

HydroFORM[®] Centralizers

**Extend
your reach.**



The centralizer of choice for drilling, reaming
and completing challenging wells.

Reliability. Precision. Proven track record.

First introduced in 2002 to assist in maintaining casing string and well integrity during casing drilling operations, Volant's HydroFORM® Centralizers have since become the centralizer of choice for drilling, reaming, and completing critical, challenging, high-profile wells. Our patented and proprietary hydroforming technology utilizes high pressure water to precision form tubular steel into a variety of customizable shapes and profiles. The end result is a high-quality, high-strength, uni-body product with a smooth geometry. Available with wrap-around rib coverage, Volant centralizers are ideal for today's complex well designs, helping to reduce torque and drag downhole, improve solids removal and fluid flow during casing or liner installation and enable a more uniform cement distribution.

The Choice is Yours.

Volant HydroFORM® Centralizers are available in standard and SlimLINE® series.

Standard series centralizers feature a 0.26" wall thickness and are available for tubulars ranging from 3.5" O.D. through 13.38" O.D., offered in a variety of rib O.D. and profile designs. The standard series sets the industry benchmark for robustness and durability, remaining intact under the most extreme downhole running conditions. For additional wear resistance, the standard series can be hard-faced to improve their durability in drilling applications.

SlimLINE® series centralizers feature a 0.19" wall thickness and have been designed to provide a maximized flow area without sacrificing rib coverage or durability. The result is a lighter, more economical centralizer that is ideal for applications where the extreme durability of the standard series may not be required, but reliability and performance of the standard series is still desired. SlimLINE® Centralizers are available for 4.5", 5" and 5.5" O.D. tubulars, offered in a variety of rib O.D. and profile designs.

Recommended Installation Method

Application	Floating	Fixed (Crimp or Set Screw)
Deviated/Long/Extended Reach Wells	Yes	Yes <i>(application specific)</i>
Casing or Liner Drilling	No	Yes
Window Exiting, Sidetrack or Multi-Lateral Wells	Yes	Yes
Flush Joint Casing*	Yes <i>(with stop collars only)</i>	Yes
Semi-Flush Connection Casing*	Yes <i>(with stop collars only)</i>	Yes

*Flush or Semi-Flush Casing Centralization

There are several cases where the use of centralizers and set screw stop collars applied to flush or semi-flush joint casings has led to the centralizers and the stop collars piling up over the length of the string. Crimping on of stop collars for a non-rotating application or crimping on of the centralizer itself for a rotating application can mitigate this issue.

An Installation Solution for Your Application.

Both the standard and SlimLINE® series are available for floating and fixed applications.

In floating applications, the centralizer is allowed to move freely, both axially and rotationally, on the casing. As a result, the centralizer acts as a plain bearing on the pipe and is free to rotate downhole, allowing the centralizers to overcome irregularities in the wellbore during run-in. For floating installations, the centralizers can be placed between stop collars, couplings, or a combination of the two. Stop collars can be affixed to the casing using radial crimping or set screws. Crimping of the stop collars is achieved using Volant's RTF™ Radial Tubular Forming Tool.

In fixed or crimped applications, the centralizer rotates with the casing at a fixed axial location on the casing or liner string. The centralizer can be attached to the casing by set screws, or for a more reliable attachment, they can be crimped. Centralizer crimping is achieved using Volant's RTF™ Tool.

The application and downhole conditions will generally dictate the installation method best suited for each application.

Reliable Products for Reliable Results.

The full range of Volant HydroFORM® Centralizers help to deliver reliable well integrity and facilitate efficient reservoir development, offering the following features and benefits:

One Piece, Steel, Uni-Body Construction

- Robust and durable, our centralizers remain intact under the most extreme running conditions
- Reduces the risk of sticking or unexpected hang-ups by ensuring there are no components to break or fail downhole

Smooth Geometry

- Enables smooth entry through the casing bowl and reduces risk of hang up
- Improves running efficiencies through reduced torque and drag
- Allows for improved hydraulic flow for fluids and solids removal
- Improved window exiting for side tracks and multi-lateral wells

Customizable Rib Design

- Helical rib design provides maximum standoff, ideal for deviated or horizontal wells where key seating can be present
- Helical rib design offers rotational flow in the annulus to improve mud removal and cement placement, improving hydraulic isolation and resulting in a more uniform cement distribution and improved cement bond
- Straight rib design is available for low clearance or tight hole applications
- Full control over the HydroFORM® process and tight material tolerances allows us to work with our customers to provide custom centralizers, rib geometry and design for special or unique applications
- Hard-facing available for applications where increased wear resistance is required

Optimizing Solutions for our Customers.

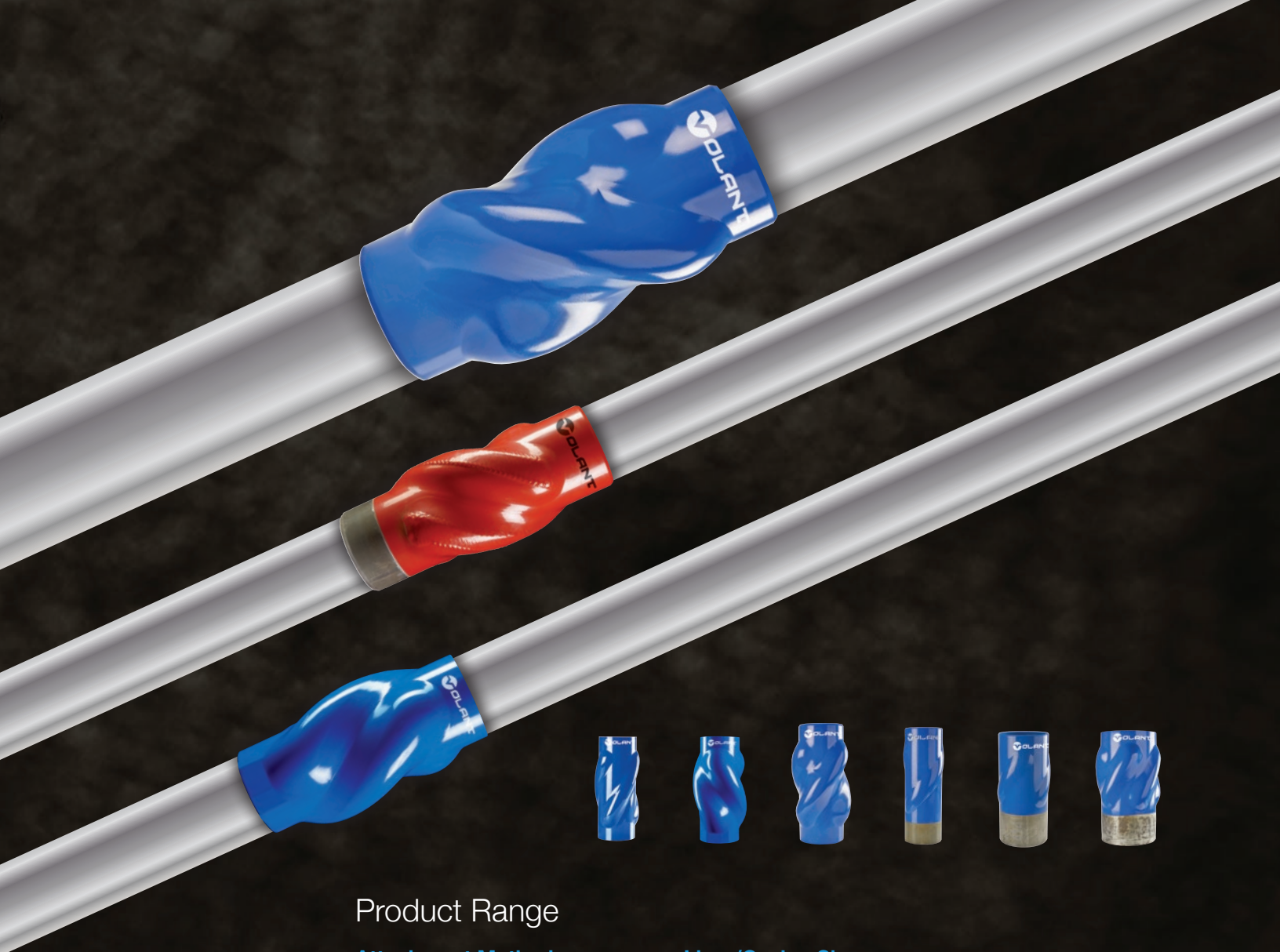
Volant provides Applications Engineering support for customers to optimize the placement of centralizers for casing and liner installations in order to improve run-ability (shorten run times and reduce non-productive time) in applications with long, challenging lateral sections and to help achieve casing standoff goals for cementing.

There are many centralizer placement programs available in the industry, but few provide a solution to mitigate problematic casing buckling effects during installation in sections with high compressive loads which can hinder running in long laterals. The right centralizers coupled with the right placement strategy can help to mitigate buckling, thereby reducing side loads and drag while running in hole, and enabling easier installations and significantly reducing casing and liner run times.

Volant utilizes commercial software programs to estimate casing standoff and assist with torque and drag analysis and, where applicable, we apply our proprietary program to optimize placement for buckling mitigation during installation. The end result is an optimized placement strategy designed to increase run-ability of the casing or liner strings, reducing running times and enabling the possibility of extending the reach of future wells through confidence that the strings can reach TD.

In addition to our placement strategy, Volant continues to work with our customers to provide optimized centralizer designs for special or unique applications. Our in-house laboratory testing is used to evaluate structural load capacities and assess other centralizer performance characteristics to ensure the product supplied will perform as required.





Product Range

Attachment Method	Liner/Casing Sizes
Floating – Standard	3.5 in (88.9 mm) to 13.38 in (339.7 mm)
Floating – SlimLINE®	4.5 in (114.3 mm) to 5.5 (139.7 mm)
Crimp On	4.5 in (114.3 mm) to 13.38 in (339.7 mm)

Talk to your Volant sales representative about which option is right for you.



Doing more with less.

Give us a problem.

Or just drop us a line if you want to learn more.

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