

# Inboard Propeller Catalog





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# About Us.

Michigan Wheel has been committed to excellence in propulsion for over 100 years. During this time Michigan Wheel has built a reputation of quality and performance by supplying recreational, commercial, and military vessels with the finest propellers available.

Being a leading global supplier of marine propulsion products requires a skilled team. Michigan Wheel's Engineering, Production, Quality, Sales, and Customer Service teams work together to supply products and services unmatched in the marine industry.

The engineering department uses the latest in CFD technology to create advanced designs. The production team uses NC milling techniques to ensure accurate hydrodynamic surfaces. The quality team uses computerized measurement recording devices to measure our products and ensure they meet our strict tolerances. Finally, Michigan Wheel's Sales and Customer Service departments work closely with our network of experienced distributors to ensure users are provided the optimal equipment for their application.

Michigan Wheel is committed to providing superior products for their customers when they are on the water for recreation, work, or in service to their country.



***“Michigan Wheel  
is committed  
to providing  
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or in service to  
their country.”***





# Locations.

American Manufacturing.  
Global Influence.



# Quality Manufacturing.

## Control

Michigan Wheel controls every aspect of the production process to ensure the finished product is an accurate interpretation of the design. From the foundry to the shipping dock, our computerized planning systems track the part through the production process. By utilizing processes developed under ISO:9001 standards, our propellers are built with repeatable precision.



## Tolerance

Michigan Wheel's manufacturing tolerances are based on the ISO-484/2 standards for marine propellers. By utilizing NC machining techniques and using the latest in propeller measurement technology, Michigan Wheel is able to build incredibly accurate propellers that meet the varied tolerance requirements of their customers.



| ABS Certification

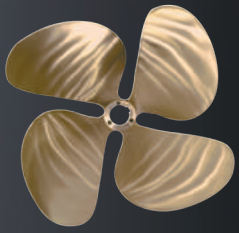
| ISO:9001







# Recreational Propellers



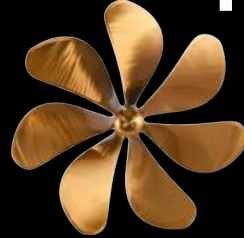
CX-400



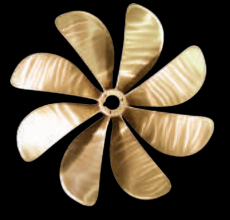
CX-500



CX-600



CX-700



CX-800



DJ-355



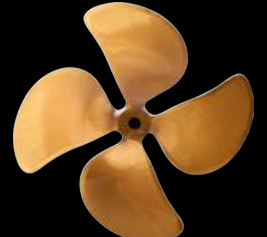
DJX



DQ-486



DQ-469



DQX



Dyna-Jet



Dyna-Quad



EPY



EQY



M-500



Marlin



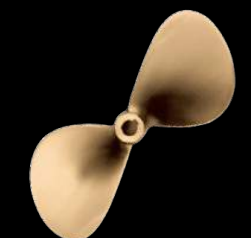
MY-T3



MY-T4



MY-T5



Sailer 2



Sailer 3



# “X” SERIES

## Specifications

| DJX            |           |
|----------------|-----------|
| Blades         | 3         |
| E.A.R.         | 0.61      |
| Diameter Range | 12” - 21” |
| Skew           | 21°       |

| DQX            |           |
|----------------|-----------|
| Blades         | 4         |
| E.A.R.         | 0.735     |
| Diameter Range | 17” - 22” |
| Skew           | 21°       |

| DQX            |           |
|----------------|-----------|
| Blades         | 4         |
| E.A.R.         | 0.810     |
| Diameter Range | 23” - 32” |
| Skew           | 21°       |

### Who Should Buy “X” Series Propellers?

The “X” Series is a high-performance line of machine finished propellers that fit a wide range of planing pleasure boats. The DJX and the DQX are evolutions of our classic Dyna-Jet and Dyna-Quad propeller designs, optimized to utilize the full power of modern engines. Designed with more efficient blade sections and increased blade area, “X” Series propellers are able to better manage cavitation and decrease vibration when compared to similar products.

Michigan Wheel uses NC machine finishing that ensures a more accurate propeller than standard hand finished propellers. This results in higher quality propellers that meet Michigan Wheel’s stringent tolerance requirements at competitive prices. The “X” Series is the standard for high quality, performance oriented propellers.



**“THE ‘X’ SERIES IS THE STANDARD FOR HIGH QUALITY, PERFORMANCE-ORIENTED PROPELLERS.”**

### Recreational Applications

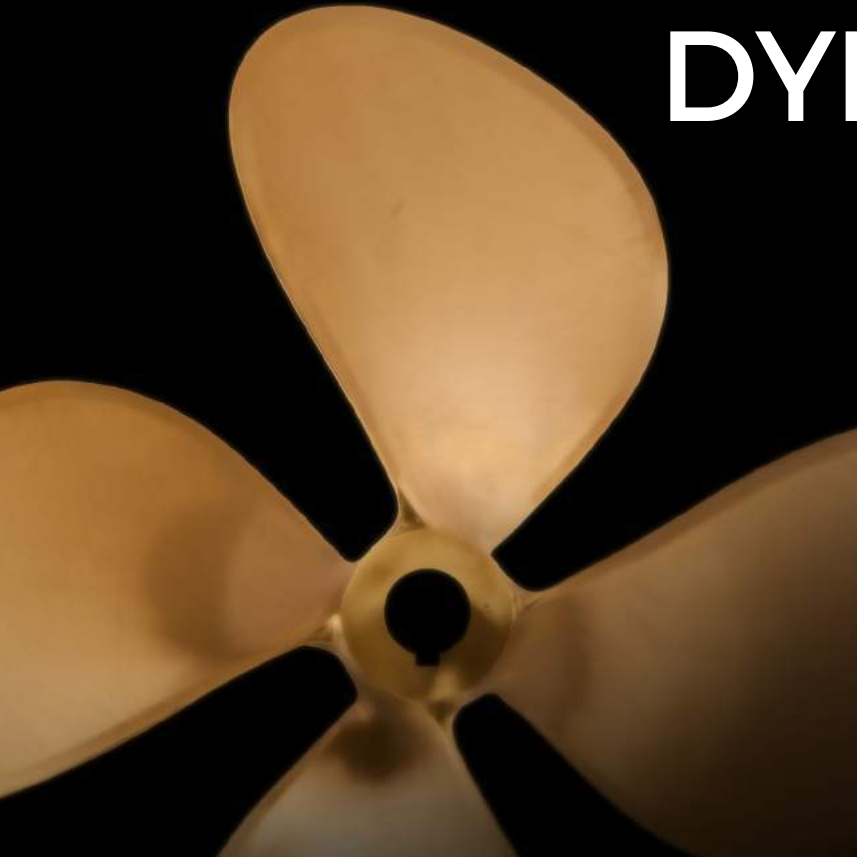
Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.

*Excellence in Propulsion.*



# DYNA-SERIES

## Specifications



| DYNA-JET       |           |
|----------------|-----------|
| Blades         | 3         |
| E.A.R.         | 0.56      |
| Diameter Range | 17" - 48" |
| Pitch Range*   | 0.7 - 1.1 |

| DYNA-QUAD      |           |
|----------------|-----------|
| Blades         | 4         |
| E.A.R.         | 0.69      |
| Diameter Range | 17" - 36" |
| Pitch Range*   | 0.7 - 1.1 |

| M-500          |            |
|----------------|------------|
| Blades         | 5          |
| E.A.R.         | 0.86       |
| Diameter Range | 24" - 46"  |
| Pitch Range*   | 0.75 - 1.3 |

\*Pitch range indicates the Pitch/Diameter ratio.

### Who Should Buy "Dyna" Series Propellers?

The Dyna Series is Michigan Wheel's classic line of performance pleasure boat propellers. Available in 3, 4, and 5 blade models to cover a wide range of vessels. The Dyna Series of propellers continues to be one of Michigan Wheel's most popular series of propellers and is considered by many to be the standard in recreational propellers.

The Dyna blade design provides a great balance of performance and durability for recreational boats and is also a popular choice for higher speed commercial vessels. Dyna Series propellers are hand finished by Michigan Wheel's skilled craftsmen to ensure quality and performance that exceeds our customer's expectations.

**"...ONE OF MICHIGAN WHEEL'S MOST POPULAR SERIES OF PROPELLERS, AND IS CONSIDERED BY MANY TO BE THE STANDARD IN RECREATIONAL PROPELLERS."**



### Recreational Applications

Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.

*Excellence in Propulsion.*

| DYNA-JET & DYNA-QUAD SPECIFICATIONS |       |                         |             |         |                              |              |            | DYNA-JET (0.56 E.A.R.)       |                                 |                           |  | DYNA-QUAD (0.69 E.A.R.)      |                                 |                           |  |
|-------------------------------------|-------|-------------------------|-------------|---------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|------------------------------|---------------------------------|---------------------------|--|
| DIAMETER                            |       | HUB DIMENSIONS (INCHES) |             |         | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
| INCHES                              | MM    | AFT END                 | FORWARD END | LENGTH  | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |                              |                                 |                           |  |
| 9                                   | 229   | 1-3/8                   | 1-1/2       | 2-1/8   | 3/4                          | 7/8          | 3/4        | 3-7/8                        | 11.7                            | 2.5                       | 10                                       | -                            | -                               | -                         | -  |
| 10                                  | 254   | 1-1/2                   | 1-5/8       | 2-1/4   | 3/4                          | 1            | 3/4        | 4-5/16                       | 14.5                            | 3                         | 17                                       | -                            | -                               | -                         | -  |
| 11                                  | 279   | 1-1/2                   | 1-5/8       | 2-1/4   | 3/4                          | 1            | 3/4        | 4-3/4                        | 17.7                            | 4                         | 26                                       | -                            | -                               | -                         | -  |
| 12                                  | 305   | 1-5/8                   | 1-3/4       | 2-3/8   | 7/8                          | 1-1/8        | 7/8        | 5-3/16                       | 21.1                            | 5                         | 40                                       | -                            | -                               | -                         | -  |
| 13                                  | 330   | 1-5/8                   | 1-13/16     | 2-3/4   | 1                            | 1-1/8        | 1          | 5-5/8                        | 24.8                            | 6                         | 60                                       | -                            | -                               | -                         | -  |
| 14                                  | 356   | 1-7/8                   | 2           | 2-3/4   | 1                            | 1-1/4        | 1          | 6                            | 28.7                            | 8                         | 86                                       | -                            | -                               | -                         | -  |
| 15                                  | 381   | 1-7/8                   | 2           | 2-3/4   | 1                            | 1-1/4        | 1          | 6-7/16                       | 33.1                            | 9                         | 120                                      | -                            | -                               | -                         | -  |
| 16                                  | 406   | 2-1/8                   | 2-3/8       | 3-1/4   | 1-1/8                        | 1-3/8        | 1-1/8      | 6-7/8                        | 37.5                            | 11                        | 167                                      | -                            | -                               | -                         | -  |
| 17                                  | 432   | 2-1/8                   | 2-3/8       | 3-1/4   | 1-1/4                        | 1-3/8        | 1-1/4      | 7-5/16                       | 42.8                            | 13                        | 224                                      | 6-3/4                        | 38.7                            | 14                        | 257                                      |
| 17**                                | 432   | 2-3/8                   | 2-5/8       | 3-3/4   | 1-1/4                        | 1-1/2        | 1-1/4      | 7-5/16                       | 42.8                            | 13                        | 224                                      | -                            | -                               | -                         | -  |
| 18                                  | 457   | 2-3/8                   | 2-5/8       | 3-3/4   | 1-1/4                        | 1-1/2        | 1-1/4      | 7-3/4                        | 47.4                            | 16                        | 298                                      | 7-1/8                        | 43.2                            | 17                        | 341                                      |
| 19                                  | 483   | 2-3/8                   | 2-5/8       | 3-3/4   | 1-1/4                        | 1-1/2        | 1-1/4      | 8-3/16                       | 53.1                            | 18                        | 388                                      | 7-1/2                        | 48.3                            | 20                        | 445                                      |
| 20                                  | 508   | 2-3/8                   | 2-5/8       | 3-3/4   | 1-1/4                        | 1-1/2        | 1-1/4      | 8-5/8                        | 59.0                            | 20                        | 500                                      | 7-15/16                      | 53.7                            | 23                        | 573                                      |
| 21                                  | 533   | 2-3/4                   | 3           | 4-1/8   | 1-3/8                        | 1-3/4        | 1-3/8      | 9-1/16                       | 64.6                            | 25                        | 640                                      | 8-5/16                       | 58.8                            | 28                        | 733                                      |
| 22                                  | 559   | 2-3/4                   | 3           | 4-1/8   | 1-3/8                        | 1-3/4        | 1-3/8      | 9-1/2                        | 71.2                            | 28                        | 803                                      | 8-11/16                      | 64.8                            | 31                        | 920                                      |
| 23                                  | 584   | 3                       | 3-1/4       | 4-1/2   | 1-1/2                        | 2            | 1-1/2      | 9-7/8                        | 77.6                            | 33                        | 1,004                                    | 9-1/16                       | 70.6                            | 36                        | 1,150                                    |
| 24                                  | 610   | 3                       | 3-1/4       | 4-1/2   | 1-1/2                        | 2            | 1-1/2      | 10-3/8                       | 84.7                            | 36                        | 1,237                                    | 9-1/2                        | 77.1                            | 40                        | 1,216                                    |
| 26                                  | 660   | 3-3/8                   | 3-3/4       | 4-7/8   | 1-3/4                        | 2-1/4        | 1-3/4      | 11-1/4                       | 99.1                            | 46                        | 1,844                                    | 10-1/4                       | 90.2                            | 52                        | 2,110                                    |
| 28                                  | 711   | 3-3/4                   | 4-1/8       | 5-3/4   | 2                            | 2-1/2        | 2          | 12-1/16                      | 114.7                           | 60                        | 2,671                                    | 11-1/16                      | 104.4                           | 66                        | 3,056                                    |
| 30                                  | 762   | 4-1/4                   | 4-5/8       | 6       | 2                            | 3            | 2          | 12-15/16                     | 131.1                           | 76                        | 3,775                                    | 11-7/8                       | 119.3                           | 84                        | 4,316                                    |
| 32                                  | 813   | 4-1/4                   | 4-5/8       | 6       | 2                            | 3            | 2          | 13-3/4                       | 150.0                           | 88                        | 5,172                                    | 12-5/8                       | 136.5                           | 97                        | 5,917                                    |
| 34                                  | 864   | 4-1/4                   | 4-5/8       | 6-1/2   | 2-1/4                        | 3            | 2-1/4      | 14-5/8                       | 170.0                           | 101                       | 6,973                                    | 13-7/16                      | 154.7                           | 112                       | 7,978                                    |
| 36                                  | 914   | 4-5/8                   | 5-1/8       | 8       | 2-3/4                        | 3-1/2        | 2-3/4      | 15-1/2                       | 190.1                           | 124                       | 9,289                                    | 14-1/4                       | 173.0                           | 138                       | 10,622                                   |
| 38                                  | 965   | 4-5/8                   | 5-1/8       | 8       | 2-3/4                        | 3-1/2        | 2-3/4      | 16-3/8                       | 212.7                           | 140                       | 12,108                                   | 15                           | 193.5                           | 156                       | 13,851                                   |
| 40                                  | 1,016 | 5                       | 5-1/2       | 9       | 3                            | 3-3/4        | 3          | 17-1/4                       | 235.3                           | 168                       | 15,646                                   | 15-13/16                     | 214.1                           | 186                       | 17,892                                   |
| 42                                  | 1,067 | 5-3/8                   | 6           | 10-7/16 | 3                            | 4            | 3          | 18-1/8                       | 258.8                           | 205                       | 20,016                                   | 16-5/8                       | 235.5                           | 226                       | 22,878                                   |
| 44                                  | 1,118 | 5-7/16                  | 6-3/16      | 11      | 3                            | 4            | 3          | 19                           | 284.5                           | 233                       | 25,187                                   | 17-3/8                       | 258.9                           | 258                       | 28,790                                   |
| 46                                  | 1,168 | 5-5/8                   | 6-1/4       | 11-7/8  | 3                            | 4            | 3          | 19-7/8                       | 311.5                           | 266                       | 31,385                                   | 18-3/16                      | 283.5                           | 293                       | 35,376                                   |

\* WR2 = ±10% in Air (inch squared lbs.)

For Dyna-Jet M.W.R. = 0.33 B.T.F. = 0.050  
 For Dyna-Quad M.W.R. = 0.33 B.T.F. = 0.047

\*\* For Dyna-Jet Series propellers only - Sizes (Dia. x Pitch) 17x16, 17x17 & 17x18 maximum bore is 1-1/2". All other 17" diameter sizes - maximum bore is 1-3/8".

### M-500 SPECIFICATIONS (0.86 E.A.R.)

| DIAMETER |       | HUB DIMENSIONS (INCHES) |             |         | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
|----------|-------|-------------------------|-------------|---------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|
| INCHES   | MM    | AFT END                 | FORWARD END | LENGTH  | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |
| 22       | 559   | 2-3/4                   | 3           | 4-1/8   | 1-3/8                        | 1-3/4        | 1-3/8      | 8-11/16                      | 64.9                            | 37                        | 1,150                                    |
| 23       | 584   | 3                       | 3-1/4       | 4-1/2   | 1-1/2                        | 2            | 1-1/2      | 9-1/16                       | 70.6                            | 43                        | 1,430                                    |
| 24       | 610   | 3                       | 3-1/4       | 4-1/2   | 1-1/2                        | 2            | 1-1/2      | 9-1/2                        | 77.1                            | 48                        | 1,770                                    |
| 26       | 660   | 3-3/8                   | 3-3/4       | 4-7/8   | 1-3/4                        | 2-1/4        | 1-3/4      | 10-1/2                       | 90.2                            | 62                        | 2,630                                    |
| 28       | 711   | 3-3/4                   | 4-1/8       | 5-3/4   | 2                            | 2-1/2        | 2          | 11-1/16                      | 104.4                           | 79                        | 3,810                                    |
| 30       | 762   | 4-1/4                   | 4-5/8       | 6       | 2                            | 3            | 2          | 11-7/8                       | 119.3                           | 99                        | 5,380                                    |
| 32       | 813   | 4-1/4                   | 4-5/8       | 6       | 2                            | 3            | 2          | 12-5/8                       | 136.5                           | 115                       | 7,380                                    |
| 34       | 864   | 4-1/4                   | 4-5/8       | 6-1/2   | 2-1/4                        | 3            | 2-1/4      | 13-7/16                      | 154.7                           | 134                       | 9,960                                    |
| 36       | 914   | 4-5/8                   | 5-1/8       | 8       | 2-3/4                        | 3-1/2        | 2-3/4      | 14-1/4                       | 173.0                           | 164                       | 13,250                                   |
| 38       | 965   | 4-5/8                   | 5-1/8       | 8       | 2-3/4                        | 3-1/2        | 2-3/4      | 15                           | 193.5                           | 186                       | 17,280                                   |
| 40       | 1,016 | 5                       | 5-1/2       | 9       | 3                            | 3-3/4        | 3          | 15-7/8                       | 214.1                           | 221                       | 22,320                                   |
| 42       | 1,067 | 5-3/8                   | 6           | 10-7/16 | 3                            | 4            | 3          | 16-9/16                      | 235.5                           | 267                       | 28,520                                   |
| 44       | 1,118 | 5-7/16                  | 6-3/16      | 11      | 3                            | 4            | 3          | 17-3/8                       | 258.9                           | 305                       | 35,900                                   |
| 46       | 1,168 | 5-5/8                   | 6-1/4       | 11-7/8  | 3                            | 4            | 3          | 18-3/16                      | 283.5                           | 347                       | 44,740                                   |

\* WR2 = ±10% in Air (inch squared lbs.)

M.W.R. = 0.37

B.T.F. = 0.046

# HYTORQ PROPELLERS

## Specifications

| MY-T3          |           |
|----------------|-----------|
| Blades         | 3         |
| E.A.R.         | 0.56      |
| Diameter Range | 9" - 36"  |
| Pitch Range*   | 0.7 - 1.1 |

| MY-T4          |           |
|----------------|-----------|
| Blades         | 4         |
| E.A.R.         | 0.69      |
| Diameter Range | 17" - 46" |
| Pitch Range*   | 0.7 - 1.1 |

| MY-T5          |            |
|----------------|------------|
| Blades         | 5          |
| E.A.R.         | 0.86       |
| Diameter Range | 22" - 46"  |
| Pitch Range*   | 0.75 - 1.3 |

### Who Should Buy HyTorq Series Propellers?

HyTorq propellers were originally designed for the pleasure boats and fishing vessels of the Canadian Maritime Provinces. These propellers were extremely successful and quickly became popular throughout North America among boaters and boat builders alike. HyTorq propellers come in 3, 4, and 5 blade configurations, allowing them to be a great fit for vessels of varying speeds, powers, and sizes.

Similar to our Dyna Series, our HyTorq line is a classic design well suited for a number of different recreational and commercial applications. Compared to the Dyna Series, HyTorq propellers have a slightly different blade shape and a touch thicker blade sections, making them a particularly good choice for commercial boats.



### Recreational Applications

*Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.*

*Excellence in Propulsion.*



| HYTORQ SPECIFICATIONS |                  |                      |            |                              |              |            | HYTORQ MY-T3   |                                   |   | HYTORQ MY-T4   |                                   |   |
|-----------------------|------------------|----------------------|------------|------------------------------|--------------|------------|----------------|-----------------------------------|---|----------------|-----------------------------------|---|
| PROPELLER DIAMETER    | AFT HUB DIAMETER | FORWARD HUB DIAMETER | HUB LENGTH | STANDARD TAPER BORE (INCHES) |              |            | WEIGHT (LB.)** | DEVELOPED AREA (IN <sup>2</sup> ) | WR <sup>2**</sup> (LB-IN <sup>2</sup> ) | WEIGHT (LB.)** | DEVELOPED AREA (IN <sup>2</sup> ) | WR <sup>2**</sup> (LB-IN <sup>2</sup> ) |
|                       |                  |                      |            | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                |                                   |   |                |                                   |   |
| 17                    | 2-1/4            | 2-1/2                | 3-1/2      | 1-1/4                        | 1-1/2        | 1-1/4      | 16             | 126.6                             | 333                                     | 19             | 153.1                             | 366                                     |
| 18                    | 2-3/8            | 2-5/8                | 3-1/2      | 1-1/4                        | 1-3/4        | 1-1/4      | 17             | 141.9                             | 392                                     | 19             | 171.7                             | 429                                     |
| 19                    | 2-3/8            | 2-5/8                | 3-7/8      | 1-1/4                        | 1-3/4        | 1-1/4      | 19             | 166.2                             | 478                                     | 21             | 202.7                             | 499                                     |
| 20                    | 2-3/8            | 2-5/8                | 4          | 1-1/4                        | 1-3/4        | 1-1/4      | 21             | 175.3                             | 553                                     | 23             | 212.1                             | 622                                     |
| 21                    | 2-3/4            | 3                    | 4-1/8      | 1-3/8                        | 2            | 1-3/8      | 27             | 202.4                             | 680                                     | 28             | 238.6                             | 790                                     |
| 22                    | 2-3/4            | 3                    | 4-1/4      | 1-3/8                        | 2            | 1-3/8      | 30             | 212.1                             | 810                                     | 31             | 256.9                             | 940                                     |
| 23                    | 3-1/8            | 3-1/4                | 4-1/4      | 1-1/2                        | 2            | 1-3/8      | 35             | 240.6                             | 1,070                                   | 39             | 288.4                             | 1,300                                   |
| 24                    | 3-1/8            | 3-1/4                | 4-5/8      | 1-1/2                        | 2            | 1-3/8      | 35             | 252.4                             | 1,220                                   | 41             | 305.4                             | 1,450                                   |
| 26                    | 3-3/8            | 3-5/8                | 5          | 1-3/4                        | 2-1/4        | 1-1/2      | 50             | 296.3                             | 1,770                                   | 53             | 358.4                             | 2,150                                   |
| 28                    | 3-3/4            | 4                    | 5-3/4      | 1-3/4                        | 2-1/2        | 1-3/4      | 57             | 343.6                             | 2,630                                   | 66             | 415.6                             | 3,240                                   |
| 30                    | 4                | 4-1/4                | 6          | 1-3/4                        | 2-3/4        | 1-3/4      | 78             | 394.4                             | 3,520                                   | 82             | 477.1                             | 4,230                                   |
| 32                    | 4-1/4            | 4-1/2                | 6          | 2                            | 3            | 2          | 94             | 448.8                             | 4,810                                   | 100            | 542.9                             | 5,960                                   |
| 34                    | 4-1/4            | 4-1/2                | 6-1/2      | 2                            | 3            | 2          | 107            | 506.6                             | 6,460                                   | 140            | 612.8                             | 8,020                                   |
| 36                    | 4-3/4            | 5-1/4                | 8-1/4      | 2-3/4                        | 3-1/2        | 2-1/2      | 130            | 567.7                             | 8,910                                   | 146            | 686.7                             | 11,230                                  |
| 38                    | 5-1/4            | 5-1/2                | 8-1/4      | 2-3/4                        | 3-1/2        | 2-1/2      | -              | -                                 | -                                       | 172            | 765.2                             | 13,750                                  |
| 40                    | 5-1/4            | 5-1/2                | 9          | 3                            | 3-3/4        | 3          | -              | -                                 | -                                       | 192            | 847.8                             | 17,180                                  |
| 42                    | 5-1/2            | 6                    | 10-1/2     | 3                            | 4            | 3          | -              | -                                 | -                                       | 240            | 930.2                             | 24,400                                  |
| 44                    | 5-1/2            | 6-1/4                | 10-1/2     | 3                            | 4            | 3          | -              | -                                 | -                                       | 282            | 1,025.8                           | 31,500                                  |
| 46                    | 5-1/2            | 6-1/4                | 10-1/2     | 3                            | 4            | 3          | -              | -                                 | -                                       | 304            | 1,121.0                           | 37,000                                  |
| 48                    | 5-1/2            | 6-1/4                | 10-1/2     | 3                            | 4            | 3          | -              | -                                 | -                                       | 340            | 1,121.0                           | 45,800                                  |

| HYTORQ SPECIFICATIONS |                  |                      |            |                              |              |            | HYTORQ MY-T5   |                                   |   |  |
|-----------------------|------------------|----------------------|------------|------------------------------|--------------|------------|----------------|-----------------------------------|---|--|
| PROPELLER DIAMETER    | AFT HUB DIAMETER | FORWARD HUB DIAMETER | HUB LENGTH | STANDARD TAPER BORE (INCHES) |              |            | WEIGHT (LB.)** | DEVELOPED AREA (IN <sup>2</sup> ) | WR <sup>2**</sup> (LB-IN <sup>2</sup> ) |  |
|                       |                  |                      |            | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                |                                   |   |  |
| 24                    | 3-1/8            | 3-1/4                | 4-5/8      | 1-1/2                        | 2            | 1-3/8      | 57             | 384                               | 1,990                                   |  |
| 26                    | 3-3/8            | 3-5/8                | 5          | 1-3/4                        | 2-1/4        | 1-1/2      | 72             | 451                               | 3,115                                   |  |
| 28                    | 3-3/4            | 4                    | 5-3/4      | 1-3/4                        | 2-1/2        | 1-3/4      | 79             | 523                               | 3,967                                   |  |
| 30                    | 4                | 4-1/4                | 6          | 1-3/4                        | 2-3/4        | 1-3/4      | 109            | 601                               | 6,480                                   |  |
| 32                    | 4-1/4            | 4-1/2                | 6          | 2                            | 3            | 2          | 150            | 683                               | 8,847                                   |  |
| 34                    | 4-1/4            | 4-1/2                | 6-1/2      | 2                            | 3            | 2          | 180            | 772                               | 11,985                                  |  |
| 36                    | 4-3/4            | 5-1/4                | 8-1/4      | 2-3/4                        | 3-1/2        | 2-1/2      | 210            | 864                               | 15,676                                  |  |
| 38                    | 5-1/4            | 5-1/2                | 8-1/4      | 2-3/4                        | 3-1/2        | 2-1/2      | 240            | 964                               | 19,961                                  |  |
| 40                    | 5-1/4            | 5-1/2                | 9          | 3                            | 3-3/4        | 3          | 260            | 1,068                             | 23,961                                  |  |
| 42                    | 5-1/2            | 6                    | 10-1/2     | 3                            | 4            | 3          | 325            | 1,177                             | 33,022                                  |  |
| 44                    | 5-1/2            | 6-1/4                | 10-1/2     | 3                            | 4            | 3          | 370            | 1,291                             | 41,260                                  |  |
| 46                    | 5-1/2            | 6-1/4                | 10-1/2     | 3                            | 4            | 3          | 410            | 1,412                             | 49,975                                  |  |



## // Why Buy MY-T Series Propellers?

Many builders rely on the continued quality and performance of the Hytorq Series of propellers. A significant amount of propellers built in the Michigan Wheel's Grand Rapids foundry are sold to OEMs or as original equipment replacements. By replacing a propeller with a new Michigan Wheel factory equivalent, boaters can guarantee continued performance from their vessel.

# SAILBOAT PROPELLERS

## Specifications

### SAILER 2-BLADE

|                |           |
|----------------|-----------|
| Blades         | 2         |
| E.A.R.         | 0.31      |
| Diameter Range | 10" - 20" |

### SAILER 3-BLADE

|                |           |
|----------------|-----------|
| Blades         | 3         |
| E.A.R.         | 0.46      |
| Diameter Range | 10" - 20" |

### "M" SERIES 2-BLADE SAILER

|                |           |
|----------------|-----------|
| Blades         | 2         |
| E.A.R.         | 0.36      |
| Diameter Range | 10" - 18" |

### "M" SERIES 3-BLADE SAILER

|                |           |
|----------------|-----------|
| Blades         | 3         |
| E.A.R.         | 0.44      |
| Diameter Range | 10" - 18" |

### "M" SERIES MP3

|                |          |
|----------------|----------|
| Blades         | 3        |
| E.A.R.         | 0.53     |
| Diameter Range | 9" - 20" |

## Who Should Buy Michigan "Sailboat" Series Propellers?

Don't let the lack of wind get you down; with Michigan Wheel Sailer series propellers you will always stany underway. Michigan Wheel Sailer propellers are available in 2- and 3-blade configurations, with skewed and non-skewed blades. Sailer series propellers are built with just th eright amount of blade area to optimize efficiency when motoring or sailing.

The MP3 propeller is available with additional blade area for larger, high-powered engines. Whether you are chasing the wind, or riding it, Michigan Wheel Sailer propellers will ensure you are getting the best speed out of your sailboat.



## Recreational Applications

*Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.*

*Ecellence in Propulsion.*

## SAILER 2 & 3 BLADE SPECIFICATIONS

| DIAMETER |     | HUB DIMENSIONS (INCHES) |             |        | STANDARD TAPER BORE (INCHES) |              |            |
|----------|-----|-------------------------|-------------|--------|------------------------------|--------------|------------|
| INCHES   | MM  | AFT END                 | FORWARD END | LENGTH | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |
| 10       | 254 | 1-7/16                  | 1-5/8       | 2-1/4  | 3/4                          | 7/8          | 3/4        |
| 11       | 280 | 1-7/16                  | 1-5/8       | 2-1/4  | 3/4                          | 7/8          | 3/4        |
| 12       | 305 | 1-9/16                  | 1-3/4       | 2-3/8  | 7/8                          | 1-1/8        | 7/8        |
| 13       | 330 | 1-9/16                  | 1-3/4       | 2-3/4  | 1                            | 1-1/8        | 1          |
| 14       | 356 | 1-3/4                   | 2           | 2-3/4  | 1                            | 1-1/8        | 1          |
| 15       | 381 | 1-3/4                   | 2           | 2-3/4  | 1                            | 1-1/8        | 1          |
| 16       | 406 | 1-15/16                 | 2-3/16      | 3-1/4  | 1-1/8                        | 1-1/4        | 1-1/8      |
| 17       | 432 | 2                       | 2-5/16      | 3-1/4  | 1-1/8                        | 1-3/8        | 1-1/8      |
| 18       | 457 | 2                       | 2-5/16      | 3-1/4  | 1-1/8                        | 1-3/8        | 1-1/8      |
| 19       | 483 | 2-1/8                   | 2-7/16      | 3-3/4  | 1-1/4                        | 1-3/8        | 1-1/4      |
| 20       | 508 | 2-1/8                   | 2-7/16      | 3-3/4  | 1-1/4                        | 1-3/8        | 1-1/4      |

## "M" SERIES 2-BLADE & 3-BLADE SAILER SPECIFICATIONS

| DIAMETER |     | HUB DIMENSIONS (INCHES) |             |        | STANDARD TAPER BORE (INCHES) |              |            |
|----------|-----|-------------------------|-------------|--------|------------------------------|--------------|------------|
| INCHES   | MM  | AFT END                 | FORWARD END | LENGTH | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |
| 10       | 254 | 1-7/16                  | 1-5/8       | 2-1/4  | 3/4                          | 7/8          | 3/4        |
| 11       | 279 | 1-7/16                  | 1-5/8       | 2-1/4  | 3/4                          | 7/8          | 3/4        |
| 12       | 305 | 1-9/16                  | 1-3/4       | 2-3/8  | 7/8                          | 1-1/8        | 7/8        |
| 13       | 330 | 1-9/16                  | 1-3/4       | 2-3/4  | 1                            | 1-1/8        | 1          |
| 14       | 356 | 1-3/4                   | 2           | 2-3/4  | 1                            | 1-1/8        | 1          |
| 15       | 381 | 1-3/4                   | 2           | 2-3/4  | 1                            | 1-1/8        | 1          |
| 16       | 406 | 1-15/16                 | 2-3/16      | 3-1/4  | 1-1/8                        | 1-1/4        | 1-1/8      |
| 17       | 432 | 2                       | 2-5/16      | 3-1/4  | 1-1/8                        | 1-3/8        | 1-1/8      |
| 18       | 457 | 2                       | 2-5/16      | 3-1/4  | 1-1/8                        | 1-3/8        | 1-1/8      |

## MP 3 SPECIFICATIONS - 0.53 E.A.R.

| DIAMETER |     | HUB DIMENSIONS (INCHES) |             |        | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
|----------|-----|-------------------------|-------------|--------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|
| INCHES   | MM  | AFT END                 | FORWARD END | LENGTH | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |
| 9        | 229 | 1-5/16                  | 1-7/16      | 2-1/8  | 3/4                          | 3/4          | 3/4        | 3-7/8                        | 11.0                            | 2.2                       | 6  |
| 10       | 254 | 1-7/16                  | 1-5/8       | 2-1/8  | 3/4                          | 7/8          | 3/4        | 4-5/16                       | 13.6                            | 2.9                       | 12                                       |
| 11       | 279 | 1-7/16                  | 1-5/8       | 2-1/8  | 3/4                          | 7/8          | 3/4        | 4-3/4                        | 16.5                            | 3.7                       | 18                                       |
| 12       | 305 | 1-9/16                  | 1-3/4       | 2-5/8  | 7/8                          | 1-1/8        | 7/8        | 5-3/16                       | 19.6                            | 4.6                       | 29                                       |
| 13       | 330 | 1-9/16                  | 1-3/4       | 2-3/4  | 1                            | 1-1/8        | 1          | 5-9/16                       | 23.0                            | 5.5                       | 43                                       |
| 14       | 356 | 1-3/4                   | 2           | 3      | 1                            | 1-1/8        | 1          | 6                            | 26.7                            | 7.5                       | 62                                       |
| 15       | 381 | 1-3/4                   | 2           | 3      | 1                            | 1-1/8        | 1          | 6-7/16                       | 30.6                            | 8.6                       | 87                                       |
| 16       | 406 | 1-15/16                 | 2-3/16      | 3-3/8  | 1-1/8                        | 1-1/4        | 1-1/8      | 6-7/8                        | 34.9                            | 10.8                      | 118                                      |
| 17       | 432 | 2                       | 2-5/16      | 3-3/8  | 1-1/8                        | 1-3/8        | 1-1/8      | 7-5/16                       | 39.3                            | 12.8                      | 161                                      |
| 18       | 457 | 2                       | 2-5/16      | 3-3/8  | 1-1/8                        | 1-3/8        | 1-1/8      | 7-3/4                        | 44.1                            | 14.6                      | 215                                      |
| 19       | 483 | 2-1/8                   | 2-7/16      | 3-3/4  | 1-1/4                        | 1-3/8        | 1-1/4      | 8-3/16                       | 49.1                            | 17.6                      | 299                                      |
| 20       | 508 | 2-1/8                   | 2-7/16      | 3-3/4  | 1-1/4                        | 1-3/8        | 1-1/4      | 8-5/8                        | 54.5                            | 19.8                      | 382                                      |



## // Which Sailer propeller is right for you?

Michigan Wheel knows that sailors demand the most out of their vessels. Incremental performance gains when under sail and motor are more significant in a sailing vessel. That is why Michigan Wheel offers a wide variety of options to choose from through it's sailer line of propellers. This gives sailors the ability to work with Michigan's team to find the best propeller for their application, because we know every knot counts.

# “M” SERIES

## Specifications

| DJ-355         |          |
|----------------|----------|
| Blades         | 3        |
| E.A.R.         | 0.56     |
| Diameter Range | 9” - 40” |

| DQ-469         |           |
|----------------|-----------|
| Blades         | 4         |
| E.A.R.         | 0.70      |
| Diameter Range | 17” - 44” |

| DQ-486         |           |
|----------------|-----------|
| Blades         | 4         |
| E.A.R.         | 0.86      |
| Diameter Range | 17” - 44” |

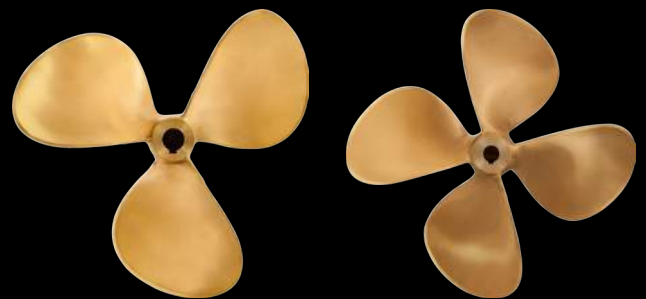
| M-506          |           |
|----------------|-----------|
| Blades         | 5         |
| E.A.R.         | 1.06      |
| Diameter Range | 22” - 46” |

### Who Should Buy “M” Series Propellers?

Michigan Wheel M-Series propellers are globally sourced to offer a competitively priced product that still meets Michigan Wheel’s strict quality standards. M-Series propellers are built from materials that meet ABS type 2 Manganese Bronze and ABS type 4 NiBrAl specifications.

These propellers meet the performance requirements for a number of different pleasure and commercial applications.

DJ355 and DQ469 propellers are 3 and 4 blade propellers built for a wide range of planing boat applications. DQ486 and M-506 are 4 and 5 blade propellers that utilize greater blade area and skew to handle higher power, diameter constrained applications. M-series propellers are available in range of sizes and special sizes are available by request.



### Recreational Applications

Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.

*Excellence in Propulsion.*

| DJ355 & DQ469 SPECIFICATIONS |       |                         |             |         |                              |              |            | DJ355 - 0.55 E.A.R.          |                                 |                           |  | DQ469 - 0.69 E.A.R.          |                                 |                           |  |
|------------------------------|-------|-------------------------|-------------|---------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|------------------------------|---------------------------------|---------------------------|--|
| DIAMETER                     |       | HUB DIMENSIONS (INCHES) |             |         | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
| INCHES                       | MM    | AFT END                 | FORWARD END | LENGTH  | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |                              |                                 |                           |  |
| 9                            | 229   | 1-3/8                   | 1-1/2       | 2-1/8   | 3/4                          | 7/8          | 3/4        | 4-1/16                       | 11.7                            | 2.5                       | 7  | -                            | -                               | -                         | -  |
| 10                           | 254   | 1-1/2                   | 1-5/8       | 2-1/4   | 3/4                          | 1            | 3/4        | 4-1/2                        | 14.4                            | 3                         | 12                                       | -                            | -                               | -                         | -  |
| 11                           | 279   | 1-1/2                   | 1-5/8       | 2-1/4   | 3/4                          | 1            | 3/4        | 4-15/16                      | 17.4                            | 4                         | 19                                       | -                            | -                               | -                         | -  |
| 12                           | 305   | 1-5/8                   | 1-3/4       | 2-3/8   | 7/8                          | 1-1/8        | 7/8        | 5-3/8                        | 20.7                            | 5                         | 31                                       | -                            | -                               | -                         | -  |
| 13                           | 330   | 1-5/8                   | 1-13/16     | 2-3/4   | 1                            | 1-1/8        | 1          | 5-7/8                        | 24.3                            | 6                         | 45                                       | -                            | -                               | -                         | -  |
| 14                           | 356   | 1-7/8                   | 2           | 2-3/4   | 1                            | 1-1/4        | 1          | 6-5/16                       | 28.2                            | 8                         | 65                                       | -                            | -                               | -                         | -  |
| 15                           | 381   | 1-7/8                   | 2           | 2-3/4   | 1                            | 1-1/4        | 1          | 6-3/4                        | 32.4                            | 9                         | 91                                       | -                            | -                               | -                         | -  |
| 16                           | 406   | 2-1/8                   | 2-3/8       | 3-1/4   | 1-1/8                        | 1-3/8        | 1-1/8      | 7-1/4                        | 36.9                            | 11                        | 127                                      | -                            | -                               | -                         | -  |
| 17                           | 432   | 2-3/8                   | 2-5/8       | 3-3/4   | 1-1/4                        | 1-1/2        | 1-1/4      | 7-5/8                        | 41.6                            | 14                        | 173                                      | 7-5/16                       | 39.1                            | 17                        | 226                                      |
| 18                           | 457   | 2-3/8                   | 2-5/8       | 3-3/4   | 1-1/4                        | 1-1/2        | 1-1/4      | 8-1/8                        | 46.7                            | 16                        | 227                                      | 7-3/4                        | 43.9                            | 20                        | 300                                      |
| 19                           | 483   | 2-3/8                   | 2-5/8       | 3-3/4   | 1-1/4                        | 1-1/2        | 1-1/4      | 8-1/2                        | 52.0                            | 19                        | 314                                      | 8-3/16                       | 48.9                            | 22                        | 394                                      |
| 20                           | 508   | 2-3/8                   | 2-5/8       | 3-3/4   | 1-1/4                        | 1-1/2        | 1-1/4      | 9                            | 57.6                            | 21                        | 403                                      | 8-5/8                        | 54.2                            | 25                        | 505                                      |
| 21                           | 533   | 2-3/4                   | 3           | 4-1/8   | 1-3/8                        | 1-3/4        | 1-3/8      | 9-7/16                       | 63.5                            | 26                        | 514                                      | 9                            | 59.7                            | 30                        | 643                                      |
| 22                           | 559   | 2-3/4                   | 3           | 4-1/8   | 1-3/8                        | 1-3/4        | 1-3/8      | 9-7/8                        | 69.7                            | 29                        | 647                                      | 9-7/16                       | 65.5                            | 34                        | 811                                      |
| 23                           | 584   | 3                       | 3-1/4       | 4-1/2   | 1-1/2                        | 2            | 1-1/2      | 10-3/8                       | 76.2                            | 34                        | 808                                      | 9-7/8                        | 71.6                            | 40                        | 1,010                                    |
| 24                           | 610   | 3                       | 3-1/4       | 4-1/2   | 1-1/2                        | 2            | 1-1/2      | 10-5/8                       | 82.9                            | 37                        | 1,004                                    | 10-5/16                      | 78.0                            | 45                        | 1,250                                    |
| 26                           | 660   | 3-3/8                   | 3-3/4       | 4-7/8   | 1-3/4                        | 2-1/4        | 1-3/4      | 11-3/4                       | 97.3                            | 48                        | 1,480                                    | 11-3/16                      | 91.5                            | 57                        | 1,850                                    |
| 28                           | 711   | 3-3/4                   | 4-1/8       | 5-3/4   | 2                            | 2-1/2        | 2          | 12-5/8                       | 112.9                           | 62                        | 2,150                                    | 12                           | 106.2                           | 73                        | 2,680                                    |
| 30                           | 762   | 4-1/4                   | 4-5/8       | 6       | 2                            | 3            | 2          | 13-1/2                       | 129.6                           | 79                        | 3,020                                    | 12-7/8                       | 121.9                           | 92                        | 3,770                                    |
| 32                           | 813   | 4-1/4                   | 4-5/8       | 6       | 2                            | 3            | 2          | 14-3/8                       | 147.4                           | 90                        | 4,140                                    | 13-3/4                       | 138.7                           | 107                       | 5,180                                    |
| 34                           | 864   | 4-1/4                   | 4-5/8       | 6-1/2   | 2-1/4                        | 3            | 2-1/4      | 15-5/16                      | 166.5                           | 105                       | 5,610                                    | 14-5/8                       | 156.6                           | 125                       | 7,020                                    |
| 36                           | 914   | 4-5/8                   | 5-1/8       | 8       | 2-3/4                        | 3-1/2        | 2-3/4      | 16-3/16                      | 186.6                           | 130                       | 7,420                                    | 15-7/16                      | 175.5                           | 153                       | 9,260                                    |
| 38                           | 965   | 4-5/8                   | 5-1/8       | 8       | 2-3/4                        | 3-1/2        | 2-3/4      | 17-1/16                      | 207.9                           | 147                       | 9,670                                    | 16-5/16                      | 195.6                           | 174                       | 12,080                                   |
| 40                           | 1,016 | 5                       | 5-1/2       | 9       | 3                            | 3-3/4        | 3          | 18                           | 230.4                           | 183                       | 13,150                                   | 17-3/16                      | 216.7                           | 215                       | 16,440                                   |
| 42                           | 1,067 | 5-3/8                   | 6           | 10-7/16 | 3                            | 4            | 3          | -                            | -                               | -                         | -  | 18                           | 239.0                           | 263                       | 21,070                                   |
| 44                           | 1,118 | 5-7/16                  | 6-3/16      | 11      | 3                            | 4            | 3          | -                            | -                               | -                         | -  | 18-7/8                       | 262.3                           | 301                       | 26,460                                   |

| DQ486 & M-506 SPECIFICATIONS |       |                         |             |            |                              |              |            | DQ486 - 0.86 E.A.R.          |                                 |                           |  | M-506 - 1.06 E.A.R.          |                                 |                           |  |
|------------------------------|-------|-------------------------|-------------|------------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|------------------------------|---------------------------------|---------------------------|--|
| DIAMETER                     |       | HUB DIMENSIONS (INCHES) |             |            | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
| INCHES                       | MM    | AFT END                 | FORWARD END | LENGTH     | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |                              |                                 |                           |  |
| 17                           | 432   | 2-3/8                   | 2-5/8       | 3-3/4      | 1-1/4                        | 1-1/2        | 1-1/4      | 8-1/2                        | 45.4                            | 20                        | 282                                      | -                            | -                               | -                         | -  |
| 18                           | 457   | 2-3/8                   | 2-5/8       | 3-3/4      | 1-1/4                        | 1-1/2        | 1-1/4      | 9                            | 50.9                            | 23                        | 374                                      | -                            | -                               | -                         | -  |
| 19                           | 483   | 2-3/8                   | 2-5/8       | 3-3/4      | 1-1/4                        | 1-1/2        | 1-1/4      | 9-1/2                        | 56.7                            | 26                        | 491                                      | -                            | -                               | -                         | -  |
| 20                           | 508   | 2-3/8                   | 2-5/8       | 3-3/4      | 1-1/4                        | 1-1/2        | 1-1/4      | 10                           | 62.8                            | 30                        | 629                                      | -                            | -                               | -                         | -  |
| 21                           | 533   | 2-3/4                   | 3           | 4-1/8      | 1-3/8                        | 1-3/4        | 1-3/8      | 10-1/2                       | 69.3                            | 36                        | 799                                      | -                            | -                               | -                         | -  |
| 22**                         | 559   | 2-3/4                   | 3           | 4-1/8      | 1-3/8                        | 1-3/4        | 1-3/8      | 11                           | 76.0                            | 40                        | 1,010                                    | 11-1/4                       | 76.8                            | 48                        | 1,270                                    |
| 23                           | 584   | 3                       | 3-1/4       | Full Taper | 1-1/2                        | 2            | 1-1/2      | 11-1/2                       | 83.1                            | 47                        | 1,260                                    | 11-3/4                       | 83.9                            | 55                        | 1,585                                    |
| 24                           | 610   | 3                       | 3-1/4       | Full Taper | 1-1/2                        | 2            | 1-1/2      | 12                           | 90.5                            | 52                        | 1,560                                    | 12-1/4                       | 91.4                            | 62                        | 1,960                                    |
| 26                           | 660   | 3-3/8                   | 3-3/4       | Full Taper | 1-3/4                        | 2-1/4        | 1-3/4      | 13                           | 106.2                           | 68                        | 2,310                                    | 13-1/4                       | 107.2                           | 80                        | 2,910                                    |
| 28                           | 711   | 3-3/4                   | 4-1/8       | Full Taper | 2                            | 2-1/2        | 2          | 14                           | 123.2                           | 85                        | 3,340                                    | 14-1/4                       | 124.4                           | 101                       | 4,200                                    |
| 30                           | 762   | 4-1/4                   | 4-5/8       | Full Taper | 2                            | 3            | 2          | 15                           | 141.4                           | 106                       | 4,680                                    | 15-5/16                      | 142.8                           | 125                       | 5,890                                    |
| 32                           | 813   | 4-1/4                   | 4-5/8       | Full Taper | 2                            | 3            | 2          | 16                           | 160.9                           | 124                       | 6,430                                    | 16-5/16                      | 162.5                           | 146                       | 8,105                                    |
| 34                           | 864   | 4-1/4                   | 4-5/8       | Full Taper | 2-1/4                        | 3            | 2-1/4      | 17                           | 181.6                           | 146                       | 8,740                                    | 17-5/16                      | 183.4                           | 174                       | 10,980                                   |
| 36                           | 914   | 4-5/8                   | 5-1/8       | Full Taper | 2-3/4                        | 3-1/2        | 2-3/4      | 18                           | 203.6                           | 178                       | 11,520                                   | 18-3/8                       | 205.6                           | 210                       | 14,555                                   |
| 38                           | 965   | 4-5/8                   | 5-1/8       | Full Taper | 2-3/4                        | 3-1/2        | 2-3/4      | 19                           | 226.8                           | 204                       | 15,020                                   | 19-3/8                       | 229.1                           | 242                       | 18,920                                   |
| 40                           | 1,016 | 5                       | 5-1/2       | Full Taper | 3                            | 3-3/4        | 3          | 20                           | 251.3                           | 250                       | 20,400                                   | 20-3/8                       | 253.8                           | 283                       | 24,380                                   |
| 42                           | 1,067 | 5-3/8                   | 6           | Full Taper | 3                            | 4            | 3          | 21                           | 277.1                           | 291                       | 26,080                                   | 21-7/16                      | 279.8                           | 330                       | 31,120                                   |
| 44                           | 1,118 | 5-7/16                  | 6-3/16      | Full Taper | 3                            | 4            | 3          | 22                           | 304.1                           | 330                       | 32,740                                   | 22-7/16                      | 307.1                           | 374                       | 38,980                                   |
| 46                           | 1,168 | 5-5/8                   | 6-1/4       | Full Taper | 3                            | 4            | 3          | -                            | -                               | -                         | -  | 23-7/16                      | 335.7                           | 421                       | 48,480                                   |

\*\* Hub Length for the M-506 is full taper.

\*WR2 = ±10% in Air (inch squared lbs.)

# “CX” SERIES

**THE CX SERIES OF PROPELLERS  
BY MICHIGAN WHEEL  
REPRESENT THE STATE-OF-THE-  
ART IN PROPELLER DESIGN,  
CONTROL, AND PERFORMANCE.  
EVERY YACHT OWNER WITH A CX  
SERIES PROPELLER CAN REST  
EASY KNOWING THEY HAVE THE  
BEST POSSIBLE PROPELLER  
UNDER THEIR BOAT.**

## **Design**

Every CX propeller is designed using state of the art hydrodynamic software, including proprietary code developed by leading propulsion experts as well as cutting edge CFD (computational fluid dynamics). Some propeller manufacturers specify diameter, pitch, and blade area and consider it a custom design, but not Michigan Wheel. Our propulsion experts modify every aspect of the design, including: section shape, camber, thickness, pitch, chord length, rake, and skew for a truly custom design specific to your vessel.

## **Control**

All CX propellers are fully NC machined for optimum accuracy. The use of 5 axis NC machine centers ensures that all hub and blade surfaces match the design geometry. Expert finishers then polish the propeller, leaving a smooth finish to minimize drag. All CX Series propellers are manufactured to close tolerance in accordance with the ISO 484/2 standard.

## **Performance**

The combination of state-of-the-art design and highly accurate manufacturing yields optimum performance for your boat. Take advantage of the increased speed across all engine load, or run at the same speeds as before at lower engine load while burning less fuel. Under heavy use, the fuel savings can pay for the propellers in less than a season. Noise and vibration are also reduced, leading to a quieter and more comfortable ride. Feel confident that you have selected the best custom propeller on the market.

## **Recreational Applications**

*Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor,  
or the Michigan Wheel team to review your application.*

*Excellence in Propulsion.*

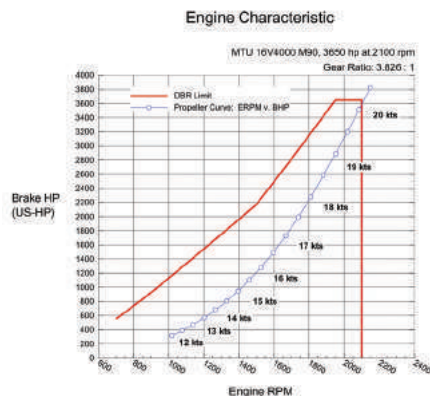
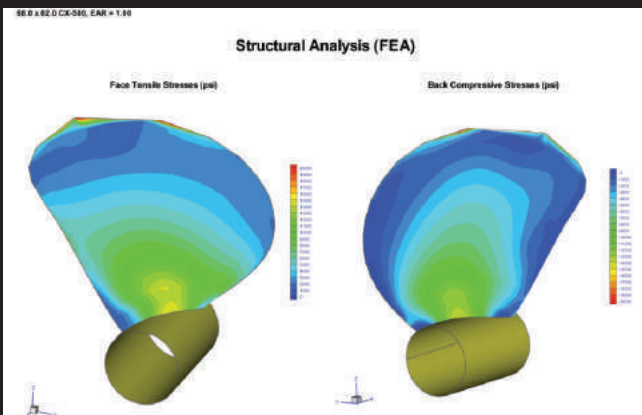


## // DESIGN CONSIDERATIONS

*While working with builders, the Michigan Wheel design team utilizes a number of tools and programs to optimize propeller design.*

Hull (Top Right) and engine (Bottom Left) characteristics are plotted against data provided by the builder/boat designer and the engine companies.

Consideration is given to the stresses on the propeller, in design. (Bottom Right)





# MARLIN SERIES

**“MARLIN SERIES PROPELLERS  
CONSISTENTLY OUT-PERFORM  
ALL OTHER SPORTFISH  
PROPELLERS ON THE MARKET IN  
SPEED AND FUEL EFFICIENCY. “**

## **Who Should Buy Marlin Propellers?**

Our Marlin is a subset of custom designs built for truly high speed vessels. Sportfish and Sportcruiser owners who want the best available propeller choose Marlins. Starting from a suite of high tech 4, 5, and 6 blade “parent” designs, each propeller in the Marlin Series is custom designed by Michigan Wheel engineers to work perfectly with your exact vessel.

The “parent” designs on which the Marlin Series is based were developed through a major research effort specifically aimed at optimizing high speed sportfish and sportcruiser propellers. Research involved high performance computer modeling and intensive scale model testing with the goal of managing cavitation and squeezing every last drop of performance from your engine.

Marlin Series propellers consistently out-perform all other sportfish propellers on the market in speed and fuel efficiency. High tech design offers superior top speed, fuel efficiency, and smoothness. By managing cavitation the user can often benefit from reduced maintenance costs and a longer propeller life. A custom designed propeller that is specifically for the boat provides optimal performance when cruising or competing.

## **Recreational Applications**

*Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor,  
or the Michigan Wheel team to review your application.*

*Excellence in Propulsion.*







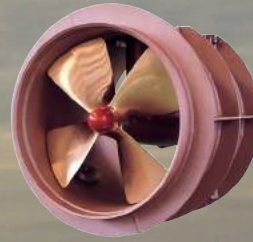
# Commercial Propellers



**NAKASHIMA**  
Controllable Pitch



**NAKASHIMA**  
Fixed Pitch



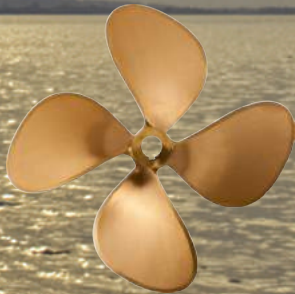
**NAKASHIMA**  
TFN Thruster



**NAKASHIMA**  
TCT Thruster



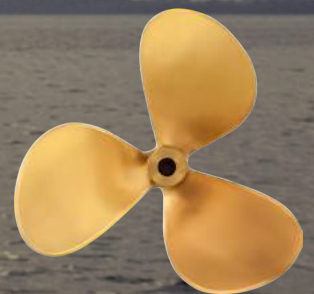
DQ Special



Dura-Quad



Kaplan



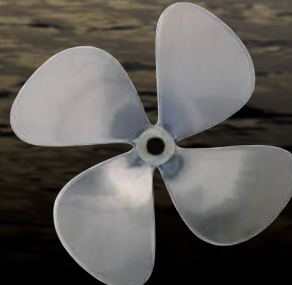
MP-3



Machine Pitch



Maxima



Pac-Master



Trawler



Work Horse



Work Horse 5



Weedless

# WORK HORSE & MACHINE PITCH

## Specifications

| MACHINE PITCH      |             |
|--------------------|-------------|
| Blades             | 3           |
| Diameter 9" - 60"  | E.A.R. 0.51 |
| Diameter 62" - 96" | E.A.R. 0.47 |

| WORK HORSE         |             |
|--------------------|-------------|
| Blades             | 4           |
| Diameter 18" - 60" | E.A.R. 0.71 |
| Diameter 62" - 96" | E.A.R. 0.62 |

| WORK HORSE 5 |      |
|--------------|------|
| Blades       | 5    |
| E.A.R.       | 0.89 |

### Who Should Buy "Work Horse" Series Propellers?

The Michigan Wheel Work Horse and Machine Pitch propellers are the best known commercial boat propellers in the world. Available in 3, 4, and 5 blade models to cover a wide range of commercial vessels. Non-standard blade areas available by request.

The blade design of Work Horse and Machine Pitch Propellers offers durability as well as performance for workboats that need to maximize bollard thrust when pushing and pulling. High quality materials make repairs by your local prop shop easier and help get your vessel back on the water faster. Commercial mariners trust Work Horse and Machine Pitch propellers to get the job done every day.



### Commercial Applications

Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.

*Excellence in Propulsion.*

| MACHINE PITCH & WORK HORSE SPECIFICATIONS |       |                         |             |        |                              |              |            |                              |                                 | MACHINE PITCH             |  | WORK HORSE                |  | WORK HORSE 5              |  |
|---|-------|-------------------------|-------------|--------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|---------------------------|--|---------------------------|--|
| DIAMETER                                  |       | HUB DIMENSIONS (INCHES) |             |        | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
| INCHES                                    | MM    | AFT END                 | FORWARD END | LENGTH | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |                           |  |                           |  |
| 9   | 229   | 1-5/16                  | 1-7/16      | 2-1/8  | 3/4                          | 3/4          | 3/4        | 3-7/8                        | 11.8                            | 2.5                       | 13                                       | -                         | -  | -                         | -  |
| 10  | 254   | 1-7/16                  | 1-5/8       | 2-1/8  | 3/4                          | 7/8          | 3/4        | 4-5/16                       | 14.5                            | 3.5                       | 21                                       | -                         | -  | -                         | -  |
| 11  | 279   | 1-7/16                  | 1-5/8       | 2-1/8  | 3/4                          | 7/8          | 3/4        | 4-5/8                        | 17.6                            | 4                         | 34                                       | -                         | -  | -                         | -  |
| 12  | 305   | 1-9/16                  | 1-3/4       | 2-5/8  | 7/8                          | 1-1/8        | 7/8        | 5-1/16                       | 20.9                            | 5                         | 50                                       | -                         | -  | -                         | -  |
| 13  | 330   | 1-9/16                  | 1-3/4       | 2-3/4  | 1                            | 1-1/8        | 1          | 4-15/16                      | 22.7                            | 6                         | 65                                       | -                         | -  | -                         | -  |
| 14  | 356   | 1-3/4                   | 2           | 3      | 1                            | 1-1/8        | 1          | 5-5/16                       | 26.4                            | 8                         | 90                                       | -                         | -  | -                         | -  |
| 15  | 381   | 1-3/4                   | 2           | 3      | 1                            | 1-1/8        | 1          | 5-5/8                        | 30.3                            | 9                         | 120                                      | -                         | -  | -                         | -  |
| 16  | 406   | 1-15/16                 | 2-3/16      | 3-3/8  | 1-1/8                        | 1-1/4        | 1-1/8      | 6-15/16                      | 34.5                            | 11                        | 160                                      | -                         | -  | -                         | -  |
| 17  | 432   | 2                       | 2-5/16      | 3-3/8  | 1-1/8                        | 1-3/8        | 1-1/8      | 6-7/16                       | 38.9                            | 12                        | 210                                      | -                         | -  | -                         | -  |
| 18  | 457   | 2                       | 2-5/16      | 3-3/8  | 1-1/8                        | 1-3/8        | 1-1/8      | 6-7/8                        | 43.6                            | 14                        | 280                                      | 17                        | 370                                      | -                         | -  |
| 19  | 483   | 2-1/8                   | 2-7/16      | 3-3/4  | 1-1/4                        | 1-3/8        | 1-1/4      | 7-1/4                        | 48.6                            | 16                        | 350                                      | 20                        | 480                                      | -                         | -  |
| 20  | 508   | 2-1/8                   | 2-7/16      | 3-3/4  | 1-1/4                        | 1-3/8        | 1-1/4      | 7-1/2                        | 53.8                            | 18                        | 470                                      | 23                        | 630                                      | -                         | -  |
| 21  | 533   | 2-7/16                  | 2-13/16     | 4-1/8  | 1-3/8                        | 1-1/2        | 1-3/8      | 8                            | 59.4                            | 22                        | 590                                      | 28                        | 790                                      | -                         | -  |
| 22  | 559   | 2-7/16                  | 2-13/16     | 4-1/8  | 1-3/8                        | 1-1/2        | 1-3/8      | 8-3/8                        | 65.1                            | 25                        | 760                                      | 32                        | 1,020                                    | -                         | -  |
| 23  | 584   | 2-13/16                 | 3-3/16      | 4-1/2  | 1-1/2                        | 1-3/4        | 1-1/2      | 8-7/8                        | 71.2                            | 30                        | 940                                      | 38                        | 1,250                                    | -                         | -  |
| 24  | 610   | 2-13/16                 | 3-3/16      | 4-1/2  | 1-1/2                        | 1-3/4        | 1-1/2      | 9-1/8                        | 77.5                            | 33                        | 1,140                                    | 41                        | 1,510                                    | -                         | -  |
| 26  | 660   | 3-3/16                  | 3-5/8       | 5-1/4  | 1-3/4                        | 2            | 1-3/4      | 9-7/8                        | 91                              | 44                        | 1,710                                    | 54                        | 2,280                                    | -                         | -  |
| 28  | 711   | 3-1/2                   | 4           | 5-1/4  | 1-3/4                        | 2-1/4        | 1-3/4      | 10-5/8                       | 105.5                           | 55                        | 2,490                                    | 68                        | 3,320                                    | -                         | -  |
| 30  | 762   | 3-13/16                 | 4-3/8       | 6      | 2                            | 2-1/2        | 2          | 11-3/8                       | 124.7                           | 70                        | 3,460                                    | 87                        | 4,590                                    | 108                       | 6,100                                    |
| 32  | 813   | 4-1/4                   | 4-13/16     | 6      | 2                            | 3            | 2          | 12-3/16                      | 141.8                           | 97                        | 5,960                                    | 121                       | 7,920                                    | 150                       | 10,526                                   |
| 34  | 864   | 4-7/16                  | 5-1/16      | 6-3/4  | 2-1/4                        | 3-1/4        | 2-1/4      | 12-7/8                       | 160.1                           | 114                       | 7,810                                    | 142                       | 10,380                                   | 177                       | 13,795                                   |
| 36  | 914   | 4-3/4                   | 5-1/2       | 7      | 2-1/2                        | 3-1/2        | 2-1/2      | 13-5/8                       | 179.5                           | 136                       | 10,350                                   | 170                       | 13,750                                   | 211                       | 18,274                                   |
| 38  | 965   | 5-1/16                  | 5-13/16     | 7-1/4  | 2-1/2                        | 3-3/4        | 2-1/2      | 14-7/16                      | 200                             | 159                       | 13,200                                   | 198                       | 17,540                                   | 246                       | 23,311                                   |
| 40  | 1,016 | 5-1/16                  | 5-13/16     | 7-3/4  | 2-3/4                        | 3-3/4        | 2-3/4      | 15-3/16                      | 221.6                           | 177                       | 16,600                                   | 221                       | 22,070                                   | 275                       | 29,331                                   |
| 42  | 1,067 | 5-1/4                   | 6           | 8      | 2-3/4                        | 3-3/4        | 2-3/4      | 15-15/16                     | 244.3                           | 211                       | 22,620                                   | 265                       | 30,090                                   | 329                       | 39,990                                   |
| 44  | 1,118 | 5-1/4                   | 6           | 8      | 2-3/4                        | 3-3/4        | 2-3/4      | 16-3/4                       | 268.1                           | 232                       | 27,820                                   | 293                       | 37,010                                   | 364                       | 49,186                                   |
| 46  | 1,168 | 6                       | 6-3/4       | 10     | 3                            | 4            | 3          | 17-7/16                      | 293.1                           | 285                       | 34,170                                   | 354                       | 45,400                                   | 440                       | 60,337                                   |
| 48  | 1,219 | 6                       | 6-3/4       | 10     | 3                            | 4            | 3          | 18-1/4                       | 319.1                           | 309                       | 41,290                                   | 386                       | 54,900                                   | 480                       | 72,962                                   |
| 50  | 1,270 | 6-9/16                  | 7-3/8       | 10-3/4 | 3                            | 4-1/2        | 3          | 19                           | 346.2                           | 362                       | 49,820                                   | 447                       | 66,190                                   | 556                       | 87,967                                   |
| 52  | 1,320 | 6-9/16                  | 7-3/8       | 10-3/4 | 3                            | 4-1/2        | 3          | 19-3/4                       | 374.5                           | 390                       | 59,370                                   | 485                       | 78,900                                   | 603                       | 104,858                                  |
| 54  | 1,371 | 6-9/16                  | 7-3/8       | 10-3/4 | 3                            | 4-1/2        | 3          | 20-1/2                       | 408.8                           | 420                       | 70,320                                   | 526                       | 93,510                                   | 654                       | 124,275                                  |
| 56  | 1,422 | 7-5/8                   | 8-3/8       | 11-1/2 | 3-1/4                        | 5            | 3-1/4      | 21-1/4                       | 434.3                           | 498                       | 83,470                                   | 615                       | 110,830                                  | 764                       | 147,293                                  |
| 58  | 1,473 | 7-5/8                   | 8-3/8       | 11-1/2 | 3-1/4                        | 5            | 3-1/4      | 21-7/8                       | 465.9                           | 533                       | 97,700                                   | 661                       | 129,810                                  | 822                       | 172,517                                  |
| 60  | 1,524 | 7-5/8                   | 8-3/8       | 12     | 3-1/2                        | 5            | 3-1/2      | 22-3/4                       | 498.6                           | 572                       | 113,880                                  | 713                       | 151,360                                  | 886                       | 201,157                                  |
| 62  | 1,575 | 9                       | 10          | 13-1/4 | 4                            | 6            | 4          | 22-1/2                       | 492.8                           | 737                       | 143,870                                  | 902                       | 190,790                                  | -                         | -  |
| 64  | 1,625 | 9                       | 10          | 13-1/4 | 4                            | 6            | 4          | 23-1/8                       | 525.1                           | 781                       | 165,830                                  | 961                       | 220,060                                  | -                         | -  |
| 66  | 1,676 | 9                       | 10          | 13-1/4 | 4                            | 6            | 4          | 23-15/16                     | 558.4                           | 828                       | 190,420                                  | 1,024                     | 252,850                                  | -                         | -  |
| 68  | 1,727 | 10-1/2                  | 11-3/4      | 14-1/2 | 5                            | 7            | 5          | 24-5/8                       | 592.8                           | 987                       | 221,140                                  | 1,199                     | 292,710                                  | -                         | -  |
| 70  | 1,778 | 10-1/2                  | 11-3/4      | 14-1/2 | 5                            | 7            | 5          | 25-3/8                       | 628.1                           | 1,039                     | 251,690                                  | 1,269                     | 333,450                                  | -                         | -  |
| 72  | 1,823 | 10-1/2                  | 11-3/4      | 14-1/2 | 5                            | 7            | 5          | 26-1/8                       | 664.5                           | 1,094                     | 285,590                                  | 1,342                     | 378,650                                  | -                         | -  |
| 74  | 1,879 | 10-1/2                  | 11-3/4      | 14-1/2 | 6                            | 7            | 6          | 26-7/8                       | 702                             | 1,159                     | 340,800                                  | 1,436                     | 452,320                                  | -                         | -  |
| 76  | 1,930 | 10-1/2                  | 11-3/4      | 14-1/2 | 6                            | 7            | 6          | 27-9/16                      | 740.4                           | 1,228                     | 388,680                                  | 1,529                     | 516,160                                  | -                         | -  |
| 78  | 1,981 | 10-1/2                  | 11-3/4      | 14-1/2 | 6                            | 7            | 6          | 28-1/4                       | 779.9                           | 1,301                     | 441,530                                  | 1,626                     | 586,630                                  | -                         | -  |
| 80  | 2,032 | 11-1/8                  | 12-1/2      | 17     | 6                            | 7-1/2        | 6          | 29                           | 820.4                           | 1,493                     | 503,610                                  | 1,844                     | 668,350                                  | -                         | -  |
| 82  | 2,083 | 11-1/8                  | 12-1/2      | 17     | 6                            | 7-1/2        | 6          | 29-3/4                       | 862                             | 1,574                     | 568,320                                  | 1,952                     | 754,640                                  | -                         | -  |
| 84  | 2,134 | 11-1/8                  | 12-1/2      | 17     | 6                            | 7-1/2        | 6          | 30-7/16                      | 904.5                           | 1,659                     | 639,650                                  | 2,064                     | 849,740                                  | -                         | -  |
| 86  | 2,184 | 11-1/8                  | 12-1/2      | 17     | 6                            | 7-1/2        | 6          | 31-3/16                      | 948.1                           | 1,748                     | 718,600                                  | 2,183                     | 955,010                                  | -                         | -  |
| 88  | 2,235 | 11-1/8                  | 12-1/2      | 17     | 6                            | 7-1/2        | 6          | 31-15/16                     | 992.7                           | 1,842                     | 805,280                                  | 2,308                     | 1,070,600                                | -                         | -  |
| 90  | 2,286 | 11-7/8                  | 13-1/4      | 18-1/4 | 6                            | 8            | 6          | 32-5/8                       | 1,038.3                         | 2,048                     | 903,200                                  | 2,547                     | 1,199,900                                | -                         | -  |
| 92  | 2,337 | 11-7/8                  | 13-1/4      | 18-1/4 | 6                            | 8            | 6          | 33-3/8                       | 1,085.0                         | 2,150                     | 1,003,950                                | 2,683                     | 1,338,260                                | -                         | -  |
| 94  | 2,388 | 11-7/8                  | 13-1/4      | 18-1/4 | 6                            | 8            | 6          | 34-1/16                      | 1,132.7                         | 2,256                     | 1,119,400                                | 2,825                     | 1,488,200                                | -                         | -  |
| 96  | 2,438 | 11-7/8                  | 13-1/4      | 18-1/4 | 6                            | 8            | 6          | 34-13/16                     | 1,181.4                         | 2,263                     | 1,238,750                                | 2,869                     | 1,648,600                                | -                         | -  |

# COMMERCIAL

## Specifications

| DQ SPECIAL     |             |
|----------------|-------------|
| Blades         | 4           |
| E.A.R.         | 0.76 - 0.91 |
| Diameter Range | 32" - 56"   |

| DURA-QUAD      |           |
|----------------|-----------|
| Blades         | 4         |
| E.A.R.         | 0.76      |
| Diameter Range | 24" - 36" |

| PAC-MASTER     |                 |
|----------------|-----------------|
| Blades         | 4               |
| E.A.R.         | 0.69            |
| Diameter Range | 20" - 30"       |
| Material       | Stainless Steel |

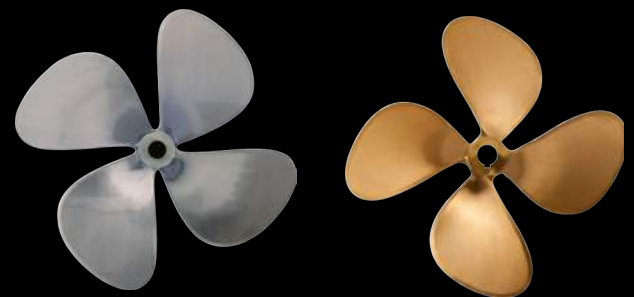
### Who Should Buy Commercial Series Propellers?

Michigan Wheel Dyna-Quad (DQ) propellers have often been used for medium to higher speed commercial applications. Over the years we have created three specialized styles of DQ propellers that meet the needs of many of today's commercial applications.

The DQ Special propeller offers greater blade area than our standard DQ propellers, allowing today's high powered commercial applications to better control cavitation and effectively convert power into thrust.

Dura-Quad propellers utilize thicker blades to hold up better to heavy use in shallow water and contact with floating debris.

Pacmaster propellers offer the sleek design of DQ propellers for operators who prefer the toughness of stainless steel.



**THREE SPECIALIZED LINES OF DQ PROPELLERS THAT MEET THE NEEDS OF MANY OF TODAY'S COMMERCIAL APPLICATIONS.**

### Commercial Applications

*Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.*

*Excellence in Propulsion.*

## DQ SPECIAL SPECIFICATIONS (0.86 E.A.R.)

| DIAMETER |       | HUB DIMENSIONS (INCHES) |             |            | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
|----------|-------|-------------------------|-------------|------------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|
| INCHES   | MM    | AFT END                 | FORWARD END | LENGTH     | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |
| 32       | 813   | 4-1/4                   | 4-7/8       | FULL TAPER | 2                            | 3            | 2          | 15-11/16                     | 173.1                           | 128                       | 8,250                                    |
| 34       | 864   | 4-1/2                   | 5-1/8       | FULL TAPER | 2-1/4                        | 3            | 2-1/4      | 16-11/16                     | 196.3                           | 152                       | 11,150                                   |
| 36       | 914   | 4-7/8                   | 5-9/16      | FULL TAPER | 2-3/4                        | 3-1/2        | 2-3/4      | 17-11/16                     | 219.5                           | 184                       | 14,850                                   |
| 38       | 965   | 4-7/8                   | 5-9/16      | FULL TAPER | 2-3/4                        | 3-1/2        | 2-3/4      | 18-5/8                       | 245.5                           | 207                       | 19,270                                   |
| 40       | 1,016 | 4-7/8                   | 5-11/16     | FULL TAPER | 3                            | 3-3/4        | 3          | 19-5/8                       | 271.6                           | 233                       | 24,710                                   |
| 42       | 1,067 | 5-3/8                   | 6           | FULL TAPER | 3                            | 4            | 3          | 20-5/8                       | 298.8                           | 275                       | 31,620                                   |
| 44       | 1,118 | 5-3/8                   | 6           | FULL TAPER | 3                            | 4-1/4        | 3          | 21-9/16                      | 328.5                           | 300                       | 39,630                                   |
| 46       | 1,168 | 6                       | 6-3/4       | FULL TAPER | 3                            | 4-1/2        | 3          | 22-9/16                      | 359.6                           | 352                       | 46,690                                   |
| 48       | 1,219 | 6                       | 6-3/4       | FULL TAPER | 3                            | 4-1/2        | 3          | 23-3/8                       | 387.5                           | 390                       | 61,190                                   |
| 50       | 1,270 | 6-3/4                   | 7-1/2       | FULL TAPER | 3                            | 5            | 3          | 24-7/16                      | 420.5                           | 460                       | 75,570                                   |
| 52       | 1,321 | 6-3/4                   | 7-1/2       | FULL TAPER | 3                            | 5            | 3          | 25-7/16                      | 456.2                           | 505                       | 91,460                                   |
| 54       | 1,372 | 6-3/4                   | 7-1/2       | FULL TAPER | 3                            | 5            | 3          | 26-7/16                      | 493.3                           | 552                       | 109,740                                  |
| 56       | 1,422 | 6-3/4                   | 7-1/2       | FULL TAPER | 3                            | 5            | 3          | 27-3/8                       | 531.9                           | 604                       | 131,130                                  |

- Notes: 1. Mass moment of inertia properties calculated using minimum standard bore.  
 2. Mass moment of inertia properties calculated using bronze.  
 3. Some DQ Specials have blade area other than 0.86.

## DURA-QUAD SPECIFICATIONS (0.76 E.A.R.)

| DIAMETER |     | HUB DIMENSIONS (INCHES) |             |        | STANDARD TAPER BORE (INCHES) |              |            |                 | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
|----------|-----|-------------------------|-------------|--------|------------------------------|--------------|------------|-----------------|------------------------------|---------------------------------|---------------------------|--|
| INCHES   | MM  | AFT END                 | FORWARD END | LENGTH | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE | PILOT S.E. BORE |                              |                                 |                           |  |
| 24       | 610 | 3                       | 3-3/8       | 6      | 1-1/2                        | 2            | 1-1/2      | 1.172           | 10-7/16                      | 85.5                            | 52                        | 1,780                                    |
| 26       | 660 | 3-3/8                   | 3-7/8       | 6-3/4  | 1-3/4                        | 2-1/4        | 1-3/4      | 1.375           | 11-5/16                      | 99.9                            | 67                        | 2,650                                    |
| 28       | 711 | 3-3/4                   | 4-1/4       | 7-1/2  | 2                            | 2-1/2        | 2          | 1.578           | 12-3/16                      | 115.7                           | 85                        | 3,830                                    |
| 30       | 762 | 4-1/4                   | 4-7/8       | 9      | 2                            | 3            | 2          | 1.531           | 13-1/16                      | 132.1                           | 113                       | 5,420                                    |
| 32       | 813 | 4-1/4                   | 4-7/8       | 9      | 2                            | 3            | 2          | 1.531           | 13-15/16                     | 151.1                           | 129                       | 7,420                                    |
| 34       | 864 | 4-1/4                   | 4-7/8       | 9      | 2                            | 3            | 2          | 1.531           | 14-13/16                     | 171.4                           | 148                       | 9,980                                    |
| 36       | 914 | 4-5/8                   | 5-1/4       | 10-1/2 | 2-3/4                        | 3-1/2        | 2-3/4      | 2.164           | 15-5/8                       | 191.8                           | 176                       | 13,260                                   |

## PAC-MASTER SPECIFICATIONS (0.69 E.A.R.)

| DIAMETER |  | ROTATION | HUB DIMENSIONS (INCHES) |             |        | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
|----------|--|----------|-------------------------|-------------|--------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|
| INCHES   |  |          | AFT END                 | FORWARD END | LENGTH | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |
| 20 x 18  |  | R        | 2-3/4                   | 3           | 4-1/2  | 1-1/2                        | 1-3/4        | 1-1/2      | 8-1/16                       | 54.2                            | 26                        | 627                                      |
| 20 x 20  |  | R        | 2-3/4                   | 3           | 4-1/2  | 1-1/2                        | 1-3/4        | 1-1/2      | 8-1/16                       | 54.2                            | 26                        | 627                                      |
| 22 x 18  |  | R        | 3                       | 3-1/4       | 4-7/8  | 1-3/4                        | 2            | 1-3/4      | 8-7/8                        | 65.5                            | 34                        | 1,003                                    |
| 22 x 20  |  | R        | 3                       | 3-1/4       | 4-7/8  | 1-3/4                        | 2            | 1-3/4      | 8-7/8                        | 65.5                            | 34                        | 1,003                                    |
| 22 x 22  |  | R        | 3                       | 3-1/4       | 4-7/8  | 1-3/4                        | 2            | 1-3/4      | 8-7/8                        | 65.5                            | 34                        | 1,003                                    |
| 24 x 20  |  | R & L    | 3-3/8                   | 3-3/4       | 5-3/4  | 2                            | 2-1/4        | 2          | 9-11/16                      | 77.8                            | 46                        | 1,545                                    |
| 24 x 22  |  | R & L    | 3-3/8                   | 3-3/4       | 5-3/4  | 2                            | 2-1/4        | 2          | 9-11/16                      | 77.8                            | 46                        | 1,545                                    |
| 24 x 24  |  | R & L    | 3-3/8                   | 3-3/4       | 5-3/4  | 2                            | 2-1/4        | 2          | 9-11/16                      | 77.8                            | 46                        | 1,545                                    |
| 26 x 20  |  | R & L    | 3-7/8                   | 4-1/4       | 6      | 2                            | 2-1/2        | 2          | 10-1/2                       | 90.9                            | 61                        | 2,302                                    |
| 26 x 22  |  | R & L    | 3-7/8                   | 4-1/4       | 6      | 2                            | 2-1/2        | 2          | 10-1/2                       | 90.9                            | 61                        | 2,302                                    |
| 26 x 24  |  | R & L    | 3-7/8                   | 4-1/4       | 6      | 2                            | 2-1/2        | 2          | 10-1/2                       | 90.9                            | 61                        | 2,302                                    |
| 26 x 26  |  | R & L    | 3-7/8                   | 4-1/4       | 6      | 2                            | 2-1/2        | 2          | 10-1/2                       | 90.9                            | 61                        | 2,302                                    |
| 26 x 30  |  | R & L    | 3-7/8                   | 4-1/4       | 6      | 2                            | 2-1/2        | 2          | 10-1/2                       | 90.9                            | 61                        | 2,302                                    |
| 28 x 26  |  | R & L    | 3-7/8                   | 4-1/4       | 6      | 2                            | 2-1/2        | 2          | 11-1/4                       | 106.2                           | 72                        | 3,303                                    |
| 28 x 28  |  | R & L    | 3-7/8                   | 4-1/4       | 6      | 2                            | 2-1/2        | 2          | 11-1/4                       | 106.2                           | 72                        | 3,303                                    |
| 30 x 20  |  | R        | 3-7/8                   | 4-1/4       | 6-1/2  | 2                            | 2-1/2        | 2          | 12-1/16                      | 122.5                           | 85                        | 4,633                                    |
| 30 x 28  |  | R & L    | 3-7/8                   | 4-1/4       | 6-1/2  | 2                            | 2-1/2        | 2          | 12-1/16                      | 122.5                           | 85                        | 4,633                                    |
| 30 x 30  |  | R        | 3-7/8                   | 4-1/4       | 6-1/2  | 2                            | 2-1/2        | 2          | 12-1/16                      | 122.5                           | 85                        | 4,633                                    |

M.W.R. = 0.326

B.T.F. = 0.060

Odd diameter & pitch within 2" of listed are quoted on request.

\*WR2 = ±10% in Air (inch squared lbs.)

# KAPLAN PROPELLERS & NOZZELS

## Specifications

| KAPLAN         |                      |
|----------------|----------------------|
| Blades         | 3, 4, 5              |
| E.A.R.         | Varies               |
| Diameter Range | Many Sizes Available |

***“SWITCHING TO A DUCTED PROPELLER FROM AN OPEN PROPELLER IS ONE OF THE MOST EFFECTIVE WAYS TO GET MORE THRUST FROM A VESSEL FOR THE SAME INPUT POWER.”***

### **Who Should Buy Kaplan Series Propellers and Nozzles?**

Vessels operating at low speeds can benefit from the use of a ducted propeller, which is a Kaplan style propeller operating inside a Kort nozzle. Switching to a ducted propeller from an open propeller is one of the most effective ways to get more thrust from a vessel for the same amount of input power.

Our nozzles are available in Type 19 and Type 37 configurations in addition to custom designs upon request. Type 19 nozzles are best used on boats where forward thrust is of highest importance and backing performance is less crucial. Type 37 nozzles are suggested when both ahead and astern performance is required.

### **Why Buy Kaplan Series Propellers and Nozzles?**

Our high-quality Kaplan propellers are offered in a wide variety of designs and materials. Our high-quality nozzles are manufactured with a unique one-piece inner diameter skin, instead of welded segments which experience erosion at the seams. That, along with heavy duty interior structure and framing, make our nozzles last longer than other nozzles on the market. Simplify your procurement with propellers and nozzles from one source. Advanced, custom designs are available.



 **Commercial Applications**

*Excellence in Propulsion.*



## KAPLAN SPECIFICATIONS (0.56 E.A.R.)

| DIAMETER |       | HUB DIMENSIONS (INCHES) |             |        | STANDARD TAPER BORE (INCHES) |              |            | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ.IN) | APPROX. NET WEIGHT (LBS.) | *WR <sup>2</sup> (LBS.-IN <sup>2</sup> ) |
|----------|-------|-------------------------|-------------|--------|------------------------------|--------------|------------|------------------------------|---------------------------------|---------------------------|--|
| INCHES   | MM    | AFT END                 | FORWARD END | LENGTH | MINIMUM BORE                 | MAXIMUM BORE | PILOT BORE |                              |                                 |                           |  |
| 35       | 889   | 4-3/4                   | 5-1/2       | 7-1/2  | 2-1/2                        | 3-1/2        | 2-1/2      | 10-9/16                      | 135                             | 117                       | 6,650                                    |
| 39       | 991   | 5-1/16                  | 5-13/16     | 8      | 2-3/4                        | 3-3/4        | 2-3/4      | 11-3/4                       | 167                             | 154                       | 11,300                                   |
| 43       | 1,090 | 5-1/4                   | 6           | 8-1/4  | 2-3/4                        | 3-3/4        | 2-3/4      | 12-7/8                       | 203                             | 196                       | 18,240                                   |
| 45       | 1,140 | 6                       | 6-3/4       | 10     | 3                            | 4            | 3          | 13-9/16                      | 222                             | 246                       | 23,220                                   |
| 47       | 1,190 | 6                       | 6-3/4       | 10     | 3                            | 4            | 3          | 14-3/16                      | 243                             | 269                       | 28,650                                   |
| 51       | 1,300 | 6-9/16                  | 7-3/8       | 10-3/4 | 3-1/2                        | 4-1/2        | 3-1/2      | 15-3/8                       | 286                             | 341                       | 43,110                                   |
| 53       | 1,350 | 6-9/16                  | 7-3/8       | 10-3/4 | 3-1/2                        | 4-1/2        | 3-1/2      | 15-7/8                       | 309                             | 371                       | 51,920                                   |
| 55       | 1,400 | 7-5/8                   | 8-3/8       | 11-1/2 | 4                            | 5            | 4          | 16-5/8                       | 333                             | 445                       | 63,600                                   |
| 59       | 1,500 | 7-5/8                   | 8-3/8       | 12     | 4                            | 5            | 4          | 17-3/4                       | 383                             | 521                       | 89,230                                   |
| 63       | 1,600 | 9                       | 10          | 13-1/4 | 4                            | 6            | 4          | 19-3/16                      | 436                             | 701                       | 126,330                                  |
| 67       | 1,700 | 10-1/2                  | 11-3/4      | 14-1/2 | 5                            | 7            | 5          | 20-5/8                       | 494                             | 907                       | 175,980                                  |
| 71       | 1,800 | 10-1/2                  | 11-3/4      | 14-1/2 | 5                            | 7            | 5          | 21-11/16                     | 554                             | 1,011                     | 231,530                                  |
| 75       | 1,905 | 10-1/2                  | 11-3/4      | 14-1/2 | 5                            | 7            | 5          | 22-3/4                       | 618                             | 1,128                     | 300,500                                  |
| 79       | 2,006 | 11-1/8                  | 12-1/2      | 17     | 6                            | 7-1/2        | 6          | 24                           | 687                             | 1,350                     | 391,360                                  |
| 83       | 2,108 | 11-1/8                  | 12-1/2      | 17     | 6                            | 7-1/2        | 6          | 25-1/16                      | 758                             | 1,493                     | 495,870                                  |
| 87       | 2,209 | 11-1/8                  | 12-1/2      | 17     | 6                            | 7-1/2        | 6          | 26-1/8                       | 832                             | 1,650                     | 621,740                                  |
| 91       | 2,311 | 11-7/8                  | 13-1/4      | 18-1/4 | 6-1/2                        | 8            | 6-1/2      | 27-7/16                      | 911                             | 1,915                     | 780,850                                  |
| 95       | 2,413 | 11-7/8                  | 13-1/4      | 18-1/4 | 6-1/2                        | 8            | 6-1/2      | 28-1/2                       | 993                             | 2,104                     | 961,860                                  |

\* WR<sup>2</sup> = ±10% in Air (inch squared lbs.)  
 Greater area ratios available and quoted upon request.  
 For use in commercial Kort Nozzle applications, resulting in 25-50% increased thrust compared to an open wheel, on low speed trawlers, draggers, and harbor tugs.

| NSMB TYPE 19 NOZZLE SPECIFICATIONS |    |        |        |                               | NSMB TYPE 37 NOZZLE SPECIFICATIONS |    |        |        |                               |
|------------------------------------|----|--------|--------|-------------------------------|------------------------------------|----|--------|--------|-------------------------------|
| PRINCIPLE DIMENSIONS (INCHES)      |    |        |        | APPROXIMATE NET WEIGHT (LBS.) | PRINCIPLE DIMENSIONS (INCHES)      |    |        |        | APPROXIMATE NET WEIGHT (LBS.) |
| A                                  | B  | C      | D      |                               | A                                  | B  | C      | D      |                               |
| 36                                 | 18 | 43.60  | 38.16  | 300                           | 36                                 | 18 | 43.80  | 41.67  | 300                           |
| 40                                 | 20 | 48.45  | 42.40  | 585                           | 40                                 | 20 | 48.67  | 46.30  | 585                           |
| 44                                 | 22 | 53.30  | 46.64  | 870                           | 44                                 | 22 | 53.53  | 50.93  | 870                           |
| 46                                 | 23 | 55.72  | 48.75  | 1,000                         | 46                                 | 23 | 55.97  | 53.24  | 1,000                         |
| 48                                 | 24 | 58.14  | 50.88  | 1,150                         | 48                                 | 24 | 58.40  | 55.56  | 1,150                         |
| 52                                 | 26 | 62.98  | 55.12  | 1,425                         | 52                                 | 26 | 63.27  | 60.19  | 1,425                         |
| 54                                 | 27 | 65.41  | 57.24  | 1,600                         | 54                                 | 27 | 65.70  | 62.51  | 1,600                         |
| 56                                 | 28 | 67.83  | 59.36  | 1,725                         | 56                                 | 28 | 68.14  | 64.82  | 1,725                         |
| 60                                 | 30 | 72.68  | 63.60  | 2,000                         | 60                                 | 30 | 73.00  | 69.45  | 2,000                         |
| 64                                 | 32 | 77.52  | 67.84  | 2,450                         | 64                                 | 32 | 77.87  | 74.08  | 2,450                         |
| 68                                 | 34 | 82.36  | 72.08  | 2,850                         | 68                                 | 34 | 82.74  | 78.71  | 2,850                         |
| 72                                 | 36 | 87.21  | 76.32  | 3,150                         | 72                                 | 36 | 87.60  | 83.34  | 3,150                         |
| 76                                 | 38 | 92.06  | 80.56  | 3,650                         | 76                                 | 38 | 92.47  | 87.97  | 3,650                         |
| 80                                 | 40 | 96.90  | 84.80  | 4,150                         | 80                                 | 40 | 97.34  | 92.60  | 4,150                         |
| 84                                 | 42 | 101.74 | 89.04  | 5,050                         | 84                                 | 42 | 102.20 | 97.23  | 5,050                         |
| 88                                 | 44 | 106.59 | 93.28  | 5,800                         | 88                                 | 44 | 107.07 | 101.86 | 5,800                         |
| 92                                 | 46 | 111.44 | 97.52  | 6,500                         | 92                                 | 46 | 111.94 | 106.49 | 6,500                         |
| 96                                 | 48 | 116.28 | 101.76 | 7,500                         | 96                                 | 48 | 116.80 | 111.12 | 7,500                         |
| 100                                | 50 | 121.12 | 106.00 | 8,500                         | 100                                | 50 | 121.67 | 115.75 | 8,500                         |
| 104                                | 52 | 125.97 | 110.24 | 9,600                         | 104                                | 52 | 126.54 | 120.38 | 9,600                         |
| 108                                | 54 | 130.82 | 114.48 | 11,000                        | 108                                | 54 | 131.40 | 125.01 | 11,000                        |
| 112                                | 56 | 135.66 | 118.72 | 12,250                        | 112                                | 56 | 136.27 | 129.64 | 12,250                        |
| 116                                | 58 | 140.50 | 122.96 | 13,750                        | 116                                | 58 | 141.14 | 134.27 | 13,750                        |
| 120                                | 60 | 145.35 | 127.20 | 16,000                        | 120                                | 60 | 146.00 | 128.90 | 16,000                        |
| 124                                | 62 | 150.20 | 131.44 | 18,000                        | 124                                | 62 | 150.87 | 143.38 | 18,000                        |
| 128                                | 64 | 155.04 | 135.68 | 20,000                        | 128                                | 64 | 155.74 | 148.16 | 20,000                        |
| 132                                | 66 | 159.88 | 139.92 | 23,000                        | 132                                | 66 | 160.60 | 152.79 | 23,000                        |



# WEEDLESS PROPELLERS

## Specifications

| WEEDLESS       |                                |
|----------------|--------------------------------|
| Blades         | 2                              |
| Diameter Range | 10" - 30"                      |
| Bore           | Standard Taper & Straight Bore |

### Who Should Buy Weedless Propellers?

Michigan Wheel Weedless propellers are specialized propellers used on mudboats in shallow weed infested waters. Their unique highly skewed blades allow the propellers to run freely without becoming tangled in floating vegetation. Thick blades and heavy duty edges add durability when striking roots and other submerged debris. When you are navigating a swamp and need a propeller that will not fail and leave you stranded, choose a Michigan Weedless.

### Weedless Propellers in Water Treatment Facilities

Weedless propellers have also become a preferred choice in many water treatment and other industrial applications. Frequently Michigan Wheel weedless propellers are used in projects around the world helping treat water in developing countries. Their unique design minimizes the collection of loose material while they are used to pump untreated water through the plants. Many sizes are available with oversized hubs to accommodate straight bores for connection to pump motor shafts.

Contact Michigan Wheel for help sizing and for availability of size and pitch combinations.

### Applications

*Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.*

*Excellence in Propulsion.*

## WEEDLESS A-C SPECIFICATIONS

| DIAMETER |     | AVAILABLE PITCH | HUB DIMENSIONS (INCHES) |             |        | MAXIMUM STRAIGHT BORE (INCHES) | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ. IN) | APPROX. NET WEIGHT (LBS.) | B.T.F. |
|----------|-----|-----------------|-------------------------|-------------|--------|--------------------------------|------------------------------|----------------------------------|---------------------------|--------|
| INCHES   | MM  |                 | AFT END                 | FORWARD END | LENGTH |                                |                              |                                  |                           |        |
| 6        | 152 |                 | 1                       | 1-11/32     | 1-3/8  | 1/2                            | 2-5/8                        | 6.2                              | 1                         | .042   |
| 7        | 178 | 4L              | 1-1/16                  | 1-1/2       | 1-1/2  | 5/8                            | 3-1/8                        | 8.5                              | 1.5                       | .042   |
| 8        | 203 | 6L              | 1-1/8                   | 1-1/2       | 1-1/2  | 5/8                            | 3-9/16                       | 10.8                             | 2                         | .042   |
| 9        | 229 | 6L, 7L, 8L      | 1-1/4                   | 1-11/16     | 1-7/8  | 3/4                            | 4-1/8                        | 13.7                             | 3                         | .042   |
| 10       | 254 | 6L, 10L         | 1-7/16                  | 1-3/4       | 2-1/4  | 3/4                            | 4-11/16                      | 14.7                             | 3.5                       | .042   |

## WEEDLESS W-C SPECIFICATIONS

| DIAMETER |     | AVAILABLE PITCH | HUB DIMENSIONS (INCHES) |             |        | MAXIMUM STRAIGHT BORE (INCHES) | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ. IN) | APPROX. NET WEIGHT (LBS.) | B.T.F. |
|----------|-----|-----------------|-------------------------|-------------|--------|--------------------------------|------------------------------|----------------------------------|---------------------------|--------|
| INCHES   | MM  |                 | AFT END                 | FORWARD END | LENGTH |                                |                              |                                  |                           |        |
| 6        | 152 | 4L, 5L          | 1                       | 1-11/32     | 1-3/8  | 1/2" Straight No Keyway        | 2-5/8                        | 6.2                              | 1                         | .042   |
| 7        | 178 | 4L, 5L, 8L, 10L | 1-1/16                  | 1-1/2       | 1-1/2  | 1/2" Straight No Keyway        | 3-1/8                        | 8.5                              | 1.5                       | .042   |
| 8        | 203 | 4L, 5L          | 1-1/8                   | 1-1/2       | 1-1/2  | 5/8" Straight No Keyway        | 3-9/16                       | 10.8                             | 2                         | .042   |
| 9        | 229 | 5L, 6L          | 1-1/4                   | 1-11/16     | 1-7/8  | 5/8" or 3/4" Straight & Slot   | 4-1/8                        | 13.7                             | 3                         | .042   |
| 10       | 254 | 5L, 9L          | 1-7/16                  | 1-3/4       | 2-1/4  | 3/4" Taper & Keyway            | 4-11/16                      | 14.7                             | 3.5                       | .042   |

## WEEDLESS SPECIFICATIONS

| DIAMETER |     | AVAILABLE PITCH        | HUB DIMENSIONS (INCHES) |             |        | MAXIMUM STANDARD TAPER BORE (INCHES) | MAXIMUM STRAIGHT BORE (INCHES) | MAXIMUM BLADE WIDTH (INCHES) | EXPANDED AREA PER BLADE (SQ. IN) | APPROX. NET WEIGHT (LBS.) | B.T.F. |
|----------|-----|------------------------|-------------------------|-------------|--------|--------------------------------------|--------------------------------|------------------------------|----------------------------------|---------------------------|--------|
| INCHES   | MM  |                        | AFT END                 | FORWARD END | LENGTH |                                      |                                |                              |                                  |                           |        |
| 10       | 254 | 6R, 8, 10, 12          | 1-7/16                  | 1-5/8       | 2-1/4  | 1                                    | 1                              | 6-11/16                      | 21                               | 5                         | .058   |
| 11       | 279 | 8, 10, 12              | 1-7/16                  | 1-5/8       | 2-1/4  | 1                                    | 1                              | 7-7/16                       | 25                               | 6                         | .058   |
| 12       | 305 | 10, 12, 14             | 1-9/16                  | 1-3/4       | 2-5/8  | 1-1/8                                | 1-1/4                          | 8                            | 30                               | 7.5                       | .058   |
| 13       | 330 | 8, 10, 12, 14          | 1-9/16                  | 1-3/4       | 2-5/8  | 1-1/8                                | 1-1/4                          | 8-13/16                      | 36                               | 9                         | .058   |
| 14       | 356 | 8, 10, 12L, 14, 16     | 1-3/4                   | 2           | 3      | 1-1/8                                | 1-1/4                          | 9-7/16                       | 41                               | 12                        | .058   |
| 15       | 381 | 8, 10, 12, 13L, 14, 16 | 1-3/4                   | 2           | 3      | 1-1/8                                | 1-1/4                          | 10                           | 47                               | 14                        | .058   |
| 16       | 406 | 8-16 Even              | 1-15/16                 | 2-3/16      | 3-3/8  | 1-1/4                                | 1-3/8                          | 10-11/16                     | 55                               | 16                        | .058   |





# LARGE COMMERCIAL PROPELLERS

## Propellers



### Partners in Propulsion

Michigan Wheel is always looking for new ways to provide cutting edge propulsion technologies to its customers. A natural progression of this is to align with other companies that have the same goals of offering high quality propulsion equipment and excellent service.

Nakashima Propeller Co., Ltd. is a world renowned propeller manufacturer and has built a reputation for offering some of the best propulsion equipment on the market. Michigan Wheel has partnered with Nakashima to expand their offering with a variety of marine propulsion products. This includes fixed and controllable pitch propellers, as well as fixed and controllable pitch thrusters.

### Fixed Pitch Propellers

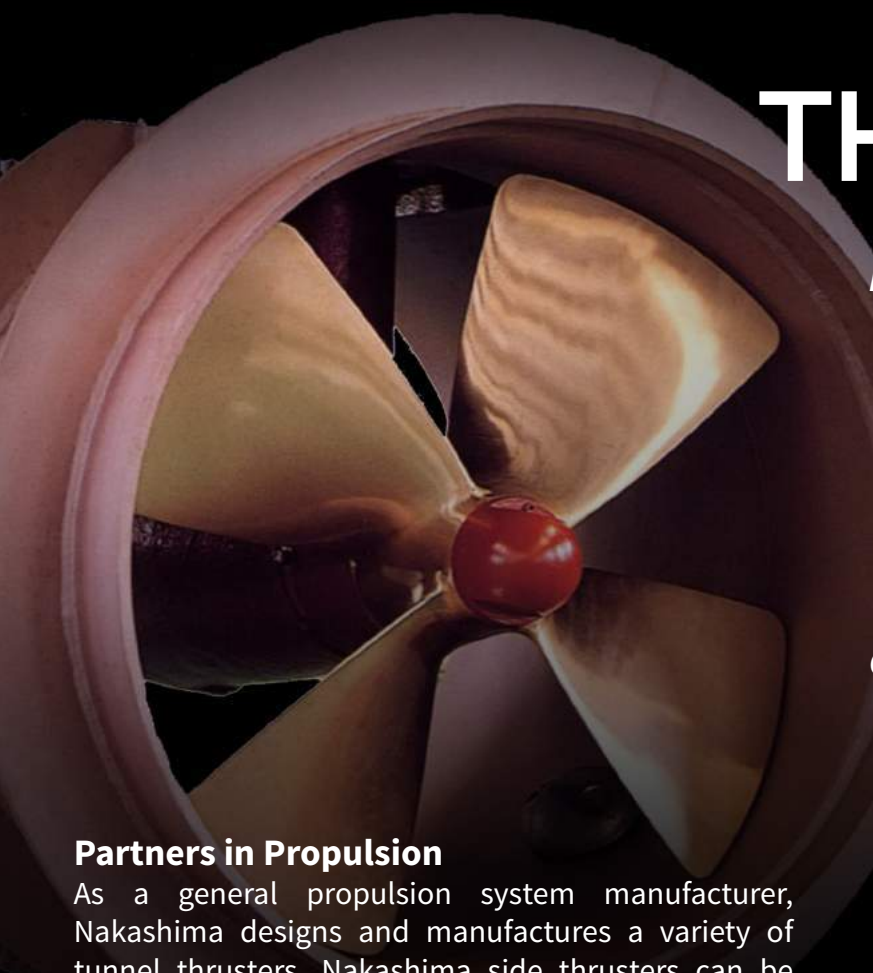
- Michigan Wheel can now offer some of the largest propellers in the world.
- Cutting edge fixed pitch propeller design and innovations such as composite propellers and propeller fin boss caps.
- Advanced blade machining and expert hand polishing.
- Nakashima offers many years of experience building and designing large propellers.

### Controllable Pitch Propellers

- Two models available to fit a wide range of applications.
- XS for applications up to 5,000 HP uses hydraulic push rod for blade movement.
- XL for applications of 5,000 HP and more uses a highly efficient hydraulic cylinder pump package one-third the size of similar systems.
- Controllable pitch propeller blade replacement.

# BOW THRUSTERS

Thrusters



## Partners in Propulsion

As a general propulsion system manufacturer, Nakashima designs and manufactures a variety of tunnel thrusters. Nakashima side thrusters can be used in a wide range of vessels including freighters, fishing vessels, ferries, roll-on/roll-off vessels, container ships, offshore supply vessels, and patrol craft.

### **Fixed Pitch Bow Thrusters**

- Model TFN tunnel thrusters utilize fixed pitch propellers to minimize maintenance costs.
- The tunnel assembly is built with a reinforced structure to allow it to be easily mounted in various types of vessels.

### **Controllable Pitch Bow Thrusters**

- Model TCT is a high performance tunnel thruster with controllable blades.
- Design has been optimized by use of tank tests to maximize thrust while minimizing noise and vibration.
- Available with propeller diameters ranging from 700mm (27.55") to 3,150mm (124").
- Bolt on blades can be easily removed for replacement or repair.

# LEGACY SERIES

## Specifications

### “Y” SERIES

|             |                      |
|-------------|----------------------|
| Blades      | 3 / 4 / 5            |
| E.A.R.      | 0.66 / 0.835 / 0.935 |
| Application | Pleasure             |

### “HX” SERIES

|             |          |
|-------------|----------|
| Blades      | 4 / 5    |
| E.A.R.      | Varies   |
| Application | Pleasure |

### MAXIMA

|                |              |
|----------------|--------------|
| Blades         | 3 / 4        |
| E.A.R.         | 0.63 / 0.836 |
| Diameter Range | 32” - 50”    |

### TRAWLER

|                |           |
|----------------|-----------|
| Blades         | 4         |
| E.A.R.         | 0.44      |
| Diameter Range | 36” - 72” |

### About our Legacy Series

Over the past century, Michigan Wheel has built many propellers for many different applications. Our pattern vault houses almost ten thousand patterns to support all the various designs required by the countless different applications. As boats have changed over the years and new propeller designs have been developed, some of our propeller designs have become less prominent. Since many of these legacy designs are highly effective for their applications, Michigan Wheel still supports them and can build brand new replacement propellers to offer the same performance as the original equipment. Replacing propellers with designs not specialized for your application can result in haul-outs, pitch changes, new vibrations, and decreased performance.

**REPLACING PROPELLERS WITH DESIGNS NOT SPECIALIZED FOR YOUR APPLICATION CAN RESULT IN HAUL-OUTS, PITCH CHANGES, NEW VIBRATIONS, AND DECREASED PERFORMANCE.”**



*Unsure if this is the right propeller for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.*

*Excellence in Propulsion.*




*Our pattern vault houses almost **ten thousand patterns** to support all the various designs required by countless different applications.*

### “Y” Series



The chosen combination of blade area and skew in this series, along with variable pitch and camber, make for a close efficiency match throughout the entire power curve. Years of propeller design experience have allowed our naval architects to optimize the “Y” design to maximize the performance of virtually all planing hulls. Boat builders choose the “Y” series as standard equipment after appreciating the difference in sea trials compared to less sophisticated product.

*Recreational Applications* 

### “HX” Series



The Federal HX series offers high tolerance hand finish propeller manufacture in a variety of design configurations. This series is primarily constant pitch, with expanded area ratios. High horsepower pleasure and commercial applications require specific propellers to achieve maximum thrust, speed, and smoothness. The proven pitch geometry yields exceptional performance without the additional cost associated with custom, CNC machined propellers.

*Recreational Applications* 

### Maxima



The heavy-duty blade thickness distribution makes the Maxima the most durable commercial offering. The blade design is wider than the standard for applications that require maximum thrust, including: moderate-speed crew supply; high horsepower applications, and passenger boats requiring maximum thrust.

*Commercial Applications* 

### Trawler

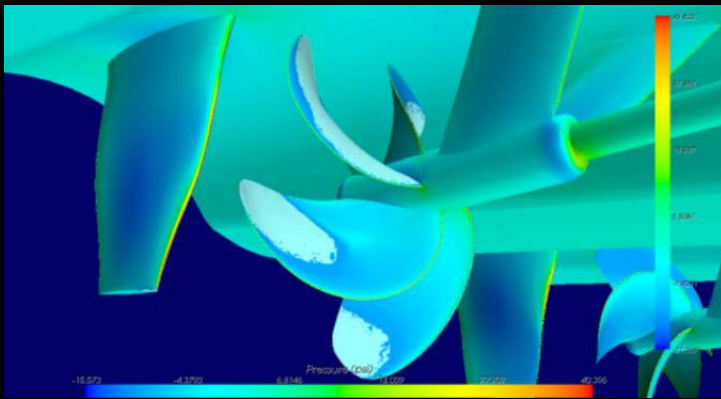


The Trawler series gives four blade performance without reduced diameter, and is primarily used on shrimp boats, trawlers, and similar vessels that need thrust and smooth running performance.

*Commercial Applications* 

## Propulsion Solutions

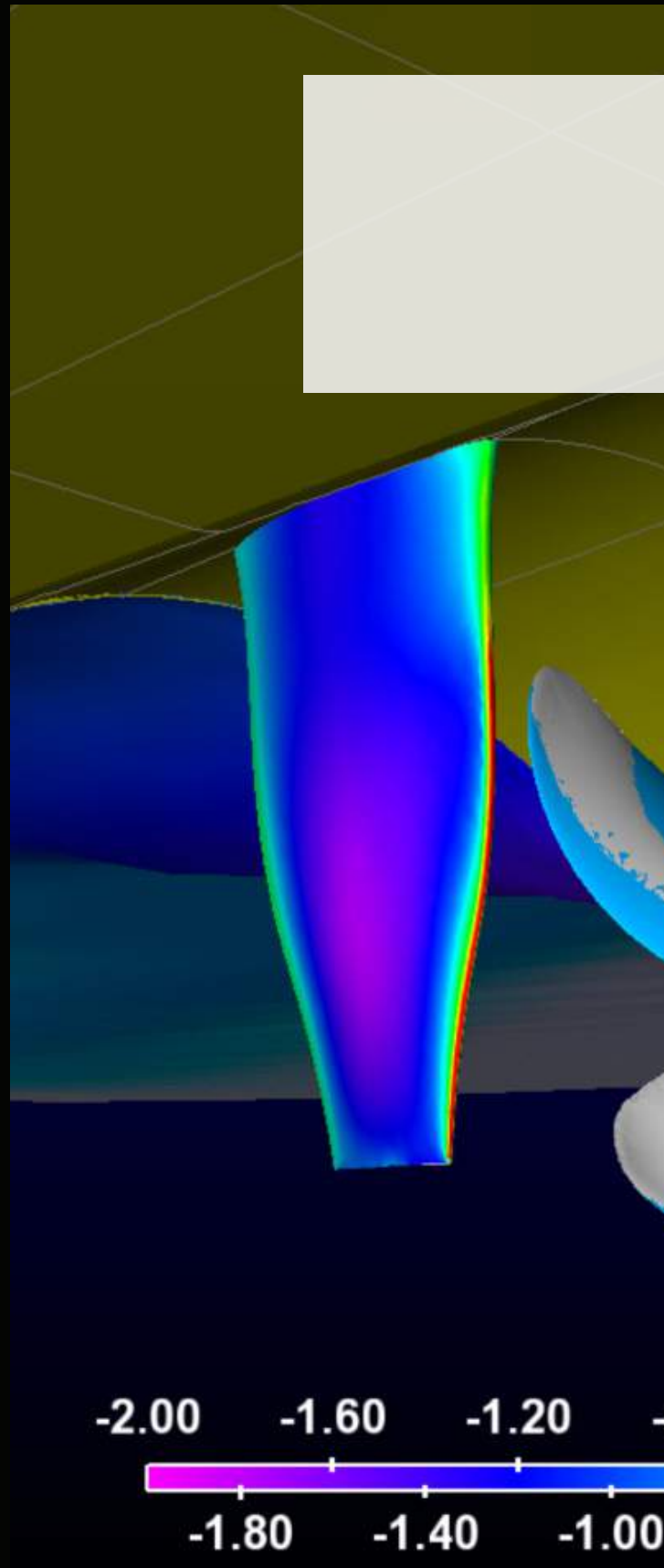
While our CX and Marlin propellers are custom designed for a boat's specific engine power, shaft RPM, and top speed, Michigan Wheel has the capability to go one step further. Through advanced computer modeling and simulation, our engineering team can examine a boat's wake and design a propeller specifically for that wake. Due to different hull shapes, shaft and strut configurations, and other differences, each boat design has its own wake characteristics. Wakes also change with speed as well as load and trim conditions.



Propellers operate in this region of disturbed water called the wake, and the conditions have a large effect on propeller efficiency and vibration characteristics. A propeller that is designed to take into account these conditions is called a wake-adapted propeller. Wake-adapted propellers offer significant efficiency gains, speed gains, and reductions in vibration.

For a long time, wake-adapted technology was only available through expensive model testing. The advent of high performance computers has allowed highly educated engineers to model the entire boat and appendages and run simulations to analyze the wake and its effect on propellers. Not only is it significantly less costly and less time consuming compared to model testing, but it also allows the propeller designer to study propeller and flow characteristics that would be impossible to measure with model testing.

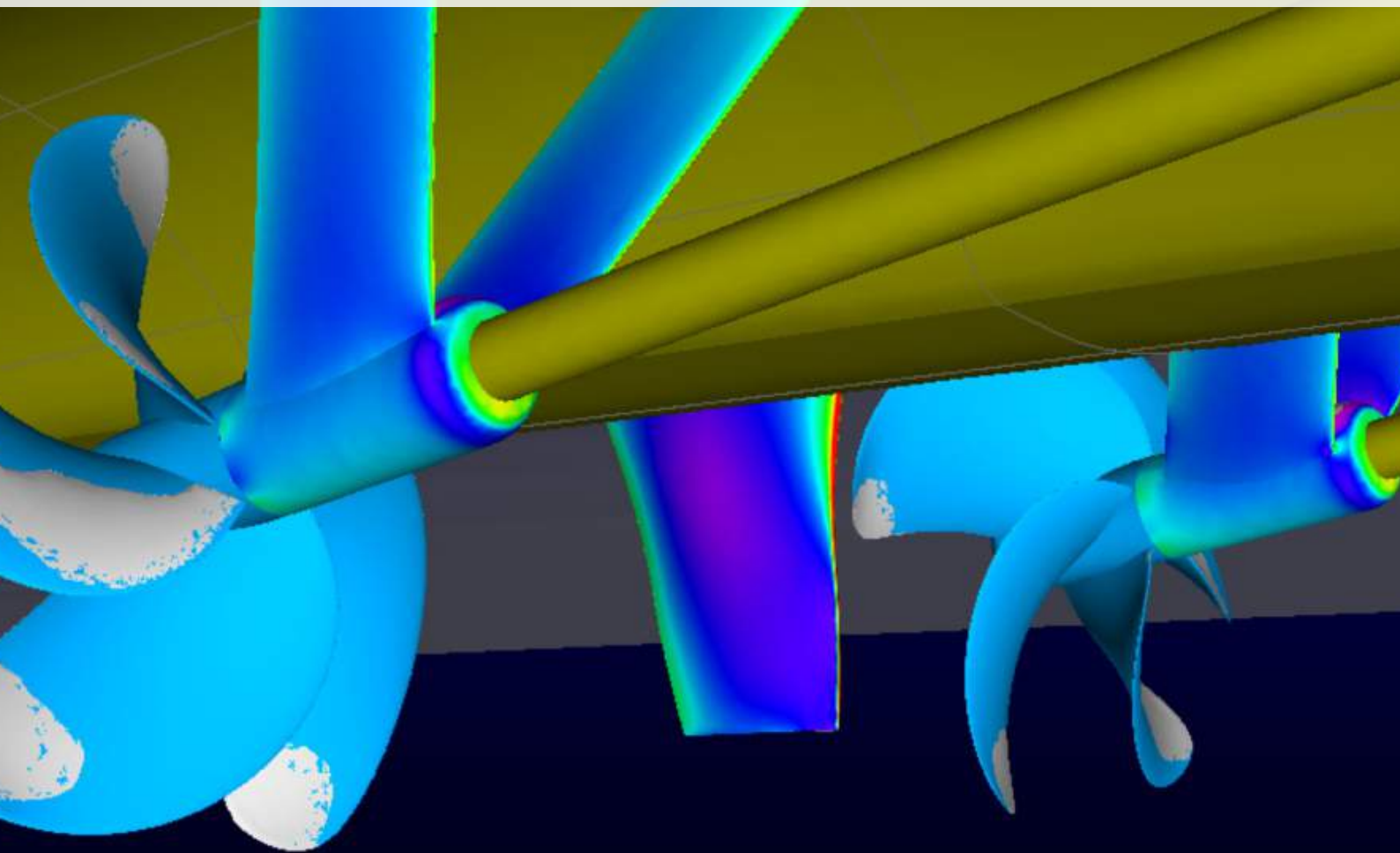
Michigan Wheel has had great success designing and manufacturing wake-adapted propellers for pleasure craft, work boats, and patrol boats. Benefits compared to off the shelf propellers include reduced fuel costs, higher top speed, and greatly reduced vibrations.





## // COMPREHENSIVE PROPULSION SYSTEMS

*Significant reduction in fuel costs; significant reduction in vibration amplitude; and an increase in top speed are all benefits to Michigan Wheel's wake-adapted propellers.*



Wave Amplitude (m)



# BRASS BEARINGS

## Tolerances

| Bearing I.D.    | O.D. Tolerance (p6) |
|-----------------|---------------------|
| Inch            | Inch                |
| 3/4" - 1 1/4"   | +0.0010" - +0.0017" |
| 1 3/8"          | +0.0013" - +0.0020" |
| 1 1/2" - 1 3/4" | +0.0013" - +0.0020" |
| 1 7/8" - 2 3/8" | +0.0013" - +0.0020" |
| 2 1/2" - 3"     | +0.0015" - +0.0023" |
| 3 1/8" - 3 3/4" | +0.0015" - +0.0023" |
| 3 7/8" - 4"     | +0.0017" - +0.0027" |
| 4 1/4" - 4 3/8" | +0.0017" - +0.0027" |
| 4 1/2" - 4 7/8" | +0.0017" - +0.0027" |
| 5" - 5 3/8"     | +0.0017" - +0.0027" |
| 5 1/2" - 5 3/4" | +0.0017" - +0.0027" |
| 5 7/8"          | +0.0020" - +0.0031" |
| 6" - 6 1/4"     | +0.0020" - +0.0031" |
| 6 1/2"          | +0.0020" - +0.0031" |
| 7"              | +0.0020" - +0.0031" |
| 7 1/4" - 10"    | +0.0022" - +0.0035" |

### High-Performance Water Lubricated Aqualube Bearings

Michigan Wheel's Aqualube bearings offer a high quality solution for water lubricated shaft applications. Aqualube bearings are designed with longitudinal grooves that form a hydrodynamic wedge, or water film, between the shaft and the bearing, even during slow speed operation. This water film is capable of absorbing shock, and reducing vibration and noise.

Aqualube bearings are built from chemical and oil resistant nitrile rubber, and are available with brass and non-metallic (Phenolic) shells to fit many applications. Every bearing is inspected to ensure quality. Michigan Wheel stocks a large inventory of common sizes, and special sizes are available upon request.

### Why Buy Aqualube Brass Bearings?

Aqualube bearings are consistently built from the highest quality materials. They offer a high resistance to abrasion and long life. When it is time to change your Aqualube bearing, Michigan Wheel offers a large variety of sizes in stock to reduce down time.

**Available in Metric & Imperial Sizes.**

**Phenolic, Brass, and Flanged styles available.**

*Unsure if this is the right bearing for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.*

*Excellence in Propulsion.*

## AQUALUBE BRASS SPECIFICATIONS

| DIAMETER |          | HUB DIMENSIONS (INCHES) |         |        | DIAMETER |          | HUB DIMENSIONS (INCHES) |       |        | DIAMETER |          | HUB DIMENSIONS (INCHES) |       |        |   |
|----------|----------|-------------------------|---------|--------|----------|----------|-------------------------|-------|--------|----------|----------|-------------------------|-------|--------|---|
| PART NO. | MATERIAL | I.D.                    | O.D.    | LENGTH | PART NO. | MATERIAL | I.D.                    | O.D.  | LENGTH | PART NO. | MATERIAL | I.D.                    | O.D.  | LENGTH |   |
| 907501   | Brass    | 3/4                     | 1-1/4   | 3      | 927502   | Brass    | 2-3/4                   | 3-1/2 | 11     | AMB040   | Brass    | 40mm                    | 55mm  | 160mm  | - |
| 908751   | Brass    | 7/8                     | 1-1/4   | 3-1/2  | 927503   | Brass    | 2-3/4                   | 3-3/4 | 11     | AMB045   | Brass    | 45mm                    | 65mm  | 180mm  | - |
| 908752   | Brass    | 7/8                     | 1-3/8   | 3-1/2  | 927701   | Brass    | 2-7/8                   | 3-3/4 | 11-1/2 | AMB050   | Brass    | 50mm                    | 70mm  | 200mm  | - |
| 908753   | Brass    | 7/8                     | 1-1/2   | 3-1/2  | 930001   | Brass    | 3                       | 3-3/4 | 12     | AMB055   | Brass    | 55mm                    | 75mm  | 220mm  | - |
| 910001   | Brass    | 1                       | 1-1/4   | 4      | 930002   | Brass    | 3                       | 4     | 12     | AMB060   | Brass    | 60mm                    | 80mm  | 240mm  | - |
| 910002   | Brass    | 1                       | 1-3/8   | 4      | 931251   | Brass    | 3-1/8                   | 4-1/2 | 12-1/2 | AMB065   | Brass    | 65mm                    | 85mm  | 260mm  | - |
| 910003   | Brass    | 1                       | 1-1/2   | 4      | 932501   | Brass    | 3-1/4                   | 4     | 13     | AMB070   | Brass    | 70mm                    | 90mm  | 280mm  | - |
| 910004   | Brass    | 1                       | 1-5/8   | 4      | 932502   | Brass    | 3-1/4                   | 4-1/4 | 13     | AMB075   | Brass    | 75mm                    | 95mm  | 300mm  | - |
| 910005   | Brass    | 1                       | 2       | 4      | 933751   | Brass    | 3-3/8                   | 4-1/2 | 13-1/2 | AMB080   | Brass    | 80mm                    | 100mm | 320mm  | - |
| 911251   | Brass    | 1-1/8                   | 1-1/2   | 4-1/2  | 935001   | Brass    | 3-1/2                   | 4-1/4 | 14     | AMB085   | Brass    | 85mm                    | 105mm | 340mm  | - |
| 911252   | Brass    | 1-1/8                   | 1-5/8   | 4-1/2  | 935002   | Brass    | 3-1/2                   | 4-1/2 | 14     | AMB090   | Brass    | 90mm                    | 110mm | 360mm  | - |
| 911253   | Brass    | 1-1/8                   | 1-3/4   | 4-1/2  | 936251   | Brass    | 3-5/8                   | 4-1/2 | 14-1/2 | AMB095   | Brass    | 95mm                    | 115mm | 380mm  | - |
| 911254   | Brass    | 1-1/8                   | 2       | 4-1/2  | 937501   | Brass    | 3-3/4                   | 4-1/2 | 15     | AMB100   | Brass    | 100mm                   | 125mm | 400mm  | - |
| 912501   | Brass    | 1-1/4                   | 1-1/2   | 5      | 937502   | Brass    | 3-3/4                   | 5     | 15     | AMB105   | Brass    | 105mm                   | 130mm | 420mm  | - |
| 912503   | Brass    | 1-1/4                   | 1-3/4   | 5      | 937504   | Brass    | 3-3/4                   | 5-1/4 | 15     | AMB110   | Brass    | 110mm                   | 135mm | 440mm  | - |
| 912505   | Brass    | 1-1/4                   | 2       | 5      | 938751   | Brass    | 3-7/8                   | 5-1/4 | 15-1/2 | AMB115   | Brass    | 115mm                   | 145mm | 460mm  | - |
| 912507   | Brass    | 1-1/4                   | 2-1/8   | 5      | 940001   | Brass    | 4                       | 5     | 16     | AMB120   | Brass    | 120mm                   | 155mm | 480mm  | - |
| 913751   | Brass    | 1-3/8                   | 1-7/8   | 5-1/2  | 940002   | Brass    | 4                       | 5-1/4 | 16     | AMB130   | Brass    | 130mm                   | 170mm | 520mm  | - |
| 913752   | Brass    | 1-3/8                   | 2       | 5-1/2  | 941251   | Brass    | 4-1/8                   | 5-1/4 | 16-1/2 | AMB140   | Brass    | 140mm                   | 180mm | 560mm  | - |
| 913754   | Brass    | 1-3/8                   | 2-1/8   | 5-1/2  | 942501   | Brass    | 4-1/4                   | 5-1/2 | 17     |          |          |                         |       |        |   |
| 915001   | Brass    | 1-1/2                   | 2       | 6      | 943751   | Brass    | 4-3/8                   | 5-3/4 | 17-1/2 |          |          |                         |       |        |   |
| 915004   | Brass    | 1-1/2                   | 2-3/8   | 6      | 945002   | Brass    | 4-1/2                   | 5-1/2 | 18     |          |          |                         |       |        |   |
| 916251   | Brass    | 1-5/8                   | 2-1/8   | 6-1/2  | 945004   | Brass    | 4-1/2                   | 5-3/4 | 18     |          |          |                         |       |        |   |
| 916255   | Brass    | 1-5/8                   | 2-5/8   | 6-1/2  | 946251   | Brass    | 4-5/8                   | 6-1/8 | 18-1/2 |          |          |                         |       |        |   |
| 917501   | Brass    | 1-3/4                   | 2-3/8   | 7      | 947501   | Brass    | 4-3/4                   | 6-1/8 | 19     |          |          |                         |       |        |   |
| 917503   | Brass    | 1-3/4                   | 2-1/2   | 7      | 948751   | Brass    | 4-7/8                   | 6-1/8 | 19-1/2 |          |          |                         |       |        |   |
| 917502   | Brass    | 1-3/4                   | 2-5/8   | 7      | 950001   | Brass    | 5                       | 6-1/8 | 20     |          |          |                         |       |        |   |
| 918251   | Brass    | 1-7/8                   | 2-5/8   | 7-1/2  | 950002   | Brass    | 5                       | 6-1/2 | 20     |          |          |                         |       |        |   |
| 918252   | Brass    | 1-7/8                   | 2-15/16 | 7-1/2  | 952501   | Brass    | 5-1/4                   | 6-3/4 | 21     |          |          |                         |       |        |   |
| 920001   | Brass    | 2                       | 2-5/8   | 8      | 952502   | Brass    | 5-1/4                   | 7     | 21     |          |          |                         |       |        |   |
| 920002   | Brass    | 2                       | 2-3/4   | 8      | 953751   | Brass    | 5-3/8                   | 6-3/4 | 21-1/2 |          |          |                         |       |        |   |
| 920003   | Brass    | 2                       | 3       | 8      | 953752   | Brass    | 5-3/8                   | 7     | 21-1/2 |          |          |                         |       |        |   |
| 921252   | Brass    | 2-1/8                   | 2-15/16 | 8-1/2  | 955001   | Brass    | 5-1/2                   | 7     | 22     |          |          |                         |       |        |   |
| 921254   | Brass    | 2-1/8                   | 3-1/8   | 8-1/2  | 955003   | Brass    | 5-1/2                   | 7-1/4 | 22     |          |          |                         |       |        |   |
| 922501   | Brass    | 2-1/4                   | 2-15/16 | 9      | 956251   | Brass    | 5-5/8                   | 7     | 22-1/2 |          |          |                         |       |        |   |
| 922502   | Brass    | 2-1/4                   | 3       | 9      | 957501   | Brass    | 5-3/4                   | 7     | 23     |          |          |                         |       |        |   |
| 922503   | Brass    | 2-1/4                   | 3-1/8   | 9      | 958751   | Brass    | 5-7/8                   | 7-1/2 | 24     |          |          |                         |       |        |   |
| 922505   | Brass    | 2-1/4                   | 3-3/8   | 9      | 960001   | Brass    | 6                       | 7-1/2 | 24     |          |          |                         |       |        |   |
| 923751   | Brass    | 2-3/8                   | 3-3/8   | 9-1/2  | 965001   | Brass    | 6-1/2                   | 8-3/8 | 30     |          |          |                         |       |        |   |
| 925002   | Brass    | 2-1/2                   | 3-1/8   | 10     | AMB025   | Brass    | 25mm                    | 40mm  | 100mm  |          |          |                         |       |        |   |
| 925003   | Brass    | 2-1/2                   | 3-1/4   | 10     | AMB028   | Brass    | 28mm                    | 42mm  | 112mm  |          |          |                         |       |        |   |
| 925004   | Brass    | 2-1/2                   | 3-3/8   | 10     | AMB030   | Brass    | 30mm                    | 45mm  | 120mm  |          |          |                         |       |        |   |
| 925005   | Brass    | 2-1/2                   | 3-1/2   | 10     | AMB032   | Brass    | 32mm                    | 45mm  | 128mm  |          |          |                         |       |        |   |
| 926252   | Brass    | 2-5/8                   | 3-3/8   | 10-1/2 | AMB035   | Brass    | 35mm                    | 50mm  | 140mm  |          |          |                         |       |        |   |
| 927501   | Brass    | 2-3/4                   | 3-3/8   | 11     | AMB038   | Brass    | 38mm                    | 55mm  | 152mm  |          |          |                         |       |        |   |

| DIAMETER  |          | HUB DIMENSIONS (INCHES) |        |        |                 |                  |
|---|----------|-------------------------|--------|--------|-----------------|------------------|
| PART NO.  | MATERIAL | I.D.                    | O.D.   | LENGTH | FLANGE DIAMETER | FLANGE THICKNESS |
| FLANGED BEARINGS CURRENTLY AVAILABLE BY SPECIAL REQUEST ONLY. | Brass    | 3-1/2                   | 4-7/8  | 14     | 7-3/8           | 1/2              |
|   | Brass    | 3-3/4                   | 5-1/4  | 15     | 7-3/4           | 1/2              |
|   | Brass    | 4                       | 5-1/2  | 16     | 8               | 1/2              |
|   | Brass    | 4-1/4                   | 5-3/4  | 17     | 8-1/4           | 1/2              |
|   | Brass    | 4-1/2                   | 6      | 18     | 8-7/8           | 1/2              |
|   | Brass    | 4-3/4                   | 6-1/4  | 19     | 9-1/8           | 1/2              |
|   | Brass    | 5                       | 6-3/4  | 20     | 9-5/8           | 9/16             |
|   | Brass    | 5-1/4                   | 6-7/8  | 21     | 9-7/8           | 9/16             |
|   | Brass    | 5-1/2                   | 7-1/4  | 22     | 10-1/4          | 9/16             |
|   | Brass    | 5-3/4                   | 7-1/4  | 23     | 10-1/4          | 9/16             |
|   | Brass    | 6                       | 7-3/4  | 24     | 11              | 9/16             |
|   | Brass    | 6-1/4                   | 8      | 22-1/2 | 10-5/8          | 9/16             |
|   | Brass    | 6-1/2                   | 8-3/8  | 23-1/2 | 11              | 9/16             |
|   | Brass    | 7                       | 9      | 25-1/2 | 11-5/8          | 9/16             |
|   | Brass    | 7-1/4                   | 9-1/4  | 26-1/2 | 11-7/8          | 9/16             |
|   | Brass    | 7-1/2                   | 9-5/8  | 27-1/2 | 12-1/4          | 9-16             |
|   | Brass    | 7-3/4                   | 9-7/8  | 28-1/2 | 12-1/2          | 9/16             |
|   | Brass    | 8                       | 10-1/4 | 29-1/2 | 11-1/4          | 5/8              |
|   | Brass    | 8                       | 10-1/2 | 29-1/2 | 13-1/4          | 5/8              |
|   | Brass    | 8-1/2                   | 10-3/4 | 31-1/2 | 13-1/2          | 5/8              |
|   | Brass    | 9                       | 11-1/4 | 33-1/2 | 14-1/4          | 3/4              |
| Brass   | 9-1/4    | 11-1/2                  | 34-1/2 | 14-5/8 | 3/4             |                  |
| Brass   | 9-1/4    | 11-3/4                  | 35-1/2 | 14-7/8 | 3/4             |                  |

# PHENOLIC BEARINGS

## Tolerances

| Bearing I.D.    | O.D. Tolerance (p6) |
|-----------------|---------------------|
| Metric          | Metric              |
| 20 mm - 35 mm   | +0.026mm - +0.042mm |
| 38 mm           | +0.032mm - +0.051mm |
| 40 mm - 45 mm   | +0.032mm - +0.051mm |
| 50 mm - 60 mm   | +0.032mm - +0.051mm |
| 65 mm - 75 mm   | +0.037mm - +0.059mm |
| 80 mm - 95 mm   | +0.037mm - +0.059mm |
| 96 mm - 100 mm  | +0.043mm - +0.068mm |
| 105 mm - 110 mm | +0.043mm - +0.068mm |
| 115 mm - 125 mm | +0.043mm - +0.068mm |
| 135 mm          | +0.043mm - +0.068mm |
| 140 mm - 150 mm | +0.050mm - +0.079mm |
| 155 mm - 160 mm | +0.050mm - +0.079mm |
| 165 mm - 170 mm | +0.050mm - +0.079mm |
| 175 mm - 180 mm | +0.050mm - +0.079mm |
| 190 mm - 260 mm | +0.056mm - +0.088mm |

### High-Performance Water Lubricated Aqualube Bearings

Michigan Wheel's Aqualube bearings offer a high quality solution for water lubricated shaft applications. Aqualube bearings are designed with longitudinal

grooves that form a hydrodynamic wedge, or water film, between the shaft and the bearing, even during slow speed operation. This water film is capable of absorbing shock, and reducing vibration and noise.

Aqualube bearings are built from chemical and oil resistant nitrile rubber, and are available with brass and non-metallic (Phenolic) shells to fit many applications. Every bearing is inspected to ensure quality. Michigan Wheel stocks a large inventory of common sizes, and special sizes are available upon request.

### Why Buy Aqualube Phenolic Bearings?

All Aqualube bearings are engineered to be compatible with metric or imperial shaft tolerances. 100% of the bearings produced are inspected for quality and must meet Michigan's strict quality standards before they are released to our customers. Phenolic shells are less reactive and can help reduce chances of corrosion in some applications such as aluminum hulls.

**Available in Metric & Imperial Sizes.**

**Phenolic, Brass, and Flanged styles available.**

*Unsure if this is the right bearing for you? Contact your local Michigan Wheel Distributor, or the Michigan Wheel team to review your application.*

*Excellence in Propulsion.*

## AQUALUBE PHENOLIC SPECIFICATIONS

| DIAMETER |          | HUB DIMENSIONS (INCHES) |         |        | DIAMETER |          | HUB DIMENSIONS (INCHES) |       |        | DIAMETER |          | HUB DIMENSIONS (INCHES) |       |        |
|----------|----------|-------------------------|---------|--------|----------|----------|-------------------------|-------|--------|----------|----------|-------------------------|-------|--------|
| PART No. | MATERIAL | I.D.                    | O.D.    | LENGTH | PART No. | MATERIAL | I.D.                    | O.D.  | LENGTH | PART No. | MATERIAL | I.D.                    | O.D.  | LENGTH |
| 961020   | Phenolic | 3/4                     | 1-1/4   | 3      | 962120   | Phenolic | 2-1/4                   | 3     | 9      | 963340   | Phenolic | 5                       | 6-1/2 | 20     |
| 961060   | Phenolic | 7/8                     | 1-1/4   | 3-1/2  | 962140   | Phenolic | 2-1/4                   | 3-1/8 | 9      | 963360   | Phenolic | 5-1/4                   | 6-3/4 | 21     |
| 961070   | Phenolic | 7/8                     | 1-3/8   | 3-1/2  | 962160   | Phenolic | 2-1/4                   | 3-3/8 | 9      | 963370   | Phenolic | 5-1/4                   | 7     | 21     |
| 961080   | Phenolic | 7/8                     | 1-1/2   | 3-1/2  | 962220   | Phenolic | 2-3/8                   | 3-3/8 | 9-1/2  | 963400   | Phenolic | 5-3/8                   | 6-3/4 | 21-1/2 |
| 961102   | Phenolic | 1                       | 1-1/4   | 4      | 962320   | Phenolic | 2-1/2                   | 3-1/8 | 10     | 963410   | Phenolic | 5-3/8                   | 7     | 21-1/2 |
| 961110   | Phenolic | 1                       | 1-3/8   | 4      | 962330   | Phenolic | 2-1/2                   | 3-1/4 | 10     | 963420   | Phenolic | 5-1/2                   | 7     | 22     |
| 961120   | Phenolic | 1                       | 1-1/2   | 4      | 962340   | Phenolic | 2-1/2                   | 3-3/8 | 10     | 963440   | Phenolic | 5-1/2                   | 7-1/4 | 22     |
| 961130   | Phenolic | 1                       | 1-5/8   | 4      | 962350   | Phenolic | 2-1/2                   | 3-1/2 | 10     | 963500   | Phenolic | 5-5/8                   | 7     | 22-1/2 |
| 961150   | Phenolic | 1                       | 2       | 4      | 962420   | Phenolic | 2-5/8                   | 3-3/8 | 10-1/2 | 963620   | Phenolic | 5-3/4                   | 7     | 23     |
| 961300   | Phenolic | 1-1/8                   | 1-1/2   | 4-1/2  | 962520   | Phenolic | 2-3/4                   | 3-3/8 | 11     | 963660   | Phenolic | 5-7/8                   | 7-1/2 | 24     |
| 961320   | Phenolic | 1-1/8                   | 1-5/8   | 4-1/2  | 962530   | Phenolic | 2-3/4                   | 3-1/2 | 11     | 963720   | Phenolic | 6                       | 7-1/2 | 24     |
| 961340   | Phenolic | 1-1/8                   | 1-3/4   | 4-1/2  | 962540   | Phenolic | 2-3/4                   | 3-3/4 | 11     | AMNM025  | Phenolic | 25mm                    | 40mm  | 100mm  |
| 961360   | Phenolic | 1-1/8                   | 2       | 4-1/2  | 962580   | Phenolic | 2-7/8                   | 3-3/4 | 12     | AMNM028  | Phenolic | 28mm                    | 42mm  | 112mm  |
| 961500   | Phenolic | 1-1/4                   | 1-1/2   | 5      | 962620   | Phenolic | 3                       | 3-3/4 | 12     | AMNM030  | Phenolic | 30mm                    | 45mm  | 120mm  |
| 961540   | Phenolic | 1-1/4                   | 1-3/4   | 5      | 962640   | Phenolic | 3                       | 4     | 12     | AMNM032  | Phenolic | 32mm                    | 45mm  | 128mm  |
| 961560   | Phenolic | 1-1/4                   | 2       | 5      | 962680   | Phenolic | 3-1/8                   | 4-1/4 | 12-1/2 | AMNM035  | Phenolic | 35mm                    | 50mm  | 140mm  |
| 961580   | Phenolic | 1-1/4                   | 2-1/8   | 5      | 962720   | Phenolic | 3-1/4                   | 4     | 13     | AMNM038  | Phenolic | 38mm                    | 55mm  | 152mm  |
| 961700   | Phenolic | 1-3/8                   | 1-7/8   | 5-1/2  | 962740   | Phenolic | 3-1/4                   | 4-1/4 | 13     | AMNM040  | Phenolic | 40mm                    | 55mm  | 160mm  |
| 961720   | Phenolic | 1-3/8                   | 2       | 5-1/2  | 962780   | Phenolic | 3-3/8                   | 4-1/2 | 13-1/2 | AMNM045  | Phenolic | 45mm                    | 65mm  | 180mm  |
| 961740   | Phenolic | 1-3/8                   | 2-1/8   | 5-1/2  | 962820   | Phenolic | 3-1/2                   | 4-1/4 | 14     | AMNM050  | Phenolic | 50mm                    | 70mm  | 200mm  |
| 961760   | Phenolic | 1-3/8                   | 2-3/8   | 5-1/2  | 962840   | Phenolic | 3-1/2                   | 4-1/2 | 14     | AMNM055  | Phenolic | 55mm                    | 75mm  | 220mm  |
| 961800   | Phenolic | 1-1/2                   | 2       | 6      | 962880   | Phenolic | 3-5/8                   | 4-1/2 | 14-1/2 | AMNM060  | Phenolic | 60mm                    | 80mm  | 240mm  |
| 961820   | Phenolic | 1-1/2                   | 2-3/8   | 6      | 962920   | Phenolic | 3-3/4                   | 4-1/2 | 15     | AMNM065  | Phenolic | 65mm                    | 85mm  | 260mm  |
| 961860   | Phenolic | 1-5/8                   | 2-1/8   | 6-1/2  | 962940   | Phenolic | 3-3/4                   | 5     | 15     | AMNM070  | Phenolic | 70mm                    | 90mm  | 280mm  |
| 961870   | Phenolic | 1-5/8                   | 2-5/8   | 6-1/2  | 962960   | Phenolic | 3-3/4                   | 5-1/4 | 15     | AMNM075  | Phenolic | 75mm                    | 95mm  | 300mm  |
| 961900   | Phenolic | 1-3/4                   | 2-3/8   | 7      | 962980   | Phenolic | 3-7/8                   | 5-1/4 | 15-1/2 | AMNM080  | Phenolic | 80mm                    | 100mm | 320mm  |
| 961920   | Phenolic | 1-3/4                   | 2-1/2   | 7      | 963020   | Phenolic | 4                       | 5     | 16     | AMNM085  | Phenolic | 85mm                    | 105mm | 340mm  |
| 961940   | Phenolic | 1-3/4                   | 2-5/8   | 7      | 963040   | Phenolic | 4                       | 5-1/4 | 16     | AMNM090  | Phenolic | 90mm                    | 110mm | 360mm  |
| 961960   | Phenolic | 1-7/8                   | 2-5/8   | 7-1/2  | 963060   | Phenolic | 4-1/8                   | 5-1/4 | 16-1/2 | AMNM095  | Phenolic | 95mm                    | 115mm | 380mm  |
| 961970   | Phenolic | 1-7/8                   | 2-15/16 | 7-1/2  | 963080   | Phenolic | 4-1/4                   | 5-1/2 | 17     | AMNM100  | Phenolic | 100mm                   | 125mm | 400mm  |
| 962000   | Phenolic | 2                       | 2-5/8   | 8      | 963100   | Phenolic | 4-3/8                   | 5-3/4 | 17-1/2 | AMNM105  | Phenolic | 105mm                   | 130mm | 420mm  |
| 962010   | Phenolic | 2                       | 2-3/4   | 8      | 963120   | Phenolic | 4-1/2                   | 5-1/2 | 18     | AMNM110  | Phenolic | 110mm                   | 135mm | 440mm  |
| 962020   | Phenolic | 2                       | 3       | 8      | 963140   | Phenolic | 4-1/2                   | 5-3/4 | 18     | AMNM115  | Phenolic | 115mm                   | 145mm | 520mm  |
| 962060   | Phenolic | 2-1/8                   | 2-15/16 | 8-1/2  | 963180   | Phenolic | 4-5/8                   | 6-1/8 | 18-1/2 | AMNM120  | Phenolic | 120mm                   | 155mm | 480mm  |
| 962070   | Phenolic | 2-1/8                   | 3-1/8   | 8-1/2  | 963200   | Phenolic | 4-3/4                   | 6-1/8 | 19     | AMNM130  | Phenolic | 130mm                   | 170mm | 520mm  |
| 962100   | Phenolic | 2-1/4                   | 2-15/16 | 9      | 963220   | Phenolic | 4-7/8                   | 6-1/8 | 19-1/2 |          |          |                         |       |        |



*Aqualube bearings are molded from a specially compounded oil and chemical resistant nitrile rubber. The nitrile rubber displays an excellent resistance to wear and abrasion and is also tough and durable. Bonded techniques developed by Michigan Wheel ensure that the strength of the bond to the shell is at least equal to the strength of the rubber itself.*

*Hale*



*Accurate recording of propeller condition. Precise measurements of:  
pitch, rake, track, spacing, geometry, and camber.*



## Advanced Technology in Electronic 3-D Propeller Analysis

Experienced propeller repair facilities prefer the Hale MRI for performing detailed and accurate propeller measurement. With the MRI's comprehensive reporting capability, the propeller technician can record and document the exact condition of a customer's propeller. The resulting concise and visual summary can assist customers in determining the optimal repair or reconditioning service best suited for their needs.



### MRI Features Include:

- Compatibility with Windows 7.
- Durable rotary and linear encoders that provide continuous and highly accurate 3D readings to the computer for analysis and recording.
- Measurements and reporting of Pitch, Rake, Track, Angular Spacing, Section Face Camber, and other geometric features for ANY propeller.
- Ability to compare one propeller to another, such as left hand vs. right hand rotation, or two of the same rotation. This allows for the exact matching of a propeller set.
- Permanent computer record of pre and post repair activities, which can be transferred to another MRI user via e-mail or data storage devices. With this information, any MRI user has the necessary details to provide a subsequent repair or recondition service resulting in a finished propeller closely matching the original. If replacement is necessary, the detailed dimensional information can be supplied to the propeller manufacturer for review and determination of an optimal new propeller.

## // COMPANY HISTORY

*With over a century of history, Michigan Wheel has become synonymous with reliable, quality propellers. Despite changes in ownership and cycles in the marine industry, Michigan Wheel has remained a dedicated supplier of marine propellers to the recreational and commercial marine industry.*







Today, Michigan Wheel offers tens of thousands of variations of propellers, and still retains its leadership position in original equipment and aftermarket propeller supply. The “Michigan” name is recognized and demanded worldwide. Much of the credit goes to the loyal and supportive Michigan Wheel distributor and builder base, and with the dedicated Michigan Wheel employees.

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An extensive history with marine propulsion has provided Michigan Wheel with a solid foundation to continue exceeding marine industry demands.

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## 1903

Michigan Wheel is organized by Harry Perkins as a machine shop for the production of a variety of items, including marine propellers.

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## 1934

Hall & Stavert is founded as a two man partnership. It will grow to become the largest propeller manufacturer in Canada.

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## 1949

Michigan Wheel Company purchases Federal Propellers, uniting the primary suppliers of recreational propellers. With a combined volume in production, Michigan Wheel Company is able to incorporate efficient manufacturing processes.

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## 1970-1979

Under new ownership by the Dana Corporation, the Michigan Wheel Company becomes Michigan Wheel Corporation, and buys Coolidge Propeller in Seattle, WA; and Gulf Coast Propeller in Pascagoula, MS.

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## 1980-1989

Computer-controlled milling gains favor, and Michigan Wheel takes advantage as one of the first to implement NC machining. Michigan Wheel’s CAD-CAM abilities are unsurpassed in the ranks of propeller manufacturers.

## 1997

Michigan Wheel acquires Canadian propeller competitor Hall & Stavert, manufacturer of the HyTorq Propeller series.

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## 2005

Michigan Wheel opens a facility in the UK, Michigan Wheel - Europe, launching a new range of inboard propellers - GOLD Line.

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## 2009

Under new ownership (The Anderson Group), Michigan Wheel Corporation is reorganized as Michigan Wheel Marine.

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## 2010

Michigan Wheel opens a facility in Dubai, United Arab Emirates, Michigan Wheel MEAA.

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## 2010

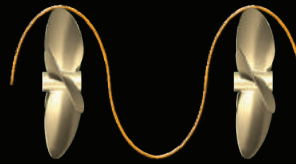
Michigan Wheel acquires UK bearing manufacturer Shearwater Marine, and introduces Aqualube to the American marketplace.

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## 2013

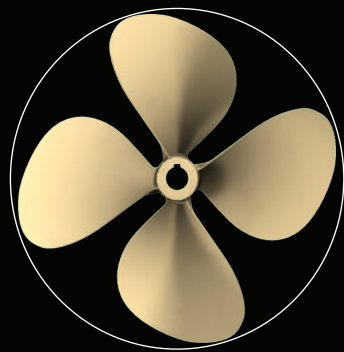
Michigan Wheel and Nakashima Propeller form a strategic partnership, allowing Michigan Wheel to offer propellers up 13m in diameter, controllable pitch propellers, and thrusters.

# // PROPELLER TERMS AND DEFINITIONS



## Pitch

The linear distance that a propeller would move in one revolution with no slippage.



## Diameter

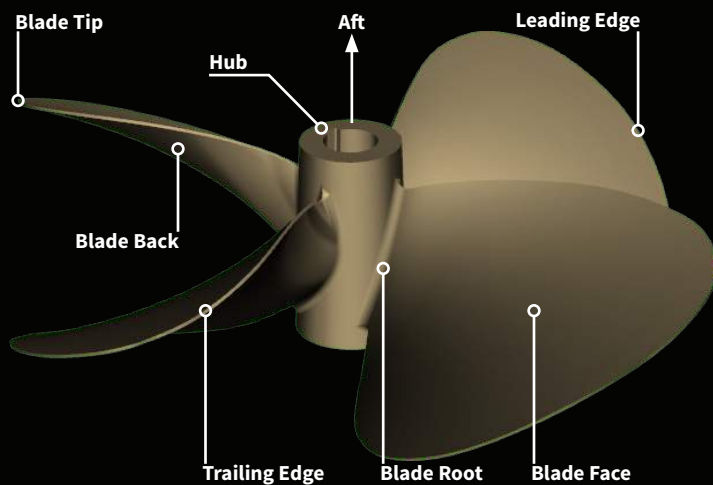
The diameter of the imaginary circle scribed by the blade tips as the propeller rotates.

## Blade Number

Equal to the number of blades on the propeller. (4-blade shown.)

## Radius

The distance from the axis of rotation to the blade tip. The radius multiplied by two is equal to the diameter.



## Leading Edge

The edge of the propeller blade adjacent to the forward end of the hub. When viewing the propeller from astern, this edge is furthest away. The leading edge leads into the flow when providing forward thrust.

## Trailing Edge

The edge of the propeller adjacent to the forward end of the hub. When viewing the propeller from astern, this edge is closest. The trailing edge retreats from the flow when providing forward thrust.

## Blade Back

Suction side. Forward side of the blade (surface facing the bow).

## Blade Face

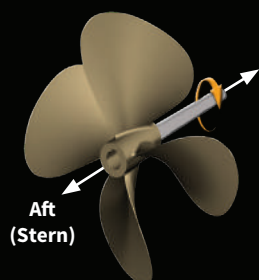
Pressure side; pitch side. Aft side of the blade (surface facing the stern).

## Blade Tip

Maximum reach of the blade from the center of the hub. Separates the leading and trailing edges.

## Blade Root

Fillet area. The region of transition from the blade surfaces and edges to the hub periphery. The area where the blade attaches to the hub.



## Rotation

When viewed from the stern (facing forward): Right-Hand propellers rotate clockwise to provide forward thrust; Left-Hand propellers rotate counter-clockwise.

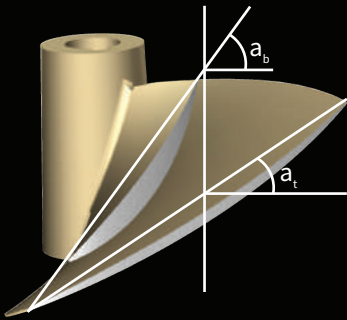
## Hub

Solid cylinder located at the center of the propeller. Bored to accommodate the engine shaft. Hub shapes include cylindrical, conical, radius, and barreled.

## Cup

Small radius of curvature located on the trailing edge of the blade.

# // PROPELLER TERMS AND DEFINITIONS



## Pitch Reference Line

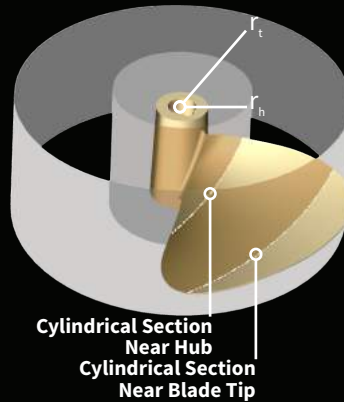
Reference line used to establish the geometric pitch angle for the section. This line may pass through the leading and trailing edges of the section and may be equivalent to the chord line. *(Image shown.)*

## Track

The absolute difference of the actual individual blade height distributions to the other blade height distributions. Always a positive value, and represents the spread between individual blade height distributions.

## Geometric Pitch Angle

The angle between the pitch reference line and a line perpendicular to the propeller axis of rotation.



## Cylindrical Section

A cross section of a blade cut by a circular cylinder whose centerline is the propeller axis of rotation.

$r_t$  = The radius of a cutting cylinder near the hub. The cylindrical section near the hub is located on the surface of this cylinder.

$r_h$  = The radius of a cutting cylinder near the tip. The cylindrical section near the tip is located on the surface of this cylinder.

## Controllable Pitch Propeller

The propeller blades mount separately to the hub, each on an axis of rotation, allowing a change of pitch in the blades and thus the propeller.

## Fixed Pitch Propeller

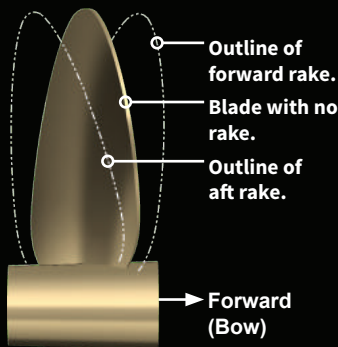
The propeller blades are permanently mounted and do not allow a change in the propeller pitch.

## Constant Pitch Propeller

The propeller blades have the same value of pitch from root to tip, and from leading edge to trailing edge.

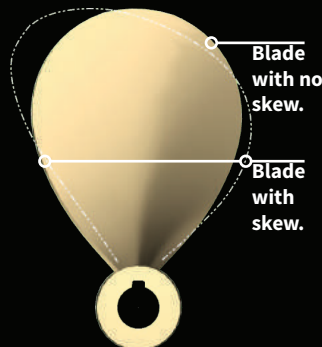
## Variable Pitch Propeller

The propeller blades have sections designed with varying values of local face pitch to pitch.



## Rake

The fore or aft slant of a blade with respect to a line perpendicular to the propeller axis of rotation.



## Skew

The transverse sweeping of a blade such that viewing the blades from fore or aft shows an asymmetrical shape.

## Aft Rake

Positive rake. Blades slant toward the aft end of the hub.

## Forward Rake

Negative rake. Blades slant toward the forward end of the hub.

## Aft Skew

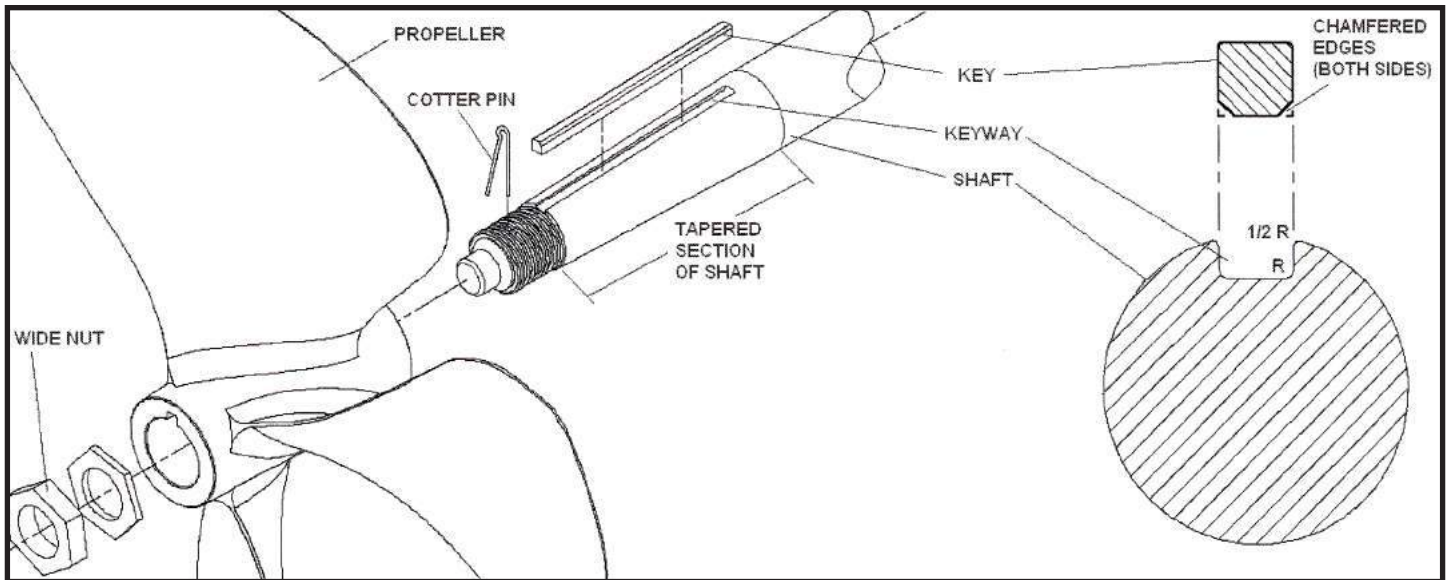
Positive skew. Blade sweep in direction opposite of rotation.

## Forward Skew

Negative skew. Blade sweep in the same direction as rotation.



# INBOARD PROPELLER INSTALLATION PROCESS



1. Push propeller snugly onto shaft taper WITHOUT key in either keyway (propeller or shaft).
2. Make sure the propeller is snug and there is no side to side movement by gently moving the propeller back and forth.
3. Make a line on the shaft with a non-graphite marker at the forward end of the propeller where it stops up against the shaft taper.
4. Remove propeller.
5. Put key into keyway on shaft taper with radiused or chamfered corners (down) in shaft keyway. (If propeller shaft keyway has radiused corners.)
6. Put propeller back onto shaft taper.
7. Check to see that the propeller moves back to the forward line made in Step 3. If it does, skip to Step 8. If it does not, perform the following:
  - a. Remove propeller from shaft.
  - b. Place a file on a flat surface area or work bench.
  - c. Run opposite end of chamfered key back and forth over file (to remove any burrs) with a downward pressure on key until side being filed is clean.
  - d. Install cleaned key in shaft keyway with chamfered corner side down in the shaft (the cleaned, filed side up in keyway).
  - e. Replace the propeller on the shaft and fit snugly on taper. Check to see if it reaches the line made as in Step 7. If it does not line up, repeat steps 7a through 7e.

Note: A vise can be used to hold key and then filed, but care must be taken not to tighten too much, causing burrs and irregularities on key.
8. When propeller hub moves to the correct position, install propeller nut on shaft and torque to seat the propeller. Install the torque jam nut also, if your shaft is so equipped.
9. Install cotter pin at the end of the shaft.



# Fixed Pitch Propellers

Marine Propulsion Systems





For over 25 years ZF Marine has produced propellers for the commercial and pleasure craft industries. Our close association with some of the leading schools of hydrodynamic design have helped shape our propeller families to be some of the industry's best in efficiency and robust design. ZF Marine has in-house naval architects ready to assist customers with the most challenging of applications and hull designs. Our manufacturing facility can produce propellers in a multitude of configurations, in a range of diameters from 50 centimeters (20") to 2 meters (79") or greater.

# The right propeller for your application



ZF Propellers

ZF Marine offers both standard and custom designed propellers utilizing CAD-CAM design technology. From yachts to ferries, cruisers to fishing vessels, whether it's a pleasure or commercial application, ZF Marine can provide "off the shelf" products, or can custom design propellers to meet specific performance criteria.

## Custom designed for individual applications

Our flexibility in being able to partner with naval architects, engineers, and end customers to design and

manufacture propellers that are unique to a single application is what sets ZF apart. Our in-house naval architects can work side by side with your project team to analyze your hull design and help maximize the performance and efficiency of the vessel's propulsion system. ZF offers complete flexibility in the diameter, number of blades, blade area ratio, section shape, skew, rake, and cupping. Our propellers can be designed to meet your exacting specifications.



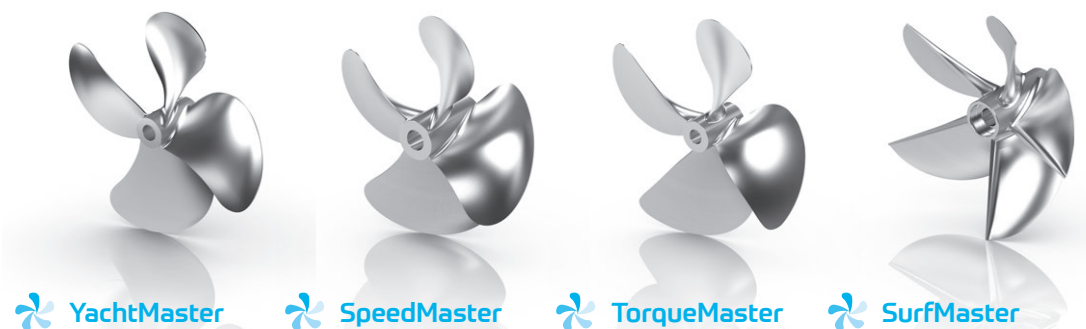


# Pleasure Craft Propellers

Pleasure Craft propellers from ZF are designed for maximum comfort and efficiency for various pleasure craft applications. Whether a sailboat, sportfish, or mega yacht, ZF has a product for the application. In addition to "standard" sized propellers ZF can create custom solutions for unique applications.



|                         |                 |                       |                                 |
|-------------------------|-----------------|-----------------------|---------------------------------|
| <b>Application</b>      | Sailing Vessels | Cruisers/<br>Trawlers | Sportfish Boats<br>(> 30 knots) |
| <b>Number of blades</b> | 3               | 4, 5                  | 4, 5                            |
| <b>DAR range*</b>       | 0.5-0.55        | 0.55-0.80             | 0.8-1.20                        |



|                         |                     |                               |                               |                |
|-------------------------|---------------------|-------------------------------|-------------------------------|----------------|
| <b>Application</b>      | Displacement Yachts | Planing Hulls<br>(> 25 knots) | Planing Hulls<br>(< 25 knots) | Surface Drives |
| <b>Number of blades</b> | 4, 5                | 4, 5                          | 4                             | 5,6            |
| <b>DAR range*</b>       | 0.55-1.20           | 0.8-1.20                      | 0.6-0.9                       | 0.8-1.20       |
|                         |                     | Progressive Pitch             | Constant Pitch                |                |

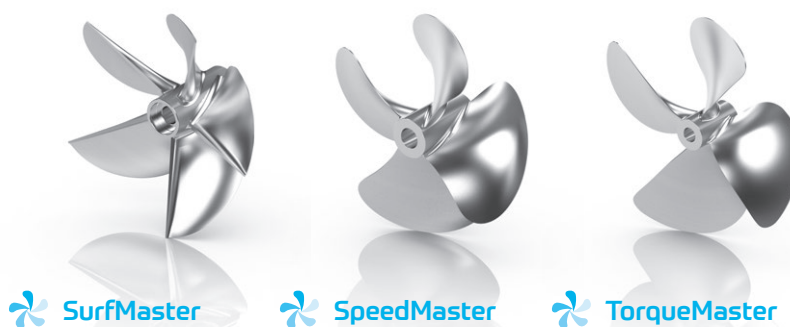
# Commercial Craft Propellers

Commercial Craft propellers from ZF are designed to meet the rigours of medium and continuous duty work applications. Commercial fishing, ferries, military, or civilian applications, it's all about getting the work done, every day. Whether you require bronze, NiBrAl, or stainless steel – all are options from ZF. In addition to standard and commercial thickness options, ZF offers DuraEdge. DuraEdge increases prop thickness at the tip of the blade. For continuous duty applications DuraEdge offers increased durability and longevity.



|                         |            |                 |                  |
|-------------------------|------------|-----------------|------------------|
| <b>Application</b>      | Crew Boats | Tugs/Push Boats | General Workboat |
| <b>Number of blades</b> | 4          | 3, 4, 5         | 4                |
| <b>DAR range*</b>       | 0.8-0.85   | 0.55-0.75       | 0.7              |

Kaplan



|                         |                |                            |                            |
|-------------------------|----------------|----------------------------|----------------------------|
| <b>Application</b>      | Surface Drives | Planing Hulls (> 25 knots) | Planing Hulls (< 25 knots) |
| <b>Number of blades</b> | 5, 6           | 4, 5                       | 4                          |
| <b>DAR range*</b>       | 0.8-1.20       | 0.8-1.20                   | 0.6-0.9                    |

Progressive Pitch

Constant Pitch

\* Other DARs are available upon customer request.

# Design and manufacturing

ZF propellers are manufactured to ISO 484/2 tolerance standards and can be ordered to meet any classification society requirements.

## Design

ZF Marine's team of design engineers offer unparalleled customer support throughout the lifecycle of a project. Once input from the customer about application and performance specification has been established, our design team runs simulations through our in-house software to complete an optimal propeller design. The design is presented to the customer and must be approved for manufacturing to commence.

## Casting

High quality alloys are chosen with the exact composition to meet both ZF's quality standards and any classification society requirements. The chemical composition and physical properties of the materials are precisely controlled and tested for each cast.

## Machining

Numerical Control machining centers are linked to the designer's 3D CAD geometry files to machine the propeller to a high tolerance. ZF Marine propellers can be machined to meet the highest geometrical tolerances required by the ISO 484/2 Class S standard.

## Dynamic Balance

Every propeller is dynamically balanced to ensure smooth operation. Dynamic balancing considerably reduces noise and vibration.

## Inspection

The propellers are scanned by industry leading measurement devices to verify every aspect of the geometry and ensure design compliance.



All of our series and custom designed propellers are serialized for easy tracking. In the event that a propeller is damaged beyond repair, a replacement can be manufactured to the original specification.

If you're looking for quality propellers & hardware, visit our website.