SurClean®

Laser Coating Removal
Precise. Safe. Green.

Susan Sprentall
CEO

The Problem

SurClean

Traditional Methods

Chemicals

Abrasives

Water Jet

Environmentally toxic

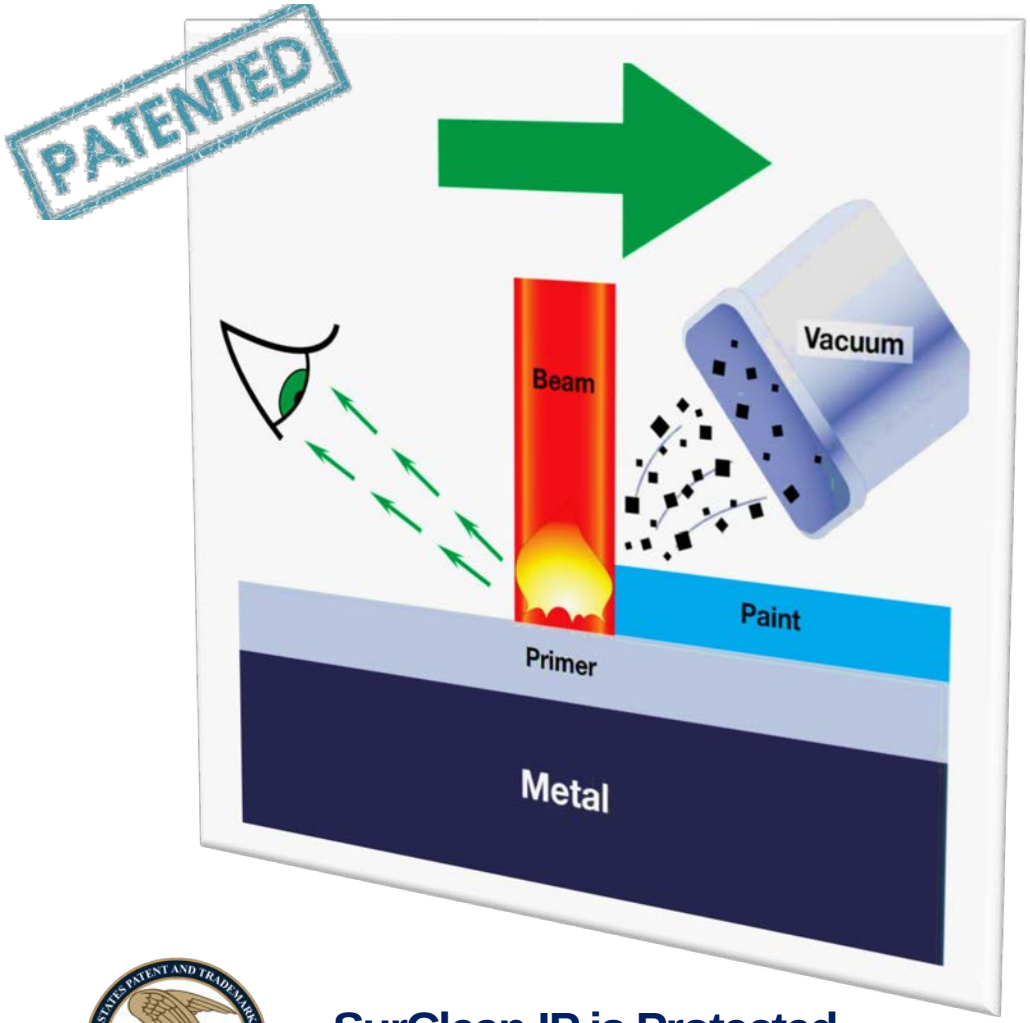
Costly

Time consuming

Antiquated process

The SurClean® Solution

- Precise Stripping by Layer
- 16x Faster than Chemicals
- No Hazardous Waste



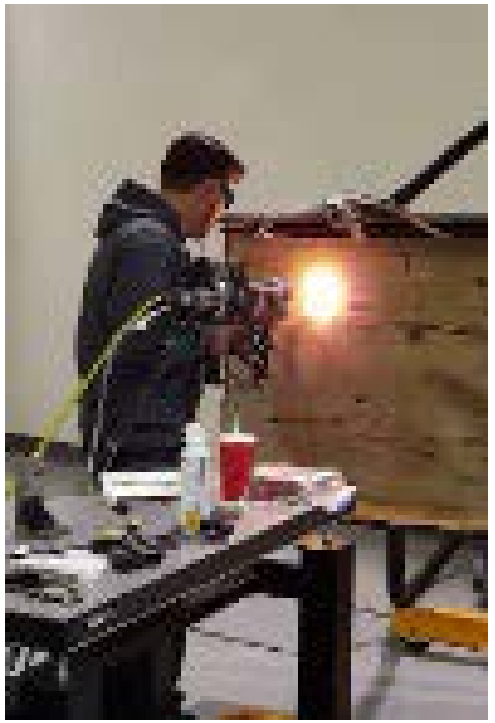
SurClean IP is Protected by Global Patent!

International patent (WO 2013/059779 A1) protects sensing and laser control method

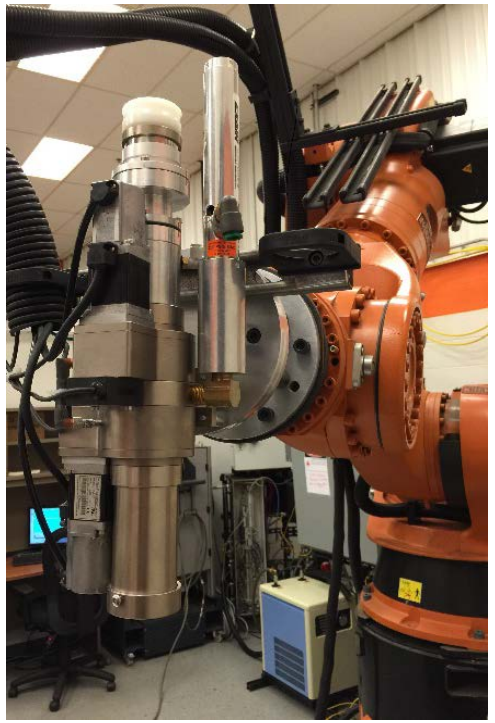
The SurClean® Solution

SMR-8

HyperDisc



OTS DMR-8



DMR-4

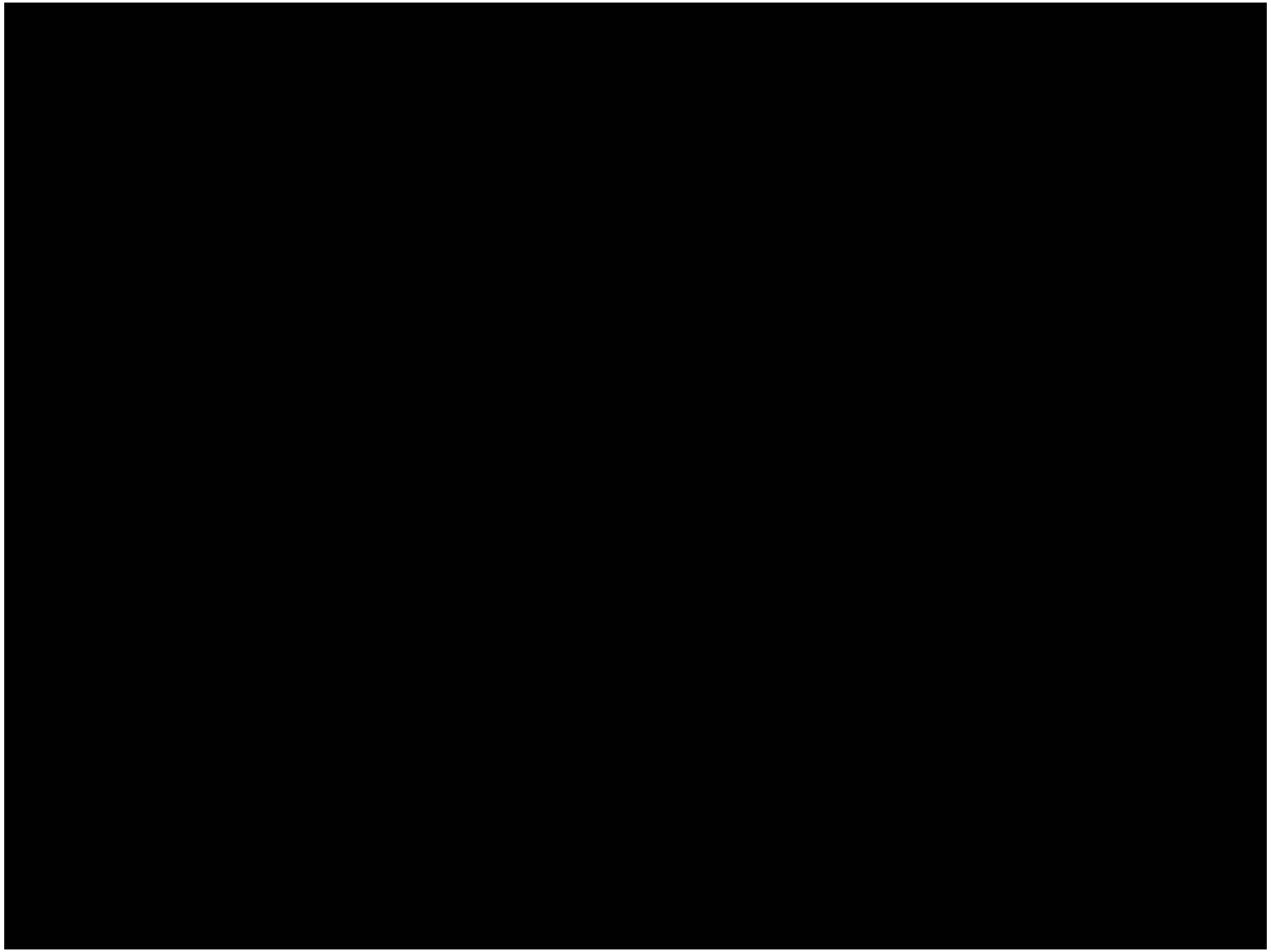
Proprietary Software

Proprietary Controls

Proprietary Beam Delivery

Proprietary Safety System

The SurClean® Solution



The SurClean® Solution

Third Party Validated Results

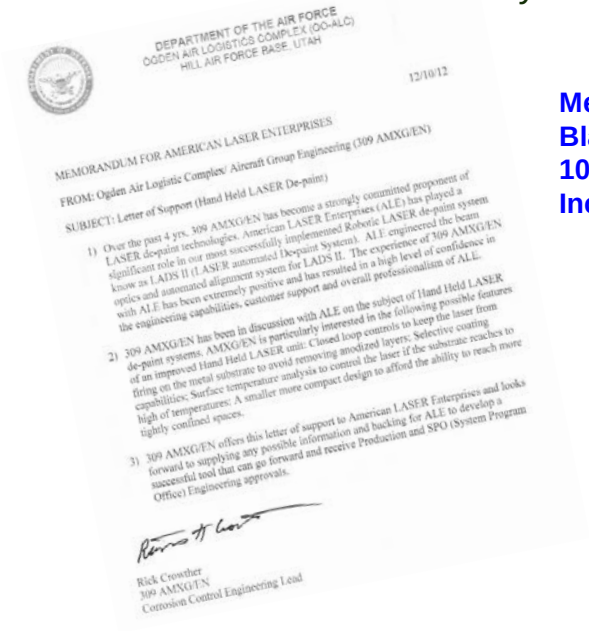
SECTOR	TRADITIONAL	LASER	
		Cost	Savings
Plane (F-16)	$9M	$2M	78%
Bridge (10K sq. ft.)	$12M	$4M	67%
Vessel (5.8K sq. ft.)	$30M	$2M	93%

Validation

SurClean

MDOT Michigan Department of Transportation

SurClean:
"best alternative seen in over 5 years"



DEPARTMENT OF THE AIR FORCE
OGDEN AIR LOGISTICS COMPLEX (OO-ALC)
HILL AIR FORCE BASE, UTAH

12/10/12

MEMORANDUM FOR AMERICAN LASER ENTERPRISES

FROM: Ogden Air Logistic Complex/ Aircraft Group Engineering (309 AMXG/EN)

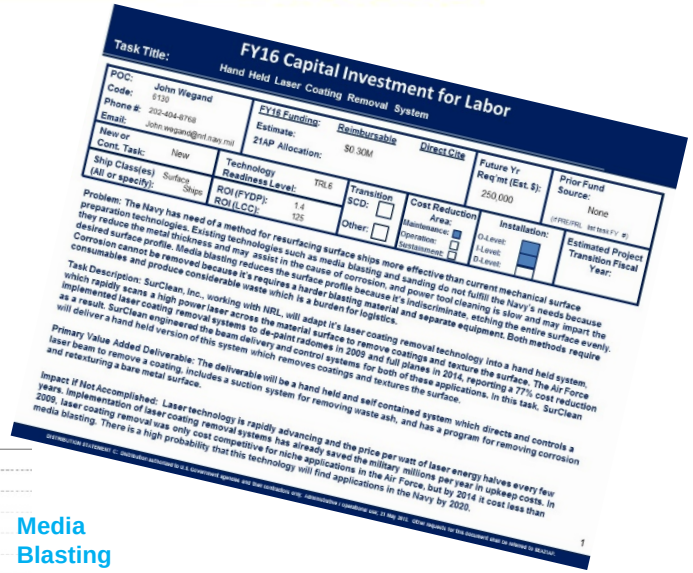
SUBJECT: Letter of Support (Hand Held LASER De-paint)

1) Over the past 4 yrs, 309 AMXG/EN has become a strongly committed proponent of LASER de-paint technologies. American LASER Enterprises (ALE) has played a significant role in our most successfully implemented Robotic LASER de-paint system know as LADS II (LASER automated Depaint System). ALE engineered the beam optics and automated alignment system for LADS II. The experience of 309 AMXG/EN with ALE has been extremely positive and has resulted in a high level of confidence in the engineering capabilities, customer support and overall professionalism of ALE.

2) 309 AMXG/EN has been in discussion with ALE on the subject of Hand Held LASER de-paint systems. AMXG/EN is particularly interested in the following possible features of an improved Hand Held LASER unit: Closed loop controls to keep the laser from firing on the metal substrate to avoid removing anodized layers; Selective coating capabilities; Surface temperature analysis to control the laser if the substrate reaches to high of temperatures; A smaller more compact design to afford the ability to reach more tightly confined spaces.

3) 309 AMXG/EN offers this letter of support to American LASER Enterprises and looks forward to supplying any possible information and backing for ALE to develop a successful tool that can go forward and receive Production and SPO (System Program Office) Engineering approvals.

Rick Crowther
309 AMXG/EN
Corrosion Control Engineering Lead



Task Title: FY16 Capital Investment for Labor
Hand Held Laser Coating Removal System

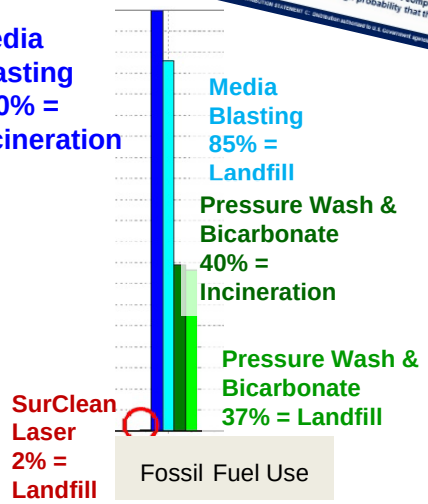
POC: John Wegand
Code: 6130
Phone #: 202-404-8768
Email: John.wegand@nrl.navy.mil
New or Cont. Task: New
Ship Class(es) (All or specify): Surface Ships
FY16 Funding: Reimbursable / Direct Cite
Estimate: 21AP Allocation: $0.30M
Technology Readiness Level: TRL6
ROI (FYDP): 1.4
ROI (LCC): 125
Transition SCD: Other:
Cost Reduction Area: Maintenance: Operation: Sustainment:
Future Yr Req'mt (Est. $): 250,000
Installation: O-Level: I-Level: D-Level:
Prior Fund Source: None
Estimated Project Transition Fiscal Year:

Problem: The Navy has need of a method for resurfacing surface ships more effective than current mechanical surface preparation technologies. Existing technologies such as media blasting and sanding do not fulfill the Navy's needs because they reduce the metal thickness and may assist in the cause of corrosion; and power tool cleaning is slow and may impart the desired surface profile. Media blasting reduces the surface profile because it's requires a harder blasting material and separate equipment. Both methods require Corrosion cannot be removed because it's indiscriminate, etching the entire surface evenly. consumables and produce considerable waste which is a burden for logistics.

Task Description: SurClean, Inc., working with NRL, will adapt it's laser coating removal technology into a hand held system, which rapidly scans a high power laser across the material surface to remove coatings and texture the surface. The Air Force implemented laser coating removal systems to de-paint radomes in 2009 and full planes in 2014, reporting a 77% cost reduction as a result. SurClean engineered the beam delivery and control systems for both of these applications. In this task, SurClean will deliver a hand held version of this system which removes coatings and textures the surface.

Primary Value Added Deliverable: The deliverable will be a hand held and self contained system which directs and controls a laser beam to remove a coating, includes a suction system for removing waste ash, and has a program for removing corrosion and retexturing a bare metal surface.

Impact if Not Accomplished: Laser technology is rapidly advancing and the price per watt of laser energy halves every few years. Implementation of laser coating removal systems has already saved the military millions per year in upkeep costs. In 2009, laser coating removal was only cost competitive for niche applications in the Air Force, but by 2014 it cost less than media blasting. There is a high probability that this technology will find applications in the Navy by 2020.



CLEAN TECH OPEN

Third Party Tests

Particulate Study

- Performance Environmental Services, Inc,.
- Airborne contaminants were captured and evaluated way below allowable amounts
- Lead was captured and validated inorganics are not vaporized

Metallurgy Study

- Department of Transportation Contractor
- Performed tensile strength testing
- Surface structure testing
- Ph test
- Conclusion – laser process did not change the structure, strength or Ph of the steel.
- Corrosion study is ongoing but after 1 year, it is corrosion free.

OEM Support

SurClean

Advanced Integration Technology

Turnkey Factory Automation for the Future of Aerospace

COHERENT

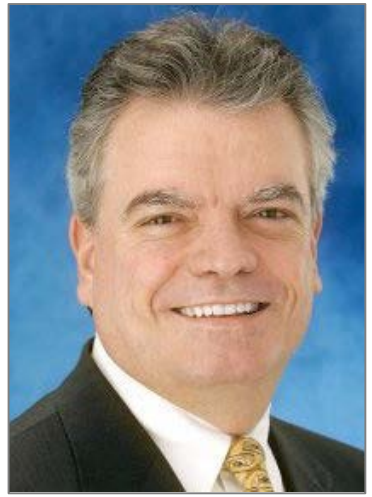
FANUC

laserline

TRUMPF

The Team

Chris Harano
BOD Fundraising



Pietro Sarcina, CFO

Don Sprentall, CTO

Susan Sprentall
President & CEO

Why Laser

- Proven technology
  - Laser power levels have increased
  - Cost has decreased
  - Beam delivery improvements
  - Sensor technology for control and safety
- Cost savings
  - Environmental issues addressed
  - Selective layer by layer removal
- Experienced Team
  - Knows the technology
  - Provide components to address your application
  - Support of major OEM’s

Laser Ablation Coating Removal
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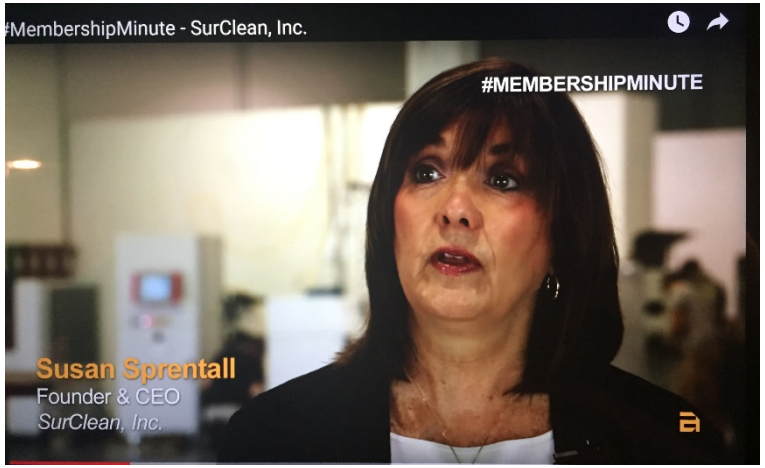
www.SurClean.com

https://youtu.be/3kpq72OtFcY



https://youtu.be/HJJSWBeTI2U

Contact for more information
slsprentall@SurClean.com
248.797.9352
28016 Oakland Oaks Ct. Wixom, MI 48393

Summary

New Technology Challenges Tradition

The 5 C's

C – Change
C -- Starts at the C- Level
C – Requires Communication
C – Requires Collaboration
C – Country