

**SERIES 7100  
TYPE NC/EC/MF**



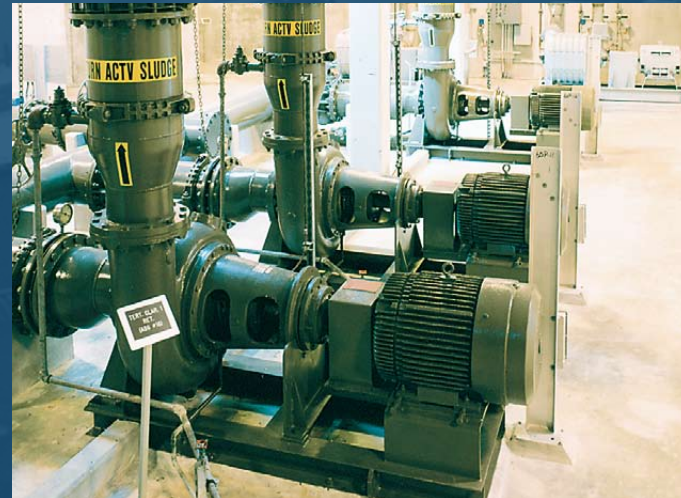
**HEAVY DUTY PUMPS  
FOR WASTEWATER AND  
RAW WATER**





# 7100 SERIES / TYPE NC/EC/MF

## HIGH-EFFICIENCY, SOLIDS-HANDLING PUMPS



The Morris 7100 is a series of large dry-pit pumps that can handle abrasive solids. A long service life and efficient operation are assured by robust materials, thick cast casing and customized design. The impeller and casing design ensures smooth vibration-free pumping.

Each pumping solution is typically a one-of-a-kind configured by Morris engineers to meet specific applications and operating conditions. The 7100 Series provides three distinct hydraulic ranges, and the wide overall hydraulic range is supplemented by adjustable speed drives to offer solutions that operate at the best efficiency point. Impeller profiles are designed for lowest NPSH requirements, further extending the practical operating range of the pump.

Maintenance and reassembly is made easier by features such as back pull-out design, generous inspection ports, simplified impeller clearance adjustments and self-centering/self-indexing components. The bearing frame design allows maximum interchangeability across the product lines and pump sizes to minimize spare part inventory.

To assure proper system design integration, Morris Pumps takes single-source responsibility for motors, adjustable speed drives, surge protection systems and intermediate line shafts.

- High efficiency
- Easier maintenance
- Longer life
- Vibration-free pumping

### TYPICAL APPLICATIONS

For both wastewater and clean water applications in water utilities and industrial processes.

### WASTEWATER PUMPING STATIONS

The high flow conditions at end-of-the-line pumping stations and combined sewer/storm systems are the natural home for the Morris 7100. The same applies to controlling equalization basins/tunnel systems to eliminate disruptive surges that could overwhelm the wastewater treatment processes.

### RAW WATER INTAKE

The high flow and resistance to abrasion make the Morris 7100 well suited to feeding raw surface water to potable water treatment plants. A minimized footprint reduces the space and construction costs associated with the intake structure.

### INDUSTRIAL PROCESSES

Customized solutions can be engineered for water intensive processes such as make-up water in power generation, metal and steel production or wash-down applications. High temperatures, aggressive pumpage or stringy materials from sugar processing etc. are similarly typical applications.

## CUSTOM SYSTEMS ARE THE STANDARD

### THREE BASIC PUMP DESIGNS

The flexibility in this line of pumps is based on three basic pump designs as well as a wide choice of sizes, configurations and materials. Based on your specifications, a Morris engineer will select and specify the right solution in terms of pump speed, efficiency, specific speed, driver size, wear, equipment life or cost.

The system is factory assembled and witness tested prior to shipment to further ensure you get a cost-effective solution that delivers long-term reliability.

The standard material selection for wastewater is cast gray iron due to its low cost and characteristic strength and durability. If mild corrosion or abrasion protection is required, a 3% nickel iron is suggested due to the wear resistance and uniformity of castings.

For high head/high pressure or heavy shock load applications Morris offers optional ductile iron construction for increased strength and overall toughness.

Various grades of stainless steel and special metallurgies are available, for example CD4MCu (duplex stainless steel), high-chrome iron, Ni-Hard, bronze, or other unique metals to meet the most demanding corrosive or abrasive applications.

Morris utilizes standard and modified Francis Vane or mixed flow impeller designs. Most pump models are available in either 2 or 3 vane impellers (some with 4 or 5 vane impellers) to suit the specific conditions.

A variety of mechanical shaft seals and packing solutions are available as appropriate to the situation.

### SPECIFICATIONS

- Capacities to 140,000 GPM (32,000 m<sup>3</sup>/h)
- Heads to 260 ft (79 m)
- Temperatures to 250° F (120° C)
- Pressures to 110 PSIG (758 kPa)
- Discharge sizes from 4" to 54" (100 – 135 mm)
- Solids to 9 3/4" (388 mm)



**BUILT FOR SUPERIOR PERFORMANCE**



# 7100 SERIES / TYPE NC/EC/MF

## ENSURING LONGER LIFE AND EASIER MAINTENANCE

**MORRIS PUMPS**  
— BUILT FOR SUPERIOR PERFORMANCE

### SEAL WATER DRAIN

A tapped drain at the lowest point on the stuffing box cover permits continuous drainage of all leakage from the stuffing box.

### PUMP SUPPORT FEET

Vertical configured pumps (VPM and VOS) are designed for three-point mounting at the pump casing. When the driver is to be coupled directly to the pump (VPM), Morris' exclusive fabricated pedestal is mounted directly on the pump feet. This places the motor's weight on the support piers. No stress is "passed through" the pump casing. (Smaller motors may also be pedestal mounted directly on the bearing frame.)

### INSPECTION PORTS

A generous and smooth internally contoured inspection plate is provided on the casing. Inspection ports may be optionally furnished in suction elbow or suction spool piece.

### FLUSH WATER RINGS (OPTIONAL)

A series of holes in the suction cover wear ring allows water to be continuously injected during pump operation. This water injection flushes away abrasives and fibrous material, thus extending the wear life of the wet-end components.

### TEMPERATURE AND VIBRATION MONITORING (OPTIONAL)

A wide variety of temperature and vibration monitoring devices are available. A conveniently located pump-mounted junction box can be supplied to terminate the sensor conductors and facilitate connections to customer's instrumentation system.

### BEARINGS

Engineered for a minimum B-10 life of 100,000 hours. Grease lubricated bearings are standard on most pumps with oil lubricated bearings optional on most.

### IMPELLER ADJUSTMENTS

Shims between the upper face of the bearing frame and bearing retainer allow a simple but effective method of maintaining impeller clearances. Wear ring and pump life is enhanced when impeller clearance is optimized.

### STUFFING BOX

The easily accessible stuffing box and split bronze gland make adjustment or repacking a simple procedure. The proper box proportions and Teflon seal cage design help ensure low temperatures and extended packing life (Bronze seal cage available). Standard stuffing box dimensions allow the use of a variety of optional mechanical seals.

### SHAFT AND SHAFT SEAL

The AISI 4150 alloy steel pump shaft is protected from abrasion in the stuffing box area by a hardened 400 series stainless steel shaft sleeve. The hooked sleeve design effectively seals the shaft from the pumped liquid.

### IMPELLER

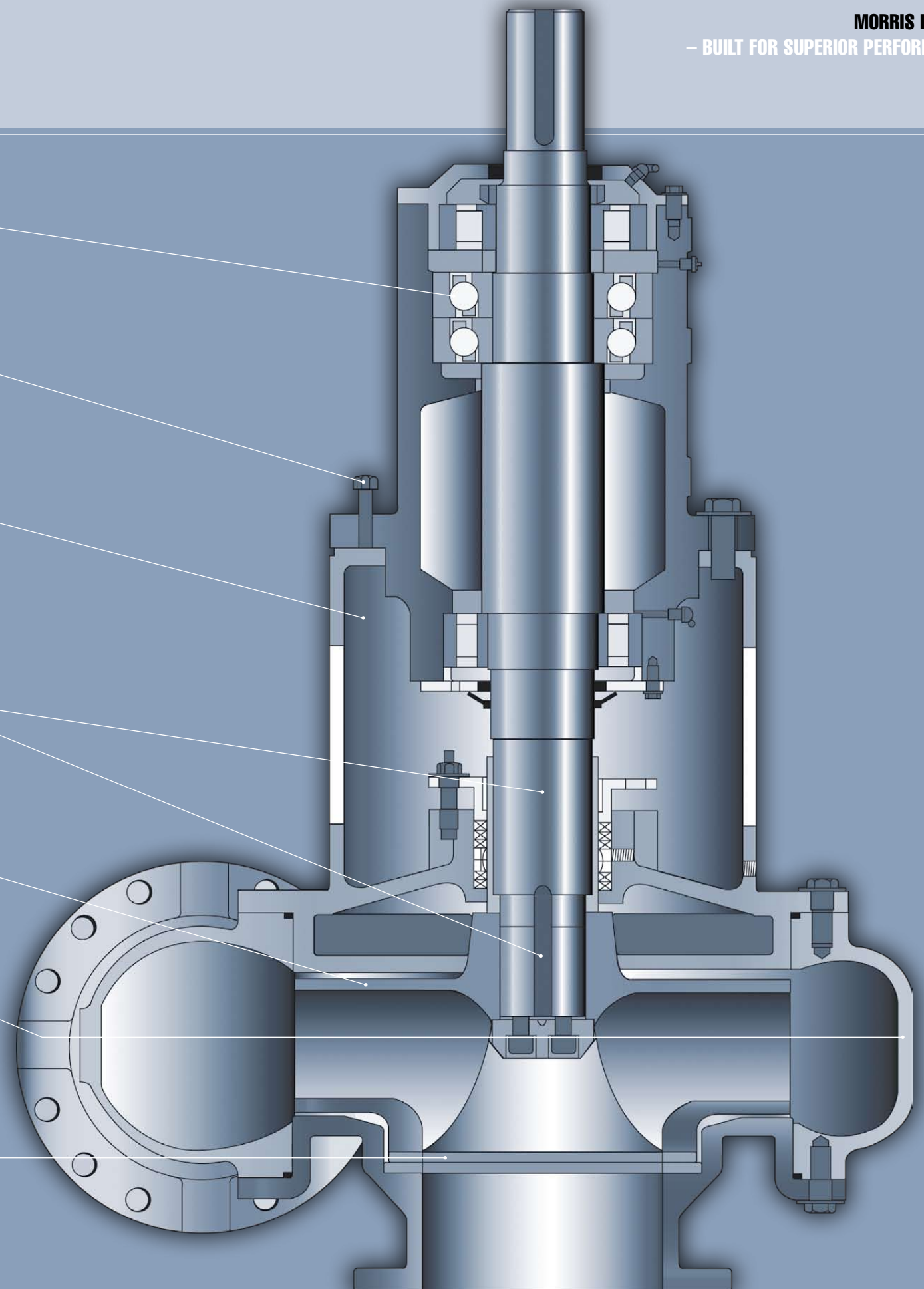
The impeller is designed for optimum balance between efficiency, solids handling and abrasion resistance. Multiple vane impellers are available for each pump model.

### PUMP CASING

The casing is a one-piece design for smooth hydraulic flow and maximum solids passage. Extra thick casting walls provide extended protection against abrasion and corrosion. Back pull-out design allows removal of the impeller and bearing frame without disturbing existing piping.

### WEAR RINGS

Replaceable 400 series stainless steel rings protect the impeller and suction cover from wear. Axial sealing permits impeller adjustment to maintain proper clearance. Wear rings available in optional materials and hardness ratings.



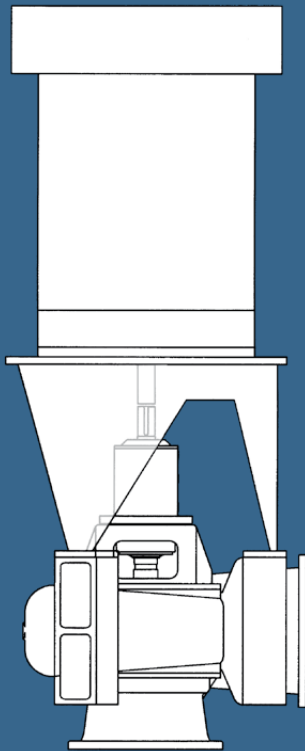
# 7100 SERIES FLEXIBLE INSTALLATION

Morris 7100 Series are available in mounting configurations to meet your driver or installation needs. Morris applications engineers will select or fabricate the best configuration to meet the unique requirements of each installation.

Vertical mounting is available in both pier-mount or pedestal-mount on most models.

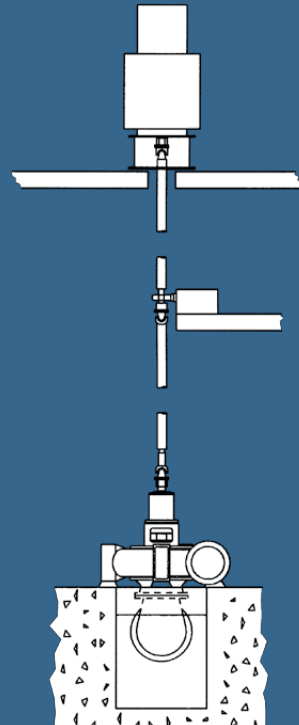
## VERTICAL PEDESTAL MOUNTED

The motor is directly mounted and connected to the pump assembly.



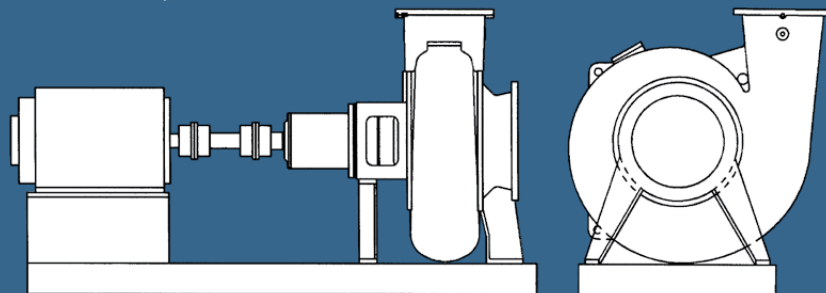
## VERTICAL OPEN SHAFT

A common configuration when motor location requires remote mounting at higher elevation due to flooding or space requirements.



## HORIZONTAL BALL BEARING

A fabricated steel base that supports both the pump and driver in a horizontal position.



## MORRIS PUMPS COVER THE COMPLETE RANGE ...

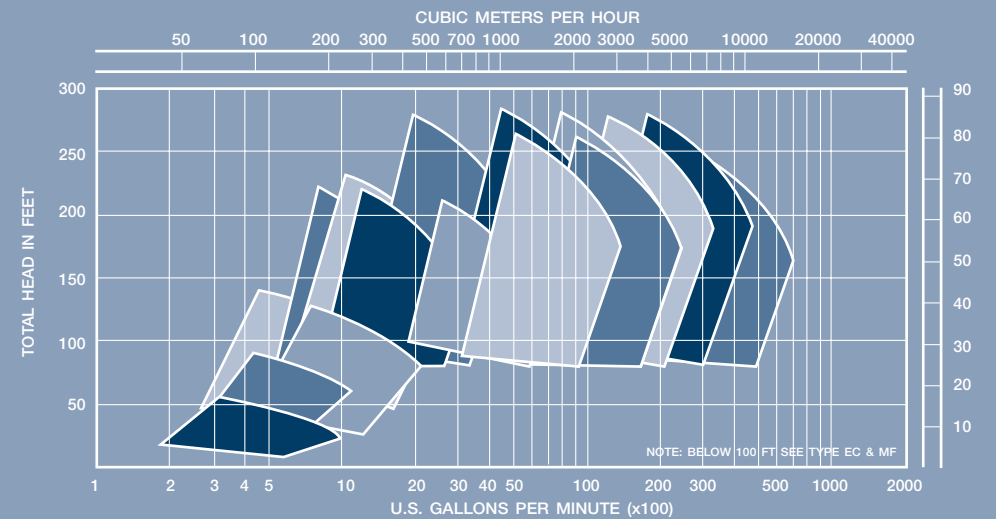
Morris pumps cover the complete range of flow and head requirements encountered in the water industry. Shown opposite are the three distinct hydraulic designs that provide the highest practical pump speed for a given head in combination with the low pump NPSH requirements.

This job-matched approach maximizes operation and performance efficiencies while minimizing the physical size of the pump and the power requirements of the pump driver.

On the basis of the operating conditions identified by the specifier, Morris consultants select a pump to give the highest specific speed. Specific speed is a correlation of pump capacity, head and speed at the best efficiency point (BEP) and is indicative of the shape, hydraulic geometry and characteristics of an impeller and casing.

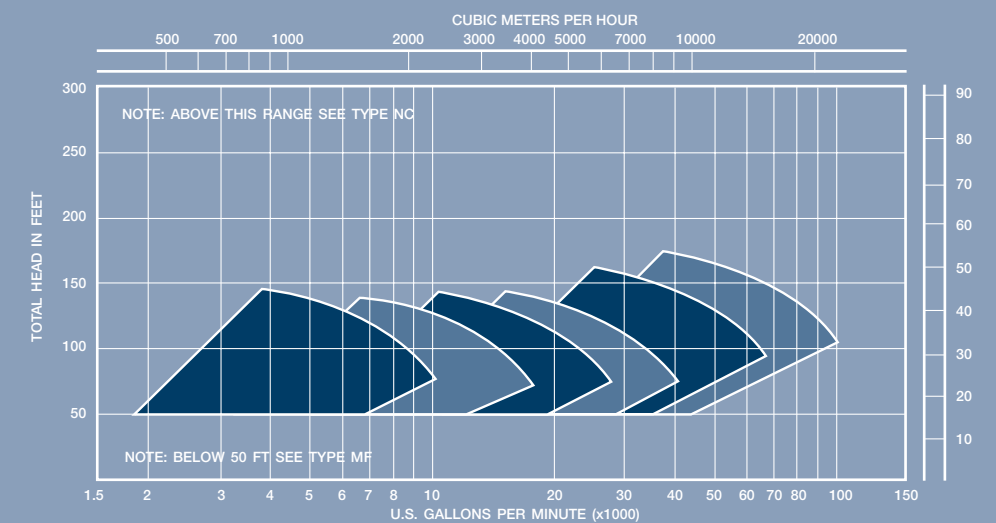
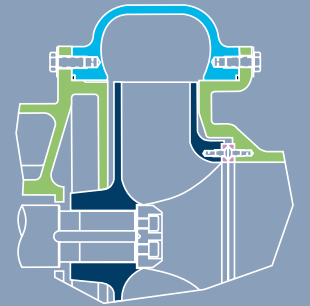
These design considerations enable the pump system designer to predict pump suction requirements and to verify pump and station intake design limitations.

# 7100 SERIES / TYPE NC/EC/MF BEST EFFICIENCY BY FULL HYDRAULIC COVERAGE



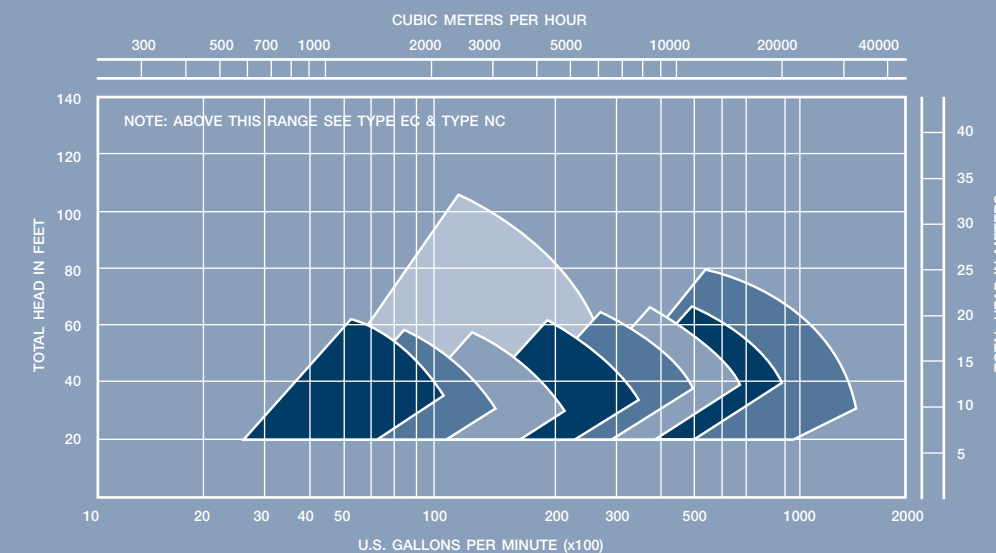
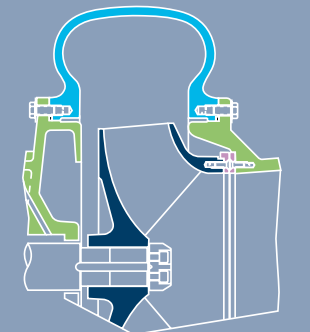
## NON CLOG IMPELLER (NC)

- Head Range: High (275' TDH max.; BEP TDH's ~200')
- Capacity Range: Up to 75,000 USGPM
- Impeller Type: Francis Vane
- Specific Speed Range: 1,800 ~ 2,700



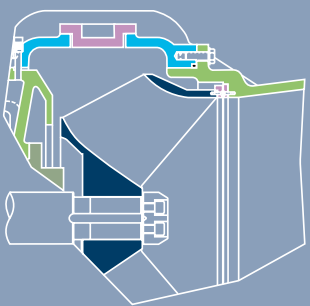
## EXTRA CAPACITY IMPELLER (EC)

- Head Range: (175' TDH max.; BEP TDH's ~100')
- Capacity Range: Up to 100,000 USGPM
- Impeller Type: Modified Francis Vane
- Specific Speed Range: 2,700 ~ 3,700



## MIXED FLOW IMPELLER (MF)

- Head Range: Low (100' TDH max.; BEP TDH's ~50')
- Capacity Range: Up to 150,000 USGPM
- Impeller Type: Mixed Flow
- Specific Speed Range: 4,700 ~ 5,800





## WHEN OTHER PUMPS CAN'T TAKE IT

The Morris 7100 is a series of large dry-pit pumps that can handle abrasive solids.

For well over one hundred years, Morris pumps have been built using proven design and manufacturing methods. This rich history combines with an effective utilization of today's engineering methods and technologies.

We work hand-in-hand with pumping system designers and consultants. And we pride ourselves in bringing the end-user a reliable, trouble-free system that exceeds expectations.

The Morris brand stands for tough, heavy-duty wastewater pumps manufactured by Yeomans Chicago Corporation, a Grundfos-owned company.

**MORRIS 7100 WASTEWATER PUMPS ARE BUILT FOR  
SUPERIOR PERFORMANCE**

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