

GO TO EXTREMES!

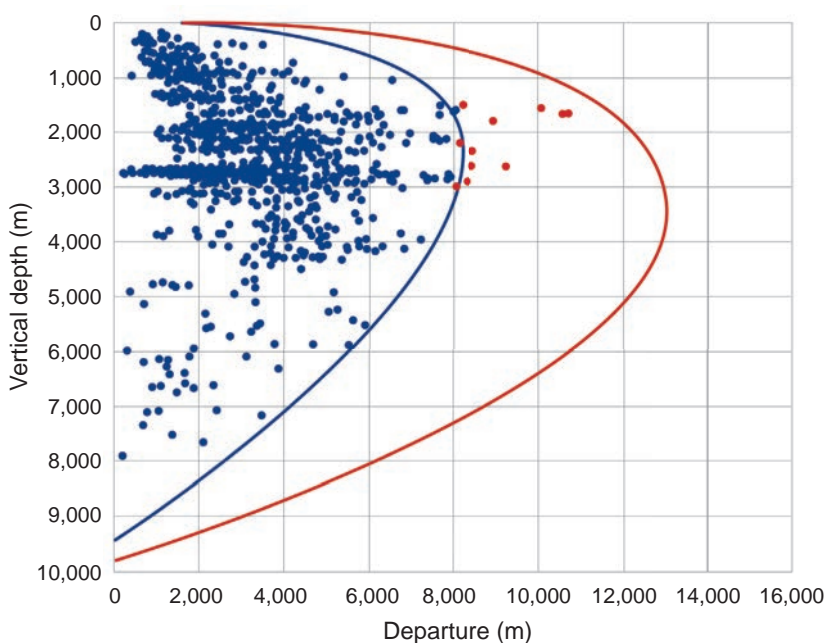
More reach. More speed. Less cost.



OTTO FUCHS Drilling Solutions

OFDS is an integrated product and service provider to the upstream oil & gas industry. We are specialized in bringing high strength-to-weight metallic solutions to oil and gas operators, drillers and service companies for downhole and subsea applications. With our aluminum and titanium alloy products, it is the objective of OFDS to help our customer's operations achieve **more reach, more speed and less cost.**

Expanding the ERD Envelope
(with high strength-to-weight solutions)



Why OTTO FUCHS?

- More than 100 years of experience
- Best-in-class quality and service
- Industry leading pipe/tube capability
- Wide range of alloys and tempers
- Highly flexible service model

Why aluminum alloy?

- Increase drilling WOB and ROP
- Increase drilling reach
- Use smaller and lower cost rigs
- Eliminate RSS and associated costs
- Reduce casing wear and downhole "Jewelry"

FuchsRohr® AluDrill™ HPP - Internal Upset (iu) - Type 1

Mechanical and Physical Properties

This sheet represents pipe in new condition.

Pipe Type	3 ½	4	4 ½	5	5 ½	5 ¾	6 ¾
Tool Joints	NC 35	NC 40	NC 46	NC 50	5.5 FH	5.5 FH	6.625 FH
OD nominal (in)	3.65	4.15	4.64	5.07	5.63	5.88	6.87
ID nominal (in)	2.65	3.15	3.64	4.07	4.63	4.85	5.72
ID min (in)	1.73	2.44	2.87	3.25	3.94	4.27	4.75
Wall Thickness (in)	0.50	0.50	0.50	0.50	0.50	0.51	0.58
Cross Section Area (in ²)	4.95	5.73	6.51	7.19	8.06	8.64	11.37
Weight Pipe (lb)	193.0	222.0	253.0	283.0	312.0	331.0	447.0

Pipe Body Alloy HPP K60 R _{p0,2} = 60 ksi (415 N/mm ²)							
Tensile Strength (lb)	296,900	343,600	390,300	431,100	483,500	518,500	682,100
Modulus (msi)	10.60	10.60	10.60	10.60	10.60	10.60	10.60
Torsional Yield Strength (ft-lbf)	19,900	27,000	35,200	43,200	54,900	61,600	95,300
80% Torsional Yield Strength (ft-lbf)	15,920	21,600	28,160	34,560	43,920	49,280	76,240
Collapse Resistance (psi)	15,800	13,700	11,800	10,400	8,900	8,700	8,100
Internal Yield Pressure (psi)	16,400	14,500	12,900	11,800	10,700	10,500	10,000

Tool Joint							
OD Tool Joint (in)	4 ½	5 ½	6	6 ¾	7	7 ¼	8
ID Tool Joint (in)	2 5/16	2 7/16	2 ¾	3 ¼	4	4	4 ¾
Box Tong Length, Lb (in)	17	17	17	17	17	17	17
PIN Tong Length, Lp (in)	14	14	14	14	14	14	14
Yield Strength (ksi)	120	120	120	120	120	120	120
Weight Tool Joint (lb)	92.00	144.00	166.00	184.00	198.00	192.00	241.00
Tensile Yield Strength (lbf)	566,500	881,800	1,166,300	1,249,800	1,244,500	1,244,500	1,653,200
Torsional Yield Strength (ft-lbf)	16,900	30,100	44,400	51,700	55,900	56,500	85,500
Recommended Make-Up-Torque (ft-lbf)	10,100	18,100	26,600	31,000	33,600	33,900	51,300

Assembly TJ + Pipe							
Weight Tool Joint + Pipe (lb)	285	366	419	467	510	523	688
Adjusted Weight in Air (lb/ft)	9.10	11.60	13.30	14.80	16.20	16.60	21.80
Adjusted Weight in 12 lb/gal mud (lb/ft)	5.40	7.20	8.20	9.20	9.90	10.10	13.20
Torsional Ratio TJ/Pipe	0.85	1.11	1.26	1.20	1.02	0.92	0.90
Shoulder To Shoulder Length (ft)	31.50	31.50	31.50	31.50	31.50	31.50	31.50
Open Displacement (US gal/ft)	0.31	0.37	0.42	0.47	0.52	0.54	0.72
Closed Displacement (US gal/ft)	0.57	0.75	0.93	1.11	1.36	1.47	2.00
Capacity (US gal/ft)	0.26	0.38	0.51	0.64	0.84	0.93	1.27

Properties of further types and alloys on request.

We do not assume any liability for use or application of this data. The data is intended for demonstration purposes only. Date: March 2016

