TWISTER XL3™ TECHNICAL REPORT

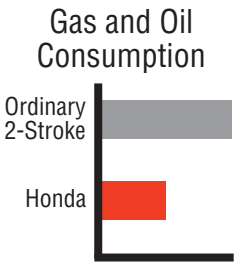
MACHINE OVERVIEW

A “Real” ULV Backpack/Knapsack Sprayer as backed by WHOPES, laser droplet testing and decades of proven performance, the Twister XL-3 system produces one of the best spray droplet spectrums ever created. The Twister XL-3 uses the highest quality components and patented designs that have become the industry standard for Vector Control. The Twister XL-3 uses a Honda engine, one of the most reliable 4-stroke engines available to drive a rugged high speed 3-stage compressor. The compressed air feeds the Dyna-Fog Microtec nozzle with enough energy to atomize droplets less than 20 microns (VMD) at flow rates 2-3 times that of the next closest competitor. Higher flow means faster coverage and less money per application.

HONDA® GX-35 4-STROKE… NO MIXING OF OIL AND GASOLINE

- Air Cooled, Overhead Cam, 4 Stroke
- Reliable/Easy Starting
- Long Life
- No Mixing of Oil and gasoline
- Light Weight & Quiet Operation

Honda® GX-35 4-Stroke



YEARS OF PROVEN PERFORMANCE

Since its inception in 1995 (originally designed for use in many regions of Central and South America), the Twister XL-3 has been the machine of choice by more Health Ministries around the world than any other backpack ULV. Designed for hands free portability, during operation the Twister XL-3 puts the minimum weight in the operator’s hand (1.4 lbs., 0.63 kg) without any “gyroscopic” fatigue caused by hand-held gasoline powered units.

COMFORTABLE DESIGN

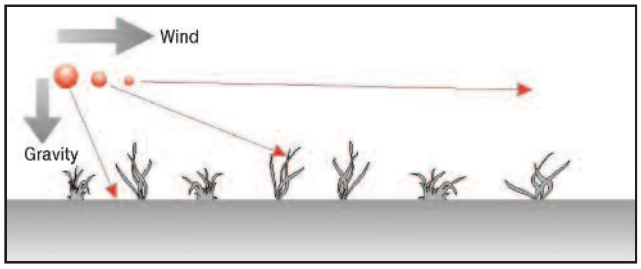
We view customer feedback as a key to developing the best possible product. The ergonomic design of the Twister XL-3 sets it apart from any other backpack/knapsack unit. Special industrial foam padding was specifically designed to isolate any machine vibration from the operator. Triple layered padding gives a tailored comfort feel enabling the operator to literally "wear" the backpack. This enables long use without operator fatigue. The flexible lightweight nozzle further minimizes any fatigue and isolates vibration away from the operator's hand.

WHY USE A TWISTER XL-3 "REAL" ULV SPRAYER INSTEAD OF A "ULV BACKPACK MISTER" ?

Determining the proper machine for Vector Control can be confusing. The key to making a successful choice should be based on the machines ability to produce a consistently uniform droplet spectrum in the 10-20 VMD range. Applying product in this manner assures the most efficient application. This leads to reduced application time, reduced chemical usage and is the most environmentally sound decision. A true "Real" ULV backpack like the Twister XL-3 will produce droplets specifically designed for flying insect control, in particular Vector Control. It is proven fact from years of research by organizations like the World Health Organization Pesticide Evaluation Scheme (WHOPES), American Mosquito Control Association (AMCA), Pan American Health Organization (PAHO) and others that to efficiently kill a mosquito like the Aedes Aegypti requires a spray droplet size of 10-20 VMD (Volume-Median-Diameter).

Diameter (Micron)	Time to fall 3m
1	28 hours
10	17 minutes
100	11 seconds
200	4 seconds
400	2 seconds
1000	1 second

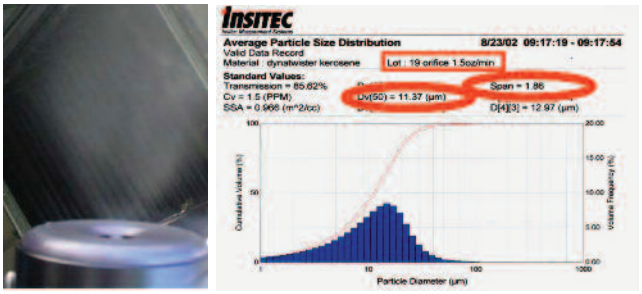
To do this requires a significant amount of energy and a specially designed nozzle not found on centrifugal blower type Mister/Mist Blower units. In fact, spray in the form of "Mist" is not acceptable for Vector Control and is defined by WHOPES as having a droplet size of 50-100 VMD with less than 10% of the droplets being under 30 VMD. The table below (Ross and Lembi, 1985) illustrates the importance of creating a small droplet for vector control. Droplets must be small enough to stay suspended in air to be able to impinge onto the mosquito.



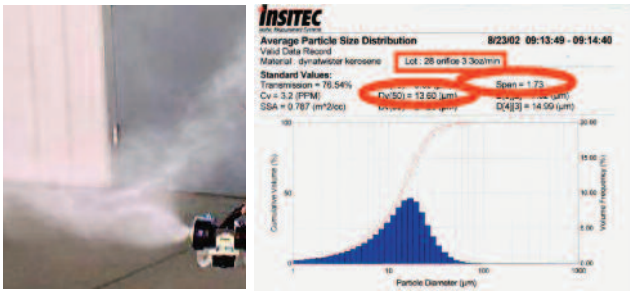
Note: in still air a 200 µm droplet will take less than 5 seconds to fall 3 m, whereas a 20 µm droplet will take almost 5 minutes.

In the laser droplet tests shown below on the Dyna-Fog Twister, notice the similarity in the three graphs. Flow rate goes up over 3.5 times from the first test (top) to the third test (bottom photo) yet the droplet spectrum remains virtually the same. This is only achievable using high energy and efficient nozzle design. Droplet spectrums from units using centrifugal blowers cannot achieve these results. These tests were conducted by the late Mr. Jim Robinson (Pasco County Mosquito Control Director) in Lee County Florida.

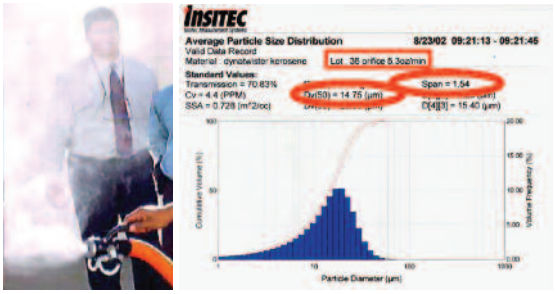
Test 1 - 44



Test 2 - 98



Test 3 - 157 ml/min



TYPICAL TRAITS OF BACKPACK MISTERS

- Not designed exclusively for Vector Control or other small droplet applications
- They create larger droplets that "fallout" rapidly and fail to reach flying insects
- Ideal for larger droplet applications (30-100 VMD Range)
- Typically less expensive because they employ blowers rather than compressors
- Some tend to be heavy and require pressurized systems for flow

TWO EXAMPLES OF BACKPACK MISTERS

MACHINE SPECIFICATIONS: TWISTER™ XL3 — MODEL 3950, SERIES S

Type:	Knapsack/Backpack-Motorized, Aerosol Generator, Non Thermal, Insecticide, Ultra-Low-Volume (ULV).
Engine:	Honda 4 stoke high performance engine. Emissions compliant, low fuel consumption, extra quiet. Operating speed 7500 RPM.
Blower:	High speed Rotary type, 3-Stage, Belt driven, 95 cfm (2.68 m3/min) unrestricted, pressure 3 psi. (.2 bar) max., tangential dis - charge, ground steel shaft with two high quality ball bearings.
Flow Control:	Interchangeable restricting orifice to produce di erent flow rates, from 1.5 oz/min (45 ml/min) to *17 oz/min (500 ml/min). * When using optional Dual Nozzle attachment.
Nozzles:	Single high output Microtec™ nozzle. Optional extra dual nozzle kit for higher output.
Tanks:	Corrosion resistant, high density Polyethylene. Formulation: 1 U.S. Gallons (3.78 liters), Gasoline: .67 liters.
Droplet Size:	Produces 90% of the droplets below 20 um (ULV) Mass Medium Diameter (VMD) at flow rates up to 6.0 oz/min (178 ml/min). Higher flow rates will provide larger droplets for residual deposit.
Accessories:	Curtis Viscometer to determine the formulation viscosity, 2-cycle oil beaker, funnel, spare parts kit.
Options:	Twin Nozzle Kit (P/N 39716)
Dry Weight:	26 lbs. (11.8 Kg.)
Dimensions:	14.75" L (37.5 cm) x 12" W (30.5 cm) x 22.5" H (57.2 cm)
Shipping:	25" L (63.5 cm) x 19" W (48.3 cm) x 16" H (41.1 cm) Volume: 4.39 cu.ft. (.123 cu. meter), Weight: 36 lbs (16.3 Kg)

Part #	Description
39750	Twister XL3 Motorized Knapsack ULV Sprayer

Twister XL3™

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