



SMOOTHDRILL® PRODUCTS

ORE - Oil Resistant Element

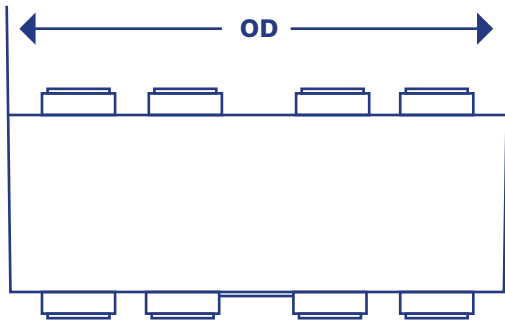


**Increase
productivity
while protecting
equipment**

Features

Benefits

Less Drill Downtime	— More productivity
Improved Penetration Rate	— Better bottom line
Oil Resistant	— Longer life in the presence of oil contamination
Isolation and Damping of Shock and Vibration	— Lower repair cost and less downtime
Longer Bit Life	— Less downtime and better penetration rate



Nominal Size	Load Range (Pull Down)	OD
28"	Up to 150,000 lbs.	28-1/2"
22"	Up to 90,000 lbs.	22-1/4"
18"	Up to 75,000 lbs.	17-1/4"
14"	Up to 60,000 lbs.	14"

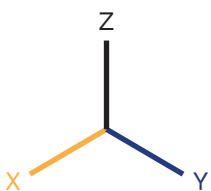
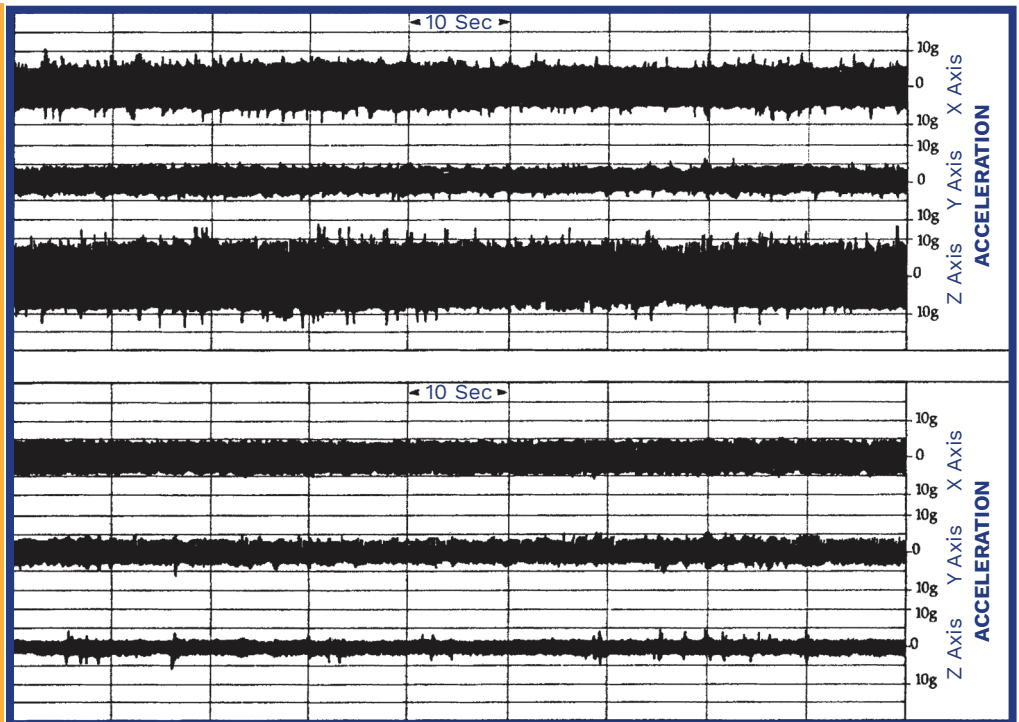
Effectiveness of SmoothDrill® in Blasthole Drilling

A field study was conducted by an independent geotechnical and materials engineering company using an accelerometer to evaluate SmoothDrill® effectiveness. The actual charts to the right show results from a blasthole drill equipped with a SmoothDrill® and one with a standard coupling.

Testing conditions were identical: Pulldown was 85,000 lbs., rotary speed was 90rpm and average penetration rate was 0.80 ft./min.

The upper vibrograph represents vibrations at the drill head without SmoothDrill® and the lower vibrograph represents the vibrations with SmoothDrill®.

The third chart reveals a summary comparison of the 2 vibrographs.



Aspect	Without SmoothDrill ®	With SmoothDrill ®
X Axis Average Acceleration	9g	5.5g
X Axis Peak Acceleration	12g	9g
Y Axis Average Acceleration	5g	4.5g
Y Axis Peak Acceleration	9g	11g
Z Axis Average Acceleration	12g	2.5g
Z Axis Peak Acceleration	22g	11g
Reduction of Vibrations in X Axis	$(9g - 5.5g) / 9g = 39\%$	
Reduction of Vibrations in Y Axis	$(5g - 4.5g) / 5g = 10\%$	
Reduction of Vibrations in Z Axis	$(12g - 2.5g) / 12g = 79\%$	