



**RANDOLPH AUSTIN COMPANY**

[www.RandolphAustin.com](http://www.RandolphAustin.com)

# Operations Manual

**Pump Series: 600**

**Model #610-100**

- 610 Pump Head
- Single Speed Belt Drive Unit
- ¼ Hp, 60 Hz, 1 ph, Motor

**Randolph Austin Company  
2119 FM 1626  
Manchaca, Texas 78652  
(512) 282-1590**

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# Randolph Austin Company

## Peristaltic Pumps

### WHY CHOOSE A PERISTALTIC PUMP?

Peristaltic pumps work by using a flexible tubing inside a raceway, which is alternately compressed by a set of rotating rollers. This flexing action insulates the materials being transferred from the moving parts of the pump. The advantages are important when transferring sterile solutions, abrasives, inks or any other fluid, which would ordinarily contaminate or destroy the internal components of a pump. Because of the action of the Randolph pump, it is an excellent choice for shear sensitive fluids and applications where fluid metering is necessary.

### PERFORMANCE PARAMETERS

Several factors such as viscosity, pressure, speed, pump configuration, and tubing selection, influence the flow rate of a Randolph pump. These factors must be considered to determine the selection of a pump.

Fluids with increased viscosity will result in reduced flow rates. Careful consideration needs to be made to the distance and height of the pump relative to fluids being pumped, especially if they are viscous. The further the pump is from the source, the greater the flow loss.

The discharge pressure capabilities of the Randolph pump will vary with the type and size of tubing selected as well as the operating conditions of the pump. Excessive discharge pressure may rupture tubing or reduce the effective tubing life.

Tubing selection must consider the fluid compatibility, temperature, and pressure, which the pumping application will see. It is recommended that the tubing be immersed in the fluid to be pumped for a minimum of 24 hours as a method of determining chemical compatibility. However, there is no guarantee that tubing which passes a "soak" test will perform in the same manner inside the pump. The soak test, while providing valuable information, does not replicate the dynamic situation inside the pump.

### WHY YOU SHOULD CHOOSE A RANDOLPH PERISTALTIC PUMP

Randolph pumps are manufactured to exacting tolerances with high quality materials. The rugged construction of the Randolph pump makes it an ideal choice for applications where trouble free performance is necessary.

With over forty years' experience, in peristaltic pumps, Randolph Austin Company has a proven track record of value and service to our customers.

### STANDARD CONSTRUCTION

Randolph pumpheads are available in a variety of material constructions. Models 250, 500, 610, and 750 are machined from aluminum housings and use stainless steel internal components for corrosion and wear resistance. The model 880 pump is machined from an aluminum casting, and uses plated steel components for its impeller plate and shaft.

### STAINLESS STEEL MODELS

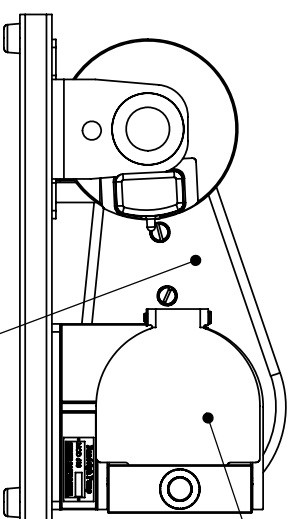
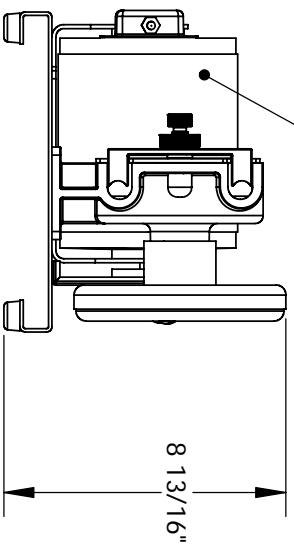
Randolph Austin Company offers the 615 and 755 model pumps in a 316 stainless steel housing. This material is well suited for washdown applications. Model 615 and 755 pumps have the same performance characteristics as the standard model 610 and 750 pumps respectively.

### PLASTIC PUMP HEADS.

The 300 and 400 series pumps housings are made from polycarbonate. These pumps offer the O.E.M. cost effective, quality units to incorporate into their design. The 300 series pump is designed to mount directly of motor and can be configured in a variety of forms. The 400 series pump is a panel mount pump with a standard three-impeller roller yoke and hinged side cover. The 400 series is the newest pump in the Randolph Austin catalog.

REVISIONS			DATE	APPROVED
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A		Motor Assembly added - Corrected Belt Guard Assy No. Added p/n for rubber feet	09/16/04	
B		Hinged 610-PHO Added to Assy	05/11/09	

Qty 1: 03-00060  
Motor Sub Assembly  
1/4 Hp, 60 Hz, 1 Ph, 115 VAC, O.D.P. motor  
with line cord & switch

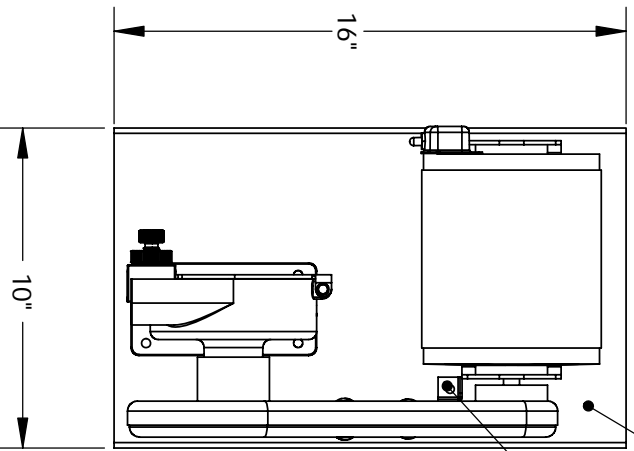


Qty 1: 610-PHO  
610 Pump Head

Qty 1: 62-0220  
Belt Guard Assembly - 610 pump

Qty 1: 62-0001  
Base

Qty 1: 02-0165  
Mounting Bracket

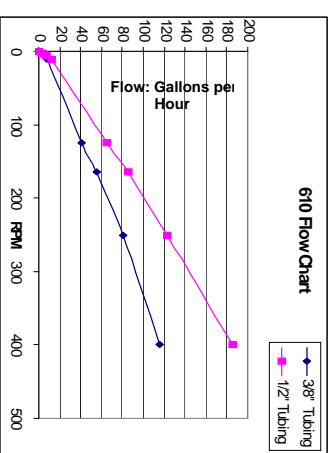


**Specifications:**

- 1: 430 Rpm, Single Speed, Non-Reversing
- 2: Power Requirements: 115 VAC, 60 Hz, 1 Ph, 5.7 Amps
- 3: Flow Rate: Max Flow with 1/2" ID Tubing = 200 GPH  
Max Flow with 5/8" ID Tubing = 125 GPH

B.O.M - Items Not Shown

04-0481: Pulley, 1 1/2", Motor  
00-0492: Pulley, 6", Pump  
00-0582: "V" Belt



Randolph Austin Co

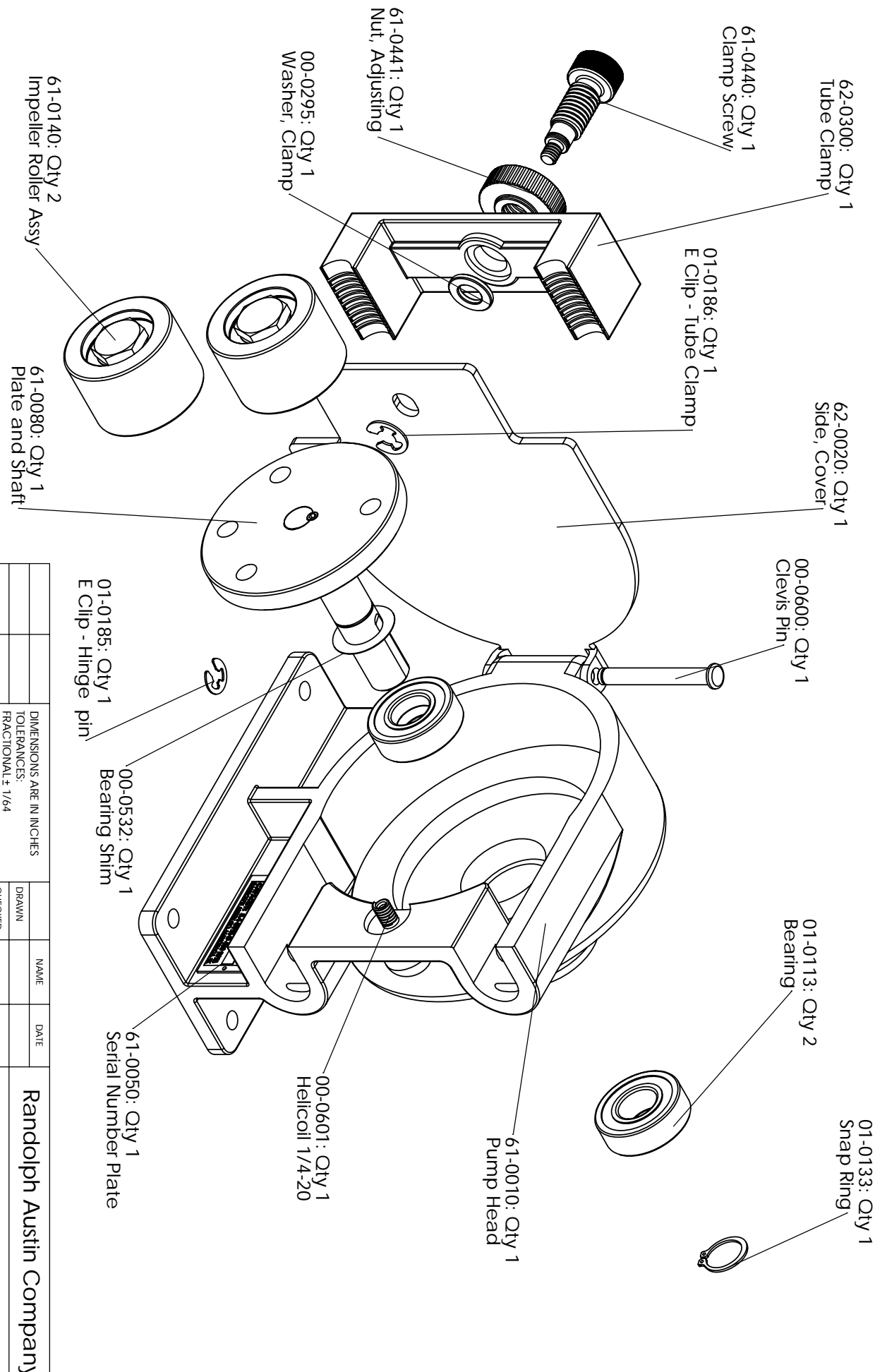
610-100  
Assembly Print

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NAME	DATE	REVISIONS	DESCRIPTION	DATE	APPROVED
DRAWN					
CHECKED					
ENG APPR					
MFG APPR					
Q.A.					
COMMENTS:					
FINISH	--				
USED ON					
APPLICATION					

Ship weight : 32 lbs  
Box: 18 X 12 X 10

SCALE: 1/8" = 1" WEIGHT: SHEET 1 OF 1

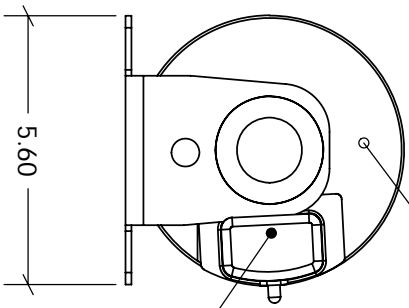


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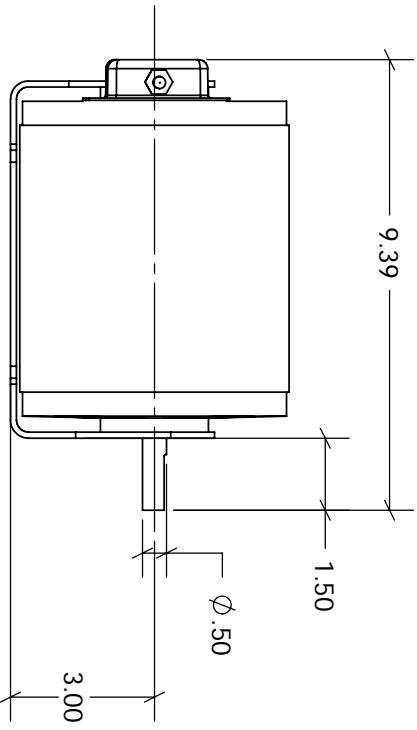
APPLICATION		DO NOT SCALE DRAWING		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 1/64 ANGULAR MACH ± 1° TWO PLACE DECIMAL ± .010 THREE PLACE DECIMAL ± .005		DRAWN	NAME	DATE	<b>Randolph Austin Company</b>  610 Pump Head Exploded Assembly View Pumps after Aug-2008
NEXT ASSY	USED ON	FINISH	--	MATERIAL	--	CHECKED			
				MFG APPR		ENG APPR			
				Q.A.					
				COMMENTS:					
SIZE	DWG. NO.	SCALE:1:15	WEIGHT:					REV.	
<b>A</b>	<b>610-PHO-XP</b>								
								SHEET 1 OF 1	

REVISIONS		DATE	APPROVED
ZONE	REV.		

03-0061:  
Motor, 1/4 hp, 1 ph, 60 Hz  
ODP, 115 AC



05-0145:  
Switch Assy



Motor & Switch Assy:

Motor: 03-0061  
General Dim & Specifications:  
Base Mounted, Split Phase, Dripproof, Resilient  
1/4 Hp, 1ph, 115 VAC, 60 Hz  
SF: 1.0  
Full Load Amps: 5.7  
Frame: 48

Toggle Switch: 05-0145

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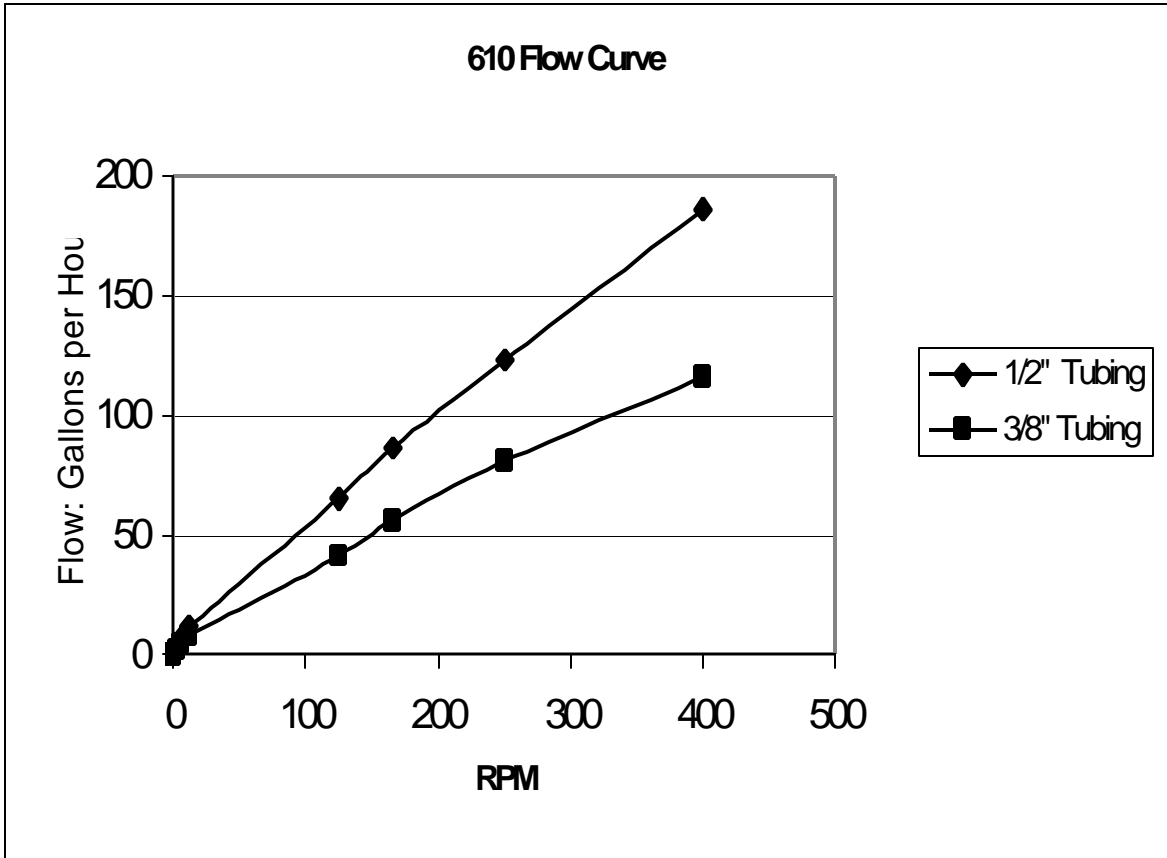
DIMENSIONS ARE IN INCHES		NAME	DATE
TOLERANCES:		DRAWN	
FRACTIONAL: ± 1/64		CHECKED	
ANGULAR: MACH ± 1		ENG APPR	
TWO PLACE DECIMAL ± .01		MFG APPR	
THREE PLACE DECIMAL ± .005		Q.A.	
MATERIAL	FINISH	COMMENTS:	
--	--		
DO NOT SCALE DRAWING	APPLICATION		
	NEXT ASSY		
	USED ON		

Randolph Austin Co  
03-0060: 1/4 Hp Motor  
Assembly

SIZE	DWG. NO.	REV.
A	03-0060	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 2



600 Series Pumps – Flow Curve



Flow curve established with water and a minimum lifting distance. Flow will be affected by fluid viscosity and lift distance.



## HOW TUBING IS INSERTED IN THE PUMP

1. Turn power off. Remove side plate and tubing clamp. Remove existing tubing by manually turning rollers while gently tugging on the tubing.
2. Manually move rollers so that they are horizontal in relation to the base of the pump. Carefully insert tubing through the top tubing clamp section and the top of the pump housing. Manually turn the rotor in a counter clockwise direction until the roller begins to compress the tubing and begin feeding the tubing behind the bottom roller.
3. When the pump has moved ½ turn the tubing should be in a compressed state at the 9:00 o'clock position.
4. Return the side plate and tubing clamp to the pump. Tighten the knurled nuts on the side plate and tube clamp.

Tubing sizes and capacities of the Randolph Pump:

Pump Series	Tubing Size
250	.062" (3/16") ID x .187" (3/16") OD
250	.125" (1/8") ID x .250" (1/4") OD
300	.250" ( 1/4") ID x .437" (7/16") OD
400	.250" ( 1/4") ID x .437" (7/16") OD
510	.187" (3/16") ID x .375" (3/8") OD
510	.250" ( 1/4") ID x .437" (7/16") OD
610, 615, 620	.375" (3/8") ID x .625" (5/8") OD
610, 615, 620	.500" ( 1/2") ID x .750" (3/4") OD
750	.625" (5/8") ID x .937" (15/16") OD
750	.750" (3/4") ID x 1.062" (1 1/16") OD
880	.750" (3/4") ID x 1.125" ( 1 1/4") OD
880	1.00" ( 1") ID x 1.500" (1 1/2") OD

## Tubing Sizes and Materials – 600 Series Pumps

**Povinal™** is a polyvinyl alcohol based tubing which is excellent for use in applications with aliphatic, aromatic and chlorinated hydrocarbon solvents. **Povinal™** has good flex fatigue resistance and is suitable for many industrial applications. It may be used as a substitute for fluoroelastomer polymers in some applications. Not recommended for use with water or solutions containing concentrations of water. Available in lengths up to 500 feet. Pump tubing is teal in color.

**Cilran™** is made from a thermoplastic elastomer which possesses exceptional chemical resistance to acids and bases. **Cilran™** has low gas permeability, good flex fatigue resistance and meets USP Class VI specifications. Ideal for use in many laboratory applications, it may be used in place of silicone for some applications. **Cilran™** is translucent white in color and available in lengths up to 500 feet.

**E-D Plex™** is a multi-purpose tubing that is ideally suited for applications which range from transferring paint, ink, acids and bases. Some oil and hydrocarbons will work with **E-D Plex™**, but should be tested before use. Combining the environmental resistance of EPDM with the chemical resistance of chloroprene, **E-D Plex™** possesses similar elastomeric performance found in more expensive vulcanized rubber, while still maintaining high flex fatigue resistance.. **E-D Plex™** has been proven very successful in peristaltic pump applications where continuous flexing is required.

**Vytex™** is a clear flexible polyvinyl tubing ideal for general purpose usage in applications with dilute aqueous solutions (both acids and alkali's) and for food and beverage usage. Strong acid solutions may be used with **Vytex™** for short intervals, but should be flushed with water after use. The smooth surface allows for easy flushing and cleanup for food and beverage applications. **Vytex™** is a durable, high flex tubing with a Shore "A" durometer of 60 allowing a long life expectancy for continuous flexing where peristaltic pumps are used. Available in lengths up to 500 feet.

**PROTHANE II™** is a transparent, aqua blue, polyester polyurethane tubing that exhibits excellent abrasion resistance, has good low temperature properties and is resistant to ozone and oxidation. **PROTHANE II™** exhibits an excellent resilience to continuous flexing and impacting experienced in peristaltic pumps. Along with these exceptional features **PROTHANE II™** exhibits good hydrolic stability, good oil and fuel resistance and high tensile and tear strength. **PROTHANEII™** is resistant to diesel fuel, kerosene, motor oil, mild solvents, aromatic hydrocarbons, gasoline, and concentrated acid and alkaline solutions. The tubing should be tested with the chosen fluid in all cases.

# Randolph Austin Company

## Tubing Chemical Resistance Chart

Code indicates the percentage weight gain or loss after 24 hours immersion in the fluid.

(B) Best = 1-4%, (G) Good = 5-10%, (F) Fair = 11- 15%, (P) Poor = 16%+

The data contained herein are based on tests conducted on representative samples and are considered accurate. The results should indicate liquids that could be used with the tubing. However no guarantee is given or implied regarding the application of this data to the safe use of the tubing. It is suggested that the purchaser conduct tests to determine if this material is suited to this application.

	Cilran™	ED-Plex™	Povinal™	Prothane II™	Vytex™
<b><u>Aqueous Solutions</u></b>					
Water	B	B	P	B	B
Sodium Chloride (Saturated)	B	B	F	B	B
Aluminum Sulfate	B	B	P	B	B
<b><u>Acids &amp; Bases</u></b>					
Sulphuric Acid (66° Be)	B	B	P	G	B
Acetic Acid, Glacial	B	P	P	P	F
Hydrochloric Acid (30° Be)	B	B	P	P	G
Nitric Acid (40° Be)	B	B	P	P	G
Sodium Hydroxide (50% sol.)	B	B	P	B	B
Ammonia Hydroxide	B	B	P	B	B
<b><u>Aliphatic Hydrocarbons</u></b>					
Diesel Fuel	P	P	B	G	G
Naptha	P	P	B	G	G
Mineral Oil	P	P	B	G	B
<b><u>Aromatic Hydrocarbons</u></b>					
Toluene	P	P	B	P	P
Xylene	P	P	B	P	G
<b><u>Chlorinated Solvents</u></b>					
Trichloroethylene	P	P	B	P	P
Carbon Tetrachloride	P	P	B	P	P
Methylene Chloride	P	P	B	P	P
<b><u>Ketones</u></b>					
Acetone	B	B	F	P	P
Methyl Ethyl Ketone (MEK)	G	G	F	P	P
<b><u>Esters</u></b>					
Amyl Acetate	P	B	F	P	P
Butyl Acetate	P	B	F	P	P
Ethyl Acetate	P	F	F	P	P
<b><u>Alcohol</u></b>					
Butyl Alcohol	G	G	P	G	B
Isopropyl Alcohol	G	B	F	B	B
Methyl Alcohol	B	B	F	G	B
Ethyl Alcohol (90%)	B	B	G	G	G
<b><u>Glycol</u></b>					
Ethylene Glycol	B	B	G	B	B
Glycerine	B	B	G	B	B
<b><u>Vegetable Oil</u></b>					
Safflower Oil	B	B	B	B	G

# MATERIAL SAFETY DATA SHEET

Randolph Austin Company - 2119 F.M. 1626 – Manchaca, TX 78652

**PRODUCT NAME:** Tube Lube  
**PRODUCT CODE:** N/A

**Date:** Nov-02-2001

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## SECTION I

### HAZARDOUS INGREDIENTS

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<u>Ingredient</u>	<u>Percent</u>	<u>TLV</u>
None (at this time)		

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## SECTION II

### HEALTH HAZARDS

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**Threshold Limit Value:** N/E

**Effect of Overexposure**

**Eyes:** Prolonged exposure may cause eye irritation.

**Skin:** Prolonged exposure may cause skin irritation

**Inhalation:** UNK

**Ingestion:** Harmful if swallowed in sufficient quantities.

**First Aid**

**Eyes:** Flush with plenty of water for 15 minutes while lifting eyelids to insure entire eye surface is washed.

**Skin:** Wash with soap and water

**Inhalation:** UNK

**Ingestion:** Consult physician.

**Other Information:** None

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## SECTION III

### SPECIAL PROTECTION INFORMATION

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**Respiratory Protection:** No special respiratory protection is required under normal situations. During the generation of large quantities of oil mist, use a MSHA/NIOSH approved respirator.

**Ventilation Requirement:** No special ventilation is required

**Protective Clothing:**

**Eyes:** Normal Protection against foreign substances – safety goggles.

**Skin:** Chemical resistant gloves should be used

**Additional Protective Measures:** Eye Wash Station and safety shower should be provided

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## SECTION IV

### FIRE AND EXPLOSION HAZARD DATA

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**Flash Point (Method):** 540 ° F (c.c.)

**Flammable Limits (% Volume in Air):** N/A

**Upper:** N/A      **Lower:** N/A

**Extinguishing Media:** Water – Fog, Foam, Carbon Dioxide and Dry Chemical

**Special Fire Fighting Procedures:** Standard fireman's body protection. Self-contained breathing apparatus must be used to protect from products of combustion.

**Unusual Fire and Explosion Hazards:** Keep away from heat, sparks and open flame

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# MATERIAL SAFETY DATA SHEET

Randolph Austin Company - 2119 F.M. 1626 – Manchaca, TX 78652

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## SECTION V

### PHYSICAL DATA

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<b>Boiling Point:</b> N/A	<b>Specific Gravity (Water =1):</b> 0.959	<b>Vapor Pressure (MM HG):</b> UNK
<b>Evaporation Rate:</b> N/A	<b>Solubility in Water:</b> UNK	<b>Vapor Density (Air =1):</b> N/A
<b>pH:</b> UNK	<b>Weight per Gallon:</b> 7.95 lbs	<b>Percent Volatile by Volume:</b> N/A

**Appearance and Odor:** Light Yellow, Oily, No Apparent Odor

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## SECTION VI

### REACTIVITY DATA

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**Stability:** Stable

**Incompatibility:** N/A

**Conditions to Avoid:** Keep from contact with oxidizing materials.

**Hazardous Decomposition Products:** Product of incomplete combustion can include CO, CO<sub>2</sub> and dense smoke.

**Hazardous Polymerization:** Will not occur.

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## SECTION VII

### SPILL AND LEAK PROCEDURES

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**Steps to be taken if material is released or spilled:** Soak up spill with sand, earth or sawdust. Flush with detergent and water.

**Waste Disposal Method:** Dispose of in accordance with Federal, State and local regulations

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## SECTION VIII

### D.O.T. SHIPPING INFORMATION

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**Proper Shipping Name:** None

**Hazard Class:** None

**ID Number:** None

**Label Requirements:** None

**Other Information:** None

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## SECTION IX

### ADDITIONAL INFORMATION

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**This information may be of importance to you:**

**Precautions to be taken in handling and storing:** Store in closed containers, protect from moisture and foreign matter. Keep away from heat and excessively warm areas.

**Other precautions:** Do not transfer to unmarked containers.

**Conditions to Avoid:** Keep from contact with oxidizing materials

N/A = Not Applicable

N/D = Not Determined

N/E= Not Established

UNK = Unknown

Date Issued: 03/07/1986

Date revised: 11/01/2001

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