**Particle Removal – All Sizes**

CO₂ snow cleaning removes particles of all sizes, even inorganic particulates down to 0.3 micron, and lower. In the example below, we scribed a Si wafer and cleaned it with the CO₂ Snow Jet. Comparison of the same areas before and after cleaning (at 1000x magnification) shows complete particle removal after CO₂ Snow Jet cleaning. The process works on wafers, optics, metals, sensors, and many other materials.

**Organic Removal**

Here, we scribed a Si wafer and rubbed facial grease on the surface. Comparing the same area at 1000x magnification, we see that CO₂ Snow Jet cleaning totally removed the stain. Further analysis by X-ray photoelectron spectroscopy showed total stain removal and reductions in the background hydrocarbon content. Cleaning is as effective as solvents.
**Mechanism** – The cleaning mechanism for the CO₂ Snow Jet is simple. Expanding either liquid or gaseous CO₂ through a small orifice leads to nucleation of small dry ice particles and a high-speed carrier gas stream. Upon impact with a substrate, the dry ice removes particulates via momentum transfer and organics via a transient solvent process. See [www.co2clean.com](http://www.co2clean.com) for details.

**Applications** – many different applications have been successfully demonstrated:

- Contamination removal from wafers, metals, polymers, glasses, and ceramic substrates;
- Cleaning optics, i.e., coated lenses, mirrors, lasers, IR and UV optics, fiber optics;
- Sample preparation before surface analysis (AES, XPS, SIMS);
- Sample preparation for AFM;
- General cleaning applications in laboratories, cleanrooms, and manufacturing;
- Disk drive parts and assemblies;
- Cleaning vacuum system parts, components and systems; and
- General substrate preparation and general cleaning.

**Equipment** – Four different units are offered with prices starting at about $1800. See [www.co2clean.com](http://www.co2clean.com) for more details. The two most popular units are:

**Standard Unit** - As seen in the left image, these units include a hand-held on/off gun, a PTFE lined stainless steel flexible hose, a CGA320 cylinder fitting, and two nozzles - one stainless and one polymer. An optional pressure gauge and filter are included in the photo.

**High Purity Unit** – Similar to the standard unit but with an electropolished manual valve (middle) and all compression fittings, or this unit can be equipped with a solenoid (right).

---

**Applied Surface Technologies**

15 Hawthorne Drive
New Providence NJ 07974
(908) 464-6675
FAX: (908) 464-7475
email: co2clean@co2clean.com

[www.co2clean.com](http://www.co2clean.com)