



Iron Horse Tools LLC

Shale Gas Separator Overview

US 15/222,339

US 15/360,046

Company Overview

Iron Horse Tools, LLC (“IHT” or the “Company”) is an oilfield service company primarily focused on providing rental products and service solutions around the wellhead.

- ❑ Since inception in 2008, IHT has grown from one location in Corpus Christi, Texas to eight strategic locations targeting unconventional plays across the United States.
- ❑ IHT’s current rental equipment consists of drilling chokes, auto chokes, mud-gas separators, air busters (or managed pressure drilling separators), flare stacks with igniters, vent and panic line, drive-overs, liquid catch cans, BOP test truck/trailer units, rotating control devices, frac support (flowback) and production/testing (flowback).

IHT organizes its products and services into four business lines: Pressure Control Services, Mud-Gas Related Devices, BOP Nipple-Up & Testing Services, and Rotating Control Devices, or RCDs.

Pressure Control Services	Mud-Gas Related Devices	BOP Nipple-Up & Testing Services	Rotating Control Devices (RCDs) API 16RCD-Certified
<ul style="list-style-type: none"> ❑ Hydraulic Chokes ❑ Autochokes ❑ Flowback (Frac Support) ❑ Flowback (Production & Testing) 	<ul style="list-style-type: none"> ❑ Mud-Gas Separators ❑ Flare Stacks and Igniters ❑ Vent and Panic Line ❑ Drive-overs ❑ Liquid Catch Cans ❑ Shale-Gas Separators 	<ul style="list-style-type: none"> ❑ Blowout Preventer (BOP) Testing ❑ Hydrostatic Testing ❑ Torque Wrenches ❑ Stack Lifts ❑ Casing Saws 	<ul style="list-style-type: none"> ❑ Iron Horse – 2 (2,000 psi static pressure rating. Low and medium pressure heads) ❑ Iron Horse – 5 (5,000 psi static pressure rating)



Shale Gas Separator Overview

The Iron Horse Tools **Shale-Gas Separator** is a state-of-the-art solution for air drilling in the Marcellus, Utica, and similar formations.

While drilling with air, all cuttings are pumped out of the wellbore through the separator to the primary shale shakers and drying shakers where the cuttings are contained in a dry, half-round tank.

This unique system does the following:

- ❑ Reduces the amount of solidification material used
- ❑ Reduces haul-off trucking expense
- ❑ Reduces environmental footprint in landfill
- ❑ Keeps backyard clean
- ❑ Prevents any chance of flash fire in the backyard



Key Rationale – Why the Iron Horse Shale Gas Separator?

➤ Safety

By maintaining a constant “liquid seal” in the separator, air and gas are removed quickly through the vent line and out through the flare stack. This allows only water and cuttings to be discharged from the separator through the six-inch flow line to the possum belly of the primary shale shakers, then onto the drying shakers. The liquid seal prevents air and gas from being discharged over the shakers or in the backyard, therefore eliminating any chance of a flashfire.

➤ Environmentally Friendly & Cost-Effective

By discharging cuttings directly onto the shakers/drying shakers, there is a significant reduction of solidification material needed. With dry cuttings and a reduction of mix-off materials, the total tonnage of the cuttings hauled off is significantly reduced, as well as the environmental footprint in the landfill.



How It Works

The Iron Horse Tools system operates and maintains a constant liquid seal by means of electronic level indicators and a VFD (Variable Frequency Drive) which automatically adjusts pump speed to regulate fluid level while drilling on air.

“The Feed Pump”

When air drilling operations start, our vessel is already running. We have a pump feeding water from the rig pits to the system and a pump discharging water from the system back to the rig shakers.

The pump that is feeding the system is providing water to a series of six nozzles that provide the following:

- Three-inch nozzle provides dust kill
- Three (3) one-inch nozzles create a hydro cyclone within the bottom of the vessel which eliminates the chance of packing off.
- Two (2) one-inch nozzles on the discharge line acting as fluid venturi to assist in the suspension of solids while pumping.

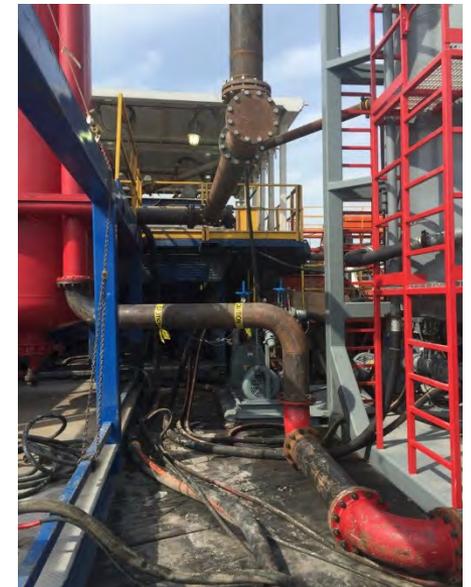


How It Works

“The Discharge Pump”

The VFD-driven discharge pump will automatically adjust the speed of the pump to assure a constant liquid seal.

- If fluid level decreases to an unacceptable level, the pump will slow down until liquid seal is at an acceptable level.
- If fluid level increases to an unacceptable level, the pump will speed up until volume is back down to an acceptable level.
- As a redundant safety feature, the system has an automatic bypass that triggers at a high-level point. This allows the discharge pump to catch up in the event that the fluid level is high in excess of five seconds. This bypass can also be used to divert sweeps once they are visibly present on returns.



How It Works

The Pumps

Because of its reliability and durability for extreme duty usage, the Iron Horse Shale Gas Separator system uses the Cornell STX Trash Pump with hardened impeller and housing. There is a spare on hand with every separator package.

Pump Data

Cornell's Self-Priming Pump, with industry-leading efficiency, runs several percentage points higher than that of other manufacturers.

Features the patented Cycloseal® Backplate and uniquely designed volute for best performance, with a 6" suction and 6" discharge.

- Optional self-cleaning wear plate
- Modular bearing frame
- Cornell's Cycloseal® with type 2 seal
- Dual protection of bearings with external seal leakage monitor (vent to atmosphere)
- Retrofit-able with existing installations
- High-efficiency design
- Oversized oil reservoir for better cooling
- Replaceable shaft sleeve
- Heavy-duty ductile iron construction
- Designed for SAE conversion
- High RPM capability



Mud-Gas Related Devices

Additional Photos



Iron Horse Tools

We look forward to working with you.

For more information, please visit us at our website or contact your local Iron Horse Tools contact...

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