

ASURE3D™ Additive Manufacturing Systems for Cryogenic Cleaning.

The ultimate solution to clean AM metal components.



Challenge

Additive manufacturing (AM) processes use metal powder to build, layer by layer, a 3D printed metallic component. Excess powder typically adheres to the surface of the finished component, often collecting in holes and cavities. Redundant powder particles need to be removed before the part can be used. However, the high temperatures required to melt this residue may cause discoloration of component surfaces which need to be treated. This requires a cleaning process that is flexible enough to clean the component's surface without damaging the filigree structures of the AM product.

Solution

The ASURE3D™ cryogenic cleaning solution was developed to maximize cleaning flexibility. This process enables the operator to adapt the CO₂ snow / abrasive

material ratio from gentle to abrasive. The unique technology combines the benefits of dry ice and sand blasting in one flexible and cost-effective system.

Innovation

The ASURE3D cryogenic cleaning device creates dry ice particles by expanding liquid CO₂ directly. Using compressed air, the particles are accelerated in a specially designed nozzle up to sonic speed and shot onto the surface to be cleaned. The cleaning effect of this procedure relies on flash cooling, kinetic energy, embrittlement and gas impact. An abrasive agent can be combined with the dry ice particles to remove stubborn powder residue. With this process, much less abrasive material is needed to remove adhering powder residue compared to conventional sand blasting.

At a glance

The ASURE3D cryogenic cleaning device is a specially designed cleaning unit for AM metal components. Its flexibility allows operators to easily adapt it to their specific needs, offering everything from gentle to abrasive cleaning power while ensuring maximum protection of intricate and delicate component structures. The encapsulated equipment design provides maximum health protection and safety for the operator. Alternative cleaning methods such as grinding or chemical cleaning are harmful to the environment and less productive.

Components

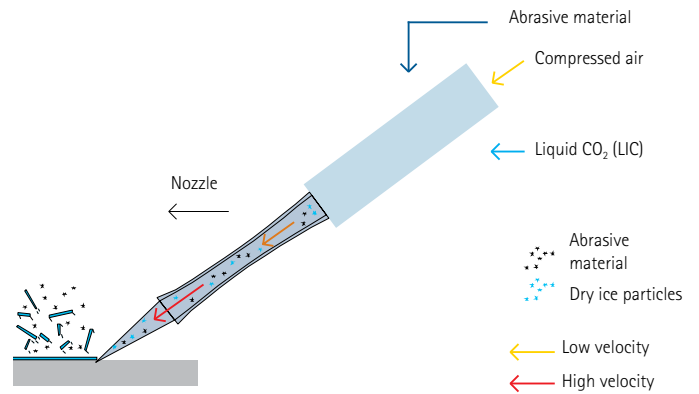
The ASURE3D cryogenic cleaning system comprises the following components:

- Cryogenic cleaning snow+ unit for blast cleaning with CO₂ snow and/or abrasives
- Specially designed, blasting cabinet suitable for manual blasting AM metal components for a perfect surface finish
- Sound insulation feature keeps noise levels low
- Exhaust silencer
- Pedal switch to operate the built-in blasting gun
- Dedicated filter and exhaust system
- Optional CO₂ measurement and warning sensor

Benefits at a glance

- Heavy-duty turntable for components up to 110 lbs.
- Flexible cleaning power which can be seamlessly adjusted without interrupting the process flow
- CO₂-based cleaning means much less abrasive material to consume and dispose of
- Operating costs are often lower than conventional cleaning processes
- Lower jet pressure emits less noise compared with conventional dry ice cleaning
- Programmable Logic Controls (PLC) for the cabinet and filter
- Low environmental impact
- CO₂ particles ensure clean results down to the surface microstructure
- CO₂ snow enables a residue-free component surface

How the ASURE3D cryogenic cleaning technology works



Technical data

External dimensions L x W x H	41.5 in x 57 in x 73 in
Cabin dimensions L x W x H	27.5 in x 45 in x 27.5 in
Workpiece dimensions L x W	13 in x 20 in x 12 in
Weight	330 lbs.
Workpiece weight	up to 110 lbs.
Noise level	80 db(A) at 58 psi
Mains connection	230/400V (50Hz)
Power cable length	6 ft.
Illumination	160 W (LED optional)
Turntable diameter	20 in
Filter power / maximum load	0.48 kW / 31,750 ft ³ /h



Messer Americas

200 Somerset Corporate Blvd
Suite 7000
Bridgewater, NJ 08807
Phone: 1-800-755-9277
sales@messer-us.com
www.messer-us.com



Part of the Messer World