TURBINE/AIRCRAFT WASHING SYSTEMS

Configured for the Operators Needs
And Environmentally Compatible
The single most proactive task to prevention of corrosion is to remove the salts and sulphides deposited on the airframe and in the engines.

All engine manufacturers recommend frequent rinses/washes with **pure** water.

Daily rinses for engines operated with five miles of salt water are essential.
Integrated Systems Approach

- User driven configurations to meet operational and environmental requirements
- Both long term fixed base operations and mobile fly away solutions available
- Cost driven systems that account for both operational and environmental costs
System Characteristics

- Reliable source of consistent highest quality pure water
- Application tools to apply water and detergent tailored to the platforms being cleaned
- Environmentally compatible capture of waste water and material
- Environmentally compatible recycling of the waste water and material
WATER PURIFICATION

Not All Pure Water Is The Same
Not All Water Is The Same

- Locally produced bottled water is not a guarantee of purity.

- On site water purification offers the operator controlled water purity. There are two types of purification systems available to the operator; distillation and reverse osmosis.

- Only distilled water reliably meets and exceeds all engine rinse pure water requirements specified by Turbomeca and Rolls Royce.
Pure Water Source

- *TurboPure Water Distillers* are recommended to provide the most cost efficient and consistent water quality exceeding current OEM and DOD requirements

- Plug into any available pressure water source
- Operate on 115/250 VAC, 60 or 50 HZ
- Automatic tracking of water purity with indicators
- May be equipped for drinking water
## TURBOPUREWATER TEST RESULTS COMPARED TO STANDARDS

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear, limpid (pure), colorless w/o deposits or suspended materials</td>
<td>Clear, pure, colorless w/o deposits or suspended materials</td>
<td>Clear, pure, colorless w/o deposits or suspended materials</td>
<td>Clear and colorless</td>
</tr>
<tr>
<td>Conductivity @ 25°C</td>
<td>max 5μS/cm**</td>
<td>max 5μS/cm</td>
<td>max 5μS/cm</td>
<td>2μS/cm</td>
</tr>
<tr>
<td>pH</td>
<td>5.5–7.0</td>
<td>5.5–7.0</td>
<td>5.5–7.0</td>
<td>5.63</td>
</tr>
<tr>
<td>Oxygen</td>
<td>Max 0.4 Mg/L</td>
<td>Max 0.4 Mg/L</td>
<td>Max 0.4 Mg/L</td>
<td></td>
</tr>
<tr>
<td>Ash</td>
<td>max 2 ppm</td>
<td>max 2 ppm</td>
<td>max 2 ppm</td>
<td>n.d. *****</td>
</tr>
<tr>
<td>Calcium</td>
<td>NA****</td>
<td>NA</td>
<td>NA</td>
<td>n.d.</td>
</tr>
<tr>
<td>Magnesium (total)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>n.d.</td>
</tr>
<tr>
<td>Total Hardness</td>
<td>NA</td>
<td>1f vice***</td>
<td>NA</td>
<td>n.d.</td>
</tr>
<tr>
<td>Chloride</td>
<td>NA</td>
<td>1 ppm</td>
<td>NA</td>
<td>n.d.</td>
</tr>
<tr>
<td>Sodium (total)</td>
<td>NA</td>
<td>1 ppm</td>
<td>NA</td>
<td>n.d.</td>
</tr>
<tr>
<td>Sulfate</td>
<td>NA</td>
<td>1 ppm</td>
<td>NA</td>
<td>n.d.</td>
</tr>
<tr>
<td>Total Dissolved Solids (TDS)</td>
<td>NA</td>
<td>2 ppm</td>
<td>NA</td>
<td>n.d.</td>
</tr>
</tbody>
</table>

* Conducted by Midwest Laboratories Inc., Omaha, NE. Specific results available on request.

** Disclosure:
Pure & Secure LLC, (TurboPureWater) has no personal or financial relationship with Midwest Laboratories Inc.

**μS is the symbol for measurement of electrical conductivity in micro-siemens

*** French measurement

****NA (Not Applicable)

*****n.d. (Not detected)
Our XQ-1000 is ideal for single helicopters.
The XQ-1000 is our newest system and is designed for single helicopter operators. Like all of our systems, the XQ-1000 can produce multiple types of water so can be used for rinse water, drinking water and battery water.
- Produces 9 gpd (35 lpd)
- Stores 10 gallons (39 L)
- 120V/240V versions
- 50/60 Hz versions
- Meets USCG specs
- Meets Turbomeca specs
- Pretreatment Optional
- Wall Mounted DI
- Purity Indicator Lights
- 1 Year Warranty
- Extended Warranty Option
- Pump included

Our XQ-1400 is ideal for small operations.
The XQ-1400 is designed to support up to 4 helicopters. The XQ-1400 can produce multiple types of water so can be used for rinse water, drinking water and battery water.
- Produces 12 gpd (45 lpd)
- Stores 25 gallons (97 L)
- 120V/240V versions
- 50/60 Hz versions
- Meets USCG specs
- Meets Turbomeca specs
- Pretreatment Optional
- Wall Mounted DI
- Purity Indicator Lights
- 1 Year Warranty
- Extended Warranty Option
- Pump included

Our XQ-5600 is ideal for oil platforms.
The XQ-5600 is designed for onshore or off-shore operations. With 50 gallons of storage, this system can provide high-purity water for many helicopters, battery maintenance and bio-secure drinking water needs.
- Produces 50 gpd (189 lpd)
- Stores 50 gallons (189 L)
- Purity Indicator Lights
- 240V 50/60 Hz
- Meets USCG specs
- Meets Turbomeca specs
- Pretreatment Included
- Wall/Frame Mounted DI
- Optional Indicator Lights
- 1 Year Warranty
- Extended Warranty Option
- Pump included

Our HQ-7000HS is used by the USCG.
The HQ-7000HS is a higher capacity system that includes most of our support services. Used in U.S. Coast Guard operations nationwide and is popular for bio-secure drinking water as well.
- Produces 60 gpd (225 lpd)
- Stores 75 gallons (290 L)
- Purity Meter
- 240V 50/60 Hz
- Meets USCG specs
- Meets Turbomeca specs
- Pretreatment Included
- Wall/Frame Mounted DI
- Optional Indicator Lights
- 1 Year Warranty
- Extended Warranty Option
- Pump included

Our XQ-72K is for large operations.
The XQ-72K is our largest system for major operations with multiple water applications. Bio-Secure drinking water can be bottled or networked to multiple coolers. Great for major centers.
- 600 gpd (2,300 lpd)
- Various Storage Options
- Custom Configurations
- 240V, 50/60 Hz
- Meets USCG specs
- Meets Turbomeca specs
- Pretreatment included
- Wall/Frame Mounted DI
- Digital Purity Meter
- 1 Year Warranty
- Extended Warranty Option
- Pump included
<table>
<thead>
<tr>
<th>MODEL</th>
<th>CAPACITY Makes/Stores Gals in 24Hrs</th>
<th>USE/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>XQ1400</td>
<td>12/25</td>
<td>Includes 1-year warranty, hook-up kit, pre-treatment softener cartridge kit, twin DI cartridges with purity alert light systems, spare filters and heating element, hand held TDS meter, manuals. Available options include 5-year warranty, drinking water distribution, Pre-treatment sediment and carbon filters, medical grade DI system with digital purity meters.</td>
</tr>
<tr>
<td>XQ5600</td>
<td>50/50</td>
<td>Includes 1-year warranty, hook-up kit, twin DI cartridges with purity alert light systems, drinking water distribution, Pre-treatment regenerating softener, Pre-treatment sediment and carbon filters, spare filters and heating element, hand held TDS meter, manuals. Available options include 5-year warranty medical grade DI system with digital purity meters.</td>
</tr>
<tr>
<td>XQ7000</td>
<td>60/75</td>
<td>Includes 1-year warranty, hook-up kit, twin DI cartridges with purity alert light systems, drinking water distribution, Pre-treatment regenerating softener, Pre-treatment sediment and carbon filters, spare filters and heating element, hand held TDS meter, manuals. Available options include 5-year warranty medical grade DI system with digital purity meters.</td>
</tr>
</tbody>
</table>
Distiller/RO Combo Units

- Provides the distillation process to provide ultra-pure water for the turbine rinses

- And Reverse Osmosis process for the quantity of purified water required for airframe washes.

- Requires external tank to store the RO water in volumes large enough for multiple airframe washes
# Distiller/RO List Prices

## TURBOPURE DISTILLER/RO UNITS

### Airframe Wash and Turbine Rinse Combination Systems

<table>
<thead>
<tr>
<th>Model</th>
<th>XQ-1400WR</th>
<th>XQ-7000WR</th>
<th>XQ-7000-2WR</th>
<th>XQ-72000-WR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pretreatment</strong></td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Distilled Rinse System</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production, GPD (24 hrs)</td>
<td>12</td>
<td>60</td>
<td>120</td>
<td>630</td>
</tr>
<tr>
<td>Internal Storage, Gallon</td>
<td>25</td>
<td>75</td>
<td>150</td>
<td>5</td>
</tr>
<tr>
<td>DI Cartridges w Resi-lights</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>special DI tank</td>
</tr>
<tr>
<td># Rinses /day</td>
<td>3</td>
<td>15</td>
<td>30</td>
<td>300</td>
</tr>
</tbody>
</table>

### Purified Airframe Wash**

| Production, GPD (24 hrs) rate | 1500 | 2500 | 5000 | 6000 |
| External Storage (Tank) | 500 | 500 | 1000 | 1000 |
| # washes/day (200 g.p.wash) | 7 | 12 | 25 | 25+ |
Rinse–Wash Application Equipment

For Turbines and Airframes
“Tactical” location engine washing and/or fresh water compressor rinsing
- Uses existing mil spec gas path cleaner and water container at the aircraft location
- Uses aircraft 28VDC power or built in battery pack
- Fly away unit weighs 40lbs with tool kit. 22lbs without tool kit.
Turbine Engine Wash System (TEWS)

- Self-contained, one-man operational engine wash system.
- It has its own diesel engine power source and carries both gas path cleaner and water.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>20”W X 38”L X 43” H</td>
</tr>
<tr>
<td>System Weight</td>
<td>322 pounds dry</td>
</tr>
<tr>
<td>Tank Capacity</td>
<td>16 Gal Rinse, 12 Gal Chemical</td>
</tr>
<tr>
<td>Fixed Fluid Output</td>
<td>2.5 Gal/Min @45 psi non adjustable</td>
</tr>
<tr>
<td>Hoses</td>
<td>50’ Fluid Supply Hose with Inline Bypass and Quick Connect, 50’ Air Supply Hose with Quick Connect</td>
</tr>
</tbody>
</table>

Model # 2/045D–TEWS, NSN, 4940–01–514–0087
Aircraft Washing System (AWS)

- Designed for aircraft wash and flight line or ground support decontamination and cleaning.
- System has a capacity of 525 gallons of water, 60 gallons of soap, with a high-pressure delivery system and an auxiliary soap delivery system.
Intergrated Turbine/Aircraft Wash System

- 20 Foot Portable Enclosed Module
- Climate Controlled – Heating & Air Conditioning
- Ultra-pure water for turbine rinse/wash
- RO water for airframe washing – store up to 1,000 gallons
- Hydroblaster aircraft washing module
- 4 each – 100 foot hose reels
- TEWS cart for flight line turbine rinses
Preliminary

Raw Water Source
20GPM @ 40Psi Minimum

Dual Reel 100' Hose Installation

20 Foot Turbine/Airframe Portable Wash Module
Static AWS and TEWS Installations
Climate Controlled-non Arctic environment
Distiller: 240VAC, 80Amp, 1Phase, 4-wire

TRACE Wash Module 20-7000-2WR
10/10/13
Example ITAWS Layout

40 Foot Unit with Water Purification and recycling system included.
Portable Wash Racks

- HydroMat—includes liners, pumps, waste water filters and water filled berm
- A28’X68’ mat would be sufficient for a Black Hawk or an S–92
- Drive On, Back Off Configuration
Hydropad

- Modular 8’ X 20’ steel floor sections
- Portable, no underlayment required
- 16 Ton per axle load capacity including on-off ramp
- Sealed gutters trap solids for later removal
- Sump box with ½ HP pump for water recovery

- Optional roll on rain cover available
- Optional sidewalls and light stanchions available
Hydropad wash rack collects waste water and solids for later disposal or recycling

Recycling can reclaim 80% of water used
Hydropad and AWS

Recommendations for Wash Systems
Recommended Systems Medium Twin Helicopter

- Turbine Rinse/Wash only—rinse daily in severe conditions
  - XQ–1400 Distiller****
  - TAC–Cube Turbine wash applicator
  - Tool Kit for AW–139

- Turbine and Airframe Cleaning–Daily turbine and airframe rinse
  - XQ–7000 Distiller ****
  - TEWS and AWS
    - ****Installed in hanger
    - Assumes no water reclamation
Mobile Wash System (ITAWS)—multiple aircraft support

- 20 foot ITAWS module with
  - EHOV – for airframe wash
  - TEWS – for turbine wash
  - XQ–7000–WR
  - Stores 1000 gallon RO water and 75 gallons distilled water
  - Options for 2 to 4 each 100 foot hose reels and wands

- Will handle up to 8 medium twin helicopter engine and airframe rinses daily
- Higher capacity systems available