

# Grant Prideco GEO™ drill pipe

## Designed to perform

Harsh conditions in geothermal drilling applications require advanced drilling tubulars. As the world leader in premium drill stem products, we offer innovative drilling solutions for the most challenging Geothermal Drilling applications. Our custom engineered products include drill pipe, heavy weight drill pipe, drill collars and accessories. We have advanced R&D and fully integrated manufacturing with facilities in the United States, Mexico, China and the Middle East.

### GP GEO™ Drill Pipe

GP GEO™ drill pipe provides superior technical performance and service life, exceeding current industry standards.

Our products include:

- Proprietary upset designs to ensure stronger than the pipe weld strength in tension
- Connections designed with minimized outside diameters (OD) and maximized inside diameters (ID) to allow largest possible pipe sizes in a given hole size.
- An array of high-performance connections providing extended torque capabilities and reducing the chance of twist-offs.
- Sour service grades to allow for safer drilling in environments that have H2S present.
- Thick and robust tubes (95% Remaining Body Wall minimum) to maximize buckling resistance and allow for more tube wear prolonging service life.
- Heavier walled drill pipe to enhance service life as the GEO™ drill pipe internal surfaces cannot receive internal plastic coating and will be exposed to corrosive chemicals.

Grant Prideco has its own green tube mill and tool joint manufacturing, providing full traceability and quality control of products. Our proprietary tool joint manufacturing process produces tool joints that meet or exceed API specifications and tolerance requirements. Each finished drill pipe joint is inspected to guarantee visual and dimensional properties and tested to ensure proper mechanical characteristics.

### GP GEO™ Drill Pipe Configurations

The following table shows the most representative configurations utilized for Geothermal Drilling. For performance values or further product descriptions, please contact your local Grant Prideco Sales representative.



Nominal size, weight and grade	Connection	Tool joint OD (in.)	Tool joint ID (in.)	Max MUT (ft-lb)	Max pullback (lb)
3½ in. 15.5 ppf (0.368 in.) S-135	NC-38	5	2⅞	15,900	560,800
3½ in. 15.5 ppf (0.368 in.) S-135	GPDS™ 38	5	2⅞	17,400	560,800
4 in. 15.7 ppf (0.330 in.) S-135	Delta™ 391	4⅞	2⅞	21,400	746,400
4½ in. 20.0 ppf (0.337 in.) S-135	Delta™ 425	5⅞	3	30,300	620,600
5 in. 25.5 ppf (0.362 in.) S-135	NC-50	6⅞	2¾	41,200	704,300
5 in. 25.5 ppf (0.362 in.) S-135	GPDS™ 50	6⅞	3¼	46,600	704,300
5 in. 25.5 ppf (0.362 in.) S-135	Delta™ 471	5⅞	3¼	37,900	704,300
5 in. 25.5 ppf (0.362 in.) S-135	Delta™ 527	6½	3¾	49,800	704,300
5 in. 25.5 ppf (0.362 in.) S-135	Delta™ 544	6⅞	4	50,300	704,300
5½ in. 24.7 ppf (0.361 in.) S-135	5½ Full Hole (FH)	7	4	33,400	704,300
5½ in. 24.7 ppf (0.361 in.) S-135	Delta™ 544	6⅞	4	50,300	862,700

*Customized sizes could be engineered for our customers.*



### SmoothEdge™ tool joints and hardbanding solutions prolong asset life

To help protect your pipe from excessive wear during running, hardbanding can be applied on the tool joint box section, box taper or tool joint pin section. We can apply it raised, semi-raised or inlayed (flush), as desired.

To extend the life of your assets, we offer SmoothEdge tool joints, a proprietary sacrificial wear pad added to the outer pin and box for the installation of more prominent hardbanding. SmoothEdge is height adjustable to allow for customer-specific hardbanding applications. The use of SmoothEdge tool joints in conjunction with hardbanding extends the service life of your tool joints.

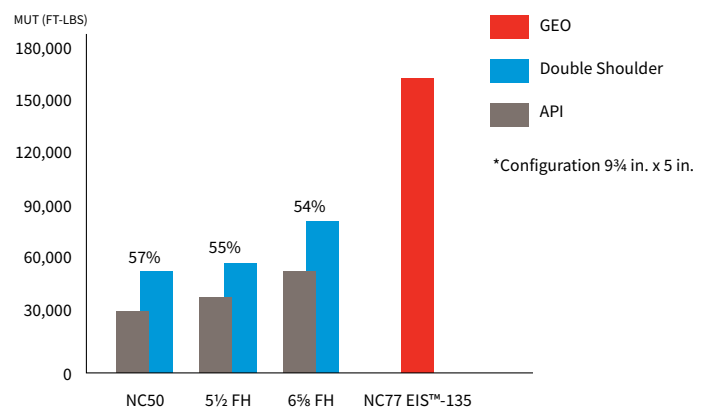
Grant Prideco also offers specialty hardbanding designed and well suited for geothermal applications. With improved tungsten carbide distribution, our Halo™ hardbanding gives 300% more wear resistant than comparable industry tungsten carbide hardbandings.

### Selecting the right GP GEO drill pipe configuration for your project

Standard API connections have limitations in terms of torque capacity and service life, especially in highly deviated drilling in hot environment. When this occurs, drillers turn to double shoulder connections that offer higher torque as well as improved operating service life. The GP GEO product line offers a full gamut of double shoulder connections, some with thread designs compatible with standard API connections, providing full interchangeability with API drill pipe and accessories. These double shoulder connections can be built in 135 ksi yield strength material to maximize performance.

### Performance Comparisons

Torque Performance



For ultra-challenging geothermal drilling jobs requiring additional torsional strength, Grant Prideco's NC77 EIS™-135 connection for 7 in. and above drill pipe, provides higher torque than any other API and double shoulder connection.

NOV is a leading provider of technology, equipment, and services to the global energy industry that supports customers' full-field drilling, completion, and production needs. Since 1862, NOV has pioneered innovations that have improved the cost-effectiveness, efficiency, safety, and environmental impact of customer's operations, especially in directional work combined with heat.