ApplicAtions
■ Blending and pumping of slurried gravel-pack fluids
■ Real-time integrated monitoring and control of gravel-pack treatments

Benefits
■ Minimizes risk of job failure through precise control of proppant concentration

Features
■ Improved proppant delivery accuracy because of precise control of proppant concentration
■ Small surface footprint that can fit in tight rig space
■ Improved job efficiency through remote-control operations
■ Precise control of the solid/liquid ratio at design values
■ Hydraulic knife gate with trapezoidal sand-metering orifice
■ Loss-in-weight measurement system for on-demand sand concentration verification
■ Det Norske Veritas (DNV) 2-7-3−certified lifting and crash frame structure
■ Operator touchscreen control panel
■ Optional installation of one liquid additive module or one dry additive feeder
■ Programmable logic controller (PLC)-based electronics
■ Dedicated recirculation line for brine-based slurries
■ Programmable optimum density (POD) blender mechanical architecture for reliability and servicing
■ Onboard hydraulic and pneumatic power

The Hornet® blender is a skid-mounted unit designed for continuous mixing of gravel-pack slurry in offshore environments. The blender precisely controls sand concentrations, even at low pump rates and low solid-to-liquid ratios. This cost-effective unit is well suited for gravel-packing and high-rate water-packing operations. It can be manually operated if necessary.

The Hornet blender features a modular design consisting of three smaller skid modules (mixer, control system, and engine pack) mounted to a skid-base frame along with process piping. A removable lifting frame also serves as a crash protection frame that mounts over the skid module and base frame.

A wet manifold diesel engine rated to 325 hp directly drives the mixer. The mixer uses an automatically controlled, gravity-fed, trapezoidal gate and a plumbing configuration that allows the unit to operate in continuous recirculation mode through the suction header of a triplex pump and then back to the mixer. This process keeps sand suspended in brine-based fluids.

The standard unit comes without peripheral devices such as dry additive feeder or liquid additive system, but options allow one of each to be installed and a second offboard liquid additive skid to be used.

The Hornet blender runs in fully automated mode, with set points received from the operator or from SandCAT® sand control computer-aided treatment acquisition system. The on-board loss-in-weight measurement system allows operators to perform periodic checks of sand concentration during a job. It also allows adjustments to be made to the baseline sand calibration information stored in the system electronics. This information is used to fine-tune metering performance and to account for possible discrepancies in sand flow due to humidity and other factors.
## Blender Specifications

<table>
<thead>
<tr>
<th>Engine</th>
<th>Caterpillar® C9 wet manifold diesel engine</th>
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<tbody>
<tr>
<td>Power, hp</td>
<td>325 at 2,200 rpm; 280 at 1,500 rpm</td>
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<tr>
<td>Max. torque, lb-ft at 1,450 rpm</td>
<td>988</td>
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<tr>
<td>Cooling</td>
<td>LYM Mesabi® radiator package with integrated charge air cooler, hydraulic oil cooler, engine system cooler, and blender gearbox lubricant cooler</td>
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| Hydraulics | Power take-off (PTO)-driven pressure-compensated pump at 1,100 psi and 40 galUS/min max. to power the following systems:  
- sand metering gate  
- sand silo cutoff gate  
- dry additive feeder (optional)  
- up to two liquid additive systems (optional) |
| Drive train | Spicer® 1810 series driveline and universal joints, manual clutch |
| Length, in | 225 |
| Width, in | 66 |
| Height, in | 103 |
| Max. weight (approximate), lbm | 20,000 (includes weight of system operational fluids and spillage in spill pans) |
| Mixer | Patented Schlumberger vortex mixer |
| Optional additive systems | One onboard dry additive feeder  
One onboard liquid additive skid  
One offboard liquid additive skid |
| Operating temperature range, degF [degC] | 32 to 120 [0 to 50] |
| Max. working sand, ppa | 6 |