

OIL DROPLET GENERATORS

MODELS 9307 AND 9307-6

APPLICATION NOTE 9307-001 (A4)

Laskin nozzle oil droplet generator models 9307 (single-jet) and 9307-6 (six-jet) are designed to generate large amounts of seed particles for the seeding of PIV or LDV flows. They are also ideal for seeding in high-speed flows for wind tunnel experiments. These generators are typically used with olive oil, but can also be used with other fluids such as DEHS or salt solutions (for aerosolizing solid salt particles).

The oil droplet generator operates when pressurized air atomizes oil in the generator reservoir to produce the droplets. An internal impactor plate blocks large droplets from getting into the droplet stream exiting the device, allowing it to generate particles with a reasonably narrow size distribution. Generally, a larger particle output volume can be obtained without seriously affecting the droplet size range by increasing the inlet pressure. A valve and pressure gauge arrangement provides an easy way to control the inlet air pressure. Both models are equipped with an external gauge which indicates the oil level in the atomizer chamber.



Instructions for Operation

The oil droplet generator is very easy to use. The seeding agent is added to the reservoir (typically olive oil), and the unit is attached to a pressurized air supply. It is not necessary to remove the cover of the unit to add the oil; the oil can be poured directly through the outlet port. The following steps instruct users how to operate the generator, to provide the desired oil droplets as seed particles for your PIV or LDV measurements:



1. Using a funnel, add the seeding fluid (typically olive oil) into the outlet port chimney, as shown in Figure 1. It is not necessary to completely fill the reservoir; but enough oil is required to cover the Laskin nozzles, which are located near the bottom of the reservoir. About one inch (2.54 cm) of oil is enough to cover the nozzles on the fluid level viewing window, shown in Figure 2.



Figure 1: Outlet Port Chimney



Figure 2: Fluid Level Viewing Window

2. Once the oil has been added, the unit can be attached to the pressurized air supply. A standard 100 psi line is required. Attach the pressure hose to the inlet pressure nozzle, as outlined in Figure 3.



Figure 3: Pressure Hose

3. Adjust the pressure by turning the pressure adjust valve on the pressure gauge, as shown in Figure 4. A maximum gauge pressure of 25 to 30 psi is typical for most standard pressure systems. When opening the pressure valve, atomized oil will exit the outlet port chimney. Take care to not breathe in the atomized oil. It is important to use the oil droplet generator in an area with adequate ventilation. The typical mean diameter of the oil droplets is around 0.5 to 1.0 micron.



Figure 4: Pressure Gauge Showing the Inlet Pressure



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