INTEGRITY PUMP & MOTOR GROUP, LLC

Lineshaft Selection Chart for C1045

SHAFT		PUMP THRUST (LBS.)									
SIZE	RPM	2000	4000	6000	8000	10000	15000	20000	25000	30000	40000
(INCH)		MAXIMUM HORSEPOWER RATING									
7/8"	1160	26	26	24	22						
	1770	40	39	37	34						
	3450	78	76	72	66						
1"	1160	42	41	40	38						
	1770	63	62	60	58						
	3450	123	121	118	113						
1- 3/16"'	700	38	38	37	36						
	880	47	47	46	45						
	1160	63	63	62	60						
	1770	95	94	93	91						
	3450	187	186	183	179						
1- 1/2"	700	85	84	84	83	83	79				
	880	105	105	104	103	102	99				
	1160	141	149	140	139	137	132				
	1770	212	212	211	209	207	200				
	3450	417	416	414	411	407	393				
1-11/16"	700	125	125	125	124	124	121				
	880	155	155	155	154	153	150				
	1160	208	208	207	207	206	201				
	1770	314	314	313	312	310	304				
	3450	618	617	615	613	610	597				
1-15/16"	700	198	198	197	197	196	194				
	880	245	245	245	244	243	240				
	1160	329	329	328	327	326	322				
	1770	496	496	496	494	492	487				
	3450	975	974	973	971	968	957				
2-3/16"	700	294	294	293	293	292	290				
	880	364	364	364	363	363	360				
	1160	488	488	488	487	486	483				
	1770	737	737	735	735	733	728				
	3450	1448	1448	1446	1444	1442	1433				
2-7/16"	700	407	407	405	403	401	388	382	366		
	880	505	504	502	500	497	481	474	453		
	1160	677	676	674	670	667	645	635	608		
	1770	1022	1022	1017	1012	1007	974	959	918		
2-11/16"	700	570	570	569	569	569	567	565	562	560	552
	880	706	706	705	705	705	703	701	697	694	684
	1160	947	947	946	946	945	942	939	935	930	917
	1770	1428	1428	1427	1427	1427	1422	1417	1410	1403	1383
2-15"16"	700	756	756	756	756	755	753	752	749	747	740
	880	937	937	937	937	936	934	932	929	926	917
	1160	1275	1257	1256	1256	1255	1253	1250	1246	1242	1230
	1770	1896	1896	1895	1894	1893	1890	1886	1880	1873	1855
3-3/16"	700	980	979	979	979	979	977	976	973	971	965
	880	1214	1214	1214	1213	1213	1211	1210	1206	1204	1196
	1160	1628	1628	1628	1627	1627	1624	1622	1618	1614	1603
	1770	2456	2456	2455	2454	2454	2450	2447	2441	2435	2419

shaft weights	
1"	2.67 lbs
1 3/16"	3.77
1 1/4"	4.18
1 1/2"	6.01
1 11/16"	7.60
1 15/16"	10.02
2 3/16"	12.80
2 7/16"	15.88
2 11/16"	19.31

Horsepower ratings listed are based on shafting having 85,000 psi elastic limit and 110,000 psi ultimate tensile strength.

When there is a key at the shaft coupling (as when a flanged coupling is used with a shaft motor), reduce the above horsepower 25%

Correction Factors for other shaft types

MATERIAL	FACTOR	MATERIAL	FACTOR
303 STAINLESS STEEL	0.75	317-4 PH STAINLESS STEEL	1.52
316 STAINLESS STEEL	0.75	MONEL	0.94
416 STAINLESS STEEL	1.15	18-18 PLUS	1.45

ALL RATINGS CONFORM TO ANSI B 58.1 (AWWAE 101) SPECIFICATIONS

INTEGRITY PUMP & MOTOR GROUP, LLC

Material Hardness

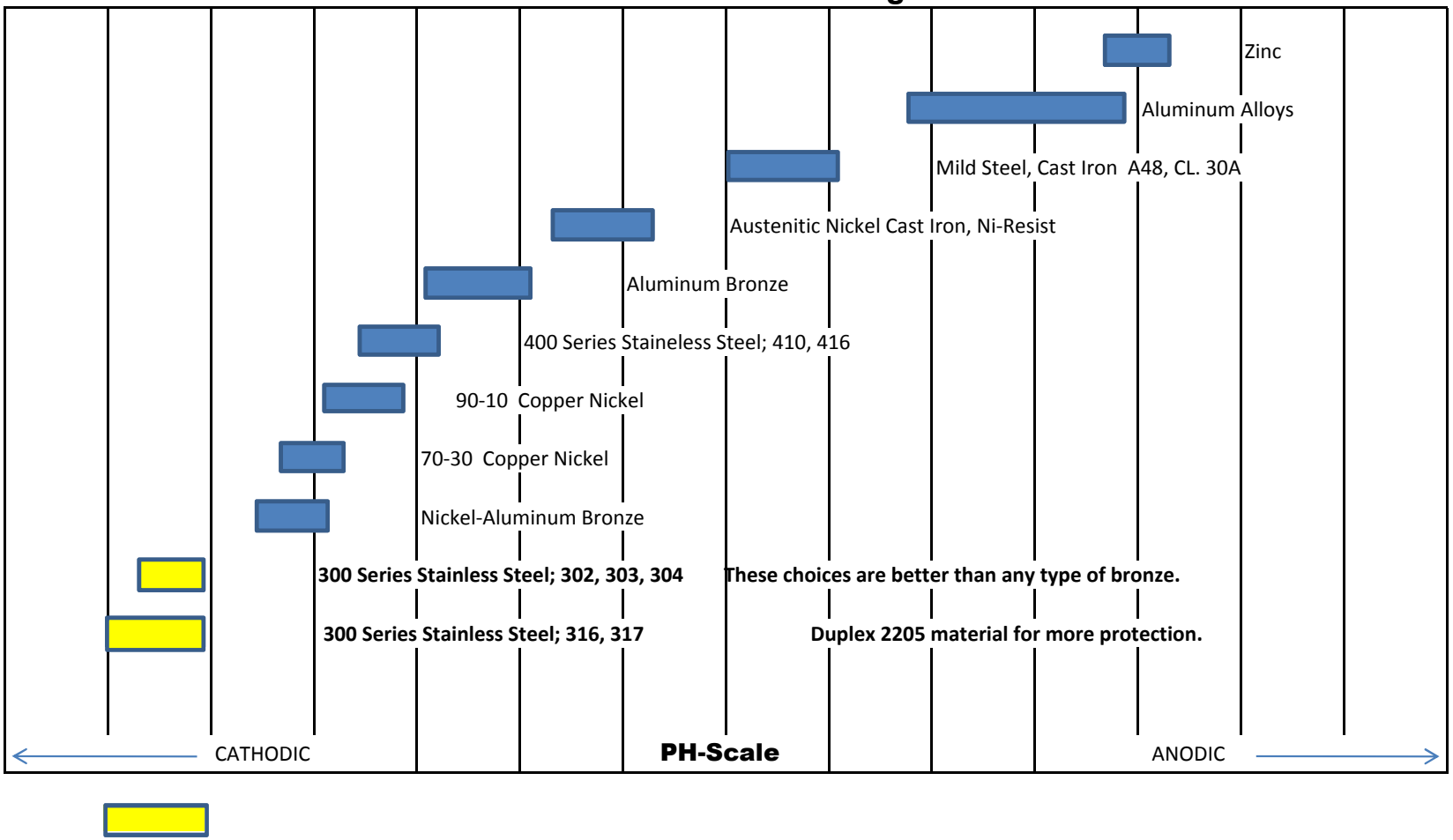
Castings
Shafting

Metal	Tensile Strength (PSI)	Brinell Hardness Range
Cast Iron	30,000 - 50,000	190 - 280
Ductile Iron	60,000	132
SAE 40 Bronze	26,000 - 42,000	60 - 80
Aluminum Bronze	80,000	150 - 250
Nickel Aluminum Bronze	85,000	159
304 Stainless Steel	85,000 - 125,000	212 - 277
316 Stainless Steel	80,000 - 90,000	150 - 190
Monel K 500	140,000	260
Duplex 2205	90,000	290
Alloy 20	80,000	200
1045 Steel	80,000 - 120,000	160 - 240
416 Stainless Steel	75,000 - 135,000	155 - 260
17-4 PH Stainless Steel	145,000 - 200,000	311 - 420

Physical properties, including tensile strength and hardness, can very with heat-treating, cold-working or changing the percentages of chemical elements. Some metals with a low hardness value still have excellent wear characteristics.

Chemical resistance charts should be reviewed before making a final selection on materials for your application.

Chart For Galvanic Effects In Flowing Seawater



Yellow indicates best material for seawater applications

1. It is not recommended to use Cathodic and Anodic materials together in a pump for seawater applications.
2. Sacrificial Zinc anodes connected to pump parts in seawater applications will also help galvanic effects.

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High Chlorides

Pump Construction - Grounding is Essential!

Product	Salinity	Modifications
Drinking water	1,000 – 4,000 ppm	standard construction
Upstream River water	3,000 – 4,000 ppm	standard construction
Swimming Pool water	4,000 – 5,000 ppm	upgraded shaft & bearings
Brackish water	12,000 – 14,000 ppm	304SS pump construction
Sea Salt Water*	32,500 – 35,000 ppm	304SS pump construction 316SS shaft & fittings
*deep or low oxygen content		
Sea Salt Water * *	> 35,000 ppm	316SS pump construction
**high oxygen content, > 80 degree F temperature **closer to Tropic of Cancer or Tropic of Capricorn		

Special Notes:

- Many brackish water areas are stratified and a lower salinity product can be acquired by proper pump placement.
- Frothing sea water is highly oxygenated and requires all 316SS
- As salinity increases, electrical conductivity increases, proper and extensive grounding will help prolong life. Additional sacrificial anodes can also prolong pump life in many applications.

Integrity Pump and Motor standard construction:
Ductile iron bowls, stainless steel impellers, 416SS shaft, stainless steel fittings.

316L and Duplex are the next levels of protection, but costs rise quickly.

Pump life based on construction of materials, as it relates to the salinity of the water, is not an exact science. The application must be reviewed; cost, conditions, location, and other elements may determine a different pump construction for the job.

TNEMEC

PRODUCT DATA SHEET

EPOXOLINE SERIES 141

PRODUCT PROFILE

GENERIC DESCRIPTION Modified Polyamine Epoxy

COMMON USAGE High solids coating which offers high-build edge protection and excellent corrosion resistance. For use on the interior and exterior of steel or concrete tanks, reservoirs, pipes, valves, pumps and equipment in potable water service as well as other steel and concrete substrates.

COLORS **ANSI/NSF Std. 61 colors:** 1211 Red, 1255 Beige, 33GR Gray, 35GR Black and WH03 Off-White. **Note:** Other colors may be available for non-potable water applications. Contact your Tnemec representative. Minimum order requirements may apply. **Note:** Epoxies chalk with extended exposure to sunlight. Lack of ventilation, incomplete mixing, miscatalyzation or the use of heaters that emit carbon dioxide and carbon monoxide during application and initial stages of curing may cause yellowing to occur.

SPECIAL QUALIFICATIONS Certified by **NSF International** in accordance with **NSF/ANSI Std. 61.** Ambient air cured Series 141 is qualified for use on tanks and reservoirs of 1,000 gallons (3,785L) capacity or greater, pipes four (4) inches (10 cm) in diameter or greater and valves two (2) inches (5 cm) in diameter or greater. Conforms to **AWWA D 102 Inside Systems No. 1 and No. 2.** Conforms to **AWWA C 210.** Contact your Tnemec representative for systems and additional information. Reference the "Search Listings" section of the NSF website at www.nsf.org for details on the maximum allowable DFT.

PERFORMANCE CRITERIA Extensive test data available. Contact your Tnemec representative for specific test results.

COATING SYSTEM

PRIMERS **Steel:** Self-priming, 1, 20, FC20, 27, 37H, L69, L69F, N69, N69F, V69, V69F, 90-E92, 90-97, 91-H_2O, 94-H_2O, 135, L140, L140F, N140, N140F, V140, V140F, 394, 530
Concrete: Self-priming, 20, FC20, 27, L69, L69F, N69, N69F, V69, V69F, L140, L140F, N140, N140F, V140, V140F, 215, 218
CMU: Self-priming or Series 130, 215, 218

TOPCOATS **Exterior:** Series 73, 180, 1074, 1074U, 1075, 1075U, 1080, 1081. Refer to COLORS on applicable topcoat data sheets for additional information. **Note:** The following maximum recoat time applies when using Series 73, 180, 1074, 1074U, 1075, 1075U, 1080 or 1081: thirty (30) days. If this time limit is exceeded, Series 141 must be uniformly scarified prior to topcoating.

SURFACE PREPARATION

PRIMED STEEL **Immersion Service:** Scarify the Series 20, FC20, L69, L69F, N69, N69F, V69, V69F, L140, L140F, N140, N140F, V140 or V140F prime coat surface by brush-blasting with fine abrasive before topcoating if it has been exterior exposed for 30 days or longer and 141 is the specified topcoat.

STEEL **Immersion Service:** SSPC-SP10/NACE 2 Near-White Blast Cleaning with a minimum angular anchor profile of 2.0 mils
Non-Immersion Service: SSPC-SP6/NACE 3 Commercial Blast Cleaning with a minimum angular anchor profile of 2.0 mils

CONCRETE Allow to cure for 28 days. Abrasive blast referencing SSPC-SP13/NACE 6, ICRI CSP 3-5 Surface Preparation of Concrete and Tnemec's Surface Preparation and Application Guide.

ALL SURFACES Must be clean, dry and free of oil, grease, chalk and other contaminants.

TECHNICAL DATA

VOLUME SOLIDS 82% ± 2.0% (mixed) †

RECOMMENDED DFT 4.0 to 18.0 mils (100 to 455 microns) in one coat. **Note:** Thickness requirements will vary with substrate, application method and exposure. Contact your Tnemec representative. Maximum dry film thickness for NSF exposure is 18.0 mils.

CURING TIME AT 5 MILS DFT

Temperature	To Handle	To Recoat	Immersion
90°F (32°C)	3 hours	4 hours	7 days
75°F (24°C)	4 hours	5 hours	7 days
65°F (18°C)	7 hours	9 hours	8 days
55°F (11°C)	13 hours	18 hours	9 days
45°F (7°C)	20 hours	30 hours	13 days
40°F (4°C)	22 hours	42 hours	18 days

Curing time varies with surface temperature, air movement, humidity and film thickness.
Note: For pipe and valve applications, allow 14 days cure at 75°F (24°C) prior to immersion.

VOLATILE ORGANIC COMPOUNDS EPA Method 24
Unthinned: 0.52 lbs/gallon (63 grams/litre)
Thinned 4%: 0.75 lbs/gallon (90 grams/litre)
Thinned 5%: 0.84 lbs/gallon (101 grams/litre)
Thinned 10%: 1.27 lbs/gallon (153 grams/litre) †

HAPS **Unthinned:** 1.3 lbs/gal solids
Thinned 5%: 1.6 lbs/gal solids
Thinned 10%: 1.9 lbs/gal solids

THEORETICAL COVERAGE 1,315 mil sq ft/gal (32.2 m^2/L at 25 microns). See APPLICATION for coverage rates. †

NUMBER OF COMPONENTS Two: Part A (amine) and Part B (epoxy)

MIXING RATIO By volume: Two (Part A) to one (Part B)

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