

INSPECTION & HARDBANDING

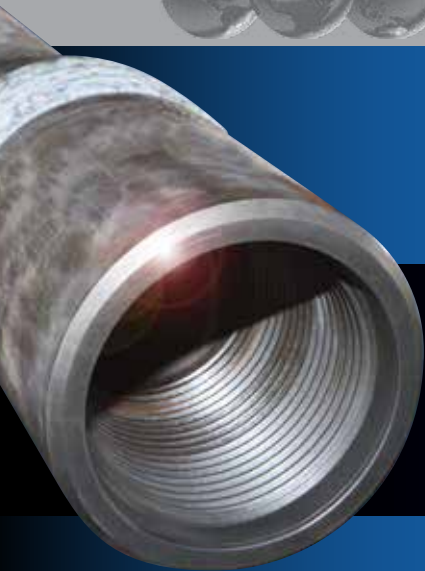
Oilfield Tubular Services



KNIGHT
oil tools



Knight Oil Tools' objective is to cost-effectively, efficiently and safely help optimize drilling operations around the world.



Complete tubular services... anytime, anywhere

INSPECTION SERVICES

- FLUT Inspection
- UTEA Inspection
- EMI Drill Pipe Inspection
- BHA Inspection
- Portable Lathe Refacing
- Water Blasting
- Tubular OD/ID Brushing / Rattling

HARDBANDING APPLICATIONS

- Tri Tanium Hardband
- Tuffband NC
- Smooth X Tungsten
- Armacor M
- C/T
- Duraband NC

Established in 1996, Tri*Drill Services LLC is a service line of Knight Oil Tools. Tri*Drill Services is a full-service provider of NDT inspections and hardbanding for drill pipe, bottom hole assembly components and heavy lift rig and handling equipment. Tri*Drill Services also offers pipe maintenance services and storage. Inspection units are mobile for both land and offshore drilling operations, while hardbanding units are available for land rig or yard locations.

Our services are available 24/7 with our standard to provide the highest quality service while meeting or exceeding all safety requirements. We continue to upgrade our quality process with programs such as DNV (Det Norske Veritas) and Fearnley Procter NS-1 and NS-2 certifications.

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| <ul style="list-style-type: none"> • Full Length Ultrasonic Inspection (FLUT) of Drill Pipe • Ultrasonic End Area Inspection • EMI Drill Pipe Inspection • Bottom Hole Assembly (BHA) Inspection • Hoisting & Handling NDE Equipment Inspection • Portable Lathe Refacing – Drill Pipe, Hevi-Wate Drill Pipe and Drill Collars | <ul style="list-style-type: none"> • Pipe Maintenance <ul style="list-style-type: none"> – Water Blasting – OD/ID Brushing – OD/ID Coating • Hardbanding <ul style="list-style-type: none"> – Portable Units – Stationary Units • Hardness Testing • Full Machine Shop Services |
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Our full-service facility located in Broussard, La. has a 30-acre yard that operates around the clock, seven days a week to service customers in the Gulf Coast, ArkLaTex and Oklahoma regions.

Ensuring Safe Operations

As a recognized leader in safety training and preparedness, Knight Oil Tools' Tri*Drill Services service line has implemented in-house training programs to prepare employees to safely handle every situation from tool preparation to environmental issues. Tri*Drill Services maintains the highest level of safety certification – ASME Section 9.





Accurate and Reliable Inspection and Documentation

- **FLUT Inspection** – The FLUT unit is a pulse echo system that detects transverse, longitudinal and oblique flaws while giving wall thickness reading over 100% of the drill pipe tubes and electronically records all data.
- **UTEA (Ultrasonic End Area) Inspection** – UTEA inspections on drill pipe and surfaces scan 36" on the pin and 48" on the box running towards the tool joints, concentrating heavily on the weld zone. Instrumentation of shear wave with the proper transducers look for imperfections that other NDT inspection methods cannot identify.
- **EMI Drill Pipe Inspection** – EMI units are dual-function units with Hall Effect sensors that provide a full range of pipe inspection. Mobile units are available for rig locations – onshore and offshore.
- **BHA Inspection** – Magnetic particle, black light, dye penetrant and full RSC dimensional inspection methods are used to perform BHA inspections on any drilling component. Mobile units are available for both land and offshore drilling operations.
- **Hoisting and Handling Equipment Inspection** – Tri*Drill Services provides an inspection and electronic documentation program for heavy lift equipment used on drilling rigs.
- **Portable Lathe Refacing** – Portable lathe refacing unit can reface and re-bevel API-type connections with superior results when compared to the sand paper method. The surfaces will be a smooth machine finish with machine shop accuracy, providing a reliable bevel and sealing surface on connections.
- **Water Blasting** – Tri*Drill Services has the capability at our Broussard, LA facility to remove scale, rust, corrosion and cement with pressure up to 20,000 psi. The system is fully contained and all waste is disposed through an EPA-certified company and documentation is maintained.
- **Tubular OD/ID Brushing/ Rattling** – Our brushing unit is designed to remove rust, scale and dried drilling fluid over the entire length of the pipe tube.

***All of the above services are available for Range II, Range III and HDLS (Heavy Duty Landing String) pipe.*

Whether performing inspections on drill pipe, tubing, BHA components or heavy lift rig and handling equipment, Tri*Drill Services ensures accurate, reliable and superior results.

Our level I and level II inspectors are certified and tested according to ASNT guidelines and follow DS-1 specifications. Tri*Drill Services also has an ASNT certified level III on staff who is a current associate member of I.P.I.A.





Tri*Drill Services' Hardbanding Product Line has more than 60 years experience and is an industry leader in applying alloys on drill stem components. Our "casing-friendly" hardbanding extends the life of drill strings by reducing casing wear from 14% without hardbanding to as little as 5% with the application of the appropriate alloy.

Tri*Drill Services' hardbanding process stands apart within the industry – from its unmatched safety standards and equipment to its plasma cutting services – which provide for the smooth removal of previous alloys prior to re-application.

Hardbanding Applications

Knight Oil Tools' Tri Drill Services service line offers a variety of hardbanding options – each determined by the customer, downhole environment, region being drilled and the size and type of pipe.

- **Tri Drill, Tri Tanium** – Application is one of the best wear-resistant alloys in the industry today and is proven to be the most effective option for reducing casing wear and tool joint wear in both cased hole and the open hole. This application is appropriate for non-hardbanded tool joints or over the existing Tri Tanium hardbands. Tri Drill Services is NS-1 approved for new applications and reapplications at its Broussard facility.
- **Postals Industries Duraband NC, Tuffband NC** – Applications are crack free and casing friendly. They can be applied on most types of existing hardband applications. Unlike most reapplications, to apply Duraband and Tuffband it is not necessary to remove the existing hardband applications, making these products a cost effective solution. Duraband with its high volume of tightly packed micro constituents is the better of the two products having less casing wear and tool joint wear. Tungsten carbide pellets can be applied to both of these products creating the ultimate wear resistance for the drill string in the open hole. Tri-drill Services is NS-1 approved for new applications and reapplications for both of these products at its Broussard facility.
- **Stoody 62, 56** – Applications are crack free and casing friendly products. Both of these products are only applied on non-hardbanded tool joints or over existing 56 and 62 hardbands. The 62 is the better of the two for less casing wear and tool joint wear. Tri Drill Services is NS-1 approved for new applications and reapplications for both of these products at its Broussard facility.
- **Armacor M Star, Universal** – Applications are casing friendly products. The M Star deposits are not crack free and this application should be applied to non hardband tool joints or over the existing M Star deposits. The Universal is a crack free deposit and this application is appropriate for non hardbanded tool joints and over the existing Universal deposits.
- **Arcco 100XT, 150XT, 350XT** – Applications are crack free and casing friendly products. Arcco's products are designed to cover a range of needs whether to have significant protection in casing wear or maximum protection for the drill pipe. These products are only applied on non-hardbanded tool joints or over existing Arcco products.
- **Smooth X Tungsten** – Application is tungsten-based and used on bottomhole assemblies and in abrasive conditions to prevent tool joint wear in severe conditions.

Hardbanding Benefits/Advantages

- Tri*Drill Services' hardband produces a 3/32" raised application on drill stem components, resulting in longer lasting tubulars and reduction of casing wear.
- Portable hardbanding units save pipe transportation costs.
- Tri*Drill Services is one of the few companies in the industry that provide plasma removal along with hardbanding services. The ability to easily and effectively remove existing hardbanding gives customers another cost-effective solution.
- Hardbanding stenciling system provides a history of hardbanding applied by Tri*Drill Services.

