Keeping it Clean – Sanitary Pumps 101

Specifying Peristaltic Pumps

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Who Is Watson-Marlow?

- In business over 50 years, the world’s largest, most experienced manufacturer of peristaltic pumps and tubing
- Leading experts in peristaltic pumps...it is all we do. 100% dedicated to peristaltic pump technology for the sanitary process industry.
- Worldwide company with direct stocking, sales, and support offices in US, UK, Netherlands, France, Germany, Italy, Belgium, South Korea, China, South Africa, Brazil
- Subsidiary of the Spirax Sarco Engineering Group - world leading manufacturer of steam equipment & systems
Agenda

- How a Peristaltic Pump Works
- Features of the Peristaltic Pump
- Specifying a Peristaltic Pump

How a Peristaltic Pump Works

- Simplicity
- Rotor Turns
- Rollers Squeeze Tubing
  - Trapping Fluid/Gas
- Product is Pushed Ahead and
  - Out Pump as Rollers Advance
- Suction is Achieved by Tubing
  - Springing Back, Sucking in
    - Fluid – Like a Squeeze Bulb
How a Peristaltic Pump Works

- Tubing Life Proportional to Speed/Number of Roller Passes
- Slower Speed, Fewer Rollers = Longer Life

Features of the Peristaltic Pump

- Wide Performance Range
- Metering
- Self Priming, Dry Priming
- Dry Running – No Damage to Pump
- Low Shear – Will Not Damage Fluid Being Pumped
- Handles Mixed Phase Flow – Solids/Gases
Features of the Peristaltic Pump

- Reversible Flow
- No Valves/No Seals
- Low/Cost Maintenance
- Completely Sanitary
- No Contact Between Product and Pump
- Tubing = Single-Use, Inexpensive Fluid Path

Specifying a Peristaltic Pump

- Flow Rate
- Pressure – suction and discharge
- Fluid
- Duty Cycle
- Type of Control
- Enclosure
- Voltage
Pump Selection – Three Steps

• Pump Size
• Tubing
• Drive Selection

Pump Size

• Using Flow Rate Find Pump Series
Tubing Selection – Function of…

- Pump Head
- Flow Rate
- Fluid
- Pressure
- Duration of Use

Tubing Selection – Wall Thickness

- Tubing works hand in hand with pump head
- Wall thickness must match pump head gap
Tubing Selection

- Use Flow Rate Table to Select Tube Size

### Flow Rate Ranges with S20R2 or S20R head (ml/min*)

<table>
<thead>
<tr>
<th>Tube Size</th>
<th>0.5mm</th>
<th>0.8mm</th>
<th>1.6mm</th>
<th>3.2mm</th>
<th>6.4mm</th>
<th>8.0mm</th>
<th>9.6mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4 mm Thick Wall Tubing</td>
<td>100</td>
<td>108</td>
<td>119</td>
<td>129</td>
<td>139</td>
<td>149</td>
<td>159</td>
</tr>
<tr>
<td>1.0 mm Thick Wall Tubing</td>
<td>91</td>
<td>102</td>
<td>114</td>
<td>126</td>
<td>138</td>
<td>150</td>
<td>162</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tube Size</th>
<th>Speed Range (9.4 to 220 rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5mm</td>
<td>1/30&quot; 1/32&quot; 1/16&quot; 1/8&quot; 3/16&quot; 3/32&quot; 1/4&quot; 5/32&quot; 3/16&quot;</td>
</tr>
</tbody>
</table>

### Materials

- **Platinum Cured Silicone**
  - most commonly used material
  - life 100+ hours
  - low pressure 15psi
- **Santoprene (Bioprene, Pharmed)**
  - good chemical resistance
  - life 3000+ hours
  - low pressure 30psi
- **StaPure**
  - reinforced platinum cured silicone
  - life 3000+ hours
  - pressure up to 100psi
Tubing Selection

• Continuous Tubing
  • Fewer connections
• Pre-fitted Tubing Elements
  • Secure loading
  • Higher pressure

Tubing Selection—Single Use Bag Sets

• Trend in Industry
• Not Just Specifying a Bag!
  Tubing on Bag
  Must Work with Pump
Drive Selection

• Control Options
  • Manual
    • Control at pump only
    • Speed
    • Direction

• Control Options
  • Analog
    • 4-20mA control
    • Remote stop/start
    • Remote direction
    • Status outputs
    • Speed output
Drive Selection

• Control Options
  • Digital
    • RS232, RS485
    • Profibus, Foundation Fieldbus
    • Complete control of pump
    • Enhanced outputs – status, maintenance
    • Single wire

THANK YOU!!

• Questions?
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