

HISIDE Blender

High-Speed, In-Line, Dilution Equipment



FEATURES

- Accurate, high-volume mixing on the fly
- All-steel construction and no moving parts
- Minimal pressure drop across the unit
- In-line baffle pre-mixing and in-line static mixers
- Same unit for OBM and SBM

BENEFITS

- Fewer downhole problems
- Faster turnaround for supply vessels
- Easy-to-use, trouble-free operation
- Energy-efficient design requires less power
- Thorough mixing of mud, brine and chemicals
- Versatility for lower equipment costs

The HISIDE[†] Blender unit is an example of scientific theory and practical engineering meeting to create the next evolution of mix-on-the-fly technology.

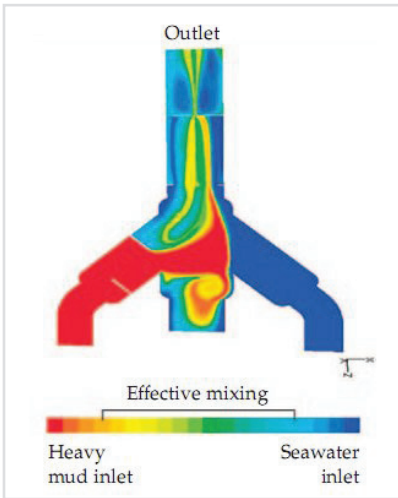
In offshore drilling, precise fluid density and rheological control are much too important to be left to a mix-on-the-fly unit that may not be doing its job. M-I SWACO[†] engineers, using advanced Computational Fluid Dynamics (CFD) modeling, have proven that this is often the case. With the aid of CFD, M-I SWACO has designed and engineered the HISIDE Blender unit as the answer to the question of accuracy and speed in mix-on-the-fly operations. Capitalizing on a unique combination of baffle geometry, exhaustive design and patented¹, Westfall[^] static mixers; the HISIDE Blender unit delivers efficient cut-back of WBM and effective shearing of OBM, ensuring downhole stability, emulsion quality and rapid supply-boat turnaround.

Features

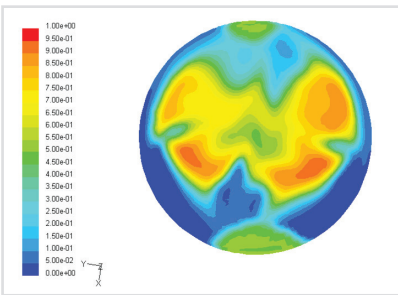
- 4-in. (DN100) and 6-in. (DN150) seawater and weighed-mud inlet lines
- Unique dual, in-line, baffle, pre-mixing zones
- Exclusive in-line, single or dual, patented, Westfall static mixers
- High shear capability up to $4,350 \text{ s}^{-1}$
- All-steel construction
- No moving parts
- Energy-efficient static mixers ensure minimal pressure drop
- Quick-connect victaulic for inlet lines
- CFD-modeled, field-tested design

Benefits

- Large-volume inlet and rapid mixing capability remove need for any rig storage and ensure rapid turnaround of supply vessels
- Consistent mixing performance ensures hole stability and integrity
- Improvement of hole conditions prior to cementing
- High flow rates with minimal pressure drop
- Improved in-line turbulence and multiple recirculation zones
- Suitability for both WBM and OBM give the HISIDE Blender unit extra flexibility



CFD model showing cross-section of blending action



Effective Mixing

How It Works

The HISIDE Blender design ensures turbulent flow in both the seawater and drilling-mud inlet lines by the use of baffles which are positioned to direct the heavy fluid to commingle with the seawater. As a result, both the seawater and drilling mud enter the 8-in. (DN200) mixing body and begin mixing immediately, despite the natural tendency for the higher-density fluid to channel through the lower-density fluid. The sudden volume change in the primary mixing chamber changes the fluids' velocity and allows for a longer residence time which promotes further mixing.

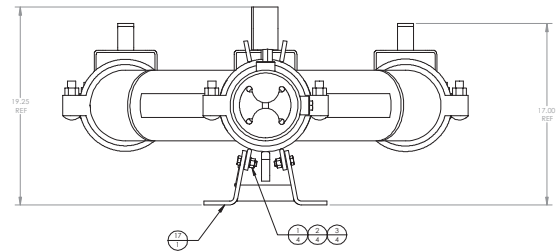
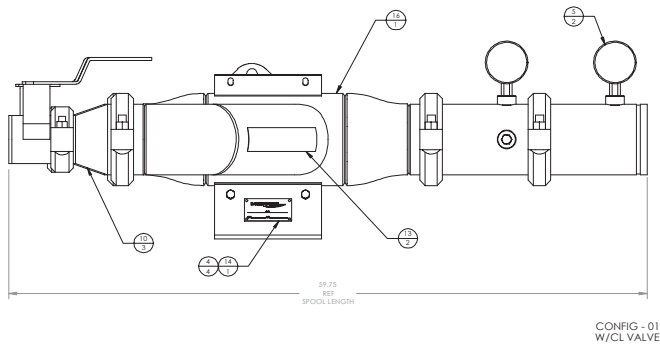
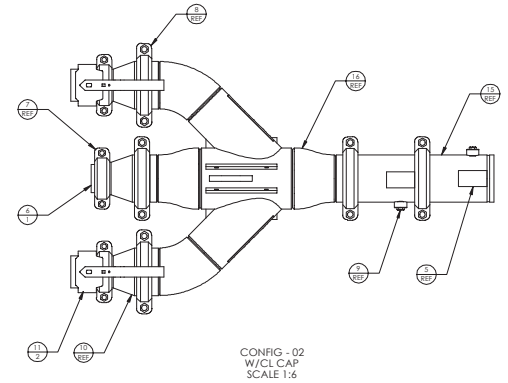
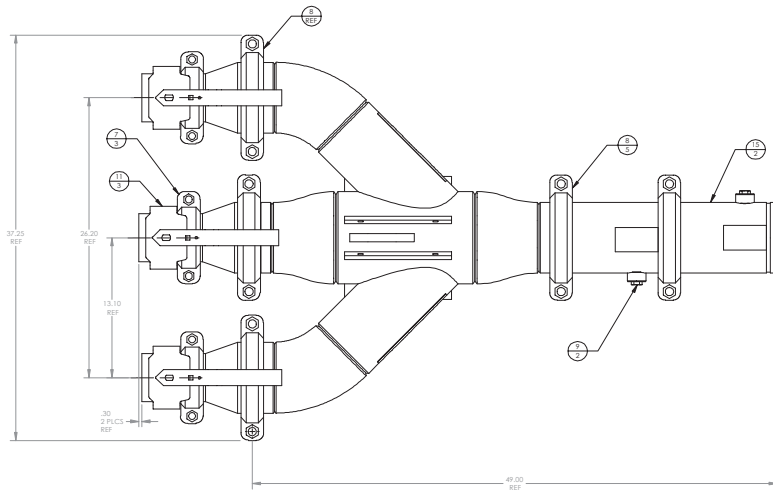
As the partially mixed fluid exits the 8-in. (DN200) mixing zone into the 6-in. (DN150) discharge, recirculation zones are created. Within the 6-in. (DN150) outlet, these recirculation zones are optimized as the flow encounters each of the Westfall static mixers. Aside from mixing, the static mixers have sheared the fluid with calculated shear rates on the order of 4350 s^{-1} , which is significantly higher than competing technologies. As a result of this design, operators can be confident that a homogenous fluid is discharged from the unit.

Specifications

	Length in. (mm)	Width in. (mm)	Height in. (mm)	Input Lines in.	Brine/ Output Line in.	Main Mixing Body in.	Weight lb (kg)	Static Mixers in. (mm)
HISIDE Blender	63.6 (1,615.4)	37.3 (947.4)	19.2 (487.7)	4 (DN100)	6 (DN150)	8 (DN200)	320 (145.1)	6 (150)

- Material: 316/316L stainless steel
- Standard: B31.3 ANSI/ASME Code for Pressure Piping — Chemical Plant and Refinery
- Static mixers: Stainless steel
- Weight: 320 lb (145.1 kg) (with 3 valves)
- Two configurations available
 - 6-in inlet configuration to accommodate total discharge flow rates up to 2200 GPM (8328 L/min)
 - 4-in inlet configuration to accommodate total discharge flow rates up to 1600 GPM (6056 L/min)

Engineering Drawing: HISIDE Blender



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