

ENGINEERING DATA FROM AURORA PUMP

The North Aurora test facilities are capable of providing pump test performance data in seven basic formats to meet a variety of customer needs. These are: (1) Certified Performance Test, (2) Certified Witness Performance Test, (3) Hydrostatic Test Submittal, (4) Vibration Test Submittal, (5) NPSH Test, and (6) Witness NPSH Test.

1. **CERTIFIED PERFORMANCE TEST** data consists of head, capacity and horsepower readings taken over the full operating range of the pump. The recorded test data is plotted in performance curve form showing TDH vs capacity, BHP vs capacity, EFF. vs capacity and RPM vs capacity. The performance curve is certified correct for the individual pump by the Test Department and submitted to the customer. Maximum test facility capabilities are described below. Reduce speed test and calculations to higher speed can be furnished upon request. Refer to page 2, (A) for price adjustments on special test requirements.
2. **CERTIFIED WITNESS PERFORMANCE TEST** is identical to the Certified Performance Test with the exception that the entire test is witnessed by the customer or a customer representative.
3. **HYDROSTATIC TEST** data consists of a static pressure test at 1-1/2 times the maximum working pressure. Maximum working pressure consist of suction pressure plus pump total differential head. The customer must specify the suction pressure. If the value of suction pressure is not advised or the pump is to be provided with flooded suction, e.g. sump pump, the pressure test will be applied at 1-1/2 times the shut-off head. A certificate of compliance showing the test pressure is submitted to the customer **by the Quality Control Department.**

4. **VIBRATION TEST** data consists of a series of vibration measurements taken at both outboard and inboard pump bearings. **SOUND TEST** data consists of a series of 1/3 octave band measurements taken at appropriate distances and locations. With the pumping unit operating at the customer's specified operating conditions, the data is recorded on printed forms for submittal to the customer.
5. **NPSH TEST** data consists of a head, capacity, horsepower and NPSH test over the full operating range of the pump. The recorded test data is plotted in performance curve form, showing TDH vs capacity, BHP vs capacity, EFF. vs capacity, RPM vs capacity and NPSH vs capacity. The complete performance curve for the individual pump is submitted to the customer. (Same limitations as the certified performance test.)
6. **NPSH WITNESS TEST** is identical to the NPSH Test with the exception that the entire test is witnessed by the customer or a customer representative.
7. **CRITICAL FREQUENCY ANALYSIS** should be done on variable frequency drive units to minimize the possibility of vibration issues within the required operating range of the pump. Aurora Pump will not be held responsible for vibration problems associated with pump units placed in variable frequency drive applications where a vibration analysis has not been completed.

All guarantees of performance (e.g., the shape of the curve, horsepower, head, capacity, efficiency, NPSHR, etc.) must be quoted by the factory and may require a factory test. The testing charges in these pages only cover the testing of actual performance, not the cost of obtaining guaranteed performance. To establish the cost of obtaining guaranteed performance, a specific quote must be obtained from Application Engineering.

TEST LAB CAPABILITIES

ELECTRICAL*
3Ø, 460 VAC, 60 HZ TO 500 HP
3Ø, 230 VAC, 60 HZ TO 50 HP
1Ø, 115 VAC, 60 HZ TO 5 HP
3Ø, 380 VAC, 50 HZ TO 400 HP

FLOW CAPACITY
FLOWS TO 18,000 GALLONS PER MINUTE

* For other special requirements contact factory.

DRIVERS						
Calibrated lab motors: see page 2, note (2)						
SPEED	3560	1750	1150	875	700	580
largest motor HP	500	500	350	400	75	50
Variable Frequency Drive up to 400 HP for Metric and Diesel speeds.						

NPSHR DETERMINATION	
Hot Water Method	All 100 Series, 4 x 5 x 12 and Smaller 300 Series and 600 Series with No. 4A P.F. only
Vacuum Break-Off Method	All Other Models
See reverse side for prices.	

LIST PRICE SHEET ENGINEERING TESTS

LIST PRICE SUBJECT TO AURORA PUMP STANDARD MULTIPLIER ONLY

PUMP SERIES		CERTIFIED PERFORMANCE TEST (A)	WITNESS PERFORMANCE TEST (A)	CERTIFIED HYDRO-STATIC TEST SUBMITTAL	SOUND OR VIBRATION TEST SUBMITTAL (C)	NPSH TEST (A) (D)	WITNESS NPSH TEST (A) (D)
PART NUMBER							
110, 120A, 130		\$861	\$2,309	\$488	\$909	\$5,526	\$7,134
150		861	2,309	488	909	5,526	7,134
200		N/A	N/A	N/A	N/A	N/A	N/A
321, 323, (B)		861	2,309	488	909	5,526	7,134
324, 326		861	2,309	488	909	5,526	7,134
341, 342, 361, 362, 3801	1-1/4"-2"	861	2,309	488	909	5,526	7,134
	2-1/2"-6"	861	2,309	488	909	5,526	7,134
344, 364, 3800	1-1/4"-2"	861	2,309	488	909	5,526	7,134
	2-1/2"-5"	861	2,309	488	909	5,526	7,134
	6"-8"	861	2,309	488	909	1,539	7,134
374B		861	2,309	488	909	5,526	7,134
382A, PVM		861	2,309	488	909	1,539	3,149
410, 420, 430	PS 1, 2	861	2,309	488	909	1,539	3,149
	PS 3, 4	861	2,309	488	909	1,539	3,149
	PS 5	861	2,309	488	909	1,539	3,149
	PS 6B, 7	861	2,309	488	909	1,539	3,149
520, 530	1"	N/A	N/A	N/A	N/A	N/A	N/A
630, 640, 670	1"-2"	N/A	N/A	N/A	N/A	N/A	N/A
	2-1/2"-6"	N/A	N/A	N/A	N/A	N/A	N/A
610, 650, 660	2"- 4"	1,328	2,309	488	909	1,539	3,149
	6"- 8"	1,328	2,309	488	909	1,539	3,149
	10"-14"	1,328	2,309	488	909	1,539	3,149
	15"-20"	1,328	2,309	488	909	1,539	3,149

N.A. - Not Available

(A) All special test requirements must be clearly stated on the order transmittal form.

(B) NPSH test is available for Model 323, with 2" suction and below.

(C) Sound or vibration tests will cost \$539 list each if accompanied by a Certified Performance Test. Sound and vibration tests are done per Hydraulic Institute's recommended procedures.

(D) NPSH testing includes a Certified Performance Test.

NOTES:

1. All prices based on single pump test.

2. Testing with job drives - performance test run with customer equipment (includes standard performance test, run to judge pump acceptance):

- a) Single speed driver up to 500 HP, 50 or 60 Hz, 460V Max.....x2
- b) Variable speed driver, customer controller, up to 100 Hp @ 60 Hz only, 460V Maxx3
- c) Variable speed Test Lab driver up to 500 HP, 50 or 60 Hz, 460V Max.....x2.5
- d) Diesel driver, customer furnished, 5000 lb. Max, pump size no bigger than 8" Discharge x10" Suction.....x2

3. All other special testing for systems, where practical, or with special job drives, etc. must be first approved by Price adjustment will be applied as necessary.

LIST PRICE SHEET ENGINEERING OPTIONS

LIST PRICE SUBJECT TO AURORA PUMP STANDARD MULTIPLIER ONLY

OPTION	DESCRIPTION	LIST PRICE	OPTION NO.	
50	Special Calculations			
	Bearing Life	\$822	50A	
	Thrust Loads (Hydraulic)	688	50B	
	Shaft Deflection	419	50C	
	Critical Speed (First) (Lateral)	893	50D	
	WR ² by Calculation	1,492	50E	
	WR ² by Estimation from Tests	449	50F	
	N.P.S.H. (when not shown on Curve)	374	50G	
	Minimum Submergence Recommendations	303	50H	
	Completing Customer Data Sheets in addition to above Items	374	50J	
	Seismic Calculations	Refer to	50K	
	Torsional Critical Speeds	Factory	50L	
51	Special Curves			
	Single Line	\$303	51A	
	Family	748	51B	
	Multi-Speed	716	51C	
	Overlay on System Head Curves	716	51D	
	Guaranteed Efficiency Curves	RTF	51E	
52	Drawings Request if Not Available on Website			
	GA Drawing (general layout/may not be to scale)	\$210	999-5062-999	
	2D CAD file (general layout to scale)	\$525	999-5063-999	
	2D CAD file (general layout certified for order)	\$594	999-5061-999	
	3D CAD Model file (general layout to scale in 3D format)	RTF	999-5064-999	
53	Customer Representative Pre-Assembly or Finished Assembly Inspection	\$893	53A	
RTF	12 x 30	STEEL BASES WITH GROUT HOLES Please specify "ADD GROUT HOLE OPTION" on Face of Order	\$98	RTF
	12 x 34		112	RTF
	12 x 38		112	RTF
	13 x 42		141	RTF
	15 x 44		141	RTF
	18 x 44		141	RTF
	18 x 48		141	RTF
	18 x 54		141	RTF
	18 x 60		141	RTF
	18 x 65		153	RTF
	22 x 60		153	RTF
	22 x 72		153	RTF
	22 x 84		153	RTF
	999-0050-999		CERTIFICATE OF COMPLIANCE	\$89
999-0057-999	MATERIAL CERTIFICATION (PHYSICAL & CHEMICAL)	732	999-0057-999	

**LIST PRICE SHEET
 ENGINEERING OPTIONS**

LIST PRICE SUBJECT TO AURORA PUMP STANDARD MULTIPLIER ONLY

OPTION	DESCRIPTION					
54	SPECIAL COATINGS & SURFACE PREPARATIONS					
	The following protective coatings and surface preparations are available and are to be used on exterior surfaces only. This is not intended to be used as a recommendation of coatings, but rather as an aid to assist in pricing the few coatings that are commonly specified.					
	NOTES:					
	1. Pricing and description as determined from this page MUST appear on the face of the order transmittal.					
	2. Pricing on the page are prices "per unit".					
	3. We do not sandblast elec. Motors, galvanized tanks, diesel engines or any other equipment not manufactured by Aurora. Diesel engines will be furnished only with manufacturers standard finish.					
	4. We do not paint stainless steel or bronze unless specifically requested.					
	5. For materials not on this page, consult factory.					
	6. See following pages for complete coating specifications.					
	7. Caution: Many of these coatings may contain lead or other harmful substances.					
	8. Aurora Pump will not be responsible for damage to coating incurred during shipment or installation.					
	TABLE 1					
	NAME OF COATING:		Pump Size	APPROX. FILM THICKNESS	LIST PRICE	OPTION NO.
	Epoxy-Phenolic Coating (Tnemec 69), Aurora Coating Spec #523 Includes Option 54L Surface Prep (SSPC-SP10)		BASE & CPLNG GRD	5. MLS	\$841	54B
			1 1/4"-6"		1,856	
			8"-14"		2,959	
	A.N.S.I. 61 Gray Machinery Enamel, Aurora Coating Spec.# 581 Includes Option 54L Surface Prep (SSPC-SP10)		BASE & CPLNG GRD	5. MLS	\$824	54D
			1 1/4"-6"		1,820	
			8"-14"		2,900	
	High Quality Alkyd Machinery Enamel, Aurora Coating Spec #582 (Specify color - consult Engineering) Includes Option 54L Surface Prep (SSPC-SP10)		BASE & CPLNG GRD	5. MLS	\$799	54E
			1 1/4"-6"		1,764	
			8"-14"		2,811	
	Tnemec 69 as Primer, Aurora Coating Spec #584 Includes Option 54L Surface Prep (SSPC-SP10)		BASE & CPLNG GRD	1.5 MLS	\$715	54G
			1 1/4"-6"		1,578	
			8"-14"		2,515	
	Coal Tar-Epoxy to be applied on underside of baseplate and all parts below. Aurora Coating Spec.# 587		1 1/4"-6"	8. MLS	\$727	54J
			8"-14"		1,090	
	Bitumastic Black Coating to be applied on underside of baseplate, and all parts below, Aurora Coating Spec. # 400		1 1/4"-6"	10. MLS	\$680	54A
8"-14"			1,021			
TABLE 2						
SURFACE PREPARATION REQUIREMENTS						
Remove any oil, grease, dirt, etc., by cleaning with solvent in accordance with SSPC-SP1	All Sizes	STANDARD				
Remove at least two-third of all visible rust, scale, etc., by commercial blast cleaning in accordance with SSPC-SP6	BASE & CPLNG GRD	\$432	54K			
	1 1/4"-6"	951				
	8"-14"	1,516				
Remove at least 95% of all visible rust, scale, etc., by blasting to near white conditions in accordance with SSPC-SP10.	BASE & CPLNG GRD	\$496	54L			
	1 1/4"-6"	1,094				
	8"-14"	1,744				
Remove all visible rust, mill scale, etc., by blasting to white metal in accordance with SSPC-SP5.	BASE & CPLNG GRD	\$570	54M			
	1 1/4"-6"	1,258				
	8"-14"	2,006				
TO USE THIS PIECE SHEET FOLLOW THE STEPS LISTED BELOW:						
1. Select the appropriate coating from Table 1 and note the list price figure.						
2. Multiply the list price by number of coats req'd. However, if min. MIL thickness is specified, multiply list price by appropriate figure to obtain cost for specified thickness. Use approx. film thickness from Table 1						
3. For Mounted Pumps, select the price for the appropriate Pump Size and add the cost for the Base & Coupling Guard						
4. Add list price of additional special preparation (if any) from Table 2 to cost figure (from previous step).						
5. Multiply cost from Step 4 by appropriate multiplier for product it will be used on. (See Table 3 below for multiplier).						
TABLE 3						
MULTIPLIER	PRODUCT					
1	All model 210, 220 & 680 units, all simplex sump pumps, all "pump only" units, all motor driven pumps					
1.5	All duplex sump pumps, all model 280 & 750 units, all diesel driven pumps (not fire pumps).					

Electric Control Panels & Accessories will be Additional Cost

LIST PRICE SHEET ENGINEERING OPTIONS

COATING SPECIFICATION DESCRIPTIONS

SPECIFICATION NO. 400 BITUMASTIC BLACK COATING (OPTION 54A)

Generic Makeup:

Waterproof coating made from pitch, selected solvents, mineral fillers and special additives.

Typical Use:

To be applied on underside of baseplate and all parts below. Suitable for coating sump pumps in the sewage industry.

Resistant to severe chemical fumes and corrosive vapors. Do not use on surfaces submerged in potable water.

Coating Manufacturers Are Factory Choice. Suppliers Normally Used Are:

1. Kop-coat Bitumastic Super Service Black
2. Rustoleum #9578

NOTE: Do not submerge until 14 days after final coat is applied.

SPECIFICATION NO. 523 EPOXY-PHENOLIC COATING (OPTION 54B)

Generic Makeup:

A cross-linked epoxy-phenolic that is cured with an alkaline curing agent.

Typical Use:

Suitable for immersion service in severe conditions if film thickness of 12 to 15 mils. Resistant to acids, alkalies, solvents, etc.

Coating Manufacturers Are Factory Choice. Suppliers Normally Used Are:

1. TNEMEC 69 Series Hi-Build Epoxoline
2. Plasiil Plasite #7122-H Epoxy

NOTE: SSPC-SP6 sandblast required (non-immersion service) SSPC-SP10 sandblast required (immersion service)

SPECIFICATION NO. 581 A.N.S.I. 61 GRAY MACHINERY ENAMEL (OPTION 54D)

Generic Makeup:

Light fast color pigments in an alkyd resin vehicle with aliphatic hydrocarbons solvent.

Typical Use:

When specified as A.N.S.I. 61 Gray enamels or anytime an alkyd enamel or machinery enamel is specified with no color called out.

Resistant to moisture, chemical fumes, weather, abrasion, oil and dry heat to 250°F.

Coating Manufacturers Are Factory Choice. Suppliers Normally Used Are:

1. TNEMEC Tneme-Gloss 2-2053-61 Gray Enamel

NOTE: Prime coat required (see specification #584 for primer)

LIST PRICE SHEET ENGINEERING OPTIONS

SPECIFICATION NO. 582 ALKYD MACHINERY ENAMEL (OPTION 54E)

Generic Makeup:

Fast color pigment in an alkyd resin vehicle with aliphatic hydrocarbons solvent.

Typical Use:

When a specific color (other than gray) of alkyd or machinery enamel is specified. Resistant to moisture, chemical fumes oil, weather, abrasion and dry heat to 250°F for light colors, 150°F for darker colors.

Coating Manufacturers Are Factory Choice. Suppliers Normally Used Are:

1. Rustoleum #1586

* Specify color

NOTE: Prime coat required (see specification #584 for primer)

SPECIFICATION NO. 584 PRIMER (OPTION 54G)

Generic Makeup:

Rust inhibiting pigments in a combination of several special resins.

Typical Use:

Suitable for either submerged or non-submerged metals, for use under alkyds, epoxies, coal tars, rubber base, emulsions.

Resistant to weather, corrosive atmospheres. Not for use with vinyls or surfaces submerged in potable water.

Coating Manufacturers Are Factory Choice. Suppliers Normally Used Are:

1. TNEMEC #69 Hi-Build Epoxoline

SPECIFICATION NO. 587 COAL TAR-EPOXY (OPTION 54J)

Generic Makeup:

Silicates with epoxy resins, coal tar and polyamide curing agent in aromatic solvent.

Typical Use:

To be applied on underside of baseplate and all parts below. Resistant to chemical environment, high humidity, alkali acid, water, abrasion, gasoline, diesel oil and dry heat to 200°F. Not suitable for potable water.

Coating Manufacturers Are Factory Choice. Suppliers Normally Used Are:

1. Rustoleum #9578
2. TNEMEC 46H-413 Coal Tar

NOTE: SSPC-SP10 sandblast required for immersion service

LIST PRICE SHEET ENGINEERING OPTIONS

ABS Certificates for ABS Type Approved pumps

LIST PRICE SUBJECT TO AURORA PUMP STANDARD MULTIPLIER ONLY

Driver HP	List Price
under 5	\$721
5-15	\$857
15-30	\$1,033
30-50	\$1,170
50-100	\$1,288
100-200	\$1,431
200 and up	Base Price \$1,431
	Price Per Each Additional 10 HP over 200 HP \$58

Note: Add the fees for Certified Performance Test and Certified Hydro Test to each pump that requires ABS cert.

Examples

40 HP Driver	Price	\$1,170
175 HP Driver	Price	\$1,431
250 HP Driver	Base Price	\$1,431
	Additional HP Price, (250-200)/10 * 58	\$290
	Total Price	\$1,721

ABS requests the following information for creation of certificates

Pump Information: GPM, PSI, RPM and driver HP.

Vessel Information: Vessel name, hull number, and the planned use for the pump.

SASO Certificate of Compliance Fee Schedule

Order Value	Certificate Fee	
0-10,000 USD	\$269	USD
10,001-60,000	\$431	USD
60,001-100,000	\$539	USD
100,001-200,000	\$1,023	USD
200,001-500,000	\$1,991	USD
500,001 and above	\$2,745	USD

When ordering this certificate please use control number: 999-5060-999