

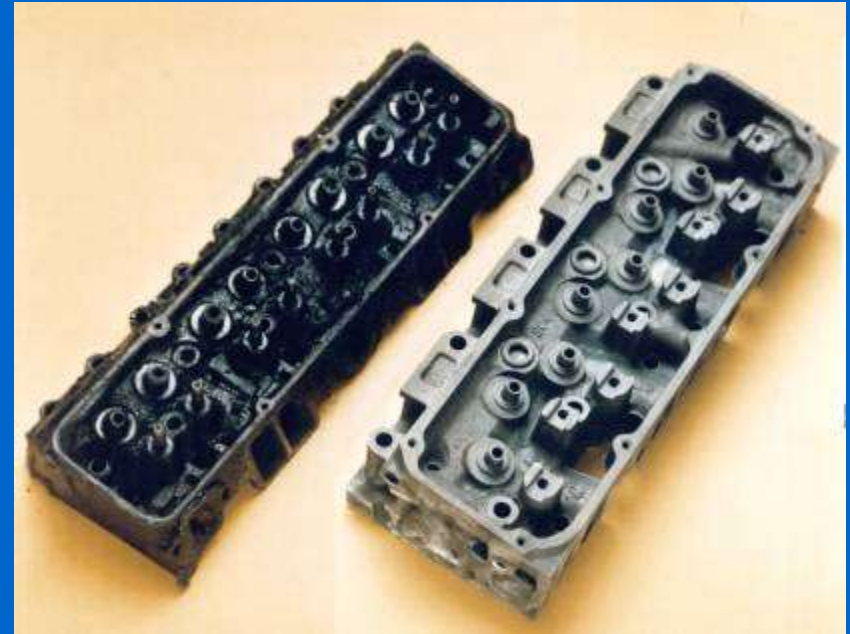
Rapid Cleaning of Engine Components

Multifunctional Molten Salt Bath Cleaning

Jim Malloy
Kolene Corporation

Engine Component Cleaning

molten salt provides fast, thorough, and complete cleaning:



- removes carbon, coke, and oil sludge residues
- does not mask defects or flaws, e.g. hairline cracks
- removes cured paints and soils
- produces inspection-ready components in a single operation

Companies Utilizing the Process

ELECTRO-MOTIVE



GE
Transportation



CATERPILLAR

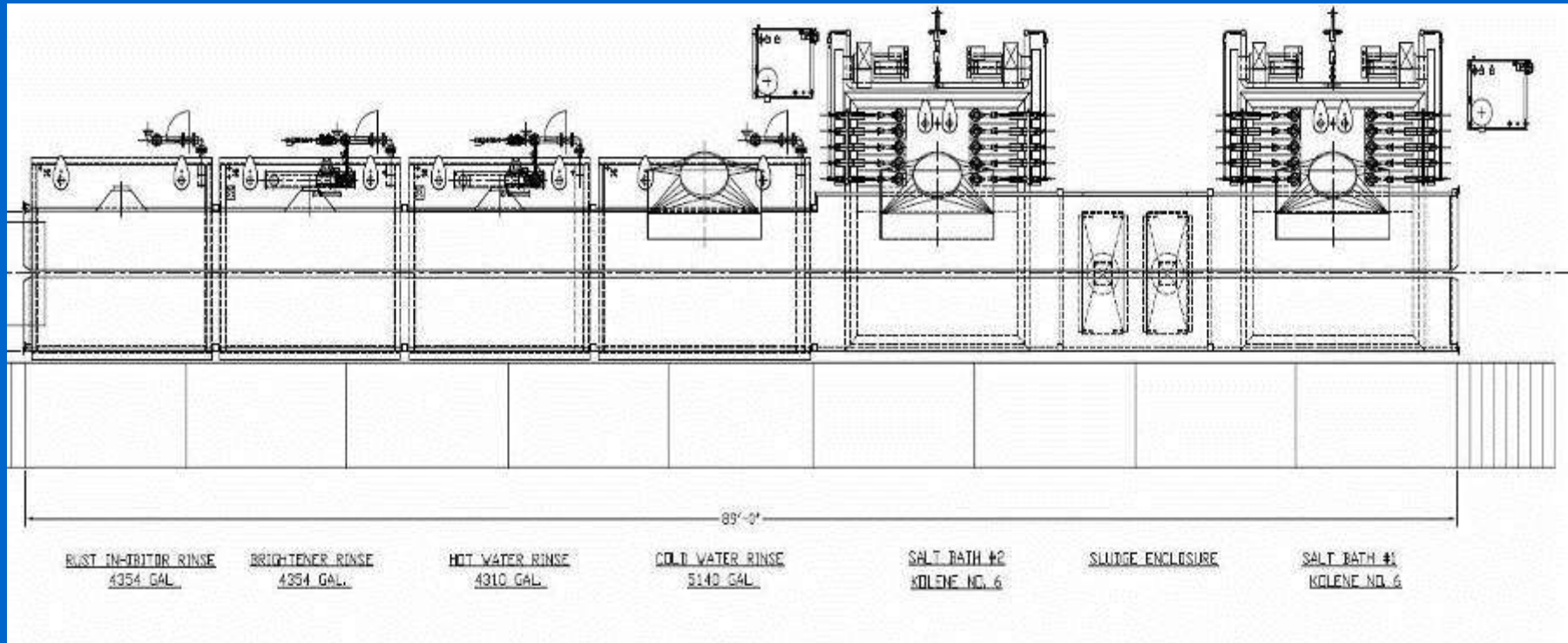
Dura-Bond



Cleaning Objectives

- EXISTING METHODS WERE DISJOINTED:
 - provide cleaning system that promotes linear / sequential work flow patterns and workload tracking
- EXISTING METHODS WERE SLOW:
 - produce components more rapidly and of higher quality than currently possible
- EXISTING STEPS WERE MONOFUNCTIONAL:
 - condense multiple processes into single efficient workflow with multifunctional technology: carbon removal, paint stripping, derusting / brightening

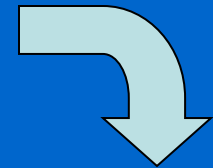
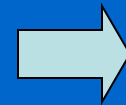
Depot-Class Cleaning System



large scale engine component cleaning line
(work travel right to left)

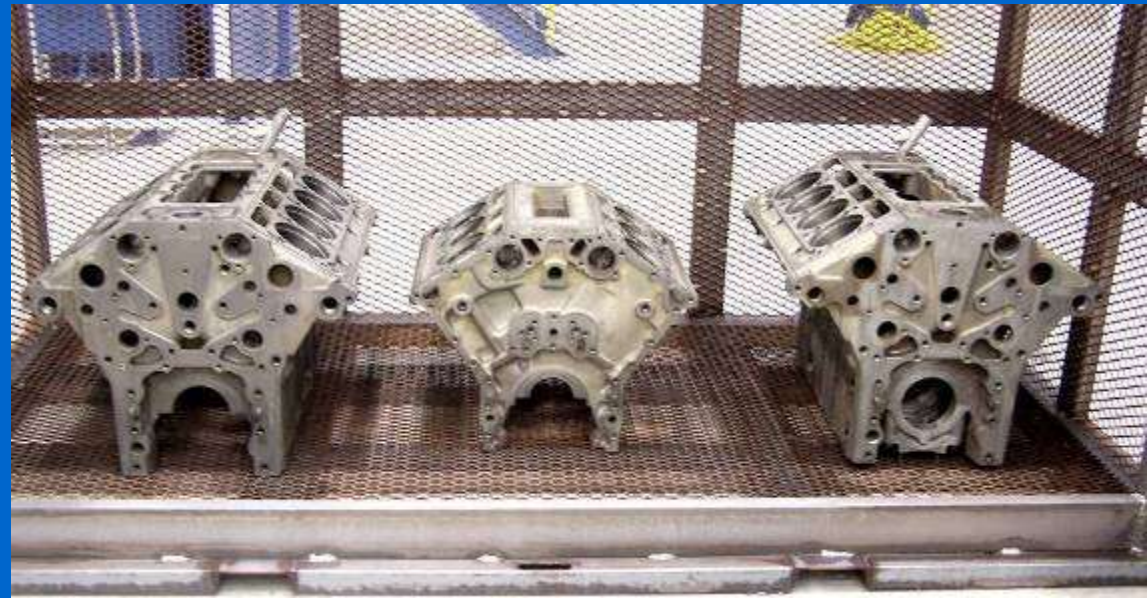


Rapid Cleaning & Fast Turnaround

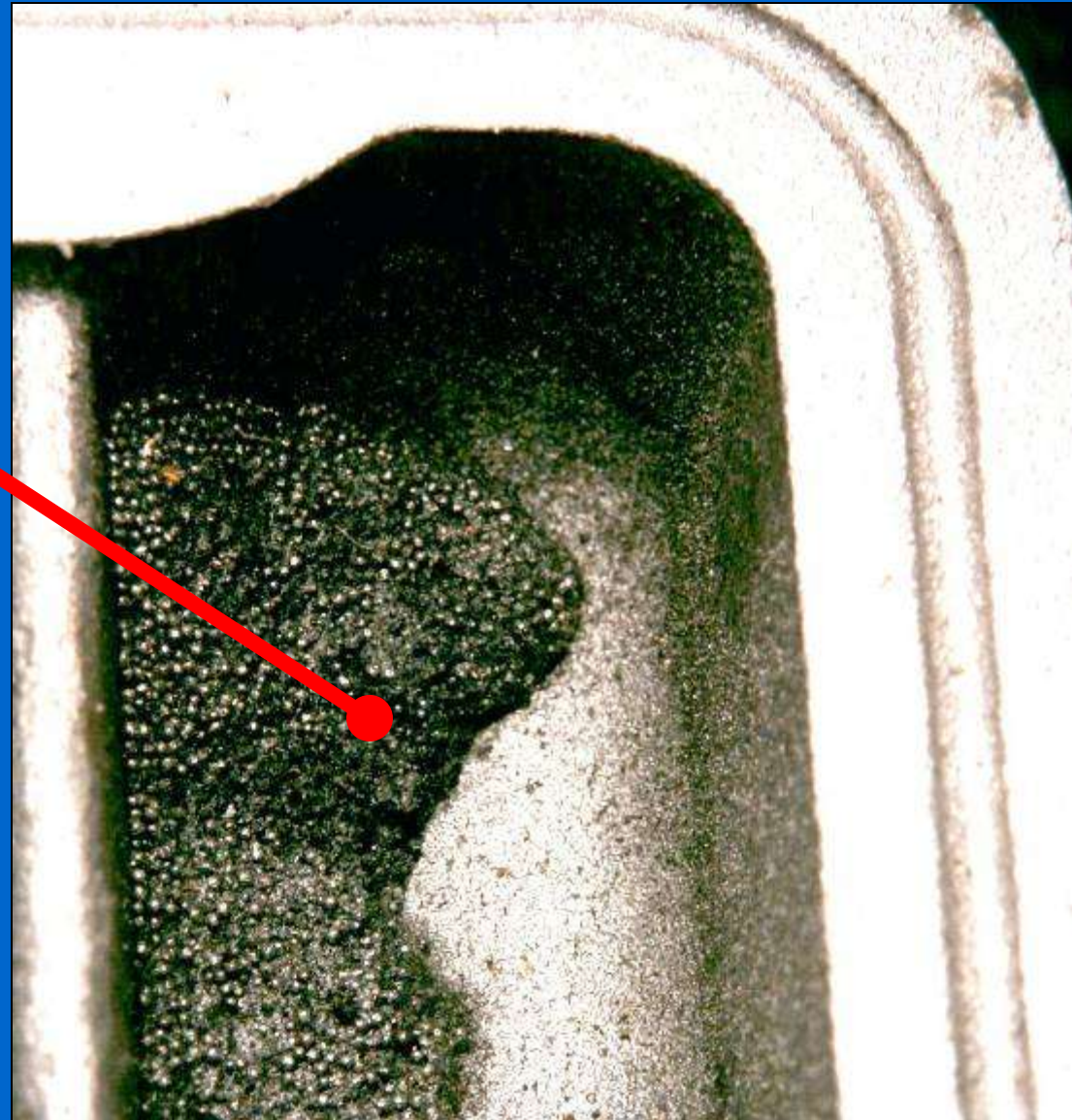


...from teardown

...to clean and inspection ready in less than an hour



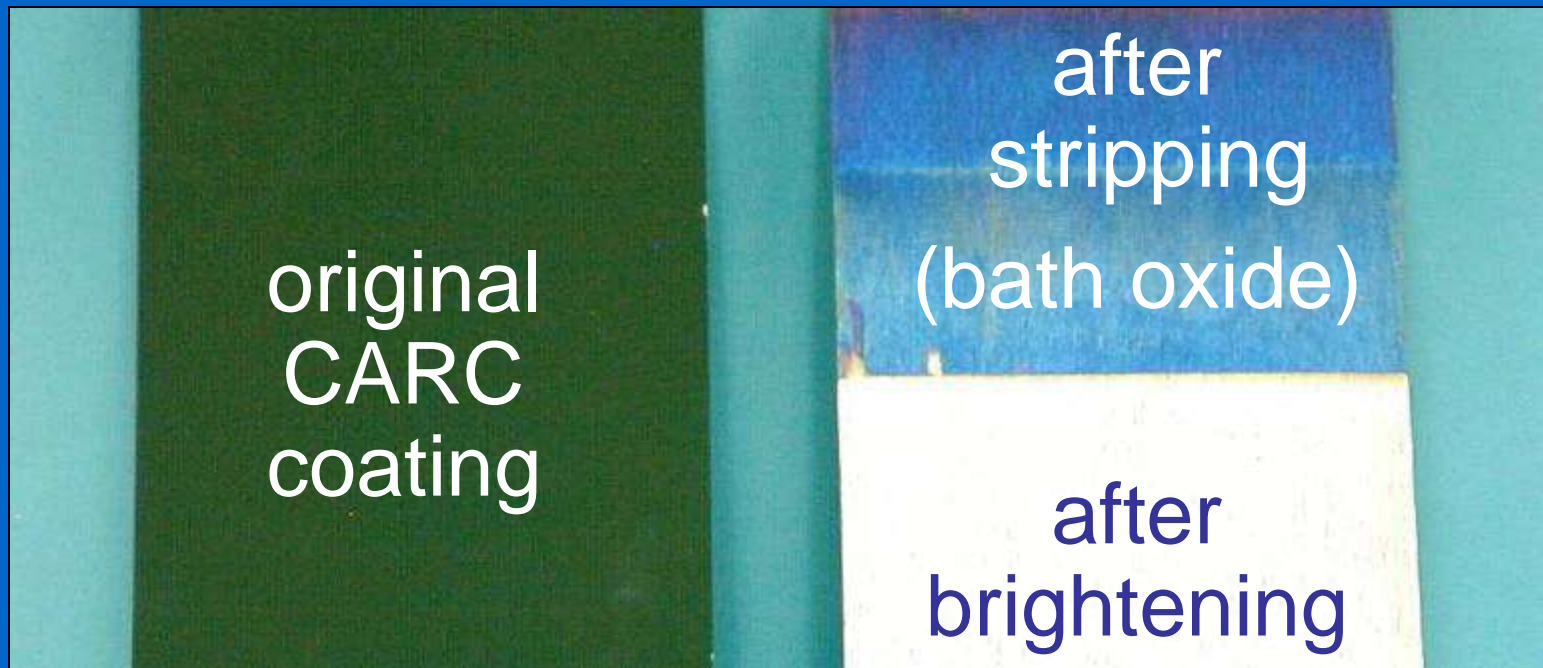
Improves Cleanliness & Reliability



example of retained
shot after shot blast
mechanical cleaning

Stripping of Chemical Agent Resistant Coatings

- rapidly removes CARC in a few minutes
- generates inorganic byproducts that are easily managed



Alloy Cleaning & Renewal

- suitable for stainless steels, titanium and superalloys
- conditions scale, oxides, and sulfidation
- dissolves flame sprayed carbide coatings
- removes moly disulfide, graphite, boron nitride and other lubricants



Aerospace Partners



Conclusions

- proven commercial technologies exist that can significantly improve quality, reliability, and productivity
- additional benefits including cost savings and positive environmental impact may be available
- commercial-sector resources are available and are eager to participate