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Preferred Technology Partner

Introduction JAG-MAG


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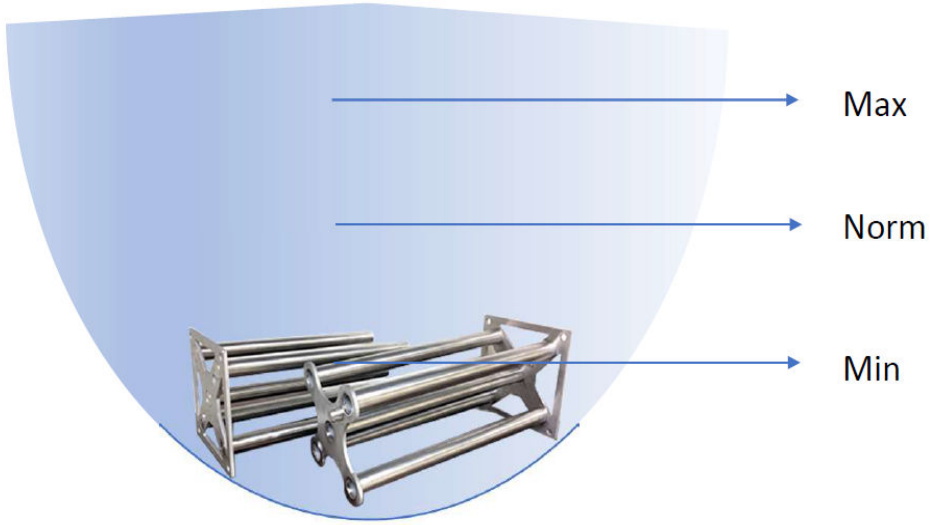
CHALLENGES TODAY WITH TRADITIONALLY DITCH MAGNETS

- Very low magnetic flux density. Can't overcome MUD hydrodynamic drag forces
- Magnets are often not placed in a defined pattern and/or has to long distance between magnet rods. Reduced magnetic grid.
- Does not cover 100% of flow cross section.(Both block and rod magnets) A lot of metallic particles goes passed and are not captured



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JAG-MAG MAPS SYSTEM

- Easy hook up on site
- Covering 100% of flow section
- Optimal Magnetic Grid
- Magnets with 12000 Gauss Peek Strenght
- Patented spoilers that breaks up laminar flow and create vortex
- Capture fines down to 0,5 micro
- Integrated Scraper System
- Easy cleaning and handling
- Semi Automatic Cleaning Station for improved HSE Environment
- Proven to be over 5 times more efficient then other flowline magnets.

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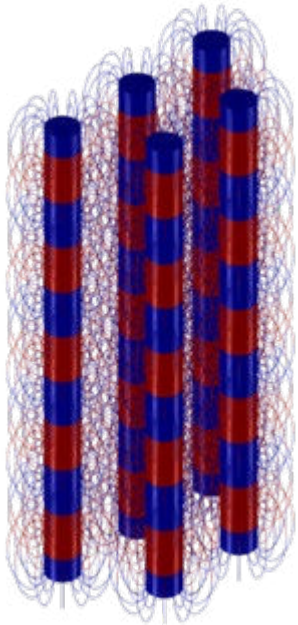
MAPS magnet grid setup

- Installation frame / feature
  - Safe handling
  - Defined placement of magnet rods
  - Maintaining optimal magnetic field grid
  - Magnet field throughout the fluid cross-section
  - Maintaining magnetic field interaction between magnet rods
  - Create vortexes around magnet rods

Installation frame with MAPS magnets on Maersk Interceptor



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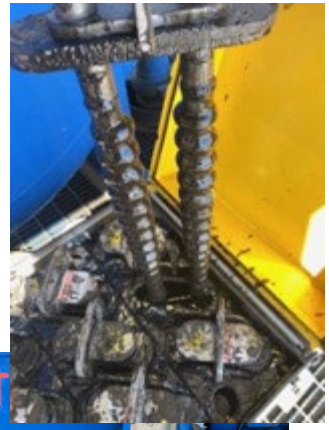
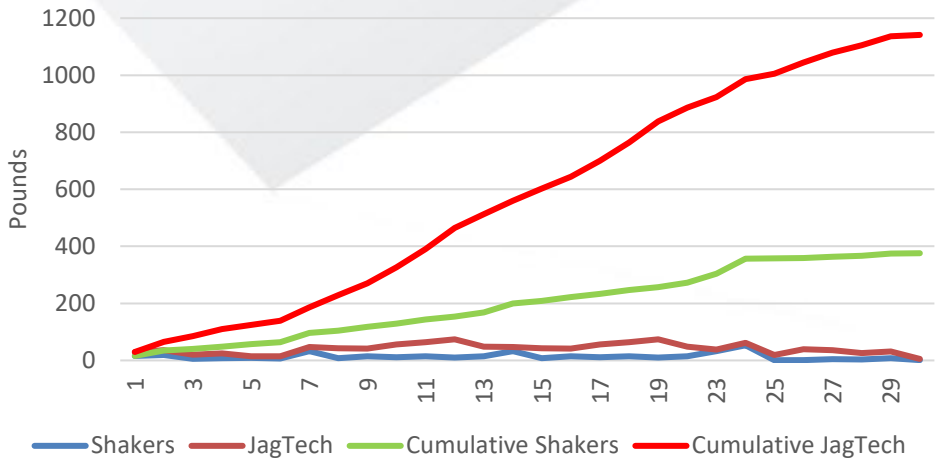
Field Study 1 - Major Operator Permian Basin

- JAG-MAG stand alone system developed in conjunction with Major Operator
- Inline Dual MAPS system requires no rig modifications and was installed downstream of existing ditch magnet system
- Daily removal of debris from Rig magnets and JagMag system weighed and logged for comparison
- Significant improvement in removal of metallic particles from the JagMag system
- JagMag system implemented for all rigs operating in the region





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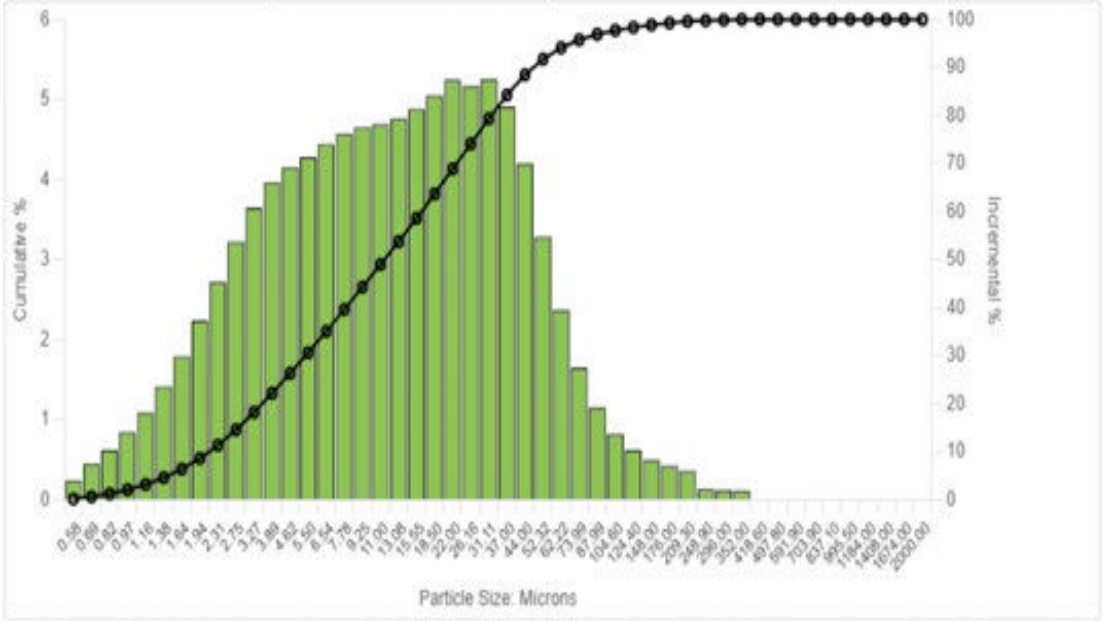
Field Study 1- Major Operator Permian Basin

MAGNET DEBRIS			
Particle Size Distribution			
Percentile	Size less than, µ	Diameter	Cumulative less
10	2.123	6	32.86
50	11.41	44	88.47
90	47.43	74	95.77



- JAG-MAG consistently removing 40-80lbs (36 kg) of debris per day
- Recovered material analysed and determined to be 100% magnetic material
- PSD performed on recovered material
- D50 - 11.41µ

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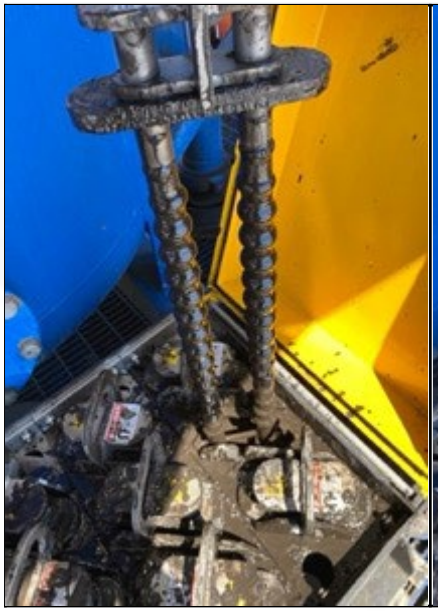
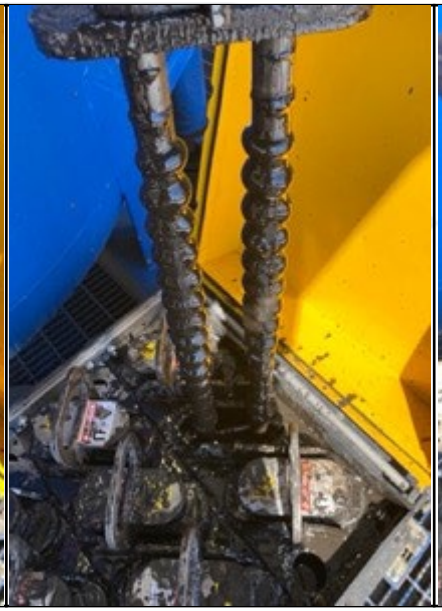
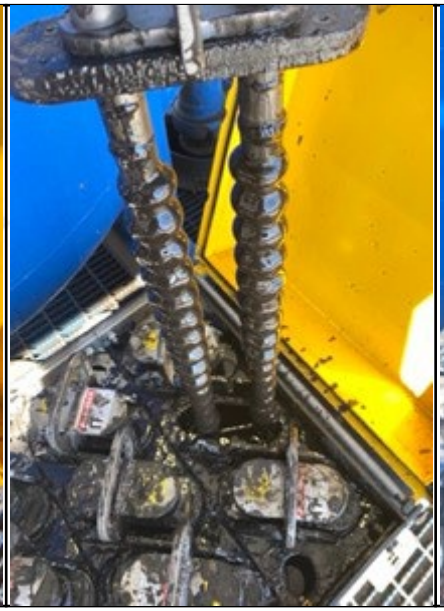
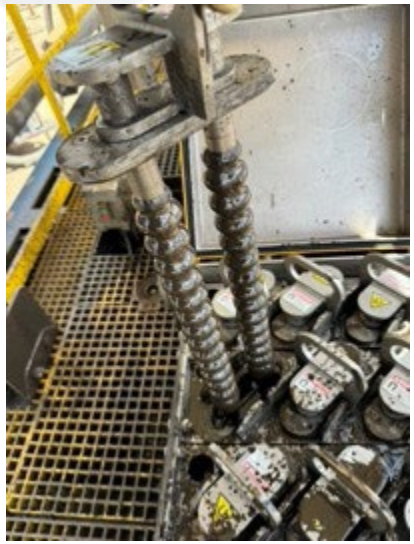
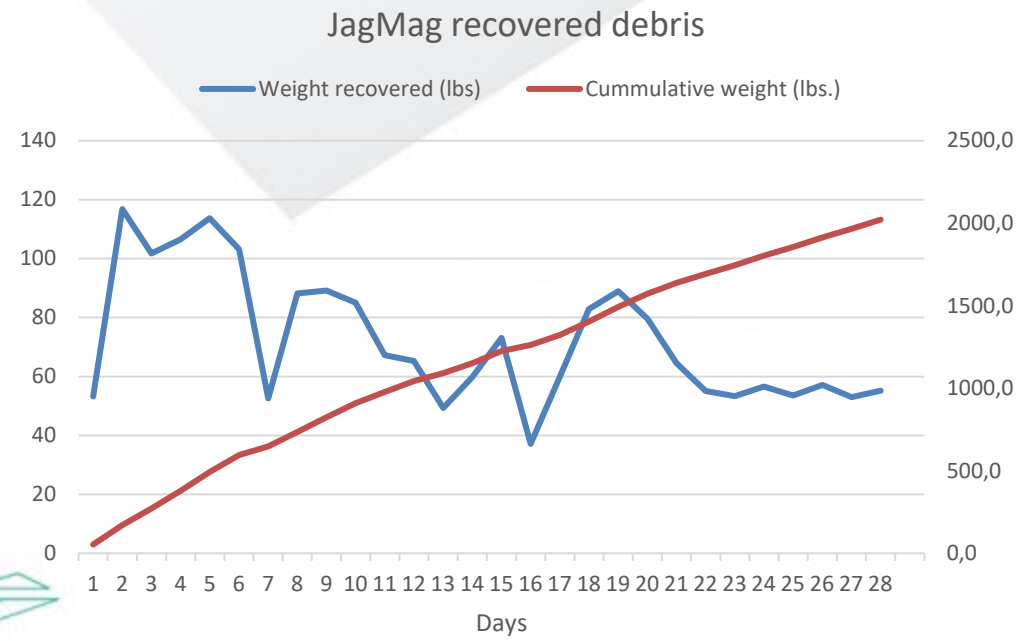
Typical Debris buildup

1 hour	2 hours	3 hours	4 hours
			

Field Study 2 - Major Operator Permian Basin

- JAG-MAG stand alone system installed on 2 rigs in Permian Basin for Major Operator
- Inline Dual MAPS system requires no rig modifications and was installed downstream of existing ditch magnet system
- Daily removal of debris from JagMag system weighed and logged
- Significant improvement in removal of metallic particles from the JagMag system
- JagMag system implemented for 11 rigs operating in the region





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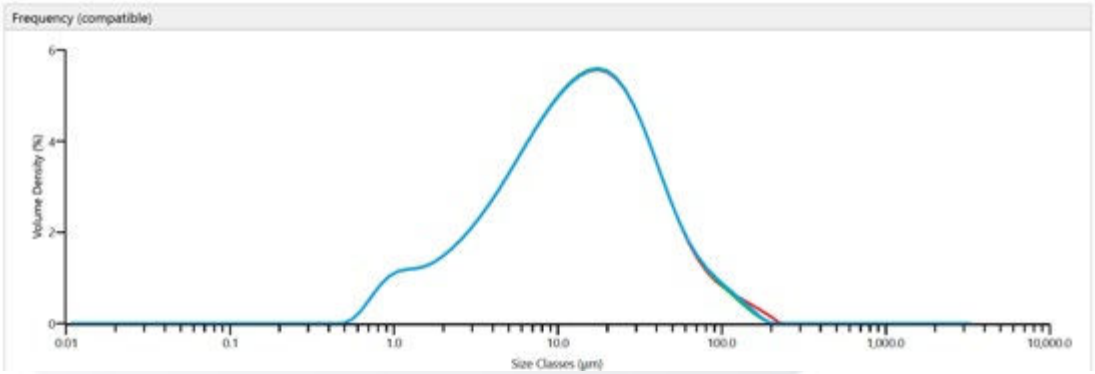
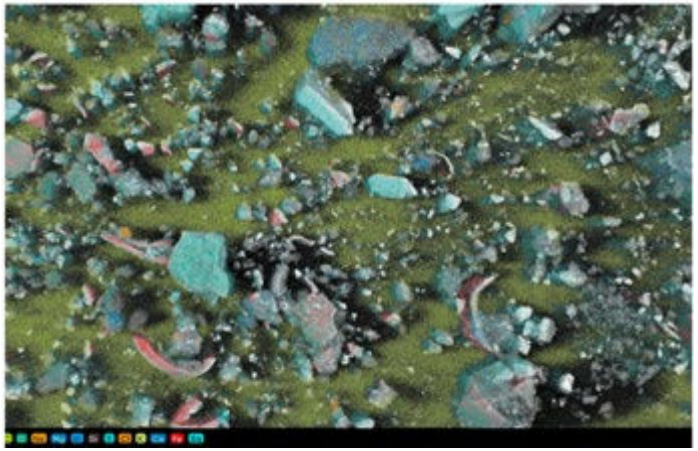
Field Study 2 - Major Operator Permian Basin



- Average removal of 72 lbs (32kg) of debris per day
- Recovered material analysed and was found to be of primarily ferritic material with trace elements of Chromium, Manganese, Molybdenum and Tungsten
- PSD performed on recovered material
- D50 – 13.2µ



ELEMENT	SPOT 1	SPOT 2
C	11.4	6.1
O	14.2	6.2
Na	0.1	-
Mg	0.2	-
Al	1.5	0.3
Si	3.7	0.9
S	1.0	0.3
Cl	1.8	0.3
K	0.8	-
Ca	3.1	1.1
Cr	-	1.2
Mn	-	1.0
Fe	59.8	81.9
Sr	-	-
Ba	2.1	0.7

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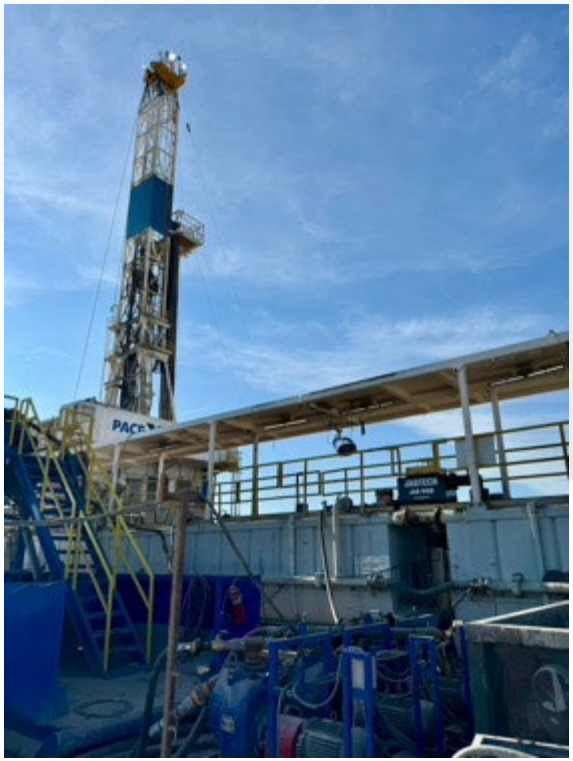
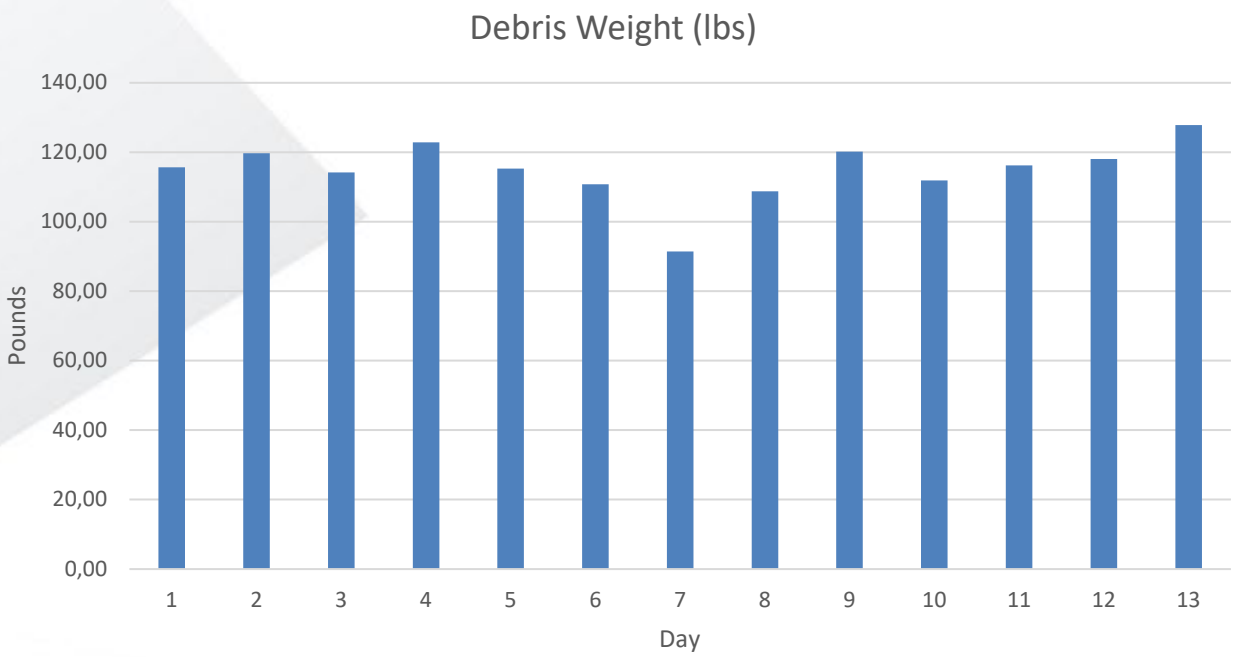
Field Study 3 - Major Operator Permian Basin

Drilling a 16,193’ section of 6 ¾” hole





1492.84 lb (676kg) recovered - 114.83 lb/day (52 kg) average

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Typical Installations

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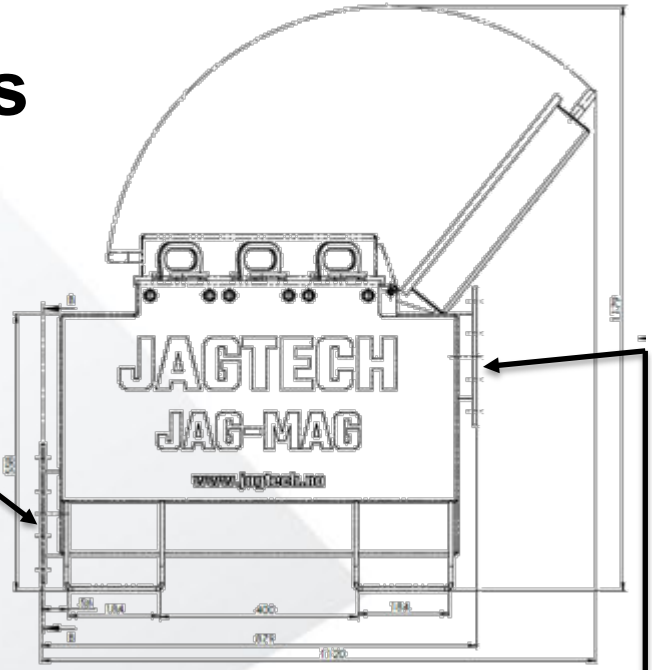
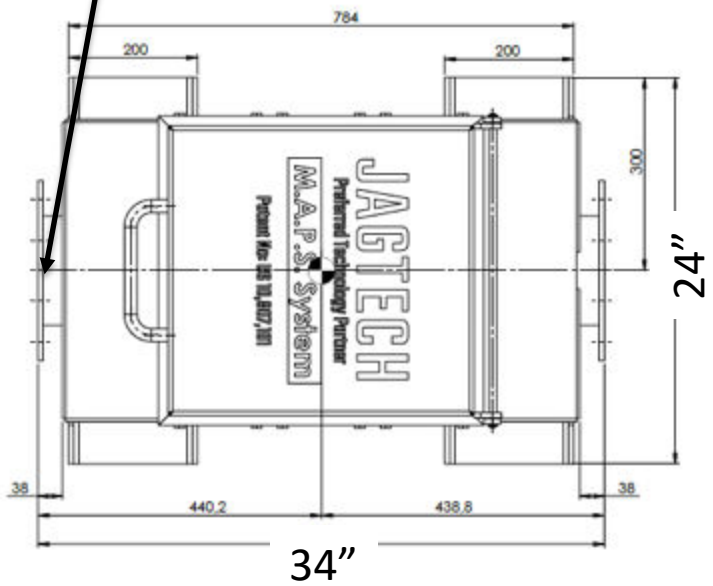
Typical Installations

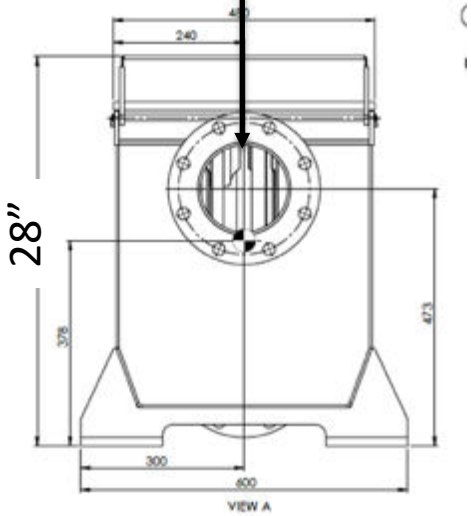
Specifications

6” CL 150 Inlet Flange



6” CL 150 Outlet Flange





Total Weight
320 lbs
145 kg

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VALUE when moving to a high efficient magnet system

- Improve Directional Drilling Accuracy
- Improve signal/noise Ratio
- Reduce Downhole Tool Failure
- Reduce Wear on HP Pipes, Pistons, Liners
- Improve Your Drilling Performance
- Reduce NPT and Carbon Emissions

Customer feedback: «Metallic contamination in the mud is an error source we dont want there. We know more today that metallic fines in the mud leads to issues. By efficiently remove this error source in our operations we take out a problem than can couse more tripping out that leads to; rig NPT, increase our cost and leaves to more emissions» «The low rental cost for a MAPS system over a 12 month period is coverd after 2 hours non productive time. Cost can easy be placed on the well budget» Source, Meeting Equinor/Jagtech

ASME PAPER Ref: Saasen, A., Poedjono, B., Ånesbug, G.O. and Zachman, N., 2021 “Efficient Removal of Magnetic Contamination from Drilling Fluids: The Effect on Directional Drilling” J. Energy Resources Technology, 143 (10), paper103201 https://doi.org/10.1115/1.4049290

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Field Trial?
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