

## MARKSMAN™

### PDC Directional Drill Bits

Marksman PDC Directional Drill Bit series has been developed specifically for directional applications in oil and gas wells. Marksman has optimal ROP with maximized tool face control to deliver consistent yields regardless of the directional drive system. Utilizing bit to rock contact simulation software, customized tool face geometries allows directional solutions to be provided for any well program and lithology challenges.

### Application

- Curve and lateral well bores.
- Any motor, rotary steerable and high-speed applications.
- Varying lithologies.

### Features / Benefits

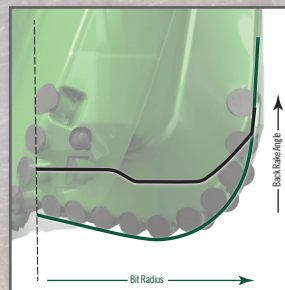
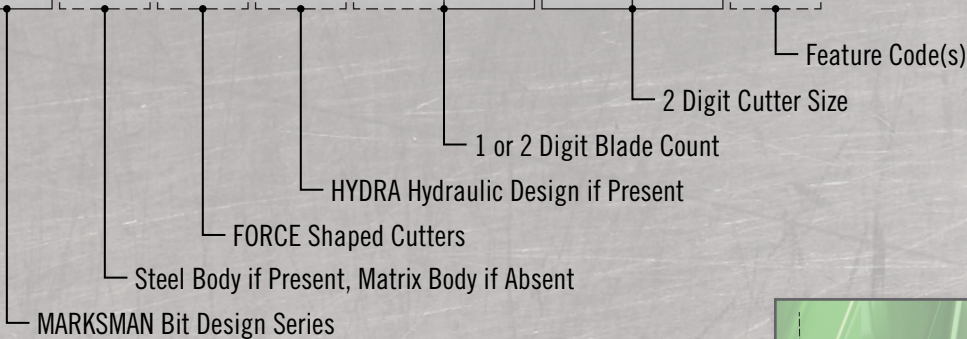
- Managed Tool Face Geometry design features result in a customized tool face geometry that stays passive during kick-off, but aggressive enough to deliver increased ROP later in the curve once the trajectory is established.
- DIG-IT™ bit to rock contact analysis software shows accurate correlation of predictive component wear and formation contact to optimize cutting structure arrangement and design to give the most ROP and directional control possible.
- PDC Designer™ software is used to simulate cutting structures to increase side cutting tendency which provides a bit that delivers predictable and consistent yield through the entire curve interval, generating a smooth curve with high well-bore quality for ease of lateral drilling and completion operations.



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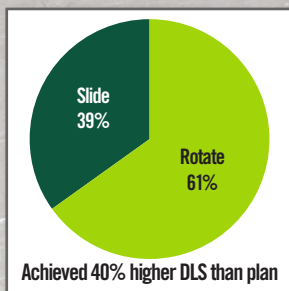


VAREL  
OIL & GAS DRILL BITS



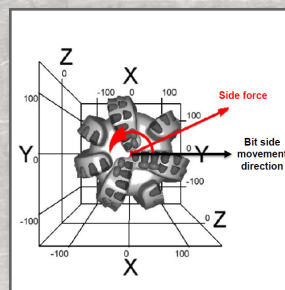
## Managed Tool Face Geometry

Curve bit design philosophy developed from decades of experience that uniquely uses a combination of profile, back rake, and cutting structure elements to create a passive tool face for kick-off while maintaining high ROP throughout the curve.



## Teamwork Yields Consistency

Marksman directional bits are the product of collaboration to benefit the whole drilling team, including the operator. By entering into mutually beneficial partnerships with directional companies, true synergy is achieved where the sum of the parts is greater than the whole and creative system solutions produce higher than expected yields, reduced sliding time, and lower bend assemblies in future runs.



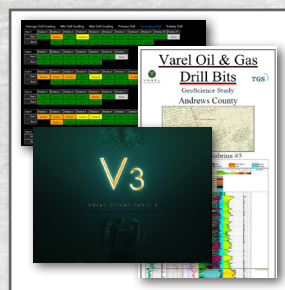
## Increased Side Cutting

Delivering easy Kick-Off and maintaining trajectory is paramount for the Marksman Directional PDC Drill Bits. This is achieved by designers painstakingly balancing down force with side force in Varel's array of advanced analytic tools. This insures the bit will make angle so the directional driller can paint the line!



## Advance Simulation Capability

Varel's Dig-It analysis allows designers to predictively see the blade, cutter and component contact with the formation at different drilling parameters so designs are customized for optimal directional and ROP performance, giving directional drillers the control they want.



## Proactive Design Process

Varel Oil and Gas does not wait for customer problems to improve their product. Varel's proactive product development process identifies bit performance issues before they are seen by customers. The proprietary analytic software V3, WearTrack and GeoScience are used to analyze run, dull, and geological data, respectively, to iterate designs so they continue to bring customers performance they need.

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