

CATALOG

INBOARD PROPELLER





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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.





66 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.



LOCATIONS AMERICAN MANUFACTURING. GLOBAL INFLUENCE.

UNITED STATES

World Headquarters 1501 Buchanan Ave. SW Grand Rapids, MI 49507

P: 1-800-369-4335

- F: 1-616-247-0227
- W: www.miwheel.com
- E: info@miwheel.com



Michigan Marine Propulsion - Europe Decoy Industrial Estate Silverhills Rd Newton Abbot, TQ12 5ND

P: +44 1626 351723

- F: +44 1626 351724
- W: www.miwheel-europe.com
- E: admin@miwheel-europe.com



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 precison.

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.















ROPELLERS











CX-600



MARLIN



DJ-355



CX-400



CX-700







SPECIFICATIONS

DJX						
BLADES	3					
E.A.R.	0.61					
DIAMETER RANGE	12" - 21"					
SKEW	21°					



DQX 17	"-22"
BLADES	4
E.A.R.	0.735
DIAMETER RANGE	17" - 22"
SKEW	21°



DQX 23"-32"						
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.

⁶⁶ THE 'X' SERIES IS THE STANDARD FOR HIGH QUALITY, PERFORMANCE-ORIENTED PROPELLERS.

Excellence in Propulsion.

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.

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

Diam	DIAMETER		HUB DIMENSIONS (INCHES)			Standard Taper Bore (Inches)		Μαχιμυμ	EXPANDED		
INCHES	MM	AFT END	FORWARD END	Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	Blade Width (Inches)	Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	^WR ² (LBSIN ²)
12	305	1-5/8	1-7/8	2-3/8	7/8	1-1/8	7/8	5-7/16	22.7	5	41
13	330	1-5/8	1-7/8	2-3/4	7/8	1-1/8	7/8	6	26.8	6	61
14	356	1-7/8	2-1/16	2-3/4	1	1-1/4	1	6-1/2	31	8	90
15	381	1-7/8	2-1/16	2-3/4	1	1-1/4	1	6-7/8	35.8	10	126
16	406	2-1/8	2-7/16	3-1/4	1-1/8	1-1/2	1-1/8	7-3/8	40.5	12	172
17	432	2-1/8	2-7/16	3-1/4	1-1/4	1-1/2	1-1/4	7-7/8	45.4	14	232
18	457	2-3/8	2-11/16	3-3/4	1-1/4	1-3/4	1-1/4	8-5/16	51.3	16	307
19	483	2-3/8	2-11/16	3-3/4	1-1/4	1-3/4	1-1/4	8-3/4	57.3	19	401
20	508	2-3/8	2-11/16	3-3/4	1-1/4	1-3/4	1-1/4	9-1/4	63.8	21	516
21	533	2-7/8	3-1/4	4-1/8	1-3/8	2	1-3/8	9-3/4	69.9	26	660
* WR2 = ±10	0% in Air (inch sq	uared lbs.)		M.W.R. = 0.37		B.T.F. = (0.048				

DQX SPECIFICATIONS (0.735 E.A.R.)

DIAMETER		HUB DIMENSIONS (INCHES)			Standard Taper Bore (Inches)		Махімим	EXPANDED			
INCHES	MM	AFT END	FORWARD END	Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	Blade Width (Inches)	Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbsin²)
17	432	2-1/8	2-7/16	3-1/4	1-1/4	1-1/2	1-1/4	7-3/16	41.4	16	279
18	457	2-3/8	2-11/16	3-1/4	1-1/4	1-3/4	1-1/4	7-5/8	46.4	18	370
19	483	2-3/8	2-11/16	3-3/4	1-1/4	1-3/4	1-1/4	8	51.9	21	482
20	508	2-3/8	2-11/16	3-3/4	1-1/4	1-3/4	1-1/4	8-7/16	57.7	24	621
21	533	2-3/4	3-1/4	4-1/8	1-3/8	2	1-3/8	8-7/8	63.2	29	794
22	559	2-7/8	3-1/4	4-1/8	1-3/8	2	1-3/8	9-5/16	69.6	33	997
* WR2 = ±10	0% in Air (inch sq	uared lbs.)		M.W.R. = 0.33	B.T.F. = 0.046						

DQX SPECIFICATIONS (0.81 E.A.R.)

Dian	Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)		Махімим	Expanded		
INCHES	MM	AFT END	FORWARD END	Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	Blade Width (Inches)	Area Per Blade (sq.in)	APPROX. NET WEIGHT (LBS.)	*WR ² (LBSIN ²)
23	406	2-7/8	3-1/4	Full Taper	1-1/2	2	1-1/2	10-5/8	83.7	45	1,392
24	432	3-1/8	3-1/2	Full Taper	1-1/2	2	1-1/2	11-1/16	91.4	50	1,714
25	457	3-1/2	3-7/8	FULL TAPER	1-3/4	2-1/4	1-3/4	11-9/16	98.6	60	2,111
26	483	3-1/2	3-7/8	Full Taper	1-3/4	2-1/4	1-3/4	12	106.9	65	2,557
27	508	3-7/8	3-7/8	FULL TAPER	2	2-1/2	2	12-1/2	114.8	77	3,099
28	533	3-7/8	3-7/8	Full Taper	2	2-1/2	2	12-15/16	123.8	83	3,700
30	559	4-1/8	4-5/8	FULL TAPER	2	2-3/4	2	13-7/8	141.5	110	5,240
32	584	4-1/2	5	Full Taper	2	3	2	14-3/4	161.8	126	7,176

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

M.W.R. = 0.37



12

DJX SPECIFICATIONS (0.61 E.A.R.)

B.T.F. = 0.046

WHY BUY "X" SERIES PROPELLERS?

Michigan "X" Series propellers are machine finished to provide some of the most accurate series propellers available. Increased blade area helps manage cavitation and vibration and ensures a smooth ride.







SPECIFICATIONS

DYNA-JET							
BLADES	3						
E.A.R.	0.56						
DIAMETER RANGE	12" - 21"						
PITCH RANGE	0.7 - 1.1						



BLADES	4
E.A.R.	0.69
DIAMETER RANGE	17" - 36"
PITCH RANGE	0.7 - 1.1



M-500						
5						
0.86						
24" - 46"						
0.75 - 1.3						

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.

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

Excellence in Propulsion.

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.

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

DYNA-JET & DYNA-QUAD SPECIFICATIONS

	Dyna-Jet & Dyna-Quad Specifications							Dyna-Jet (0.56 E.A.R.)				Dyna-Quad (0.69 E.A.R.)			
Diam	ETER	Нив [DIMENSIONS (IN	ICHES)	Standar	d Taper Bore	(INCHES)	Махімим	EXPANDED	APPROX.		Махімим	EXPANDED	APPROX.	
INCHES	MM	AFT END	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore	Blade Width (Inches)	Area Per Blade (sq.in)	Net Weight (lbs.)	*WR ² (lbsin ²)	Blade Width (Inches)	Area Per Blade (sq.in)	Net Weight (lbs.)	*WR ² (LBSIN ²)
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	3-1/4	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 Ai	r (inch square	ed lbs.)					** For Dyna	a-Jet Series	propellers on	ly - Sizes (D	ia. x Pitch) 17	7x16, 17x17 8	& 17x18 max	imum bore
For Dy For Dy	na-Jet na-Quad	M.W.R. = M.W.R. =	0.33 0.33	B.T.F. = B.T.F. =	0.050 0.047			is 1-1/2". A	II other 17" d	ameter size	s - maximum	bore is 1-3/8	<i>"</i> .		

M-500 SPECIFICATIONS (0.85 E.A.R.)

DIAMETER		HUB DIMENSIONS (INCHES)			Stand	ard Taper Bore (I	NCHES)	Махімим		A NI	
INCHES	MM	AFT END	Forward End	Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	BLADE WIDTH (INCHES)	AREA PER Blade (sq.in)	APPROX. NET WEIGHT (LBS.)	*WR ² (LBSIN ²)
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	3-1/8	3-1/4	4-5/8	1-1/2	2	1-1/2	9-1/16	70.6	43	1,430
24	610	3-1/8	3-1/4	4-5/8	1-1/2	2	1-1/2	9-1/2	77.1	48	1,770
26	660	3-3/8	3-5/8	5	1-3/4	2-1/4	1-3/4	10-1/2	90.2	62	2,630
28	711	3-3/4	4	5-3/4	2	2-1/2	2	11-1/16	104.4	79	3,810
30	762	4	4-1/4	6	2	3	2	11-7/8	119.3	99	5,380
32	813	4-1/2	4-7/8	6	2	3	2	12-5/8	136.5	115	7,380
34	864	4-1/2	5	6-1/2	2-1/4	3	2-1/4	13-7/16	154.7	134	9,960
36	914	5	5-1/2	8-1/4	2-3/4	3-1/2	2-3/4	14-1/4	173.0	164	13,250
38	965	5-1/4	5-1/2	8-1/4	2-3/4	3-1/2	2-3/4	15	193.5	186	17,280
40	1,016	5-1/4	5-1/2	9	3	3-3/4	3	15-7/8	214.1	221	22,320
42	1,067	5-1/2	6	10-1/2	3	4	3	16-9/16	235.5	267	28,520
44	1,118	5-1/2	6	10-1/2	3	4	3	17-3/8	258.9	305	35,900
46	1,168	5-1/2	6-1/4	10-1/2	3	4	3	18-3/16	283.5	347	44,740
* WR2 = ±10	% in Air (inch squ	ared lbs.)		M.W.R. = 0.37		B.T.F. = 0.	046				

D **PROPELLERS**





SPECIFICATIONS

МҮ-ТЗ								
BLADES	3							
E.A.R.	0.56							
DIAMETER RANGE	9" - 36"							
PITCH RANGE	0.7 - 1.1							



MY-	MY-T4								
BLADES	4								
E.A.R.	0.69								
DIAMETER RANGE	17" - 46"								
PITCH RANGE	0.7 - 1.1								



MY-T5								
5								
0.86								
22" - 46"								
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.

Excellence in Propulsion.

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

		HyTo	RQ SPECIFICA	TIONS			HyTorq MY-T3			HyTorq MY-T4			
		Боржирр		Standa	rd Taper Bore ((INCHES)							
Propeller Diameter	Aft hub Diameter	HUB Diameter	Hub Length	Minimum Bore	Maximum Bore	PILOT BORE	Weigнт (LB.)**	Developed Area (IN²)	WR ^{2**} (LB-IN ²)	Wеіднт (LB.)**	Developed Area (IN ²)	WR ^{2**} (LB-IN ²)	
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	3584	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	

		Hy		HyTora MY-T5					
				Stan	IDARD TAPER BORE (INC	CHES)			
Propeller Diameter	AFT HUB DIAMETER	Forward Hub Diameter	Hub Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	Wеіднт (LB.)**	Developed Area (IN²)	WR ^{2**} (LB-IN ²)
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



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HyTorq SPECIFICATIONS

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.

PROPELLERS



SPECIFICATIONS

SAILER 2-BLADE	"M" SERIES 3-BLADE SAILER "M" SERIES MP3					
BLADES 2	BLADES 3	BLADES 3				
E.A.R. 0.31	E.A.R. 0.44	E.A.R. 0.53				
DIAMETER RANGE 10" - 10"	DIAMETER RANGE 10" - 18"	DIAMETER RANGE 9" - 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"

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 stay 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 the right 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.

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

Diam	ETER		HUB DIMENSIONS (INCHES)		Standard Taper Bore (Inches)				
INCHES	ММ	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

Diam	ETER		HUB DIMENSIONS (INCHES)		Standard Taper Bore (Inches)				
INCHES	ММ	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)			Standa	rd Taper Bore (INCHES)		EXPANDED AREA		
INCHES	ММ	AFT END	FORWARD END	Length	MINIMUM BORE	Maximum Bore	PILOT BORE	Maximum Blade Width (Inches)	Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbsin²)
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
						ALC: No CONTRACTOR	The State of the State	Las and			

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SAILER 2 & 3 BLADE SPECIFICATIONS

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.





SPECIFICATIONS

DJ-3	55	M-506					
BLADES	3	BLADES	5				
E.A.R.	0.56	E.A.R.	1.06				
DIAMETER RANGE	9" - 40"	DIAMETER RANGE	22" - 46"				



DQ-4	169
BLADES	4
E.A.R.	0.70
DIAMETER RANGE	17" - 44"



DQ-4	86
BLADES	4
E.A.R.	0.86
DIAMETER RANGE	17" - 44"

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.

Excellence in Propulsion.

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

DJ355 & DQ469 Specifications							DJ355 - 0.55 E.A.R.			DQ469 - 0.69 E.A.R.					
Diam	ETER	Нив [DIMENSIONS (IN	NCHES)	Standari	D TAPER BORE	(INCHES)	Maximum Blade	Expanded Area Per	Approx. Net	*WR ²	Maximum Blade	Expanded Area Per	Approx. Net	*WR ²
INCHES	MM	AFT END	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore	WIDTH (INCHES)	BLADE (SQ.IN)	Weight (lbs.)	(LBSIN ²)	Width (Inches)	Blade (sq.in)	Weight (lbs.)	(LBSIN ²)
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				06 E.A.R.				
Diam	ETER	Нив [DIMENSIONS (IN	NCHES)	Standare	D TAPER BORE	E (INCHES)			Approx.	*\\/\D2			APPROX.	*\\/\D2
INCHES	MM	AFT END	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore	BLADE WIDTH (INCHES)	AREA PER BLADE (SQ.IN)	NET WEIGHT (LBS.)	(LBSIN ²)	BLADE WIDTH (INCHES)	AREA PER BLADE (SQ.IN)	NET WEIGHT (LBS.)	(LBSIN ²)
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.

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DJ355 & DQ469 SPECIFICATIONS





...THE CX SERIES OF
 PROPELLERS BY MICHIGAN
 WHEEL REPRESENT THE
 STATE-OF-THE-ART IN
 PROPELLER DESIGN,
 CONTROL, AND PERFOR MANCE. EVERY YACHT
 OWNER WITH A CX SERIES
 PROPELLER CAN REST EASY
 KNOWING THEY HAVE THE
 BEST POSSIBLE PROPELLER
 UNDER THEIR BOAT. 29

Excellence in Propulsion.

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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.

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





Hull Characteristic



68.0 x 62.0 CX-500, EAR = 1.00

Structural Analysis (FEA)



DESIGN CONSIDERATIONS

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

MARLIN Series





66 MARLIN SERIES PROPELLERS CONSISTENTLY OUT-PERFORM ALL OTHER SPORTFISH PROPELLERS ON THE MARKET IN SPEED AND FUEL EFFICIENCY. 99

Excellence in Propulsion.

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.

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

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COMMERCIAL Propellers



N NAKASHIMA **CONTROLLABLE PITCH**



NAKASHIMA TFN THRUSTER



N NAKASHIMA **FIXED PITCH**



TCT THRUSTER





MACHINE PITCH



DQ SPECIAL



KAPLAN







DURA-QUAD







PAC-MASTER



WORKHORSE $\left\{ \begin{array}{c} 0\\ 0\\ 0\\ \end{array} \right\}$ MACHINE PH Ц **PROPELLERS**



SPECIFICATIONS

MACH	INE PITCH
BLADES	3
E.A.R. 0.51	Diameter 9" - 60"
E.A.R. 0.47	Diameter 62" - 96"



WORKHORSE						
BLADES	4					
E.A.R. 0.71	Diameter 18" - 60"					
E.A.R. 0.62	Diameter 62" - 96"					



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.

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

			MACHINE P	итсн & Wor	rk Horse S	Specificatio	ONS			Machin	е Рітсн	Work I	Horse	Work I	Horse 5
Diam	ETER	Нив [Dimensions (In	ICHES)	Standari	D TAPER BORE	E (INCHES)	Махімим	Expanded	Approx.		Appox		Approx.	
INCHES	MM	AFT END	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore	Blade Width (Inches)	Area Per Blade (sq.in)	Net Weight (lbs.)	*WR ² (LBSIN ²)	APPROX. NET WEIGHT (LBS.)	*WR ² (LBSIN ²)	Net Weight (lbs.)	*WR ² (LBSIN ²)
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	//.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	0	2	3	2	12-3/16	141.8	97	5,960	121	7,920	150	10,526
34	014	4-7/10	5-1/10	0-3/4	2-1/4	3-1/4	2-1/4	12-7/0	170.5	114	10.250	142	10,360	011	10,795
30	914	4-3/4	0-1/2	7 4/4	2-1/2	3-1/2	2-1/2	13-3/6	179.5	130	10,350	170	13,750	211	10,274
40	905	5 1/16	5 12/16	7-1/4	2-1/2	3-3/4	2-1/2	15 2/16	200	177	16,200	221	22.070	240	20,311
40	1,010	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	203	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	-	-

MACHINE PITCH & WORK HORSE SPECIFICATIONS

COMMERCIAI **PROPELLERS**





SPECIFICATIONS

DQ SPECIAL							
BLADES	4						
E.A.R.	0.76 - 0.91						
DIAMETER RANGE	32" - 56"						



DURA-0	QUAD
BLADES	4
E.A.R.	0.76
DIAMETER RANGE	24" - 36"



PAC-MASTER							
4							
0.69							
20" - 30"							
Stainless Stee							

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.

⁶⁶...THREE SPECIALIZED LINES OF **DO PROPELLERS THAT MEET** THE NEEDS OF MANY OF TODAY'S COMMERCIAL APPLICATIONS.

Excellence in Propulsion.

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.

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

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

DIAMETER HUB DIMENSIONS (INCHES)		Stand	ard Taper Bore (In	ICHES)	Махімим			*\\/\D2			
INCHES	MM	AFT END	FORWARD END	Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	Blade Width (Inches)	AREA PER Blade (sq.in)	APPROX. NET WEIGHT (LBS.)	*WR ² (LBSIN ²)
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

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.)

Diam	ETER	Нив	HUB DIMENSIONS (INCHES)			STANDARD TAP	ER BORE (INCHES)	1	Махімим	EXPANDED		
INCHES	MM	AFT END	Forward End	LENGTH	Minimum Bore	Maximum Bore	PILOT BORE	PILOT S.E. BORE	Blade Width (Inches)	Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR ² (LBSIN ²)
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		Hu	B DIMENSIONS (INC)	ies)	STAND	ard Taper Bore (I	NCHES)	Махімим		A N	*\\\\D2
INCHES	ROTATION	AFT END	FORWARD END	Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	Blade Width (Inches)	AREA PER Blade (sq.in)	APPROX. NET WEIGHT (LBS.)	(LBSIN ²)
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" c	f listed are quote	d on request.					

PROPELLERS & NOZZLES





SPECIFICATIONS

KAPLAN							
BLADES	3, 4, 5						
E.A.R.	Varies						
DIAMETER RANGE	Many Sizes Available						

⁶⁶ 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 IN-**PUT POWER. 99

Excellence in Propulsion.

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.

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

	KAPLAN SPECIFICATIONS (0.56 E.A.R.)								
Hu	B DIMENSIONS (INCH	ies)	Stand	ard Taper Bore (I	NCHES)	Махімим			
AFT END	FORWARD END	Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	Blade Width (Inches)	BLADE (SQ.IN)	WEIGHT (LBS.)	*WR ² (lbsin ²)
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
5-1/16	5-13/16	8	2-3/4	3-3/4	2-3/4	11-3/4	167	154	11,300
5-1/4	6	8-1/4	2-3/4	3-3/4	2-3/4	12-7/8	203	196	18,240
6	6-3/4	10	3	4	3	13-9/16	222	246	23,220
6	6-3/4	10	3	4	3	14-3/16	243	269	28,650
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
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
7-5/8	8-3/8	11-1/2	4	5	4	16-5/8	333	445	63,600
7-5/8	8-3/8	12	4	5	4	17-3/4	383	521	89,230
9	10	13-1/4	4	6	4	19-3/16	436	701	126,330
10-1/2	11-3/4	14-1/2	5	7	5	20-5/8	494	907	175,980
10-1/2	11-3/4	14-1/2	5	7	5	21-11/16	554	1,011	231,530
10-1/2	11-3/4	14-1/2	5	7	5	22-3/4	618	1,128	300,500
11-1/8	12-1/2	17	6	7-1/2	6	24	687	1,350	391,360
11-1/8	12-1/2	17	6	7-1/2	6	25-1/16	758	1,493	495,870
11-1/8	12-1/2	17	6	7-1/2	6	26-1/8	832	1,650	621,740
11-7/8	13-1/4	18-1/4	6-1/2	8	6-1/2	27-7/16	911	1,915	780,850
11-7/8	13-1/4	18-1/4	6-1/2	8	6-1/2	28-1/2	993	2,104	961,860

DIAMETER		Hu	B DIMENSIONS (INCH	ies)	STAND	Standard Taper Bore (Inches)			Expanded	0 NI	
INCHES	MM	AFT END	FORWARD END	Length	MINIMUM BORE	MAXIMUM BORE	PILOT BORE	Blade Width (Inches)	Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR ² (LBSIN ²)
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

* WR2 = ±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.

	NS	MB TYPE 19 NO	ZZLE SPECIFICAT	IONS	NSMB TYPE 37 NOZZLE SPECIFICATIONS						
	PRINCIPLE DIME	INSIONS (INCHES)		Approximate Net Weight		PRINCIPLE DIME	INSIONS (INCHES)		Approximate Net Weight		
А	В	С	D	(Lвѕ.)	А	В	С	D	(Lbs.)		
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		

PROPELLERS

WE	ED	LESS	Α-
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Diam	IETER		Hu		s)	Махімим	MAXIMUM BI ADF	EXPANDED AREA		
INCHES	MM	Available Pitch	AFT END	FORWARD END	Length	Straight Bore (Inches)	WIDTH (INCHES)	Per Blade (sq.in)	Approx. Net Weight (lbs.)	B.T.F.
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

Diam	IETER		Available Pitch Aft End Forward		ies)		Махімим	EXPANDED		
INCHES	MM	AVAILABLE PITCH			Length	Maximum Straight Bore (Inches)	Blade Width (Inches)	Area Per Blade (sq.in)	APPROX. NET WEIGHT (LBS.)	B.T.F.
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

Dian	IETER		Нив	DIMENSIONS (INC	CHES)	Махімим	Maximum Maximum		EXPANDED	Approx.	
INCHES	MM	Available Pitch	AFT END	Forward End	Length	Standard Taper Bore (Inches)	Straight Bore (Inches)	Blade Width (Inches)	Area Per Blade (sq.in)	NET WEIGHT (LBS.)	B.T.F.
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



\mathbf{O}	MICHIGAN
	WHEEL

SPECIFICATIONS

WEED	LESS
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.

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

-C SPECIFICATIONS

WEEDLESS SPECIFICATIONS



LARGE COMMERCIAL **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.



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.

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.

Parthers in Propulsion.

B(0)THRUSTERS



FIXED PITCH BOW THRUSTERS

 Model TFN tunnel thrusters utilize fixed pitch propellers to minimize maintenance costs.

• The tunnel assembly is built with a vessels.

reinforced structure to allow it to be easily mounted in various types of

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, rollon/roll-off vessels, container ships, offshore supply vessels, and patrol craft.

Parthers in Propulsion.



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











SERIES

⁶⁶ REPLACING PROPELLERS WITH DESIGNS NOT SPECIAL-**IZED FOR YOUR APPLICATION** CAN RESULT IN HAUL-OUTS, PITCH CHANGES, NEW VI-**BRATIONS, AND DECREASED** PERFORMANCE. ,, Excellence in Propulsion.

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.

TRAWI	LER	МАХ	MA
BLADES	4	BLADES	3/4
E.A.R.	0.44	E.A.R.	0.63 / 0.836
DIAMETER RANGE	36" - 72"	DIAMETER RANGE	32" - 50"
Commercial Applications	Ì,	Commercial Applications	Ĵ

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.



"HX" SERIES BLADES 4/5 E.A.R. Varies **APPLICATION** Pleasure Recreational Applications



mum thrust.



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



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 maxi-



"Y" SE	RIES
BLADES	3/4/5
E.A.R.	0.66 / 0.835 / 0.935
APPLICATION	Pleasure
Recreational Applications	

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.

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.

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

POWER TOW Propellers





SPECIFICATIONS

POWE	RTOW
DESIGN VESSEL	Towboats, Pushboats
BLADE NUMBER	3,4,5
SIZE RANGE	18" to say 180" depending upon material

AVAILABLE MATERIAL



Bronze

40

Michigan Power Tow delivers the maximum thrust vessels need, with the fuel efficiency you want.

Each propeller is expertly engineered and built to Michigan Wheel's high quality material standards. Keeping an earned reputation of reliable, repairable propellers for over 100 years.



Stainless Steel

• Heavy duty edges.

NiBrAl

- Excellent durability and service life.
- Manufactured to Michigan Wheel's strict tolerances to ensure 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.



COMPREHENSIVE PROPULSION Systems





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 wakeadapted 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.



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. **99** Excellence in Propulsion.

AQUALUBE BEARINGS





WHY CHOOSE THE **MICHIGAN AQUALUBE?**

- Consistent high quality
- High resistance to abrasion
- High grade materials
- Hydrodynamic wedge formation
- Engineering excellence
- Large warehouse inventory
- 100% inspection procedure

Our Product:

The Aqualube range of rubber sleeved bearings are designed for marine and industrial applications. The Bearings feature a specially formulated nitrile rubber which offers outstanding resistance to abrasion and wear.

Michigan Wheel USA's comprehensive range of standard brass shell bearings, with tolerances suited for American shaft and strut standards, will be stocked in shaft diameter sizes 1" through 10".

We can also quote, upon request, an expanded range of bearings including:

- Sizes for shafting up to 10" in diameter.
- Metric sizes from 20mm through 260mm.
- Flanged, non-metallic (phenolic) shelled, and spiral fluted bearings.

Principle of Operation:

Rubber and water make the perfect combination for a bearing material and a lubricant. The natural resilience of rubber gives the bearing its shock, vibration and noise absorption properties.

The unique shape of the Aqualube bearing strips allow a hydrodynamic water wedge to form between shaft and bearing, even at low shaft speeds. Water is the perfect lubrication medium, particularly for marine craft. When the water enters the bearing through the longitudinal grooves it moves radially between the propeller shaft and the bearing face in a thin film. Once this film, or wedge, has developed, the shaft will not come into contact with the bearing.

Excellence in Propulsion.

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

Construction of AQUALUBE Bearings:

Aqualube bearings are molded from a specially compounded oil and chemical resistant nitrile rubber. The nitrile rubber demonstrates an excellent resistance to wear and abrasion and is also tough and durable. Bonding 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.



Abrasion Resistance:

The unique shape of the Aqualube bearing gives it an The minimum to maximum operating speed of an excellent resistance to abrasion. This helps to reduce wear on Aqualube bearing is in the range of 100 - 6,900 feet per the bearing surfaces in environments where sand and other minute (0.5 - 35 meters per second). For applications abrasive particles are held in suspension, as found in shallow outside these parameters the Michigan Wheel technical water. The bearing is designed to let these abrasive particles department should be consulted as special provision for pass over its surface and into the grooves where it is flushed lubrication may be required. out by the water feed pressure. This system prevents the particles from getting embedded into the bearing surface and Load and Deflection: causing severe wear on the propeller shaft.

Lubrication -Wear and Durability:

All types of water lubricated rubber bearings will eventually upon the quality of the lubricating water, shaft tolerance and experience wear in service, even bearings operating in clean water. It is recommended that bearings should be inspected cm2) is acceptable. for wear whenever the vessel is hauled for storage or service. In cases where the bearing is operating in shallow water an **Inspection:** annual inspection is recommended. Bearings fitted to struts and completely immersed pump bearings have adequate Prior to shipping each bearing is subject to a 100% inspection lubrication. However, where bearings are installed in a position procedure. Bearings are thoroughly inspected for dimensional where the water flow is marginal, they should be lubricated by accuracy, rubber hardness and integrity of bond between a forced water flow system. This also applies to bearings which rubber and shell. have to cope with low shaft speed and high loads.

The finished product has a smooth, shiny surface to the rubber lining which, when compared with similar products on the market, provides visual testament to the quality of the bearing. Aqualube bearing shells are manufactured from either centrifugally cast superior marine bronze or non-metallic (phenolic) material. Aqualube bearings can be supplied with integral cast flanges.

> **AQUALUBE SPIRAL BEARINGS** Available for order.

Shaft Speed:

Aqualube water lubricated bearings have a Shore hardness of 70±3 and are suitable for operation in a temperature range of -13°F to 185°F (-25°C to 85° C). For temperatures above 86°F (30°C) bearing to shaft clearances may need to be adjusted. The load which can be carried by an Aqualube bearing is dependent deflection of the shaft. A normal working load of 36 psi (2.5kgs/





BEARING I.D.	O.D. TOLERANCE (P6)
Ілсн	Ілсн
3/4" - 11/4"	+0.0010" - +0.0017"
13/8"	+0.0013" - +0.0020"
11/2" - 13/4"	+0.0013" - +0.0020"
17/8" - 23/8"	+0.0013" - +0.0020"
21/2" - 3"	+0.0015" - +0.0023"
31/8" - 33/4"	+0.0015" - +0.0023"
37/8" - 4"	+0.0017 - +0.0027"
41/4" - 43/8"	+0.0017 - +0.0027"
41/2" - 47/8"	+0.0017 - +0.0027"
5" - 53/8"	+0.0017 - +0.0027"
51/2" - 53/4"	+0.0017 - +0.0027"
57/8"	+0.0020" - +0.0031"
6" - 61/4"	+0.0020" - +0.0031"
61/2"	+0.0020" - +0.0031"
7"	+0.0020" - +0.0031"
71/4" - 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 resistence 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.

Excellence in Propulsion.

Available in Metric & Imperial Sizes. Phenolic, Brass, and Flanged styles available.

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

					DRAJJE	LANINGS					
	IMPERIAL BRA	ASS BEARINGS	·		IMPERIAL BR	ASS BEARINGS			METRIC BRA	SS BEARINGS	
Part Number	ID	OD	Length	Part Number	ID	OD	LENGTH	PART NUMBER	ID	OD	Length
907501	3/4"	1-1/4"	3"	927701	2-7/8"	3-3/4"	11-1/2"	915008	1-1/2"	55MM	102MM
908751	7/8"	1-1/4"	3-1/2"	930001	3"	3-3/4"	12"	915009	1-1/2"	55MM	6"
908752	7/8"	1-3/8"	3-1/2"	930002	3"	4"	12"	957490	5-3/4"	175MM	23"
908753	7/8"	1-1/2"	3-1/2"	931251	3-1/8"	4-1/4"	12-1/2"	AMB025A	25MM	35MM	100MM
910001	1"	1-1/4"	4"	931002	3-1/8"	4-1/2"	12-1/2"	AMB025	25MM	40MM	100MM
910002	1"	1-3/8"	4"	932501	3-1/4"	4"	13"	AMB028	28MM	42MM	112MM
910003	1"	1-1/2"	4"	932502	3-1/4"	4-1/4"	13"	AMB030A	30MM	40MM	120MM
910004	1"	1-5/8"	4"	933750	3_3/8"	4-1/8"	13-1/2"	AMB030	30MM	45MM	120MM
910005	1"	2"	4"	033751	3-3/8"	4-1/2"	13-1/2"	AMB032	32MM	45MM	128MM
910008	1"	1-1/4"	6"	935001	3-1/2"	4-1/2	1/2	AMIB035	35MM	1-7/8"	140MM
911251	1_1/8"	1-1/2"	/-1/2"	935001	3-1/2"	4-1/4	14	AMB035	35MM	50MM	140MM
011252	1-1/8"	1-5/8"	4-1/2	935002	3-1/2"	4-1/Z 5"	15"	AMB039	29MM	55MM	152MM
011252	1 1/0"	1.2/4"	4-1/2	026251	3-1/Z 2 E/0"	4 1/2"	14 1/2"	AMIRO40	401414	2 1/0"	160MM
911255	1-1/0	1-3/4	4-1/2	930231	3-5/6	4-1/2	14-1/2	AMB040	401/11/1	2-1/0	10010101
911254	1-1/8	Z	4-1/2	937501	3-3/4	4-1/2	15	AIVIB040	401/11/1	IVIIVICC	1601/11/1
912501	1-1/4"	1-1/2"	5	937502	3-3/4"	5	15"	AMIB045	45IVIIVI	2-3/8	1801/11/1
912502	1-1/4"	1-5/8	5	937504	3-3/4"	5-1/4"	15"	AIVIB045	451/11/1	65IVIIVI	1801/11/1
912503	1-1/4"	1-3/4"	5"	938751	3-7/8"	5-1/4"	15-1/2"	AMIB050	50MM	2-5/8"	200MM
912505	1-1/4"	2"	5"	940001	4"	5"	16"	AMB050B	50MM	65MM	200MM
912507	1-1/4"	2-1/8"	5"	940002	4"	5-1/4"	16"	AMB050	50MM	70MM	200MM
913751	1-3/8"	1-7/8"	5-1/2"	941251	4-1/8"	5-1/4"	16-1/2"	AMIB055	55MM	3"	220MM
913752	1-3/8"	2"	5-1/2"	942501	4-1/4"	5-1/2"	17"	AMB055B	55MM	73MM	220MM
913754	1-3/8"	2-1/8"	5-1/2"	943750	4-3/8"	5-1/2"	17-1/2"	AMB055	55MM	75MM	220MM
913756	1-3/8"	2-3/8"	5-1/2"	943751	4-3/8"	5-3/4"	17-1/2"	AMIB060A	60MM	3"	240MM
915001	1-1/2"	2"	6"	945002	4-1/2"	5-1/2"	18"	AMIB060	60MM	3-1/4"	240MM
915004	1-1/2"	2-3/8"	6"	945003	4-1/2"	5-5/8"	18"	AMB060	60MM	80MM	240MM
916251	1-5/8"	2-1/8"	6-1/2"	945004	4-1/2"	5-3/4"	18"	AMB060B	60MM	85MM	240MM
916255	1-5/8"	2-5/8"	6-1/2"	946251	4-5/8"	6-1/8"	18-1/2"	AMIB065B	65MM	3-3/8"	260MM
917501	1-3/4"	2-3/8"	7"	947500	4-3/4"	6"	19"	AMB065	65MM	85MM	260MM
917502	1-3/4"	2-5/8"	7"	947501	4-3/4"	6-1/8"	19"	AMIB070A	70MM	3-3/4"	11"
917503	1-3/4"	2-1/2"	7"	948751	4-7/8"	6-1/8"	19-1/2"	AMB070	70MM	90MM	280MM
918251	1-7/8"	2-5/8"	7-1/2"	950001	5"	6-1/8"	20"	AMB075B	75MM	96MM	300MM
918252	1-7/8"	2-15/16"	7-1/2"	950002	5"	6-1/2"	20"	AMB075C	75MM	110MM	300MM
920001	2"	2-5/8"	8"	950004	5"	6-1/4"	20"	AMIB075	75MM	4"	300MM
920002	2"	2-3/4"	8"	952501	5-1/4"	6-3/4"	21"	AMB075	75MM	95MM	300MM
920003	2"	3"	8"	952502	5-1/4"	7"	21"	AMB080	80MM	100MM	320MM
921250	2-1/8"	2-3/4"	8-1/2"	953752	5-3/8"	7"	22"	AMIB080	80MM	4"	320MM
921252	2-1/8"	2-15/16"	8-1/2"	953753	5-3/8"	7"	21-1/2"	AMB085	85MM	105MM	340MM
921253	2-1/8"	3"	8-1/2"	955001	5-1/2"	7"	22"	AMIB085	85MM	4-1/2"	340MM
921254	2-1/8"	3-1/8"	8-1/2"	955003	5-1/2"	7-1/4"	22"	AMB090	90MM	110MM	360MM
922501	2-1/4"	2-15/16"	9"	956251	5-5/8"	7"	22-1/2"	AMB090C	90MM	115MM	360MM
922502	2-1/4"	3"	9"	957501	5-3/4"	7"	23"	AMIB090	90MM	4-1/2"	360MM
922503	2-1/4"	3-1/8"	9"	958751	5-7/8"	7-1/2"	24"	AMB095	95MM	115MM	380MM
922505	2-1/4"	3-3/8"	9"	960001	6"	7-1/2"	24"	AMB095B	95MM	120MM	380MM
923751	2-3/8"	3"	9-1/2"	960008	6"	7-3/4"	24-1/2"	AMB100	100MM	125MM	400MM
923752	2-3/8"	3-1/8"	9-1/2"	960022	6-1/4"	8"	25"	AMIB100	100MM	5-1/4"	400MM
023753	2-3/8"	3-1/4"	9-1/2"	965000	6-1/2"	8_2/8"	26"	AMB105	105MM	130MM	420MM
923754	2-3/8"	3-3/8"	9-1/2"	965000	6-1/2"	8-3/8"	20	AMB110	110MM	135MM	440MM
925001	2-3/0	2"	10"	960062	7"	0-3/0 0_1/9"	13_2/4"	AMB115A	115MM	140MM	460MM
925001	2-1/2	2.4/0"	10	900002	7	9-1/0	13-3/4	AMD445	11510101	14010101	40010101
920002	2-1/2"	3-1/8"	10"	900066	1	9-1/8	20-3/8	AIVIB115		1451/11/1	4001/11/1
925003	2-1/2	3-1/4	10					AIVID12UA		IVIIVICCI	48011111
925004	2-1/2"	3-3/8"	10"					AIVIB130	130MM	170MM	52UMM
925005	2-1/2"	3-1/2"	10"					AMB135	135MM	175MM	540MM
926252	2-5/8"	3-3/8"	10-1/2"					AMB140	140MM	180MM	560MM
926254	2-5/8"	3-1/2"	10-1/2"					AMB170E	170MM	210MM	680MM
927501	2-3/4"	3-3/8"	11"					AMB170D	170MM	213.9MM	680MM
927502	2-3/4"	3-1/2"	11"					AMB170C	170MM	214.1MM	680MM
927503	2-3/4"	3-3/4"	11"					AMB170B	170MM	218.6MM	680MM
927700	2-7/8"	3-1/2"	11-1/2"					AMB170A	170MM	218.7MM	680MM

BRASS FLANGED BEARINGS

		IMPERIAL BR	ass Flanged)				IMPERIAL BR	ASS FLANGED)			Imperial Br	ass Flanged			
Part	חו			FLANG	SE SIZE	Part	חו	OD		FLANG	GE SIZE	Part	חו	00	LENCTH	FLANG	E SIZE
NUMBER	iD	00	LENGTH	DIAMETER	THICKNESS	NUMBER	iD	00	LENGTH	DIAMETER	THICKNESS	NUMBER	1D	OD	LENGTH	DIAMETER	THICKNESS
650610	3-3/4"	5"	15"	7-3/4"	1/2"	953782	5-1/2"	7-1/4"	22"	10-1/4"	9/16"	960112	8"	10-1/4"	29-1/2"	13-1/4"	5/8"
935006	3-1/2"	5"	15"	7-1/2"	1"	955002	6"	7-3/4"	24"	11"	9/16"	960114	8"	10-1/2"	29-1/2"	13-1/4"	5/8"
953302	3-1/2"	4-7/8"	14"	7-3/8"	1/2"	955004	6-1/4"	8"	22-1/2"	10-5/8"	9/16"	960140	8-1/4"	10-1/2"	30-1/2"	13-1/2"	5/8"
953352	3-3/4"	5-1/4"	15"	7-3/4"	1/2"	956252	6-1/2"	8-3/8"	23-1/2"	11"	9/16"	960202	8-1/2"	10-3/4"	31-1/2"	13-3/4"	5/8"
953402	4"	5-1/2"	16"	8"	1/2"	956260	6-1/2"	8-3/8"	30"	11"	5/8"	960242	8-3/4"	11"	32-1/2"	14"	5/8"
953452	4-1/4"	5-3/4"	17"	8-1/4"	1/2"	956310	6-3/4"	8-3/4"	24-1/2"	11-3/8"	9/16"	960402	9"	11-1/4"	33-1/2"	14-1/4"	3/4"
953502	4-1/2"	6"	18"	8-7/8"	1/2"	957502	7"	9"	25-1/2"	11-5/8"	9/16"	960406	9"	11-1/2"	33-3/8"	15"	3/4"
953552	4-3/4"	6-1/4"	19"	9-1/8"	1/2"	057506	7"	0_1/8"	25-1/2"	11_5/9"	0/16"	060502	0.1/4"	11 1/2"	24 1/2"	14 5/0"	2/4"
953602	5"	6-3/4"	19"	9-5/8"	1/2"	937300	1	9-1/0	23-1/2	11-5/0	3/10	900302	9-1/4	11-1/2	34-1/2	14-5/6	3/4
953604	5"	6-3/4"	20"	9-5/8"	9/16"	958752	7-1/4"	9-1/4"	26-1/2"	11-7/8"	9/16"	960512	9-1/2"	11-3/4"	35-1/2"	14-7/8"	3/4"
953654	5-1/4"	6-7/8"	21"	9-7/8"	9/16"	975001	7-1/2"	9-5/8"	17-1/2"	14-1/2"	5/8"	960610	10"	12-3/8"	37-1/2"	15-1/2"	3/4"
953754	5-3/4"	7-1/4"	23"	10-1/4"	9/16"	960002	7-1/2"	9-5/8"	27-1/2"	12-3/4"	9/16"	960620	10-1/4"	12-5/8"	38-1/2"	15-7/8"	3/4"
953780	5-1/2"	7-1/4"	22"	9-7/8"	9/16"	960102	7-3/4"	9-7/8"	28-1/2"	12-1/2"	9/16"	960630	10-1/2"	12-7/8"	39-1/2"	16-1/8"	3/4"

BRASS BEARINGS

PHENOLIC BEARINGS



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. Aqual-ube 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.

ID ID OD Length NUMBER NUMBER 961020 3/4 1-1/4 3" 961970 1-7/8" 961060 1-1/4" 7/8" 3-1/2" 962000 2" 961070 7/8 1-3/8 3-1/2' 962010 2" 961080 7/8" 1-1/2" 3-1/2" 962020 2" 961102 1-1/4 ⊿" 962060 2-1/8" 961110 1-3/8" 962070 2-1/8" 4" 961120 1-1/2" 962100 2-1/4" 1" 4" 961130 1-5/8" 2-1/4" 1" 4" 962120 961150 1" 2" 4" 962140 2-1/4" 961300 1-1/8" 1-1/2" 4-1/2" 962160 2-1/4" 961320 1-1/8" 1-5/8" 4-1/2" 962220 2-3/8" 961340 1-1/8" 1-3/4" 4-1/2" 962320 2-1/2" 961360 1-1/8 4-1/2" 962330 2-1/2" 961500 1-1/4" 1-1/2" 5" 962340 2-1/2" 961520 1-1/4 1-5/8 962350 2-1/2" 961540 1-1/4" 1-3/4" 962420 2-5/8" 5" 961560 1-1/4" 2" 5" 962520 2-3/4" 961580 1-1/4" 2-1/8" 5" 962530 2-3/4" 961700 1-3/8" 1-7/8" 5-1/2" 962540 2-3/4" 961720 1-3/8" 5-1/2" 962580 2" 2-7/8" 961740 1-3/8" 2-1/8" 5-1/2' 962620 3" 961760 1-3/8" 2-3/8" 5-1/2" 962640 3" 961800 1-1/2 962680 3-1/8" 2" 6" 961820 1-1/2" 2-3/8" 6" 962720 3-1/4" 961860 1-5/8 2-1/8" 6-1/2" 962740 3-1/4" 1-5/8" 961870 6-1/2" 962780 2-5/8" 3-3/8" 961900 1-3/4" 962820 2-3/8" 7" 3-1/2"

2-5/8"

2-1/2"

2-5/8"

PART

961920

961940

961960

1-3/4"

1-3/4"

1-7/8"

	METRIC PHEN	OLIC BEARINGS			METRIC PHEN	OLIC BEARINGS	
Phenolic Part Number	ID	OD	Length	Phenolic Part Number	ID	OD	Length
AMNM025	25MM	40MM	100MM	AMNM070	70MM	90MM	280MM
AMNM028	28MM	42MM	112MM	AMNM075	75MM	95MM	300MM
AMNM030A	30MM	40MM	120MM	AMNM075A	75MM	100MM	300MM
AMNM030	30MM	45MM	120MM	AMNM080	80MM	100MM	320MM
AMNM032	32MM	45MM	128MM	AMNM085	85MM	105MM	340MM
AMNM035	35MM	50MM	140MM	AMNM090	90MM	110MM	360MM
AMNM035B	35MM	55MM	140MM	AMNM090C	90MM	115MM	360MM
AMNM038	38MM	55MM	152MM	AMNM095	95MM	115MM	380MM
AMNM040A	40MM	50MM	160MM	AMNM100	100MM	125MM	400MM
AMNM040	40MM	55MM	160MM	AMNM105	105MM	130MM	420MM
AMNM045	45MM	65MM	180MM	AMNM110	110MM	135MM	440MM
AMNM050	50MM	70MM	200MM	AMNM115	115MM	145MM	460MM
AMNM055	55MM	75MM	220MM	AMNM120A	120MM	155MM	480MM
AMINM060	60MM	3-1/4"	240MM	AMNM130	130MM	170MM	520MM
AMNM060	60MM	80MM	240MM	AMNM140	140MM	180MM	560MM
ANANIMOOF	CENNA	051414	2001414				

962840

962880

7"

7-1/2" 962920

3-1/2"

3-5/8"

3-3/4"

4-1/2"

4-1/2"

4-1/2"

14"

15"

14-1/2"

⁶⁶ 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.

Excellence in Propulsion.

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

PHENOLIC BEARINGS

PART

PHENOLIC BEARINGS			IMPERIAL PHEN	OLIC BEARINGS	
OD	Length	Part Number	ID	OD	Length
2-15/16"	7-1/2"	962940	3-3/4"	5"	15"
2-5/8"	8"	962960	3-3/4"	5-1/4"	15"
2-3/4"	8"	962980	3-7/8"	5-1/4"	15-1/2"
3"	8"	963020	4"	5"	16"
2-3/4"	8-1/2"	963030	4"	5"	16-1/4"
2-15/16"	8-1/2"	963040	4"	5-1/4"	16"
2-15/16"	9"	963060	4-1/8"	5-1/4"	16-1/2"
3"	9"	963080	4-1/4"	5-1/2"	17"
3-1/8"	9"	963100	4-3/8"	5-3/4"	17-1/2"
3-3/8"	9"	963120	4-1/2"	5-1/2"	18"
3-3/8"	9-1/2"	963140	4-1/2"	5-3/4"	18"
3-1/8"	10"	963180	4-5/8"	6-1/8"	18-1/2"
3-1/4"	10"	963200	4-3/4"	6-1/8"	19"
3-3/8"	10"	963220	4-7/8"	6-1/8"	19-1/2"
3-1/2"	10"	963320	5"	6-1/8"	20"
3-3/8"	10-1/2"	963340	5"	6-1/2"	20"
3-3/8"	11"	963360	5-1/4"	6-3/4"	21"
3-1/2"	11"	963370	5-1/4"	7"	21"
3-3/4"	11"	963400	5-3/8"	6-3/4"	21-1/2"
3-1/2"	11-1/2"	963410	5-3/8"	7"	21-1/2"
3-3/4"	12"	963420	5-1/2"	7"	22"
4"	12"	963440	5-1/2"	7-1/4"	22"
4-1/4"	12-1/2"	963500	5-5/8"	7"	22-1/2"
4"	13"	963620	5-3/4"	7"	23"
4-1/4"	13"	963660	5-7/8"	7-1/2"	24"
4-1/2"	13-1/2"	963720	6"	7-1/2"	24"
4-1/4"	14"				



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





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

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.

50

• 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

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.

1903

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

1934

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

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.

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.

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.

2005

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

2009

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

2010

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

2010

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

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.



*WITH OVER A CENTURY OF HISTORY, MICHIGAN WHEEL HAS BECOME SYNONY-*COMMERCIAL MARINE INDUSTRY.

Excellence in Propulsion.

MOUS WITH RELIABLE, QUALITY PROPELLERS. DESPITE CHANGES IN OWNER-SHIP AND CYCLES IN THE MARINE INDUSTRY, MICHIGAN WHEEL HAS REMAINED A DEDICATED SUPPLIER OF MARINE PROPELLERS TO THE RECREATIONAL AND

PROPELLER TERMS AND DEFINITIONS



BLADE NUMBER

DIAMETER

The diameter of the imaginary circle scribed by the blade tips on the propeller. (4-blade shown.) as the propeller rotates.

PITCH

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

RADIUS

Equal to the number of blades 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.

BLADE TIP

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

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 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.

located on the trailing edge of the blade.

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.

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.

OUTLINE OF FORWARD RAKE BLADE WITH NO RAKE. OUTLINE OF AFT RAKE

FORWARD

(BOW)

AFT RAKE

Positive rake. Blades slant

toward the aft end of the hub.

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

axis of rotation.

FORWARD RAKE

Negative rake. Blades slant Positive skew. Blade sweep in toward the forward end of the direction opposite of rotation. hub.

BLADE BACK BLADE FACE

. TRAILING EDGE

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



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

BLADE ROOT

ROTATION

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

BLADE FACE

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

establish the geometric pitch angle for the section. This line may pass through the leading

PITCH REFERENCE

Reference line used to

and trailing edges of the

GEOMETRIC

axis of rotation.

FIXED

propeller pitch.

RAKE

PITCH ANGLE

reference line and a line

PITCH PROPELLER

The propeller blades are

permanently mounted and

do not allow a change in the

LINE

section and may be equivalent to the chord line. (Image shown.)

The angle between the pitch

perpendicular to the propeller

CYLINDRICAL SECTION NEAR HUB CYLINDRICAL SECTION NEAR BLADE TIP

CYLINDRICAL SECTION

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

- **r** = The radius of a cutting cylinder near the hub. The cylandrical section near the hub is located on the surface of this cylinder.
- \mathbf{r}_{L} = The radius of a cutting cylinder near the tip. The cylandrical section near the tip is located on the surface of this cylinder.

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.

BLADE WITH NO SKEW BLADE WITH SKEW AFT SKEW

SKEW

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

FORWARD SKEW

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

INBOARD PROPELLER INSTALLATION PROCESS

MARINE PROPELLER SHAFT END DIMENSIONS

Keyway Length		х	1-1/2 1-25/32 2-1/8	2-1/8 2-13/16 3-3/16 3-1/2	4-7/32 4-15/16	5-5/8 6-3/32 6-21/32 7-11/32		Key- way Length		х	8-1/2 9-1/4 10	10-1/2 9-5/8 10-7/8 12-1/8 13-1/4	14-3/8 15-5/8 16-7/8 18-1/8
	×	Jamb Thick	5/16 3/8 7/16	7/16 1/2 9/16 5/8	3/4 7/8	$\begin{array}{c} 1 \\ 1 \\ 1 - 1/8 \\ 1 - 1/4 \end{array}$		Clear- ance		z	3/8 3/8 3/8	3/8 1/2 1/2 1/2	2222
Vuts (iv)		lain Thick	1/2 5/8 3/4	3/4 7/8 1	-1/2 -1/2	-3/4 -3/4 -1/4		Drive)		Max	3.872 4.122 4.371	4.621 5.245 5.995 6.494 6.994	7.494 8.120 8.619 9.243
		ес Ч Т Т	51 I 0			+ - 5 + - 5 + - 5 - 1 - 1/2 - 4.5 - 4.5 - 2		Sleeve (v		Min	3.870 4.120 4.369	4.619 5.243 5.993 6.492 6.992	7.492 8.117 8.616 9.240
		hSiz	1/2 - 5/8 3/4 -	3/4 - 7/8 1 - 1/3		1-3/2 1-3/2 2-4 2:25-			M	Jamb Thick	1-1/2 1-1/2 1-5/8	1-3/4 1-7/8 2-1/8 2-1/4 2-1/4	2-1/2 2-3/4 3 3-1/8
otter-Pin	ø	Leng	34		-1-3/2	2-1/2 2-1/2 3-1/2		Nuts	F	Plain Thick	2-1/2 2-1/2 2-3/4	3 3-1/4 3-3/4 4 4-1/4	4-1/2 5 5-3/4
0		Nom Dia	1/8 1/8	1/8 5/32 5/32	3/16 3/16	1/4 1/4 1/4	ß			Size	2-1/2 - 4 2-1/2 - 4 2-3/4 - 4	3 - 4 3 - 1/4 - 4 3 - 3/4 - 4 4 - 4 4 - 4	4-1/2 - 4 5 - 4 5-1/2 - 4 5-3/4 - 4
Pin Hole		(Drill) P	9/64 9/64 9/64	9/64 11/64 11/64	13/64	17/64 17/64 17/64 17/64		-Pin		Length	3 3-1/2	3-1/2	
Cotter-]		z	1-9/64 1-21/64 1-33/64	1-33/64 1-23/32 1-29/32 7-3/37	2-23/64 2-47/64	3-9/64 3-9/64 3-41/64 4-1/64	AMI	Cotter	ø	Nom Dia	3/8 3/8 3/8	3/8	
Length of Pin End		М	1/4 1/4 5/16	5/16 3/8 7/16	12	12222		in Hole		P (Drill)	3/8 3/8 3/8	3/8	
Dia. of Pin End		Г	3/8 7/16 1/2	1/2 5/8 3/4	1-1/4	1-3/8 1-7/16 1-11/16 1-15/16	ES	Cotter-P		z	4-37/64 4-37/64 4-61/64	5-21/64 - -	
		К	1/8 1/8 1/8	1/8 1/8 3/16	3/16 3/16	3/16 3/16 1/4 1/4	VCH	Length of Pin End		М	3/4 3/4 3/4	3/4 3/4 3/4 1	
Undercut		·····	25 25 65	3 [2 [3 [3		X8 //16 //16 //16	20	Dia. of Pin End		L	2-1/8 2-1/8 2-3/8	2-1/2 2-3/4 3-1/4 3-1/2 3-7/8	4-3/8 5-1/8 5-3/8
			6 25 31,0 19,	4 4 4 6 23 39) <u> </u>	2111 2111		rcut		К	3/8 3/8 3/8	3/8 3/8 1/2 1/2	2222
Ext. Beyon tape		Н	1-5/1 1-1// 1-3//	1-3// 2 2-1//	2-3/- 3-1/-	3-1// 3-1// 4-4 3//	3-1/2	Unde		5	2-1/8 2-1/8 2-3/8	2-1/2 2-3/4 3-1/4 3-1/2 3-7/8	4 3/8 4 7/8 5 - 1/8 5 - 3/8
End of Taper to End of Thread		Ű	1-1/16 1-1/4 1-7/16	1-7/16 1-5/8 1-13/16	2-1/4 2-5/8	3 3-1/2 3-7/8	Σ	Ext. Beyond taper		Н	5-1/8 5-1/8 5-1/2	5-7/8 6-3/8 7-1/8 7-3/4 8-1/2	9-1/4 10 10-3/8 10-3/4
ead ii)	fr.	Tpi	51 II 01	9 6 8 r	9 1 -	5 5 4-1/2 4-1/2	Ц Ц Ц Ц Ц	End of Taper to End of Thread		Ū	4-3/8 4-3/8 4-3/4	5-1/8 5-5/8 6-3/8 7-1/2	8-1/4 9 9-3/8
ufT (i)	-	Dia	1/2 5/8 3/4	3/4 1 1 2/8	1-1/2	1-3/4 1-3/4 2 2-1/4	AFT9	ad		Tpi	444	4444	4444
Keyway Fillet Radius (ii)		×	1/32 1/32 1/32	1/32 1/16 1/16	1/16 1/16	3/32 3/32 3/32 3/32	SHZ	Thre	ц	Dia	2-1/2 2-1/2 2-3/4	3 3-1/4 3-3/4 4 4 4-1/4	4-1/2 5 5-3/4
		Max	0.097 0.127 0.127	0.127 0.160 0.160 0.160	0.254	0.284 0.315 0.316 0.314	Ц О Ц	Key- way Fillet Radius		R	1/8 1/8 1/8	1/8 5/32 3/16 3/16 7/32	7/32 1/4 1/4 1/4
· Side Depth	Ш	Min	0.095 0.125 0	0.125	0219	0.281 0.312 0.313 0.311	N	epth		Max	0.314 0.313 0.313	0.312 0.376 0.437 0.438 0.496	0.497 0.558 0.559 0.556
Keyway		uoj	12 12 12 12 13 13 13 13 13 13 13 13 13 13 13 13 13	8332	 8 <u>8</u> 4	/16 · · · · · · · · · · · · · · · · · · ·	NSI	way Side D	Ш	Min	0.311 0.310 0.310	0.309 0.373 0.434 0.435 0.493	0.494 0.555 0.556 0.553
		ax	875 3 550 550 550 550 550 550 550 550 550 550	250 125 5 7 2 3 3 3 3	375	625 25 25 50 50 55	M	Key		Nom	5/16 5/16 5/16	5/16 3/8 7/16 1/2	1/2 9/16 9/16 9/16
Width			65 0.1 9 0.2 0.2	15 0.3 15 0.3 15 0.3 15 0.3	- 38 	35 0.65 35 0.65 85 0.6		th		Max	0.750 0.875 0.875 0.875	1.000 1.125 1.250 1.250 1.375	1.375 1.500 1.500 1.750
Keyway	D		0.18	0.24	0.43	0.56		eyway Wid	D	Min	0.7485 0.8735 0.8735	0.9985 1.123 1.248 1.248 1.373	1.373 1.498 1.498 1.748
		Nom	3/16 1/4 1/4	5/16 5/16 5/16	716 1/2	9/16 5/8 3/4		K		Nom	3/4 7/8 7/8	1 1-1/8 1-1/4 1-1/4 1-3/8	1-3/8 1-1/2 1-1/2 1-3/4
Taper Length		U	2 2-3/8 2-3/4	3-1/8 3-1/2 3-7/8	5-3/4	6-1/2 7-1/4 7-7/8 8-5/8		Taper Length		C	9-3/8 10-1/8 10-7/8	11-5/8 10-3/4 12 13-1/4 14-1/2	15-3/4 17 18-1/4 19-1/2
meter II End	В	Max.	0.626 0.728 0.829	0.931 1.032 1.134 1.134	. 1.439 . 1.642	1.845 2.048 2.259 2.462		neter 1 End	0	Max.	2.665 2.868 3.071	3.274 3.829 4.251 4.673 4.793	5.189 5.584 5.980 6.376
Dian		Min.	0.624 0.726 0.827	0.929 1.030 1.132	1.640	1.843 2.046 2.254 2.460		Diar Smal	I	Min.	2.663 2.866 3.069	3.272 3.827 4.249 4.671 4.791	5.187 5.582 5.978 6.374
Nom Shaft Diameter		A	3/4 7/8 1	1-1/8 1-1/4 1-3/8	2.44	2-1/4 2-1/2 2-3/4 3		Nom Shaft Diameter		A	3-1/4 3-1/2 3-3/4	4 4-1/2 5 5-1/2 *6	*6-1/2 *7 *7-1/2 *8



. • e: ::22



- 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.
- radiused corners.)
- 6. Put propeller back onto shaft taper.
- the following:
 - a. Remove propeller from shaft.
 - b. Place a file on a flat surface area or work bench.
 - side being filed is clean.

 - not line up, repeat steps 7a through 7e.
 - regularities on key.
- torque jam nut also, if your shaft is so equipped.
- 9. Install cotter pin at the end of the shaft.

5. Put key into keyway on shaft taper with radiused or chamfered corners (down) in shaft keyway. (If propeller shaft keyway has

7. Check to see that the propeller moves back to the forward line made in Step 3. If it does, skip to Step 8. It it does not, perform

c. Run opposite end of chamfered key back and forth over file (to remove any burrs) with a downward pressure on key until

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

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 ir-

8. When propeller hub moves to the correct position, install propeller nut on shaft and torque to seat the propeller. Install the

Name:		Address:	Project:		Date:
Company:	City/Si	tate/Zip:	Email:		Phone/Fax:
Boat Information			Pleasure:	Commercial:	
Manufacturer:		Model:	New Model	Existing Model	Alternative Power Configuration
Boat Type - Use:				For Fishing,Tug or, I	Pushboat - Working Speed:
Overall Length (LOA Beam (B Deadrise Angle at Sterr		Waterline Length (LWL): Draft (T): Running Trim Angle:	Displacem LCG from Stu Shaft Inclination An	ent: ern: gle:	Pockets: Tunnels:
Distance: Shaft Centerline @ Distance: Shaft Centerline @ P	Propeller to Botton ropeller to Waterlin	n:	m Desired Propeller Diameter: Proiected Vessel Speed:		Desired Number of Blades: Other:
Engine Information Manufacturer:	Single:	Twin: Triple:	Other:	Diesel:	Gas:
Engine Rating Shaf Brake	t: ::	RPM Co	Horsepower RF intinuous:		esired Engine RPM: bear Reduction Ratio:
Shaft - Other Information Shaft-Bore Diameter: Wake Fraction (Wf):		Full Taper Hub Requested	Notes:		
Current or Previous Propulsion Engine Information Manufacturer:	System Informatio Single:	in for This Vessel Twin: Model:	Any existing perfor ble:	mance information assists ir Diesel:	n providing a more accurate propeller suggestion. Gas:
Engine Rating	<u>Horsepower</u> Shaft: Brake:	MA	Horsepower Continuous: Intermittent:	G	sear Reduction Ratio:
<u>Propeller Information</u> Manufacturer:	ze Stainl	Model: 1 ess Steel 0 Other 1	Diameter: Pi TE Cup No TE Cup No	:ch:	blades: Area:
Performance	Full Throttle: Cruise:	<u>RPM</u> Speed	Vessel Di	splacement during perf	formance run:

Inboard Propeller Sizing Form

MICHIGAN



Seller warrants to Buyer that the supplies or articles furnished hereunder shall at time of shipment conform to and be in accordance with the specifications, if any, referred to in this document. Propeller warranty will be considered for any claims against defects in material and workmanship within a period of one year from date of purchase. No claims will be allowed for propellers modified from factory standards. Unless certified by Seller's engineering department, performance expectation shortfall, or incorrect recommendation of propeller size, are not due cause for warranty claim. Seller's obligation under this warranty is limited to Seller's repair or replacement, at Seller's sole discretion, of those goods sold by Seller to Buyer that do not satisfy this warranty. Written notice of the warranty claim must be given to Seller by Buyer within fifteen (15 days after the warranty claim is discovered. Buyer shall obtain R.G.A. number (Return Goods Authorization) and directive of incoming transportation from Seller. Return shipment shall be prepaid at Buyer's expense and shall occur within (10) days after receipt by Buyer of Seller's written authorization. This warranty sets forth Seller's obligations and Buyer's exclusive remedy for defective products.

The determination of whether a defect exists shall be made solely by Seller. Buyer shall not return any goods to Seller until Seller has been provided a reasonable opportunity to inspect and sample the goods to determine whether a valid warranty claim exists and whether the goods should be repaired or replaced. In any event, Buyer shall not return any goods until authorized in writing by Seller.

Notwithstanding any other provision in the document, Seller expressly disclaims and excludes all other warranties, expressed or implied, including the warranties of merchantability and fitness for particular purpose and also disclaims and excludes all liability for incidental, consequential, indirect or any other special damages, including lost profits, tor breach of warranty or of contract or otherwise.

Inboard Propeller Warranty Statement



WORLD HEADQUARTERS

1501 Buchanan Avenue Southwest Grand Rapids, MI 49507 United States

> Toll-Free: 1-800-369-4335 Phone: 1-616-452-6941 Fax: 1-616-247-0227

info@miwheel.com www.miwheel.com

EUROPE HEADQUARTERS

Decoy Industrial Estate Silverhills Rd Newton Abbot, TQ12 5ND United Kingdom

> Phone: + 44 1626 351723 Fax: + 44 1626 351724

E-mail: admin@miwheel-europe.com www.miwheel-europe.com

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