

# HiRIDE Hopper

High-Speed, Rapid-Induction, Dynamic Eductor

The HiRIDE\* Hopper integrates a proprietary Minimum Pressure Drop (MPD) 175 nozzle and unique TriMix Diffuser (TMD) into an easily installed, rugged, stainless steel frame which has been designed to an optimal height for improved ergonomics. The unit is available in three configurations: FE, SE and EA.

The HiRIDE Hopper Model 175 FE unit's dynamic-positioning design offers the unique ability to rotate the MPD/TMD eductor assembly up to 180° while utilizing up to 3 in. (76 mm) of vertical travel, creating unparalleled flexibility for new installs or retrofits on offshore or land rigs. The proprietary eductor design minimizes pressure loss, provides consistently higher vacuum, requires less energy, maintains a rapid rate of induction and reduces "fish eyes." The ability to maintain high productivity under consistently low or variable circulating-pump pressures makes the HiRIDE Hopper unit the leader in rapid mixing technology.

## Features

- Unique dynamic eductor assembly offers unparalleled 180° of rotation and 3 in. (76 mm) of vertical travel (Model 175 FE)
- The patent-pending, combination Minimum Pressure Drop (MPD) 175 nozzle and TriMix Diffuser (TMD) are made of durable polyurethane
- 2,790 in.<sup>3</sup> (45.7 L) hopper (equal to a 100-lb [45.4-kg] sack of barite)
- Standard 2-in. (51-mm) bulk-liquids induction port
- 2-in. (51-mm) cam lock quick connect provides compatibility with bulk tanks
- Consistent 26.8-in (681-mm) Hg vacuum
- Lowest comparable pressure loss at 48 psi (3.3 bar)
- Lowest comparable energy requirement at 0.47 hp/gph (92 kW/m<sup>3</sup>/hr)
- 25,992 lb/hr (11,790 kg/hr) rate of solids induction for bentonite



## Features

- Rapid, complete mixing of dry or liquid additives into the fluid system
- Lowest comparable pressure loss
- Creates high shear rates in a circulating loop
- Compact design with small footprint
- Dust-free dry-product mixing

## Benefits

- Minimizes "fish eyes" in hard-to-mix products
- Requires less energy
- Flexible design eliminates extra equipment
- Ideal for rigs where space is at a premium
- A greater degree of worker safety

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- Grooved pipe connections for quick installation and removal
- Consistent mixing performance between 30 and 60 psi (2 and 4 bar)
- Durable, weather-resistant, stainless steel construction
- 600-GPM (136.2 m<sup>3</sup>/min) circulation can vacuum water through 33 ft (10 m) of 2-in. (51-mm) hose and a vertical rise of 20 ft (6.1 m) at 80 GPM (302.8 L/min)
- Reduced dimensions and weight with adjustable profile

### ***Benefits***

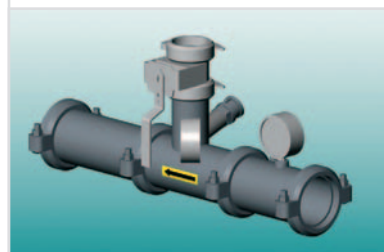
- Bulk solids induction without costly additional equipment
- Dynamic eductor allows rapid adjustment of eductor height and hopper orientation for customized installation onshore or offshore
- Smaller dimensions ensure suitability for all locations requiring minimal modifications to rig spaces or the unit itself
- Unique nozzle/diffuser design ensures mixing performance that is not affected by variable service pressure
- Combination of advanced MPD nozzle and TMD design ensure efficient entrainment of solids and elimination of “fish eyes” in less than 5 min, with hydrophobic polymers
- No spillage or hopper bridging
- Cleanouts are faster with no equipment disassembly required
- Cleaner work site reduces potential for slip and fall injuries
- More tank turnovers
- Three configurations available including:
  - Model 175 FE — Features adjustable eductor piping
  - Model 175 SE — Standard model with eductor piping fixed in position
  - Model 175 EA — An eductor-only option to be coupled with a dust-free system



*HIRIDE Hopper Model 175 FE*



*HIRIDE Hopper Model 175 SE*



*HIRIDE Hopper Model 175 EA*

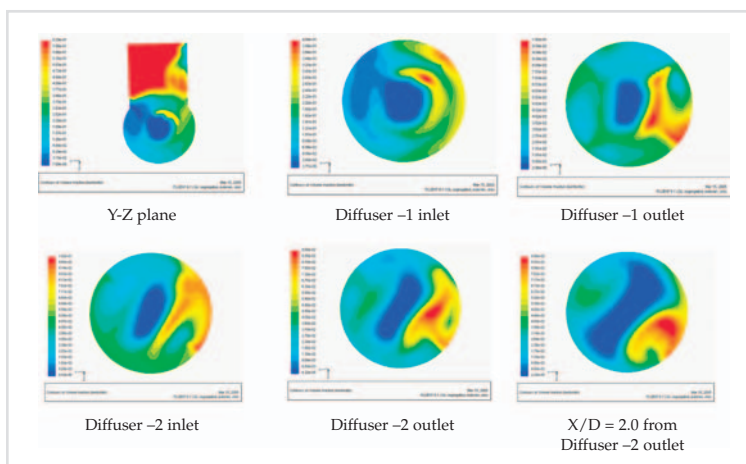
## How It Works

The HIRIDE Hopper unit is an improved means of introducing liquid, powdered or granular additives into drilling, reservoir drill-in or completion fluids on the rig. The mixing hopper facilitates the manual addition of small volumes of material supplied in individual 50- or 100-lb (22- or 44-kg) sacks.

Fluids enter the unit via a 6-in. (152-mm) line, and the MPD nozzle constricts the flow to a 1.75-in. (45-mm) orifice in the nozzle via a downstream, inwardly sloping conical shape. The flow exits the downstream side of the MPD nozzle at high velocity into a void space. The mixing hopper or other flowline opens into this void space via a manual butterfly valve. With the valve open, the high-velocity flow creates a zone of relative low pressure, which creates suction, drawing the material into the void space.

The powdered material drawn into the void space is then carried by the high-velocity flow into the mouth of the TMD diffuser where the geometry promotes turbulence and thus mixing. Flow moves through the throat of the diffuser into a secondary void space, which again changes velocity, creating more turbulence and recirculation zones. The flow then enters the second throat of the TMD and exits into the 6-in. (152-mm) pipe which again changes the flow velocity creating more recirculation and turbulence and further encouraging mixing. At this stage, all material is effectively entrained in the fluid.

There is also a 2-in. (51-mm) angled port installed directly below the 4-in. (102-mm) butterfly valve on the inlet to the educator. This port is used for the addition of liquid products from drum, bulk tank or tanker. Liquids with a viscosity similar to water can be added at a rate of up to 108 GPM (410 L/min). Induction rates will vary depending on the temperature and viscosity of the fluid added.



## Specifications

	Length in. (mm)	Width in. (mm)	Height in. (mm)	Pipe Spool Length (F-F) in. (mm)	Pipe Spool Elevation in. (mm)
HiRIDE Hopper	49 (1,244.6)	29.6 (751.8)	39.3 (998.2)	42.2 (1,071.9)	Typical 8 (203.2), varies 3 (76.2) on 175 FE

- **Table and hopper:** 304/304L stainless steel plate ¼-in. (6.35-mm) thick
- **Legs:** 304/304L stainless steel
- **Victaulic couplings:** ASTM A395/A536 and 316 stainless
- **Valves:** ASTM A395/A536 and 316 stainless (ASTM A743)
- **Piping:** 316/316L stainless steel
- **Standard:** B31.3 ANSI/ASME Code for Pressure Piping — Chemical Plant and Refinery Piping
- **Weights:** Standard table 420 lb (190.5 kg)  
Eductor only 162 lb (73.5 kg)  
Flexible unit 390 lb (176.9 kg)

### Engineering Drawing: HIRIDE Hopper

All dimensions are expressed in inches (millimeters).

