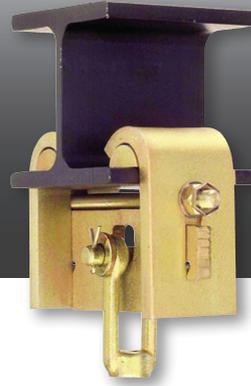




**HANWEL NEDERLAND**



# Venturi Fluid Jets

## Product & application guidelines



# Venturi Product Experts

## Products & Fluids

The following is an outline of the product types that we can design and the respective fluids that they can handle.

Product	Motive Fluid / Inlet	Suction Fluid / Branch
Eductor (for Liquids)	Liquid	Liquid
Eductor (for Slurries)	Liquid	Fluidised Solids / Slurries
Eductor (for Solids)	Liquid	Dry Solids
Liquid Jet Gas Eductors	Liquid	Gas
Mixing Eductors	Liquid	Liquid
Thermocompressors	Steam	Steam
Steam Jet Syphons	Steam	Liquid
Steam Ejectors	Steam	Gas
Air / Gas Ejectors	Gas	Gas
Pneumatic Conveyor / Venturi Feed Device	Air	Dry Solids
Instantaneous / Inline Steam Heater	Liquid	Steam
Spray Type Desuperheater	Superheated Steam	Water

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## Definition of Fluids

The following table defines the limitations / characteristics of the fluids as used in the product types outlined on the previous page.

Fluid	Definition	Example
Liquid	Any Newtonian Liquid with: <ul style="list-style-type: none"><li>- minimal solid and gaseous content</li><li>- a density &lt; 2,000 kg/m<sup>3</sup></li><li>- a viscosity &lt; 100 Cp</li></ul>	Potable Water, Processed Water, Sea Water, Fuel Oil, Chemical Additives,
Fluidised Solids / Slurries	Any Dry Solids mixed with a Newtonian Liquid with: <ul style="list-style-type: none"><li>- a solid content &lt; 80% by wt.</li><li>- a density &lt; 2,000 kg/m<sup>3</sup></li><li>- a viscosity &lt; 100 Cp</li></ul>	Sand Slurry, Sludge, Muds, GAC, PAC,
Dry Solids	Any solid particulates	GAC, PAC, Lime, Pellets, Sand, Powders,
Steam	Dry Steam at or near Saturation conditions	
Superheated Steam	Dry Steam at temperatures greater than Saturation conditions	
Gas	Any Ideal Gas or any mixture of gases which can be approximated to an Ideal Gas	Air, Nitrogen, Natural Gas, Methane,

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## Applications & Operation Notes

All enquiries are custom designed on a case by case basis to meet our customers exact requirements. As such there are no standard performance table but the following notes should help identify applications and provide guidance.

Application	Notes
Lifting	<p>Where a fluid is lifted using the 'suction' generated at the suction inlet of the eductor:</p> <ul style="list-style-type: none"><li>- maximum of 7.5 metres of lift for a fluid density of 1,000 kg/m<sup>3</sup></li><li>- fluid temperature must be 20°C below it's specific boiling point at the lowest pressure to avoid flashing.</li></ul>
Pumping	<p>Where a fluid is lifted to a greater higher or increased in pressure using the pressure recovery at the Eductor discharge:</p> <ul style="list-style-type: none"><li>- as a 'rule of thumb' the maximum discharge pressure is the suction pressure plus 40% of the difference between the motive and suction pressures. (Dependent on Fluids, Flowrates and Pressures)</li><li>- as such 'lift' is only limited by the available motive pressure</li></ul>
Solids Handling	<p>Dry Solids Handling:</p> <ul style="list-style-type: none"><li>- The Dry Solids enter the eductor via a hopper.</li><li>- The Dry Solids need to be fed into the hopper at the correct rate.</li><li>- Usually low pressure applications for transporting / mixing over short distances.</li></ul> <p>Slurry Handling:</p> <ul style="list-style-type: none"><li>- Fluidise Slurries act like a liquid but due to the solid content require higher operating pressures.</li></ul>

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Application	Notes
Dosing & Mixing	Variation on a standard Liquid Eductor application where the eductor is installed 'around the pump' to allow small amount of chemicals to be added into large volumes of liquids without causing pressure losses in the 'mainline'.
Mixing & Agitation	Where eductors are installed in a tank within the fluid to provide mixing and agitation. <ul style="list-style-type: none"><li>- Used to generate a non rotational homogeneously mixing action.</li><li>- Used to prevent settling out of solids.</li></ul>
Aeration & Evacuation	Where a Liquid Jet Gas Eductor is used to pump a gas. <ul style="list-style-type: none"><li>- To create a vacuum and evacuate a vessel / tank / remove dust</li><li>- To evacuate and prime</li><li>- To aerate a liquid</li><li>- To generate micro bubbles for water treatment</li></ul>
Vacuum & Compression	Where an Ejector / Thermocompressor is used to: <ul style="list-style-type: none"><li>- Create a vacuum</li><li>- Create a vacuum and evacuate a vessel</li><li>- Compress a low pressure gas to a higher pressure</li><li>- The minimum suction pressure a single Ejector can generate is approximately 10% of the discharge pressure.</li><li>- Multiple Ejectors can be installed in series to reduce the suction pressure further</li></ul>
Pneumatic Conveyance	Dilute Phase pneumatic transport of dry solid particulates in high velocity air flows only.
Steam Heating	Where Steam of equal to or greater pressure is injected into a pipeline to provide instantaneous heating of a Newtonian Fluid.
Desuperheating	Reduction of Superheated Steam to within 3°C of saturation temperatures using an inline spray nozzle.



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