

AVO 6050

Avo Tech International Inc. offers a variety of additives that are widely used for cleaning and metal cutting products. AVO 6050 is a Multipurpose ferrous and Non-ferrous metal working fluid, Lubricants and Coolant Additive for the general industry. It is specifically designed for Diamond Wire Saw in Photovoltaic (PV) applications and can be used in slurry sawn wafer production lines. AVO 6050 can be used in Bricking, Squaring & cropping with Diamond Wire saw for slicing the Silicon Ingot to wafers. The difference between slurry sawn and Diamond Sawn wafers is the type of wire and Surface structure. Generally wafers for the PV industry are mostly sawn with multi-wire slurry saw which is a very slow process (almost half a day to complete a cut of the Silicon Ingot to wafers). This process also generates too much waste (half the silicon sawn away and contaminating the slurry) and wire mostly steel become worn, lost strength and has to be exchanged after each complete cut. However in contrast Sawing the Ingot into wafers with a Diamond-plated wire is faster, provides flatter wafers, may only require a cooling liquid which is easy to filter from silicon debris and enables wire that can be kept for several more cut. Actually the same saw used for Slurry wire-sawing can be used for diamond wire sawing. The key difference is that the steel wire is replaced with a wire on which diamond particles have been attached and the abrasive slurry replaced by a cooling liquid such as AVO 6050. Furthermore wafering or its manufacture with diamond-plated wire is much faster (less kerf loss) and higher productivity. The Diamond sawn wafers surface roughness stays constant on the whole path of the wire while the slurry sawn wafer the surface roughness diminishes between the entrance of the wire into the Silicon ingot and its eventual exit. Interestingly the diamond wire sawn wafers also show larger thickness variations or differences compared to the compared to Slurry Sawn wafers. This is mostly due to the fact that diamond sawn wafers were cut with the wire going back and forth accompanied by a fast feed rate thus making hills at each direction of inversion (occurred more often with larger thickness variations). The slurry sawn wafers in contrast were cut with the wire travelling in one direction only and did not present a regular thickness variation pattern. AVO 6050 has built-in corrosion inhibitors that help protect the cutting equipment as well as Coolants engines or machines from rusting. It prolongs the usage life of the machines and provides long term stability of the Coolant or metal working fluid. AVO 6050 Additive also has antibacterial and micro-biocide properties to prevent algae and algae slim growth that causes very foul odor associated with metal working fluid and in recirculating water systems.

PHYSICAL & CHEMICAL CHARACTERISTICS

Appearance: Clear to hazy, light amber to straw colored viscous liquid
Solubility in water: Complete
Specific gravity/ Density: 1.04 (±0.05) Optimum: 1.06
Flash point (COC): >240°F (or none to boiling)
Freeze point: 20 °F
pH: 8.5 ±0.5
Shelf life: One year
Ease of Rinsing: Complete
Viscosity as is: 60-70CPS Spindle #2 @ 30rpm

AVO 6050 STERLING

FERROUS AND NON FERROUS METAL WORKING FLUID, LUBRICANT & COOLANT ADDITIVE

AVO 6050 could also be used as an additive to recyclable cutting fluid to save cost with less waste generation especially for grinding and beveling fluid during glass, mirror and wafer fabrication processes in the electronic and solar technology industries. This product is very versatile (and used in many applications such as emulsion and aqueous systems), economical, environmentally friendly, High yield productivity, and easily waste-treatable which makes it very attractive for the general industry.

NET CONTENTS:

LOT #

5 Gal. 55 Gal. 330 Gal.

KEEP OUT OF REACH OF CHILDREN
DANGER
See left panel for additional precautionary statements.

FIRST AID

EYE CONTACT: Flush eyes with copious amounts of water for at least 15 minutes. Get medical attention immediately if possible. **SKIN:** Flush skin contact area with plenty of water. Get medical attention if irritation persists. **INHALATION:** Get to Fresh air quickly and if irritation continues get medical attention. **INGESTION: DO NOT** Swallow or induce vomiting if ingested. If person is conscious give plenty of water to drink for dilution of the product. Get medical attention immediately. Keep away from heat, sparks, open flame or any possible source of ignition.

ADDITIONAL WARNING: Keep out of the reach of Pets and Children. For Emergency Medical Assistance, Please call your local Poison Control Center or 1-877-541-2016, USA and Canada (Call 1-800-5355-5053). Outside USA and Canada (please use 1-352-323-3500 call collect). Product is stable,

Biodegradable, with shelf life of 1-2 years. Do not blend with other products or solutions. Keep from freezing.

For further information consult our **website:**
www.Avotechinternational.com
and/or product Technical Data sheets.



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OPERATING PARAMETERS

- 1) Ferrous Metal Corrosion Prevention and Flash rust Treatment
 - a. AVO 6050-----20-50%by Vol.
 - b. Di Water-----80-50% by Vol.
 - c. Operating Temperature-----76-100°F
 - d. Rinse parts immediately to Prevent Staining especially copper & Aluminum
- 2) Coolant for Recirculating Water Treatment---60-100% by vol.
- 3) As a general Coolant/ Cutting fluid Additive with Several Mixing Ratios.

Example A:

Poly Ethylene or Poly Propylene Glycol..... 2 Parts
AVO 6050-----1/3 Part
Water-----1 Part
Operating Temperature..... Room Temp to 200°F±20°F
SPG: -----1.04±0.05

Example B:

AVO 6050----- 1Liter
DI- Water-----200Liters
SPG-----1.02 ± 0.01

Example C:

AVO 6050----- 1Liter
DI- Water-----400Liters
SPG-----1.01 ± 0.01

EQUIPMENT COMPATIBILITY

Material of construction.....Polyethylene, polypropylene, stainless steel

HEALTH & SAFETY

It is highly recommended to read the Material Safety Data Sheet before using AVO 6050.

CAUTION

NON REGULATED. Use appropriate Safety Gear when using this product such as goggles, gloves and good ventilation. Overexposure may cause irritation to skin, eyes, and mucous membrane. Product Contains: Biodegradable cleaning surfactants.