensure quick drillout.

<table>
<thead>
<tr>
<th>Application</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>To ensure proper landing of the wiper plug and provide a hydraulic ball seat</td>
<td></td>
</tr>
<tr>
<td>Integral ball seat below wiper plug seat</td>
<td>Enables actuation of hydraulic devices in string</td>
</tr>
<tr>
<td>Positive latch for liner wiper plug</td>
<td>Gives the operator indication that the plug has bumped</td>
</tr>
<tr>
<td></td>
<td>Prevents the plug from spinning during drillout</td>
</tr>
<tr>
<td>Aluminum construction</td>
<td>Allows for easy drillout</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bakerline Series Type II Landing Collar</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Liner Size</strong></td>
<td><strong>Casing Weight</strong></td>
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<td>17.0–19.5</td>
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<td></td>
<td>26–32</td>
</tr>
<tr>
<td>5.500</td>
<td>26.4–29.7</td>
</tr>
<tr>
<td>7.000</td>
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<tr>
<td></td>
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<tr>
<td>7.625</td>
<td>36–40</td>
</tr>
<tr>
<td></td>
<td>43.5–47</td>
</tr>
</tbody>
</table>
Bakerline™ series liner top cementing packoff systems provide a reliable seal between the liner setting tool string and the liner inside diameter (ID). The Baker Hughes polished bore receptacle (PBR™) packoff is a one-foot cementing packoff that can be run above or below the liner setting tool depending on configuration and application. If located below the setting tool, the PBR packoff seals in either a PBR or a honed liner hanger body. If located above the setting tool, the packoff seals in the tieback extension. This is commonly referred to as a sleeve packoff.

The seal stack can be comprised of either Molyglass chevron rings or patented Baker Hughes Bullet™ seals to ensure dependable performance, even in high-pressure/high-temperature (HP/HT) conditions. The PBR packoff holds pressure from either direction, and leaves an unrestricted liner top at the end of cementing operations, eliminating the need for drillouts.

Contact your Baker Hughes representative to learn more about how the Bakerline series PBR packoff can provide a dependable seal, even in HP/HT conditions.

Applications
- Sealing in the honed bore of the cementing PBR
- Sealing in the tieback extension (sleeve packoff)

Features and Benefits
- Positive seal at liner top
  - Permits actuation of hydraulic devices and cementing of liner
  - Directs cement through the liner shoe
- Premium HP/HT seals
  - Ensure reliable, safe operation
- Immediate full-bore access to liner bore
  - Saves time by eliminating the need for drillout
Bakerline™ series insert liner cementing equipment allows nearly any cementing accessory to be installed directly into the liner. Because a body is not required, the expense of premium threads and exotic materials is eliminated. Each seal unit is designed to cover a specific range of casing, and after it is installed it is permanently anchored and sealed in place. The desired accessory is threaded into the bottom or top of the seal unit, as appropriate.

The seal unit is a compact aluminum module with a 360° aluminum slip. The unit also includes elastomer and metal-to-metal seals. Insert cementing-float valves are designed and tested to satisfy API Recommended Practices 10F specifications.

Contact your Baker Hughes representative to find out how our Bakerline series insert liner cementing equipment can save you time and money while installing cementing accessories.
The Bakerline™ series indicating rotating packer setting dog sub is used to set compression-set liner top packers. It is useful in all wellbores, including deviated, horizontal, S-curve, and extended reach.

To provide visual confirmation that adequate setting force was applied to the liner top packer, an adjustable shear indicator is included above the setting dogs. This shear indicator is adjusted to match, or be slightly above, the required setting weight of the associated liner top packer. A positive indication at surface confirms a proper liner top set.

A tapered roller bearing assembly is also included, which allows rotation and slackoff of the running string without damaging the packer extension or setting dogs. Rotation breaks the static friction between the drillpipe and casing, reducing buckling and ensuring adequate transfer of setting force to the liner top packer.

Contact your Baker Hughes representative to learn more about how the Bakerline series indicating rotating packer setting dog sub can prevent damage and ensure proper liner top set on your next project.

Applications
- To activate and pack off compression-set liner top packers
- All wellbores, including deviated, horizontal, S-curve, and extended reach

Features and Benefits
- Adjustable shear indicator
  - Confirms that adequate setting force was applied to the liner top packer
- Tapered roller bearing assembly
  - Allows rotation and slackoff of the running string without damaging packer extension or setting dogs
Signature D and DB Retainer Production Packers
Reduce rig time and ensure reliable setting

The Bakerline™ series high-performance and versatile Signature D™ and Signature DB™ retainer production packers are considered the industry standard among permanent production packers. The Signature D and DB packers are also frequently used as permanent squeeze or testing packers, or as permanent or temporary bridge plugs.

The slim-line design of the Bakerline series Signature D and DB packers has field-proven reliability, and their solid construction enables 50% faster run-in without fear of impact damage or premature setting, reducing risk and nonproductive time. The packers have two opposing sets of full-circle, full-strength slips that ensure setting, and the packers’ unique interlocking, expandable metal backup rings create a positive barrier to packing element extrusions. The packing element resists swab-off, and packs off securely when the packer is set.

Contact your Baker Hughes representative today to learn more about how our Bakerline series Signature D and DB retainer production packers can save rig time and lower your operational risk.

Applications
- For permanent production packing
- Replacement for permanent squeeze or testing packer
- To serve as a permanent or temporary bridge plug

Features and Benefits
- Solid construction
  - Saves rig time with 50% faster run-in without fear of impact damage or premature setting
- Two opposing sets of full-circle, full-strength slips
  - Ensure packer remains properly set
- Packing element
  - Resists swab-off and packs off securely when packer is set
- Unique interlocking, expandable metal backup rings
  - Contact casing creates a positive barrier to packing element extrusion
Bakerline Series Signature D™ and DB™ Retainer Production Packers

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
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<td>6.625</td>
<td>168.2</td>
<td>20–23</td>
<td>568–325 144.5</td>
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<td>17–20</td>
<td>618–325 157.1</td>
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<td>61.1</td>
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<td>9.625</td>
<td>244.4</td>
<td>36–53.5</td>
<td>812–400 206.3</td>
<td>80–40 2.985</td>
<td>75.8</td>
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</table>

* For information on packer accessory sizes not found in the specification guide, refer to the Baker Hughes packer systems technical manual or contact your Baker Hughes representative.

- Tubing-seal assemblies, tubing-seal, and spacer nipples
- Includes some drillpipe and line-pipe weights

‡ Minimum bore applicable to standard G, E, and K seal assemblies only; not applicable to L, M, and N seal assemblies with K-RYTE and R-RYTE seals, which may have reduced IDs.
The Bakerline™ series FH™ packer is an industry-standard, hydrostatic-set, shear-release, single-string retrievable packer. It is hydraulically activated by applying tubing pressure against a plugging device below the packer. Triple-seal, multidurometer elements ensure pressure integrity over a broad range of temperatures and conform easily to casing irregularities. Packoff is mechanically locked and constantly reinforced by hydrostatic pressure.

The FH packer requires only straight pull to release, and it has a built-in unloader and bypass that aid in releasing and retrieving.

A tubing-plugging device must be positioned below the packer for actuation. Those available include the E™ hydraulic-trip sub, the CMU™ or CMD™ sliding sleeve with blanking plug, the Baker Hughes flow-control seating nipple with blanking plug, and hydraulic-setting devices.

Contact your Baker Hughes representative today to learn how our Bakerline series FH hydrostatic-set single-string retrievable packers can ensure reliability in a wide range of applications.

Applications
- Production, injection, and zonal isolation
- Single-string selective completions or dual-string completions with multiple packers
- Deviated wells or other applications when rotation for installation or removal is not required
- When it is beneficial to displace and set packers after the well is flanged up
- To test the tubing string before packer setting
- To set and test individual packers in multiple-packer completions

Features and Benefits
- Built-in unloader and bypass
  - Aid in releasing and retrieving
- Triple-seal, multidurometer elements
  - Ensure pressure integrity over a wide range of temperatures
  - Conform easily to casing irregularities
- No mandrel movement during setting
  - Allows stacked-packer applications
### Bakerline Series FH™ Hydrostatic-Set Single-String Retrievable Packer

<table>
<thead>
<tr>
<th>Casing</th>
<th>Packer</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>OD</td>
<td>Weight*</td>
<td>Size</td>
<td>Nominal ID</td>
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<tr>
<td>in.</td>
<td>lb/ft</td>
<td>in. mm</td>
<td>in. mm</td>
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<tr>
<td>4.500</td>
<td>9.5–13.5</td>
<td>43A 1.978 50.2</td>
<td>3.786 95.2</td>
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<td>5.000</td>
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<td>43B 1.978 50.2</td>
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<tr>
<td>7.625</td>
<td>193.7</td>
<td>33.7–39 47C4 2.416 61.4</td>
<td>6.468 164.3</td>
</tr>
</tbody>
</table>

* When selecting a packer for a casing weight common to two weight ranges (same OD), choose the packer size shown for the lighter of the two weight ranges. Example: For 7-in. (177.8-mm) 26-lb/ft casing use packer size 47B4. Under certain circumstances the other packer size may be run, such as when running in mixed-casing strings.

**NOTE:** Repair kits, including such items as packing elements, seal rings, etc., are available for redressing retrievable packers. Contact your Baker Hughes representative. Use only genuine Baker Hughes repair parts.

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The Bakerline™ series R-3™ double-grip retrievable casing packer is a versatile production packer intended for a broad range of production applications such as stimulation treating and testing operations.

The Bakerline series R-3 packer is compression set, and features rugged rocker-type slips for improved reliability. It also has a hydraulic button-type hold down located below the bypass valve. The packer’s bypass design allows rapid pressure equalization and resists swab-off, while its unique, built-in differential lock helps keep the bypass closed.

Contact your Baker Hughes representative today to find out the advantages of using our Bakerline series R-3 double-grip retrievable casing packer.
Bakerline Series R-3™ Double-Grip Retrievable Casing Packer

<table>
<thead>
<tr>
<th>Casing</th>
<th>Packer</th>
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</thead>
<tbody>
<tr>
<td>OD (in.)</td>
<td>Weight* (lb/ft)</td>
</tr>
<tr>
<td>4.500</td>
<td>9.5–13.5</td>
</tr>
<tr>
<td>5.500</td>
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<td>6.625</td>
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<td>7.000</td>
<td>26–29</td>
</tr>
<tr>
<td></td>
<td>20–26</td>
</tr>
</tbody>
</table>

* When selecting a packer for a casing weight common to two weight ranges (same OD), choose the packer size shown for the lighter of the two weight ranges. Example: for 7-in. (177.8-mm) OD 20 lb/ft casing use packer size 47C2. Under certain circumstances the other packer size may be run, such as when running in mixed casing strings.

- 2.347-in. (60.0-mm) x 42-in. (1.067-mm) drift bar
- Repair kits, including such items as packing elements, seal rings, etc., are available for redressing retrievable packers. Contact your Baker Hughes representative. Use only genuine Baker Hughes repair parts.
REFlex Field-Installable Reactive Element Packer
Simplify packer installation for upset joints and irregular ODs

The Bakerline™ series REFlex™ field-installable reactive element packer uses reactive element technology to offer wellbore isolation solutions for applications ranging from water shutoff and flow control to intelligent wells, multi-zone fracturing, and acid stimulation. The tool features an elastomeric polymer sealing element that reacts with oil or water to swell and isolate zones in either open or cased holes, without the need for cement, special trips, running tools, or specialized rigsite personnel.

With the same swelling and sealing characteristics of the REPacker™ reactive element packer, the REFlex field-installable packer is designed with a rigid steel cage surrounded by reactive element rubber matrix. The element can be installed onto an existing mandrel by opening the fingers and wrapping the tool onto the pipe. Once in place, the fingers are joined together to create a dry fit onto the pipe. The design allows for significant dry friction to hold the element in place while running in hole. TheREFlex packer can be manufactured with either oil-swelling or water-swelling elastomer.

As the reactive element elastomer swells, it seals the annulus between the outside diameter (OD) of the liner or casing and the inside diameter (ID) of the open hole to provide isolation between zones with different pressures, or to shut off flow in the annulus and prevent fines migration along the wellbore. After the elastomer reacts to oil or

Applications
- Deviated, vertical, deep, shallow, or extended-reach wells
- Cased or open holes
- Upset tool joints or irregular casing or liner OD

Features and Benefits
- Reactive element sealing elastomer
  - Provides permanent seal without cement
  - Offers enhanced expansion while retaining critical seal element properties
  - Reduces downtime and deferred production
  - Will not shrink if fluids change after swelling
- Steel cage surrounded by RE reactive element rubber matrix
  - Fits upset tool joints and irregular casing or liner ODs
  - Wraps around existing casing or liner mandrel
  - Simplifies installation and operation
  - Requires no running tools or specialized personnel
  - Reduces operation time and HSE risks
water and expands, it remains swollen, even when the reactive fluid is no longer present. This provides a permanent seal that will not degrade with fluid changes.

The REFlex packer can easily be installed at the rig site on tubing or liner before it is stabbed into the completion string. Because it requires no running tool or mechanical intervention, the REFlex packer reduces health, safety, and environmental (HSE) risks. It simplifies completion operations by eliminating the need for running tools and specialized rigsite personnel, and reduces wellbore damage associated with cementing operations.

Contact your Baker Hughes representative to learn more about how the Bakerline series REFlex field-installable reactive element packer can help you simplify packer installation for upset joints and irregular ODs.

### Bakerline Series REFlex Field-Installable Reactive Element Packer

<table>
<thead>
<tr>
<th>Base Pipe OD</th>
<th>Element OD</th>
<th>Element Length</th>
<th>Openhole Size</th>
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<tbody>
<tr>
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<td>in.</td>
<td>ft</td>
<td>m</td>
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<tr>
<td>4½</td>
<td>5⅜</td>
<td>1.08</td>
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<tr>
<td></td>
<td>5⅛</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>5⅝</td>
<td></td>
<td>6⅛</td>
</tr>
<tr>
<td>5½</td>
<td>7½</td>
<td></td>
<td>7½</td>
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</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
<td>8½</td>
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</table>
REBarrier Slide-on Packer
Transform casing into an annular packer

The Bakerline™ series REBarrier™ slide-on packer uses reactive element technology to offer wellbore isolation solutions for applications ranging from water shutoff and flow control to intelligent wells, multi-zone fracturing, and acid stimulation. The tool features elastomeric polymer sealing elements that react with oil or water to swell and isolate zones in either open or cased holes, without the need for cement, special trips, running tools, or specialized rigsite personnel.

With the same swelling and sealing characteristics of the REPacker™ reactive element packer, the REBarrier slide-on packer consists of a machined sleeve skeleton that houses the reactive elastomer in a recessed profile on the outside diameter (OD) of the tool. The tool slides over existing casing or liner and is secured to the pipe using radial set screws on both ends. The inside diameter (ID) of the sleeve is sealed against the pipe when two O-rings—designed to swell when in contact with either hydrocarbons or water—react and expand.

As the reactive element elastomer swells, it seals the annulus between the OD of the liner or casing and the ID of the open hole to provide isolation between zones with different pressures, or to shut off flow in the annulus and prevent fines migration along the wellbore. After the elastomer reacts to oil or water and expands, it remains swollen, even when the reactive fluid is no longer present. This provides a permanent seal that will not degrade with fluid changes.

Applications
- Deviated, vertical, deep, shallow, or extended-reach wells
- Cased or open holes
- Slides over existing casing or liner

Features and Benefits
- Reactive element sealing elastomer
  - Provides permanent seal without cement
  - Offers enhanced expansion while retaining critical seal element properties
  - Reduces downtime and deferred production
  - Will not shrink if fluids change after swelling
- Machined sleeve with recessed element
  - Slides easily over existing casing or liner
  - Simplifies installation and operation
  - Requires no running tools or specialized personnel
  - Reduces operation time and HSE risks
- Radial set screws and swelling O-rings
  - Secure the sleeve to the casing or liner
  - Create a seal between the ID of the sleeve and the OD of the casing
  - Firmly hold the sleeve and elastomer in place
The REBarrier slide-on packer can easily be installed at the rig site on tubing or liner before it is stabbed into the completion string. Because it requires no running tool or mechanical intervention, the REBarrier packer reduces health, safety, and environmental (HSE) risks. It simplifies completion operations by eliminating the need for running tools and specialized rigsite personnel, and reduces wellbore damage associated with cementing operations.

Contact your Baker Hughes representative to learn more about how the Bakerline series REBarrier slide-on packer can transform casing into an annular packer.

### Bakerline Series REBarrier Slide-on Packer

<table>
<thead>
<tr>
<th>Base Pipe OD</th>
<th>Slide-on Packer OD</th>
<th>Element Length</th>
<th>Openhole Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>in.</td>
<td>ft</td>
<td>m</td>
</tr>
<tr>
<td>3½</td>
<td>5¾-6</td>
<td>1</td>
<td>.305</td>
</tr>
<tr>
<td>4½</td>
<td>5½</td>
<td>2</td>
<td>.620</td>
</tr>
<tr>
<td>5½</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5½</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6½</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8½</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REPacker Reactive Element Packer
Cut costs while reducing operational, HSE, and wellbore damage risks

The Bakerline™ series REPacker™ reactive element packer offers wellbore isolation solutions for applications ranging from water shutoff and flow control to intelligent wells, multi-zone fracturing, and acid stimulation. The tool features an elastomeric polymer sealing element that reacts with oil or water to swell and isolate zones in either open or cased holes, without the need for cement, special trips, running tools, or specialized rigsite personnel.

REPacker reactive element packers are run in the well and begin to swell when they contact oil or water. As the packers swell, they seal off the annulus between the liner or casing and the inside diameter (ID) of the open hole to provide isolation between zones with different pressures, or to shut off flow in the annulus and prevent fines migration along the wellbore. After the elastomer reacts to oil or water and expands, it remains swollen, even when the reactive fluid is no longer present. This provides a permanent seal that will not degrade with fluid changes.

Applications
- Deviated, vertical, deep, shallow, or extended-reach wells
- Cased or open holes

Features and Benefits
- Reactive element sealing elastomer
  - Provides permanent seal without cement in cased and openhole wellbores
  - Offers enhanced expansion while retaining critical seal element properties
  - Reduces downtime and deferred production
  - Will not shrink if fluids change after swelling
- Solid packer mandrel
  - Matches characteristics of casing or liner
  - Simplifies installation and operation
  - Requires no running tools or specialized personnel
  - Reduces operation time and HSE risks
The packer is manufactured by bonding and wrapping a rubber element onto a joint of casing. The casing joint can match the mechanical properties of the proposed liner string. As a result, installing the packer within the string can be as simple as torquing another joint of pipe.

The REPacker reactive element packer is simple to deploy, and the self-energized swelling element reduces rig time while providing complete, permanent zonal isolation without complex and expensive methods, such as cementing and perforating, which can potentially impair near-wellbore permeability and shorten the life of the well. Because it requires no running tool or mechanical intervention, the packer reduces health, safety, and environmental (HSE) risks.

Contact your Baker Hughes representative to learn more about how the Bakerline series REPacker reactive element packer can help you cut costs by reducing operational, HSE, and wellbore damage risks.

Bakerline Series REPacker Reactive Element Packer

<table>
<thead>
<tr>
<th>Base Pipe OD</th>
<th>Element OD</th>
<th>Element Length</th>
<th>Openhole Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>in.</td>
<td>ft</td>
<td>m</td>
</tr>
<tr>
<td>4½</td>
<td>5½</td>
<td>5</td>
<td>1.52</td>
</tr>
<tr>
<td></td>
<td>6½</td>
<td>5</td>
<td>1.52</td>
</tr>
<tr>
<td>5½</td>
<td>6¼</td>
<td>5</td>
<td>1.52</td>
</tr>
<tr>
<td></td>
<td>6½</td>
<td>5</td>
<td>1.52</td>
</tr>
<tr>
<td>6½ or 7</td>
<td>8</td>
<td>5</td>
<td>1.52</td>
</tr>
</tbody>
</table>

REPacker reactive element packers are manufactured with blank threads and standard materials.
Mill-Out Extension
Allow Milling and Packer Retrieving in a Single Trip

The Bakerline™ series mill-out extension is designed to run below a seal bore packer. It provides a larger inside diameter (ID) below the packer seal bore that allows a single-trip packer milling tool to be used. The larger ID is required to accommodate the latching mechanism of the packer milling tool.

The Bakerline mill-out extension is available in 80 Ksi and 110 Ksi materials with either EU 8 RD or VAM TOP threads.

Contact your Baker Hughes representative today to learn more about using our Bakerline series mill-out extension to perform packer milling and retrieving in a single-trip.

Bakerline Series Mill-Out Extension

<table>
<thead>
<tr>
<th>Casing Size</th>
<th>Packer Size</th>
<th>Seal Assembly Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>mm</td>
<td>ft</td>
<td>m</td>
</tr>
<tr>
<td>5.000</td>
<td>127</td>
<td>396–268</td>
<td>40–26</td>
</tr>
<tr>
<td>5.500</td>
<td>139.7</td>
<td>450–268</td>
<td>40–26</td>
</tr>
<tr>
<td>6.625</td>
<td>168.3</td>
<td>568–268</td>
<td>80–26</td>
</tr>
<tr>
<td>7.000</td>
<td>177.8</td>
<td>618–325</td>
<td>80–26</td>
</tr>
<tr>
<td>7.625</td>
<td>193.7</td>
<td>631–325</td>
<td>80–32</td>
</tr>
<tr>
<td>9.625</td>
<td>244.5</td>
<td>812–400</td>
<td>80–40</td>
</tr>
</tbody>
</table>

Applications
- Production packer completions
- Isolation packers

Features and Benefits
- Large bore ID
  - Allows for one-trip milling and retrieving
Seal Bore Extension
Allow tubing movement to prevent failure of the tubing packer and hanger

The Bakerline™ series seal bore extension can be run to provide additional sealing when a long seal assembly is run to accommodate considerable tubing movement. The extensions can be run below a seal bore packer.

The seal bore extension has the same inside diameter (ID) as the corresponding packer seal bore it is run with, causing all seals of a long assembly to seal off in the extension. If extreme tubing movement is anticipated, it is advisable to incorporate blank sections in the seal assembly to minimize the friction of the seals inside the seal bore extension.

Contact your Baker Hughes representative today to learn more about how our Bakerline series seal bore extension can help prevent failure of the tubing packer and hanger.

Bakerline Series Seal Bore Extension

<table>
<thead>
<tr>
<th>OD (in.)</th>
<th>Length (mm)</th>
<th>Seal Assembly Size (m)</th>
<th>Packer Size (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.500</td>
<td>88.9</td>
<td>10</td>
<td>3.048</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.500</td>
<td>114.3</td>
<td>10</td>
<td>3.048</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Wireline Entry Guide with Optional Shear-Out Ball Seat and Sub
Ease re-entry of wireline tools into tubing

The Bakerline™ series wireline entry guide is designed to be run on the bottom of the tubing string, aiding in the re-entry of wireline tools into the tubing. When used with the optional shear-out ball seat, a hydraulic packer can be set without using additional plugging device.

To pressurize the tubing string, the wireline entry guide with ball seat is installed on the bottom end of the tubing, the completion is run to depth, then the ball is dropped from surface and fluid is pumped. When the differential pressure at the tool reaches a predetermined value, the ball and seat are pumped out of the tool. After the ball seat is pumped out, the sub allows unrestricted access from the tubing into the casing below the tubing string. These products are available in 80 Ksi and 110 Ksi materials, 2½-in. through 4½-in. sizes, and with EU 8RD or VAM TOP threads.

The shear-out ball-seat sub can be furnished in a box x-pin configuration for applications where it is necessary to run additional tubing or completion equipment below the shear-out ball-seat sub. When the ball and ball seat are used, they are expelled during operation, so it is necessary to ensure they will safely pass through all equipment located below them.

Contact your Baker Hughes representative today to learn more about using our Bakerline series wireline entry guide with optional shear-out ball seat to ease re-entry of wireline tools into the tubing.

Applications
- Wireline entry guide
- Aiding the re-entry of wireline tools into the tubing
- Shear-out ball seat and sub
- Setting a hydraulic packer
- Temporary plugging of the tubing during stimulation, acidizing, or testing

Features and Benefits
- Wireline entry guide
  - Single piece construction
  - Increases ruggedness
  - Located at the end of a tubing string
  - Provides assurance that wireline tools may re-enter the tubing string without hanging up
- Shear-out ball-seat sub
  - Longer shear screws
  - Allow pretesting at ambient temperature to be performed prior to running the tool
  - Back-up O-ring
  - Ensures seal integrity
The Bakerline™ series CD 6000™ and CU 6000™ sliding sleeves are high-performance, equalizing sliding sleeves that allow communication between the tubing and annulus for circulation or selective-zone production. When desired, the sleeve can be shifted open or closed using standard wireline methods and a B-type shifting tool. The tool is designed so that any lock profile and compatible seal bores can be specified. The sleeve is available in CD 6000 downshift-to-open or CU 6000 upshift-to-open versions.

The nominal working pressure for the sleeve is 6,000 psi (413.69 bar) at 275°F (135°C) service temperature. The sleeve is available in L80 or 13 chrome with F or BX profile. Modular design permits conversion from a CD 6000 sleeve to CU 6000 sleeve or vice versa by changing the upper and lower subs.

Several unique features have been combined to upgrade seal performance and increase service life of the CD 6000 and CU 6000 sliding sleeves. A specially designed diffuser ring made of high-strength thermoplastic is critically spaced between the flow ports and the upper packing unit. This prevents damage to the upper packing unit during shifting by controlling the rush of fluid or gas, and lessens the likelihood of tool string damage by providing for slow equalization of high differentials. Mill slots replace drill holes as flow ports on both the housing and the insert to allow more flow area, reduce erosion, and allow higher torque and tensile strength through the sleeve. Locating the threaded connection inside the primary seal stack eliminates the need for O-ring thread seals and cuts potential leak paths.

**Features and Benefits**
- High-strength thermoplastic diffuser ring
  - Prevents seal-stack damage during shifting by choking or controlling the rush of fluid or gas
- Mill slots
  - Reduce erosion and increase flow area while maintaining high torque ratings
- Threaded connection inside the primary seal stack
  - Eliminates the need for O-ring thread seals and cuts potential leak paths
- Locking, angled torque shoulder
  - Allows for higher torque ratings and reduces thread backoff
- Sealing system manufactured of nonelastometric and elastomeric compounds
  - Enhances performance in diverse environments
- QPQ surface finish
  - Reduces galling, corrosion, and erosion

**Applications**
- Circulating or displacing kill or completion fluids
- Multizone well production
- Selective testing of individual zones, tubing string, or completion devices
- Selective stimulation of individual zones
- Gas-lift operations

CD 6000 and CU 6000 Sliding Sleeves
Ensure reliable communication between the tubing and annulus

CD 6000 sliding sleeve
Product family no. H81000

CU 6000 sliding sleeve
Product family no. H81000
Contact your Baker Hughes representative today to learn more about how our Bakerline series CD 6000 and CU 6000 sliding sleeves can help ensure reliable communication between the tubing and the annulus.

### Bakerline Series CD 6000™ and CU 6000™ Sliding Sleeves

<table>
<thead>
<tr>
<th>Tubing OD</th>
<th>Seal Bore</th>
<th>OD</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>in.</td>
<td>mm</td>
</tr>
<tr>
<td>2.375</td>
<td>1.875</td>
<td>47.62</td>
</tr>
<tr>
<td>2.875</td>
<td>2.312</td>
<td>58.72</td>
</tr>
<tr>
<td>3.500</td>
<td>2.75</td>
<td>69.85</td>
</tr>
</tbody>
</table>

Bakerline series products are a select group of field-proven completions equipment in our most popular designs and sizes. Bakerline series products provide optimized solutions for many applications and are produced in volume to assure prompt delivery. Only products with the specifications presented in this document are available through the Bakerline series program. If other product specifications are required, contact your Baker Hughes representative.

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E-22 Anchor and G-22 Locator Tubing-Seal Assembly
Ensure an efficient and leakproof seal between the packer and production string

The Bakerline™ series G-22™ locator tubing-seal assembly is used in single- or dual-zone installations to provide an efficient, leakproof seal between the packer and production string. The seal results from the action of Chevron or bonded seals that seal off the annulus between the bore of the packer and the tubing string.

The Bakerline E-22™ anchor tubing-seal assembly is used in the same type of applications as the G-22 assembly, but uses a latch in addition to the locating shoulder for connection to the packer. The latch, in conjunction with the left-hand square threads located in the top of the packer body, enables the tubing string to be anchored to the packer.

Seal units or spacer seal units may be used with the locator-seal assemblies to provide the additional length required when tubing movement is anticipated. Any number of units may be added as required.

The Bakerline seal assemblies are offered in 80 Ksi material with EU 8RD threads in 2.375 in., 2.875 in., and 3.500 in. sizes, and they are available with either Chevron or bonded seals.

Contact your Baker Hughes representative today to learn more about how our Bakerline series G-22 and E-22 locator tubing-seal assemblies can help ensure an efficient, leakproof seal between the packer and production string.

Applications
- Single-zone completions
- Multizone completions

Features and Benefits
- G-22 locator tubing-seal assembly
  - Seal assembly allows for tubing movement during stimulation or production phase
    - Reduces forces and stresses on the system
- E-22 anchor tubing-seal assembly
  - Latch and locating shoulder
    - Provide positive indication of connection to the packer
    - Transfer forces to the casing through the packer
    - Reduce tubing forces and stresses and eliminate tubing movement

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L-10 and R-10 On-Off Sealing Connector Family
Adapt to many operational needs with connectors that offer multiple design and material options

The Bakerline™ series L-10™ (left-hand) and R-10™ (right-hand) on-off sealing connectors have the capability to simply and reliably retrieve the production string without disturbing the companion packer below. These connectors offer right- or left-hand setting, and the sealing system allows the tubing to be disconnected for fluid circulation while ensuring seal integrity when reconnected.

Only the top sub and seal nipple are exposed to flow. Tools can be set to shear up or down, and feature automatic re-engagement with set-down weight.

The connectors are rated to 10,000 psi (689.5 bar) at 275°F (135°C) with bonded seals, and to 12,000 psi (827.4 bar) at 350°F (177°C) with nonelastomeric seals. They are fully tested in gas at maximum temperature with multiple pressure reversals. The tensile rating of the Bakerline series L-10 and R-10 connectors is compatible with L-80 tubing in NACE trim and P-105 tubing in standard material.

The connectors are available in 80 Ksi and 110 Ksi, and are offered with VAM TOP, EU 8 RD, and blank threads. Elastomers are available in nitrile or thermoplastic nonelastometric, and they are available with an F or BX seating nipple profile.

The seating nipple profile is available in the top-of-the-seal nipple to permit plugging of the lower zone while the tubing is removed. Both left-hand and right-hand releasing versions are available, enabling remedial or

Applications
- To retrieve the production string without disturbing the companion packer below
- To disconnect tubing for fluid circulation while ensuring seal integrity at reconnection

Features and Benefits
- Short, compact design with no welded parts
  - Ensures a superior sealing system
- Orientation of the seals
  - Eliminates the need for O-rings
stimulation work above the packer. The plug can then be removed with conventional wireline methods, allowing production of the well to resume.

Contact your Baker Hughes representative today for more information about how the Bakerline series L-10 and R-10 on-off sealing connectors can meet a broad range of operational needs.

Bakerline Series L-10™ and R-10™ On-Off Sealing Connectors

<table>
<thead>
<tr>
<th>Tool Size</th>
<th>Minimum Seal Nipple ID</th>
<th>Washover Shoe OD (Maximum)</th>
<th>Recommended Casing Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in.</td>
<td>mm</td>
<td>in. (mm)</td>
</tr>
<tr>
<td>2.375</td>
<td>60.3</td>
<td></td>
<td>1.87 (47.5) with profile 1.930 (49.0) with blank ID</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.875</td>
<td>73.0</td>
<td></td>
<td>2.31 (58.7) with profile 2.377 (60.4) with blank ID</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.500</td>
<td>88.9</td>
<td></td>
<td>2.81 (71.4) with profile 2.942 (74.7) with blank ID</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bakerline series products are a select group of field-proven completion equipment in our most popular designs and sizes. Bakerline series products provide optimized solutions for many applications and are produced in volume to assure prompt delivery. Only products with the specifications presented in this document are available through the Bakerline series program. If other product specifications are required, contact your Baker Hughes representative.
Model BX and BXN Seating Nipples
Locate various flow control devices in the production string

The Bakerline™ series Model BX™ nonported seating nipple is a selective, downhole tubing nipple used to locate, seal, and retain Baker Hughes BX locks, and the BXN™ nonported seating nipple is a no-go, downhole tubing nipple used to locate, seal, and retain BXN locks. Both provide for the location of various wireline flow control devices in the production string. The location and number of seating nipples should be carefully considered in the completion planning stages to allow maximum versatility in the positioning of flow control accessories.

Contact your Baker Hughes representative today to learn more about using our Bakerline series Model BX and BXN seating nipples to locate a wide variety of flow control devices in the production string.

Bakerline Series Model BX™ and BXN™ Seating Nipples

<table>
<thead>
<tr>
<th>Tubing Size</th>
<th>Weight (lb/ft)</th>
<th>Seal Bore (in. mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.375</td>
<td>60.300</td>
<td>4.700</td>
</tr>
<tr>
<td>2.875</td>
<td>73.025</td>
<td>6.500</td>
</tr>
<tr>
<td>3.500</td>
<td>88.900</td>
<td>9.300</td>
</tr>
</tbody>
</table>

Applications
- Locate wireline flow control devices in the production string
- Land blanking plugs to shut in well or to test the production tubing
- Land velocity-type safety valves
- Land equalizing check valves
- Land circulating blanking plugs
- Land chokes to reduce surface flowing pressures or have pressure drops downhole to prevent surface freezing in gas production
- Land instrument hangers with geophysical devices such as pressure and temperature recorders
- Prevent loss of wireline workstring in some scenarios

Features and Benefits
- Premium materials and engineering (80 Ksi alloy steel and 13 chrome, API and VAM TOP threads)
  - Ensure reliable performance and reduce risk
- Integral locking groove
  - Prevents flow control devices from passing through the nipple
- Contoured and polished seal bore
  - Passes Chevron packing without damage
Model F and R Seating Nipples

Gain maximum versatility when positioning flow control accessories

The Bakerline™ series Model F™ seating nipple is a top no-go or selective nipple and the Model R™ seating nipple is a bottom no-go nipple. The Model F and R seating nipples provide for the location of various wireline flow control devices in the production string. The location and number of seating nipples should be carefully considered in the completion planning stages to allow maximum versatility in the positioning of various flow control accessories. The Model F and R seating nipples are available in 80 Ksi and 110 Ksi materials with either EU 8 RD or VAM TOP threads.

Contact your Baker Hughes representative today to learn more about using our Bakerline series Model F and R seating nipples to get maximum versatility when positioning flow control devices.

Bakerline Series Model F™ and R™ Seating Nipples

<table>
<thead>
<tr>
<th>Tubing</th>
<th>Nipple</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Weight</td>
</tr>
<tr>
<td>in.</td>
<td>mm</td>
</tr>
<tr>
<td>2.375</td>
<td>60.300</td>
</tr>
<tr>
<td>2.875</td>
<td>73.000</td>
</tr>
<tr>
<td>3.500</td>
<td>88.900</td>
</tr>
</tbody>
</table>

Applications

- Locating wireline flow control devices in the production string
- Land blanking plugs to shut in well or to test the production tubing
- Land velocity-type safety valves
- Land equalizing check valves
- Land circulating blanking plugs
- Land chokes to reduce surface flowing pressures or have pressure drops downhole to prevent surface freezing in gas production
- Land instrument hangers with geophysical devices such as pressure and temperature recorders
- Preventing loss of wireline workstring in some scenarios

Features and Benefits

- Premium materials and engineering (alloy steel 80 Ksi & 110 Ksi, API and VAM TOP threads, heat-treated to NACE specifications, and manufactured per NACE MR-01-75)
  - Ensure reliable performance and reduce risk
- Universal nipple profile
  - Eliminate issues associated with finding matching locks
- Integral locking groove
  - Prevents flow control devices from passing through the nipple
- Contoured and polished seal bore
  - Passes Chevron packing without damage

Bakerline Series Model F™ and R™ Seating Nipples

Tubing Nipple

Size Weight Seal Bore

in. mm lb/ft in. mm

2.375 60.300 4.700 1.781 45.200
2.875 73.000 6.500 2.250 57.200
3.500 88.900 9.300 2.750 69.900

2.812 58.700 2.310

2.750 69.900 2.812 71.400
**Select Subsurface Safety Valve**
Ensure reliable operation with a field-proven valve

The Bakerline™ series Select™ tubing-retrievable subsurface safety valve (TRSSV) meets the challenges of shallow-set applications of less than 2,000 ft (610 m) while delivering reliable and consistent closing in the presence of solids such as asphaltenes, scale, and paraffin. It does this with optimized sand exclusion, self-cleaning areas, and almost twice the closing force required. The surface-controlled valve ensures smooth and dependable flow-tube movement by generating high closure forces required in harsh, shallow-set environments.

Rated to 5,000 psi (345 bar) working pressure and 300°F (149°C) temperature, the Bakerline Select subsurface safety valve offers field-proven technology to maximize safety-valve operation while providing an economical solution that lowers risks. The valve has a metal-to-metal containment below the flapper with a redundant, resilient seal, and can incorporate an optional through-the-flapper self-equalizing system. The valve is available in 9 Cr or 13 Cr.

Contact your Baker Hughes representative today to learn more about using our field-proven Bakerline series Select subsurface safety valve to ensure reliable operation.

**Applications**
- Shallow-set applications in less than 2,000 ft
- To close in the presence of paraffin and other produced solids
- For smaller tubing sizes ranging from 2½ in. to 3½ in.

**Features and Benefits**
- Standardized component offering
  - Provides cost optimization
- Ultrastrong power spring
  - Ensures smooth and reliable closures
- Wireline-damage-resistant flapper
  - Protects sealing integrity during wireline operations
- Patented through-the-flapper self-equalizing system
  - Equalizes pressure through the safety valve without the use of pumping equipment
- Patented radial punch-control fluid communication system
  - Eliminates accidental communication primarily associated with linear shifting sleeves
- Metal-to-metal seal technology
  - Contains 100% of wellbore fluids when the valve is closed
Bakerline Series SeleC™ Subsurface Safety Valve

<table>
<thead>
<tr>
<th>Size</th>
<th>Max OD</th>
<th>Max Seal Bore</th>
<th>Piston Displacement</th>
<th>Working Pressure</th>
<th>Setting Depth</th>
<th>Max Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>mm</td>
<td>in.</td>
<td>mm</td>
<td>cc</td>
<td>psi/bar ft/m</td>
<td>°F/°C</td>
</tr>
<tr>
<td>2.375</td>
<td>60.3</td>
<td>4.500</td>
<td>114.3</td>
<td>1.875</td>
<td>47.6</td>
<td>14.6</td>
</tr>
<tr>
<td>2.875</td>
<td>73.0</td>
<td>5.000</td>
<td>127.0</td>
<td>2.312</td>
<td>58.7</td>
<td>16.7</td>
</tr>
<tr>
<td>3.500</td>
<td>88.9</td>
<td>5.700</td>
<td>144.8</td>
<td>2.810</td>
<td>71.3</td>
<td>19.5</td>
</tr>
</tbody>
</table>

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The Bakerline™ series T-Series™ tubing-retrievable subsurface safety valves (TRSSVs) offer unmatched protection in various applications. The reliability and simplicity of the T-Series valve has made it one of the most successful safety valves in the industry. The high spring-closure force guarantees performance in the presence of paraffin or other produced solids.

With Bakerline T-Series TRSSVs, you can count on premium performance and long-term reliability for the life of the well. Those features can be attributed to complete removal of elastomeric compounds and elimination of linear shifting sleeves. Incorporating nonelastomeric dynamic seals and metal-to-metal housing connections eliminates the possibility of explosive decompression, which is commonly associated with elastomeric compounds. Extensive studies by operators and independent research institutes have shown that accidental actuation of shifting sleeves and subsequent control-fluid communication is one of the primary causes for safety valve failures. By removing all shifting sleeves from the T-Series valve, Baker Hughes has eliminated one of the most common failure modes in safety valves.

The Bakerline T-Series valve is rated for 5,000-psi (344.7-bar) working pressure and is controlled from the surface via a small-diameter hydraulic control line connecting the safety valve to the surface emergency shut-down system. Since the valve is a closed type, when the applied control-line pressure is removed the valve returns to the closed position and shuts in the well. The valve is

### Applications
- Single-string completions
- Gas lift

### Features and Benefits
- Standardized component offering
  - Provides for cost optimization
- Nonelastomeric dynamic seal assembly
  - Withstands extreme pressures and temperatures up to 30,000 psi (1931 bar) and 450°F (232°C)
- Baker Hughes RBT™ housing seals, a two-step metal-to-metal sealing system
  - Provides strength and sealing under the harshest conditions
- Patented radial-punch control fluid communication system
  - Eliminates accidental communication primarily associated with linear shifting sleeves
- Patented through-the-flapper self-equalizing system
  - Equalizes pressure through the safety valve without using pumping equipment
- Ultra-strong power spring
  - Ensures deep-set capability and smooth and reliable closures
available with either a non-equalizing or a self-equalizing flapper assembly. The valve is available in 9 Cr or 13 Cr.

Contact your Baker Hughes representative today to learn more about using our Bakerline series T-Series valves to ensure premium performance and long-term reliability throughout the life of the well.

**Bakerline Series T-Series™ Subsurface Safety Valve**

<table>
<thead>
<tr>
<th>Size</th>
<th>Maximum OD</th>
<th>Maximum Seal Bore</th>
<th>Piston Displacement</th>
<th>Working Pressure</th>
<th>Setting Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>in.</td>
<td>mm</td>
<td>in.</td>
<td>mm</td>
<td>cc</td>
<td>psi</td>
</tr>
<tr>
<td>2.375</td>
<td>60.325</td>
<td>3.625</td>
<td>9.21</td>
<td>1.875</td>
<td>47.6</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2.875</td>
<td>73.025</td>
<td>4.625</td>
<td>117.5</td>
<td>2.312</td>
<td>58.7</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>3.500</td>
<td>88.9</td>
<td>5.38</td>
<td>136.7</td>
<td>2.812</td>
<td>71.4</td>
</tr>
<tr>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.500</td>
<td>114.3</td>
<td>7.125</td>
<td>181</td>
<td>3.812</td>
<td>96.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SureSSENS 125LP Monitoring System
Monitor performance and optimize PCP operations with permanent gauges

The Bakerline™ series SureSSENS™ 125LP system delivers critical data on pump pressures and fluid temperature to help operators increase run life and improve progressive cavity pump (PCP) system performance. The system can also be used to monitor artificial lift parameters via a downhole tubing encapsulated cable (TEC).

The flexibility of the system enables the selection of a number of parameters, including single-point zonal pressure measurements to multiple-point pressure measurements in multiple zone or intelligent applications. The SureSSENS 125LP sensor provides operators with a reliable tool to accurately maintain established well pressures and measure fluid temperatures while optimizing production rates and reserve recovery.

The SureSSENS 125LP system provides the following parameters:
- Intake pressure
- Intake temperature
- Discharge pressure
- Discharge temperature

**Applications**
- Heavy oil
- Conventional oil
- Gas well dewatering
- Low marginal wells
- Solids handling
- Bottomhole pressure up to 5,000 psi and temperatures up to 257°F
- Wells requiring single, multiple-point, or differential pressure measurements

**Features and Benefits**
- Supports multiple monitoring devices on a single TEC
  - Allows deployment of multiple gauges for redundant readings
- Constructed entirely of NACE MR0175 compliant materials
  - Withstands hostile environments
- Metal-to-metal sealing technology
  - Ensures mechanical integrity of gauge assembly
- Proven track record
  - Over 1,000 SureSSENS 125 gauge deployments
Contact your Baker Hughes representative today to find out how our Bakerline series SureSENS 125LP monitoring system can help you extend PCP run life and optimize production.

### Mechanical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>28.9 in. (73.4 cm)</td>
</tr>
<tr>
<td>Diameter</td>
<td>1.50 in. (3.8 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>6.0 lb (2.7 kg)</td>
</tr>
<tr>
<td>Material</td>
<td>Inconel 718</td>
</tr>
<tr>
<td>Transducer</td>
<td>Silicon-on-silicon</td>
</tr>
<tr>
<td>Transducer option</td>
<td>5,000 psi (344.7 bar)</td>
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</tbody>
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### Environmental Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Temperature rating (operating)</td>
<td>13°F−257°F (-10.5°C−125°C)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-67°F−257°F (-55°C−125°C)</td>
</tr>
<tr>
<td>Vibration</td>
<td>&gt;5G</td>
</tr>
<tr>
<td>Shock</td>
<td>500 G</td>
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</table>

### Measurement Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure measurement range (calibrated)</td>
<td>15 psi–5,000 psi (1 bar–344.7 bar)</td>
</tr>
<tr>
<td>Pressure accuracy</td>
<td>±5.0 psi</td>
</tr>
<tr>
<td>Pressure resolution</td>
<td>0.1 psi</td>
</tr>
<tr>
<td>Temperature measurement range (calibrated)</td>
<td>77°F–257°F (25°C–125°C)</td>
</tr>
<tr>
<td>Temperature accuracy</td>
<td>±1.8°F</td>
</tr>
<tr>
<td>Temperature resolution</td>
<td>0.18°F</td>
</tr>
<tr>
<td>Maximum sample rate / second</td>
<td>1</td>
</tr>
<tr>
<td>Number of gauges support/TEC</td>
<td>2</td>
</tr>
<tr>
<td>Cable distance transmission</td>
<td>30,000 ft (9144 m)</td>
</tr>
</tbody>
</table>

SureSENS™ 125LP gauge
BAKERWELD Screen

Extend well longevity and ensure effective protection with high-performance sand screens

The Bakerline™ series BAKERWELD™ gravel-pack screen is a sand-retention device set in the well to provide a simple, reliable, and effective method of preventing gravel-pack sand from entering the tubulars while allowing production fluid to flow into the well. The wire-wrapped design has up to 30 times more inflow area than slotted pipe of the same opening size, which increases well longevity.

BAKERWELD screens are constructed with keystone-shaped wire, allowing a self-cleaning action for greater flow and less chance of plugging. Each wire is welded at every point of contact with the underlying rib wire. This means it does not separate when pulled or “birdnest” when milled, offering superior fishability. Pull tests are performed on the wire-to-rib weld to ensure the highest strength and durability.

For additional strength, the screen jackets are welded directly to the base pipe using ASME Section 9 welding procedures and certified welders. All BAKERWELD screens are manufactured according to strict quality control procedures to ensure reliable performance and the highest quality in wire-wrapped screen technology. BAKERWELD screens are available in sizes from 2.375 in to 6.625 in (26.7 mm to 168.3 mm) and can be used in oil, gas, waterflood, water, and disposal wells.

A wide range of metallurgies is available for the jacket construction. The base pipe metallurgy can be specified or the base pipe can be supplied by the customer.

Applications
- Oil, gas, waterflood, steamflood, water, and disposal wells where sand control is required
- High-rate gas or oil wells

Features and Benefits
- Wire wrap is welded at each point of contact with rib wire
  - Prevents separation when pulled
  - Eliminates “birdnesting” when milled
- Keystone-shaped wire
  - Allows for self-cleaning and greater flow
  - Reduces plugging
- Compatible with a wide range of base pipe types
  - Allows screen to be used with Baker Hughes-supplied pipe (L-80 and 13 chrome standard metallurgies) or customer-supplied base pipe
- Up to 30 times more effective inlet area than a slotted pipe of the same gauge
  - Increases well longevity
- Extensive testing and vigorous quality control during manufacturing
  - Verifies highest strength and durability
  - Ensures reliable performance
Contact your Baker Hughes representative to learn more about how our Bakerline series BAKERWELD screen extends well longevity and provides effective sand control.

**Bakerline Series BAKERWELD™ Screen**

<table>
<thead>
<tr>
<th>Base Pipe Size</th>
<th>Weight</th>
<th>Pipe Size ID</th>
<th>Coupling OD</th>
<th>Hole Size</th>
<th>Number of Holes</th>
<th>BAKERWELD Screen OD</th>
<th>BAKERWELD 140 Screen OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/ft</td>
<td>in. mm</td>
<td>in. mm</td>
<td>per ft</td>
<td>per m</td>
<td>in. mm</td>
<td>in. mm</td>
</tr>
<tr>
<td>2.375</td>
<td>4.60</td>
<td>1.995 50.7</td>
<td>2.875 73.0</td>
<td>0.375 9.5</td>
<td>48 157 96 315</td>
<td>2.82 71.6 2.96 75.2</td>
<td></td>
</tr>
<tr>
<td>2.875</td>
<td>6.40</td>
<td>2.441 62.0</td>
<td>3.500 88.9</td>
<td>0.375 9.5</td>
<td>54 177 108 354</td>
<td>3.32 84.3 3.46 87.9</td>
<td></td>
</tr>
<tr>
<td>3.500</td>
<td>9.20</td>
<td>2.992 76.0</td>
<td>4.250 108.0</td>
<td>0.375 9.5</td>
<td>66 217 132 433</td>
<td>3.95 100.3 4.09 103.9</td>
<td></td>
</tr>
<tr>
<td>4.000</td>
<td>11.60</td>
<td>3.548 90.1</td>
<td>4.500 114.3</td>
<td>0.375 9.5</td>
<td>72 236 144 472</td>
<td>4.45 113.0 4.59 116.6</td>
<td></td>
</tr>
<tr>
<td>4.500</td>
<td>17.26</td>
<td>4.000 101.6</td>
<td>5.000 127.0</td>
<td>0.375 9.5</td>
<td>78 256 156 512</td>
<td>4.96 126.0 5.10 129.5</td>
<td></td>
</tr>
<tr>
<td>5.000</td>
<td>22.32</td>
<td>4.408 112.0</td>
<td>5.563 141.3</td>
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<td>84 276 168 551</td>
<td>5.47 138.9 5.61 142.5</td>
<td></td>
</tr>
<tr>
<td>5.500</td>
<td>25.30</td>
<td>4.892 124.3</td>
<td>6.050 153.7</td>
<td>0.375 9.5</td>
<td>90 295 180 591</td>
<td>5.97 151.6 6.11 155.2</td>
<td></td>
</tr>
<tr>
<td>6.625</td>
<td>35.72</td>
<td>5.920 150.4</td>
<td>7.390 187.7</td>
<td>0.375 9.5</td>
<td>108 354 216 709</td>
<td>7.11 180.6 7.25 184.2</td>
<td></td>
</tr>
</tbody>
</table>

Turned-down coupling available on request. Recommended applications should give 2-in. (50.8-mm) radial clearance from screen OD to openhole diameter, or 0.75-in. to 1.0-in. (19.1-mm to 25.4-mm) radial clearance from screen OD to casing ID for wells with gravel pack to enable retrieval. Less radial clearance will probably make screen retrieval difficult after producing the well because of the inability to wash over the screen to remove formation sand packed around it. Additional sizes and additional base pipe sizes/weights available upon request. Contact your local Baker Hughes representative for additional information.
The Bakerline™ series SLIM-PAK™ screen provides the benefits of a prepacked screen without sacrificing critical outside diameter (OD) or inside diameter (ID) dimensions. The screen system makes gravel-packed or frac-packed completions more reliable without dimensional restrictions or performance limitations, and it offers a cost-effective solution where premium screen is not economical.

The SLIM-PAK screen consists of a wire cloth wrapped around a perforated pipe base, a precured layer of Baker Bond™ resin-coated proppant, and a BAKERWELD™ screen jacket welded to a perforated pipe base. The surface-cured Baker Bond layer offers maximum permeability and compressive strength to properly inhibit formation sand production through annular pack imperfections, making it particularly well suited for frac packing and for difficult gravel placement applications.

Some artificial lift wells, such as rod pumps and submersible pumps, produce trace amounts of fines which can cause premature equipment failure. Provided the well does not make enough sand to justify a gravel pack, installation of a SLIM-PAK screen can extend the life of the downhole pumping equipment.

The Bakerline series SLIM-PAK screen is available in a wide variety of sizes and metallurgies, and similar to our BAKERWELD screens, they are manufactured according to documented quality control procedures to ensure reliable performance.

Applications
- Gravel-packed and frac-packed completions
- Long interval and highly deviated or horizontal applications
- Can be used as a standalone screen without gravel packing in certain applications
  - Low-productivity wells
  - Exploratory drill stem testing
  - Wells with downhole pumps to reduce pump damage and fines caused by the pumps

Features and Benefits
- Baker Bond layer
  - Ensures maximum permeability and compressive strength because it is surface-cured after assembly
  - Restricts formation sand production through pack imperfections
  - Ensures zone coverage when close spacing between zones limits the gravel reserve
- Slender construction
  - Eases passage through tight spots and doglegs
Contact your Baker Hughes representative to learn more about how our Bakerline series SLIM-PAK screen provides reliable and cost-effective sand control.

**Bakerline Series SLIM-PAK™ Screen**

<table>
<thead>
<tr>
<th>Base Pipe Size</th>
<th>Weight</th>
<th>Pipe Size ID</th>
<th>Coupling OD Standard</th>
<th>Hole Size</th>
<th>Number of Holes BAKERWELD Screen OD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/ft</td>
<td>kg/m</td>
<td>in.</td>
<td>mm</td>
<td>in.</td>
</tr>
<tr>
<td>1.050</td>
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<td>1.70</td>
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<td>4.500</td>
</tr>
<tr>
<td>4.500</td>
<td>11.60</td>
<td>17.26</td>
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<td>5.500</td>
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</tr>
<tr>
<td>6.250</td>
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<td>10.625</td>
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Recommended applications should give 2-in. (50.8-mm) radial clearance from screen OD to openhole diameter, or 0.75-in. to 1.0-in. (19.1-mm to 25.4-mm) radial clearance from screen OD to casing ID for wells with gravel pack to enable retrieval. Less radial clearance will probably make screen retrieval difficult after producing the well because of the inability to wash over the screen to remove formation sand packed around it. Additional base pipe size/weights available upon request.

Contact your local Baker Hughes representative for additional information.
Bakerline Series Single-Zone Cased Hole Applications

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One-trip single-string selective completion

Single-string selective completion

Bakerline Series Multizone Cased Hole Applications

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Bakerline Horizontal Openhole Completion System

TORXS™ liner hanger assembly with BAKERWELD™ sand screens and REPacker™ reactive element packers.

Openhole completion setting assembly

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