PENTAIR

FAIRBANKS NIJHUIS™

SOLIDS HANDLING PUMPS

www.FairbanksNijhuis.com

PENTAIR

FAIRBANKS NIJHUIS™

History and Development

Since the early part of this century, Fairbanks Nijhuis Pump has set industry standards in innovative engineering, manufacturing and successful operating experience of solids handling pumps. Fairbanks Nijhuis designed the first solids handling impeller. The first bladeless impeller was designed and patented by Fairbanks Nijhuis and became commercially available in 1935. In the early 1950's, Fairbanks Nijhuis pioneered the first "submersible" solids handling pumps for both dry and wet pit applications in solids, slurry, pulp and sludge handling pumping equipment, and more recently Vertical Turbine Solids Handling (VTSH®) pumps have been developed and marketed.

From just a few gallons per minute to over 100,000 GPM, Fairbanks Nijhuis solids handing pumps cover a broad range of hydraulics with outstanding dependability. All dry pit pumps, available in vertical or horizontal configurations, are designed and built in a facility dedicated to the research, development and manufacturing of pumping equipment. Integrated machining, assembly, testing and inspection assures unparalleled quality and reliability. The careful design of pumps allows for ease of disassembly and servicing. Parts and service are available throughout the world from the Fairbanks Nijhuis factory, authorized distributors and repair centers.

All this is why hundreds of thousands of successful Fairbanks Nijhuis pumps are in operation around the world.

Applications and Installations

Fairbanks Nijhuis offers dry pit pumps in four basic configurations: horizontal, vertical-coupled via intermediate shafting, vertical close-coupled and vertical biltogether. The liquid end hydraulics are identical and provide numerous driver mounting and coupling designs. With the exception of the biltogether, in which the motor bearings carry the thrust and radial loads, the bearing frames are standardized among the various configurations.

This permits wide interchangeability of spare parts and maximum flexibility to satisfy changing customer demands. Pumps can be modified to large or smaller sizes, or changed from horizontal to vertical and vice versa. The pumps can be revised by a simple service order, saving the user from having to purchase complete new equipment.

Solids handing pumps often operate in unattended pump stations and other installations which require utmost reliability and freedom from clogging or other downtime maintenance. Plants today demand pumps to provide sustained high performance, the best possible design to resist clogging, and minimum size driving motors and controls to reduce construction and operation costs. Fairbanks Nijhuis™ dry pit solids

handling pumps can be found in a variety of installations, including sewage lift stations and treatment plants, fibrous sludge and slurry handling, pulp and general industrial solids handling service.

With over 100 years of proven experience in the pumping of solids, slurries, sludge, pulp, trash, sewage and grit, Fairbanks Nijhuis Pump has the product and engineering knowledge to meet your pumping needs. A number of precision cast impellers are offered in two-vane, bladeless and recessed designs.

Precision Cast Impellers

Large passageways, blunt well-rounded leading vanes, and thick hydrofoil shape prevent long stringy material from wrapping around the leading edge. Impellers are matched with thick-wall equalizing-pressure, constant-velocity volutes. This design channels the flow away from the impeller vanes into the circular flow area of the impeller passageways and casing, to assure passage of large solids and long stringy materials, reduce turbulence and radial and bending shaft forces. Abrasive wear is minimized, bearing, mechanical seal (when used) and shaft life is lengthened, and most important, maintenance and downtime costs are greatly reduced, resulting in true savings. An added advantage is a smooth, quiet and trouble-free installation.

Used primarily in sewage lift stations and treatment plants where sewage flows are relatively low, the bladeless impeller will handle 10-25 percent more solids, long stringy material and trash than a conventional two-vane impeller. Interchangeability of the two-vane and bladeless impeller designs allows for existing stations to adapt to changing conditions by simply changing out the impeller. No changes to piping, drive shafts or pump setting are required.

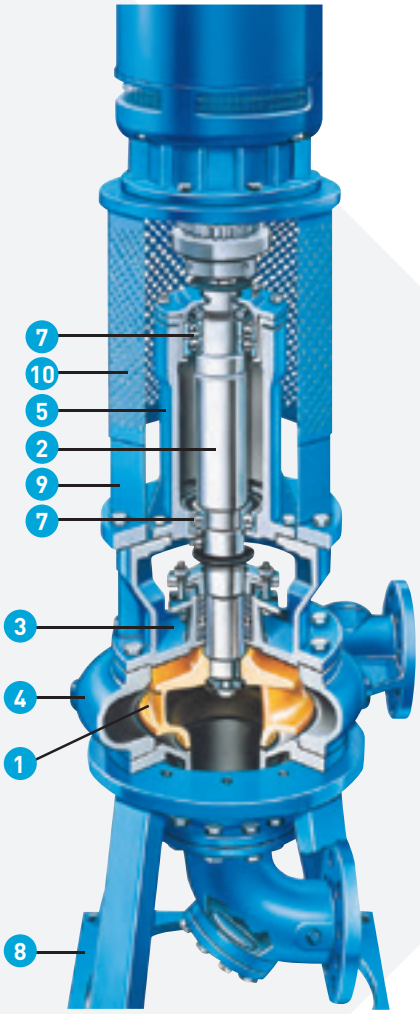
Biltogether Pump

The 5400 Series solids handling pumps are available in a biltogether configuration. The suction elbow, base, volute and impeller are identical to other configurations. The biltogether arrangement features an impeller mounted directly on the high-strength motor shaft. A renewable stainless steel sleeve protects the shaft through the mechanical seal area. The motor is designed to provide a nominal L10 bearing life of 40,000 hours at best efficiency point.

These biltogether units are typically applied in sewage lift station applications.

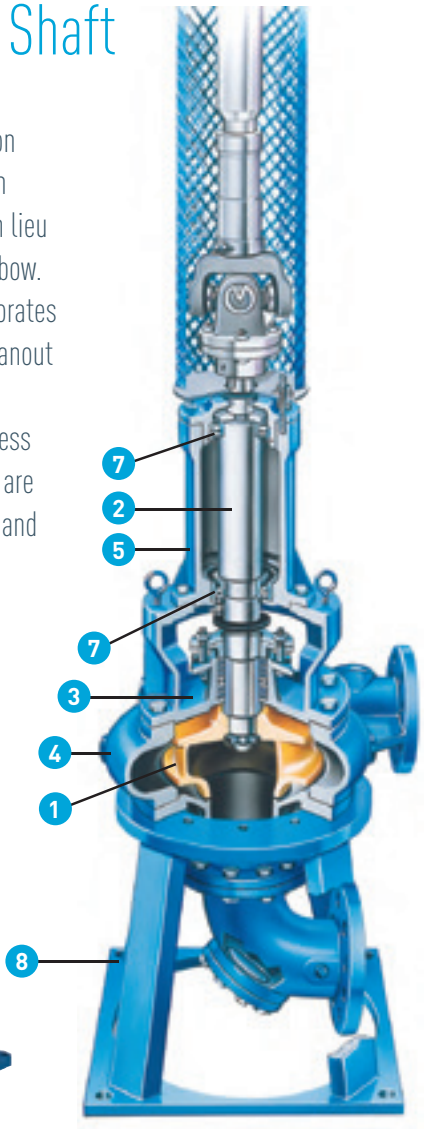
Pump Features

Vertical Close-coupled



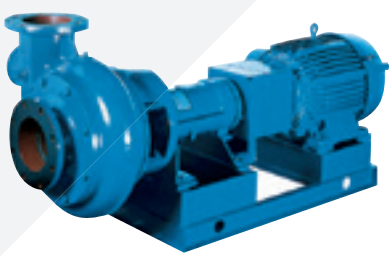
Vertical Flex Shaft

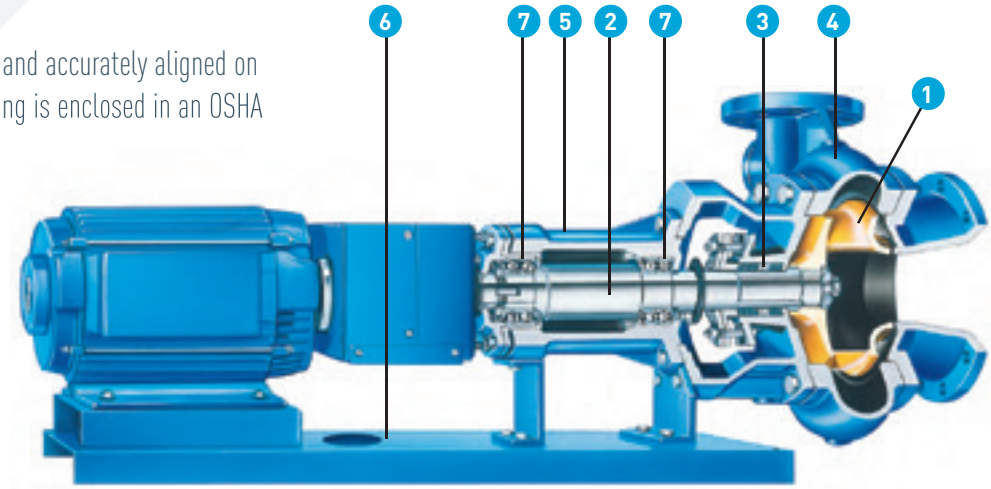
A heavy-duty, one-piece, integrally cast combination base/elbow is available on most 4" vertical pumps in lieu of a separate base and elbow. The cast iron base incorporates a contoured handhole cleanout located 180 degrees from the suction flange. Stainless steel and other materials are available for the impeller and casing wear rings.



Horizontal

Horizontal pumps and motors are mounted and accurately aligned on a heavy-duty steel base. The flexible coupling is enclosed in an OSHA coupling guard.





Pump Features

Standard Features

1. Available in either an efficient radial flow, solids handling two-vane, or bladeless design, impellers have blunt, well-rounded leading vanes and a thick hydrofoil shape to pass large solids and long stringy material. Precision cast impellers are designed and matched specifically to the equalizing-pressure, constant-velocity volute. Impellers are secured to the shaft with key and locking bolt.

2. Heavy-duty, high strength manganese steel shafts are rated for 100,000 psi tensile strength and 75,000 psi yield strength. Shafts are accurately machined over their entire length and precision ground at the bearing surface. Through the stuffing box area, the shaft is protected with a renewable stainless steel sleeve, and positively sealed to prevent leakage between the shaft and sleeve.

3. The rugged backhead is accurately machined to ensure shaft alignment with an oversized, integrally cast packing box. This box is designed for use with packing or virtually all popular mechanical seals without the need to re-machine. A two-piece interlocking gland is used to keep a minimum of five rings of packing and a split water seal ring in place. With a double mechanical seal, a solid one-piece gland is used. The stuffing box has a 1/4" injection and vent tap for clear water or grease connection. The backhead is tapped for ease of connection piping to route packing box leakage to the drain. The backhead has a large opening for easy access to the packing box for gland adjustment and packing removal.

4. The one-piece, thick-walled circular volute has rounded fluid passages designed to transport any size solid that passes through the impeller. The volute incorporates a large cleanout opening, allowing access to the impeller. The entire rotating assembly can be removed without disturbing the piping. (On horizontal units, a spacer-type coupling is required to remove the rotating assembly without disturbing the driver.)

5. Heavy-duty cast iron bearing frames are machined to assure accurate alignment. A lip-type grease seal contacts the shaft to prevent the entrance of contaminants into the bearing housing. Zerk-type grease fittings are used for lubrication. Jacking bolts allow for external impeller adjustment to maintain original pump hydraulics and extend pump life.

6. Horizontal pumps are mounted on a steel base with mounting feet bolted to the pump frame and backhead.

7. Radial and thrust loads dictate what bearing combinations are required. Combinations of single and double row bearings are used to provide long bearing life. Bearings are deep-groove, grease lubricated. Horizontal pumps are also available with oil lubricated bearings. Bearings are designed for a nominal L10 life of 100,000 hours.

8. Vertical pumps are mounted on a rigid structural base to support the weight of the pump and motor. The open base construction allows access to the suction elbow, gauge connection and large contoured handhole cleanout.

9. In a vertical close-coupled configuration, the pump includes a motor base. This rugged, heavy-duty base supports the weight of the motor and has sufficient height and large openings for easy access to the coupling.

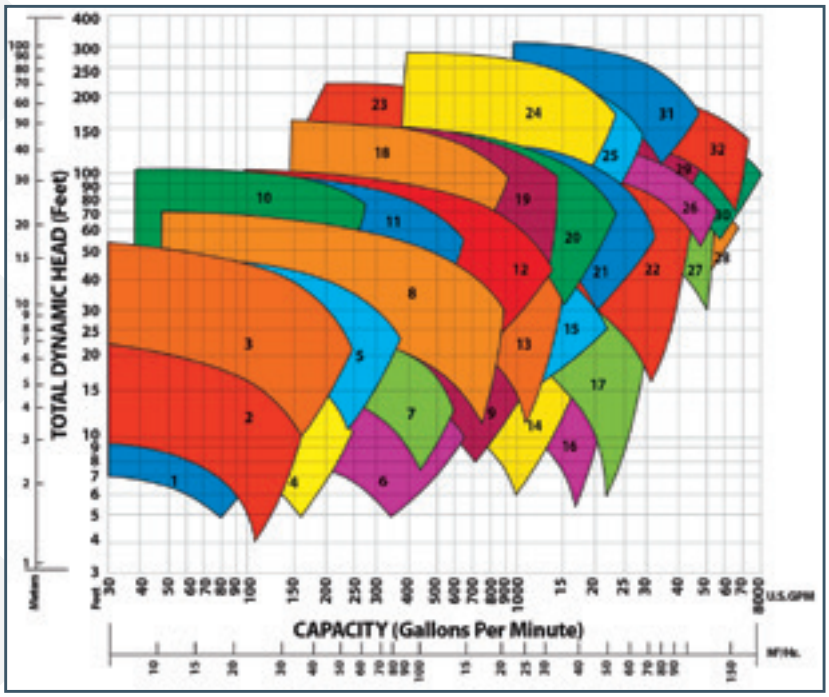
10. An OSHA coupling guard is provided as standard in close-coupled construction.

Performance Data

Solids Handling Performance

Solids Handling Performance		
Number	Pump	RPM
1.	1"-54x2	900
2.	2"-54x1	1200
3.	2"-54x1	1800
4.	3" 54x2	1200
5.	3"-54x1	1800
6.	4"-54x2	900
7.	4"-54x3	1200
8.	4"-54x1	1800
9.	5"-54x3	1800
10.	2"-54x2	1800
11.	3"-54x2	1800
12.	4"-54x2	1800
13.	5"-54x3	1200
14.	6"-54x3	900
15.	6"-54x3	1200
16.	8"-54x4	720

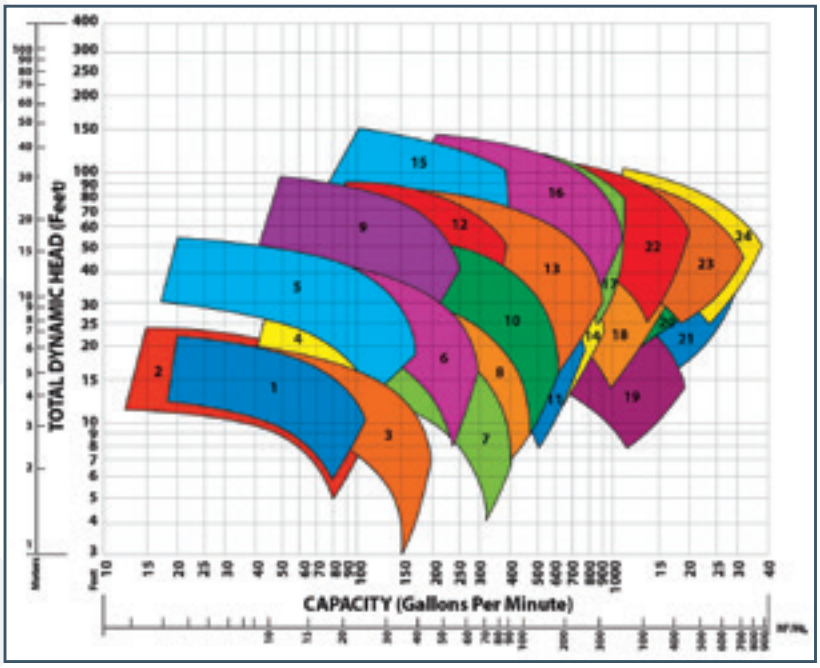
Solids Handling Performance		
Number	Pump	RPM
17.	8"-54x4	900
18.	3"-54x3	1800
19.	4"-54x3	1800
20.	5"-54x3	1800
21.	6"-54x3	1800
22.	8"-54x4	1200
23.	4"-54x5	1800
24.	4"-54x4	1800
25.	5"-54x6	1800
26.	8"-54x5	1200
27.	10"-54x5	900
28.	10"-54x0	720
29.	8"-54x6	1200
30.	10"-54x0	900
31.	6"-54x6	1800
32.	10"-54x5	1200



Bladeless Performance

Bladeless Performance		
Number	Pump	RPM
1.	2"-54x1K	1200
2.	2"-54x2K	900
3.	3"-54x1K	1200
4.	2"-54x2K	1200
5.	2"-54x1K	1800
6.	3"-54x1K	1800
7.	4"-54x1K	1200
8.	4"-54x2K	1200
9.	2"-54x2K	1800
10.	4"-54x1K	1800
11.	4"-54x3K	1200
12.	3"-54x2K	1800

Bladeless Performance		
Number	Pump	RPM
13.	4"-54x2K	1800
14.	5"-54x3K	1200
15.	3"-54x3K	1800
16.	4"-54x3K	1800
17.	5"-54x3K	1800
18.	6"-54x4K	900
19.	8"-54x4K	720
20.	8"-54x4K	900
21.	10"-54x5K	720
22.	6"-54x4K	1200
23.	8"-54x4K	1200
24.	10"-54x5K	900



PENTAIR

3601 FAIRBANKS AVENUE, KANSAS CITY, KANSAS 66106 www.FairbanksNijhuis.com