

## CHEMICAL MIXING SERVICES

Axis Energy Services designed and built a data-driven chemical mixing and injection system for use with either stick pipe or coil tubing applications that can reduce the cost of chemicals and increase efficiencies during drill outs.

By accurately controlling the injection rate of chemicals pumped downhole and using data acquisition to blend the chemicals more precisely to reduce waste, the end result is a faster drill out, which drives down costs and cycle times for customers.

### Data-Driven Performance

Axis provides real-time data during the job and post-job reports for customers to view online.

- Sensor and control technology activate the hydraulically driven chemical add pumps from a data control center onboard the mixing unit where all parameters dictated by the customer are programmed and maintained.
- Cost savings are realized through the precision control and metering of chemicals during the injection process.

### Experienced Crews

When Axis crews are involved in each step of the completions process, we can ensure safe practices and expert service for our customers.

- Axis provides experienced and safety-focused crews to support all chemical mixing and pumping applications.
- Axis crews use data reports during each job to determine when to speed up pumps, when to drill faster or slower, and when to add chemicals to the wellbore, producing a more successful and efficient drill out.

### SPECS

#### Fit-for-Purpose, Technology-Driven Equipment

Axis invests in sensor and control technology to reduce the cost of chemicals and increase efficiencies during drill outs.

- The primary flow source for automated injection is a clean side turbine meter.
- Six micro motion mass meters confirm and record chemical delivery from the chemical add pumps.
- In the event of electronic failure, the system can be operated manually in order to minimize downtime.
- On-board water filtration system includes four filter pods hard plumbed to centrifugal pumps to streamline the rig up and filter maintenance during drill operations.
- Hydraulically driven mixing paddles used for agitation rather than recirculating the discharge centrifugal allows mixing rates up to 17bpm at 80psi and does not reduce the suction supply pressure to the drill pumps.

### AXIS ENERGY SERVICES

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## CHEMICAL MANAGEMENT SYSTEM

### Chemical Add Units

**Pre-emission diesel-powered hydraulic blend plant**  
130 bhp

**Hydraulically driven onboard systems**  
Chemical add pump drive motors, tub agitators, and C-pumps

**Liquid additive system (LAS) controls**  
Multiple source inputs for automation

**Axis CORE® technology**  
The mixing plant can be customized to be tied to Axis CORE® technology, Axis' new proprietary data acquisition and predictive analytics system

In the event of control panel failure, system can run in automatic or manual to minimize downtime

Real-time data logging for mix rate, line psi, return psi, and chemical injection

Twin 15bbl mix tanks with vertical hydraulic driven agitators

Capable of tub bypass direct injection, mixing thru tanks, sweeps, batch treatments, or injection into third-party pumps

Utilizes time-tested positive displacement gear pumps for chemical adds with micromotion mass meters being the primary source of chemical tracking rather than using mag pick ups counting pump rotation

Unit is capable of mixing diverter

Units come equipped with eye wash stations and spill clean up supplies



## FLUID MANAGEMENT SYSTEM

### Filter Units

**Pre-emission diesel-powered hydraulic system**  
130 bhp

**Hydraulically driven Mission Sandmaster**  
5 x 4 x 11 mechanical seal C-pumps

Hard plumbed vertical quick service filter pods with built-in manifold and bypass

Transfer rates designed and confirmed at 17bpm at 80psi continuously

Standalone, vertical, quick-service filter pods with built-in manifold and bypass, skid-mounted with 50bhp diesel engine driven C-pump to be set between return and work tanks for quick rig up and efficiency

Each unit is equipped with 300 feet of 4" Fig 206 suction/discharge hoses with O-ring seals and one piece crimped on ends

Unit can carry 4 totes on board

Units come equipped with eye wash stations and spill clean up supplies

## EQUIPMENT INVENTORY

### Chemical Add Unit

### Filter Unit

