



The Practical Application of Non-Chlorinated Ultra Low VOC
Metalworking Fluids Using Renewable Resource Based
Technology.

**SCAQMD METALWORKING FLUID
SYMPOSIUM**

March 2012

Presented by: Paul Frederick, Sales & Technical Resource Manager
American Research Specialty Products Inc.

Our Objective

In 2009 we at ARSP recognized several events taking place at the:

- CA State Level, GCI AB 1879 & SB 509
- The Federal EPA, Focus on CP's
- SCAQMD, Rule 1144

All of which we believed would require new metalworking technology to fill industrial applications and be fully compliant with new laws and regulations .

Design Charter

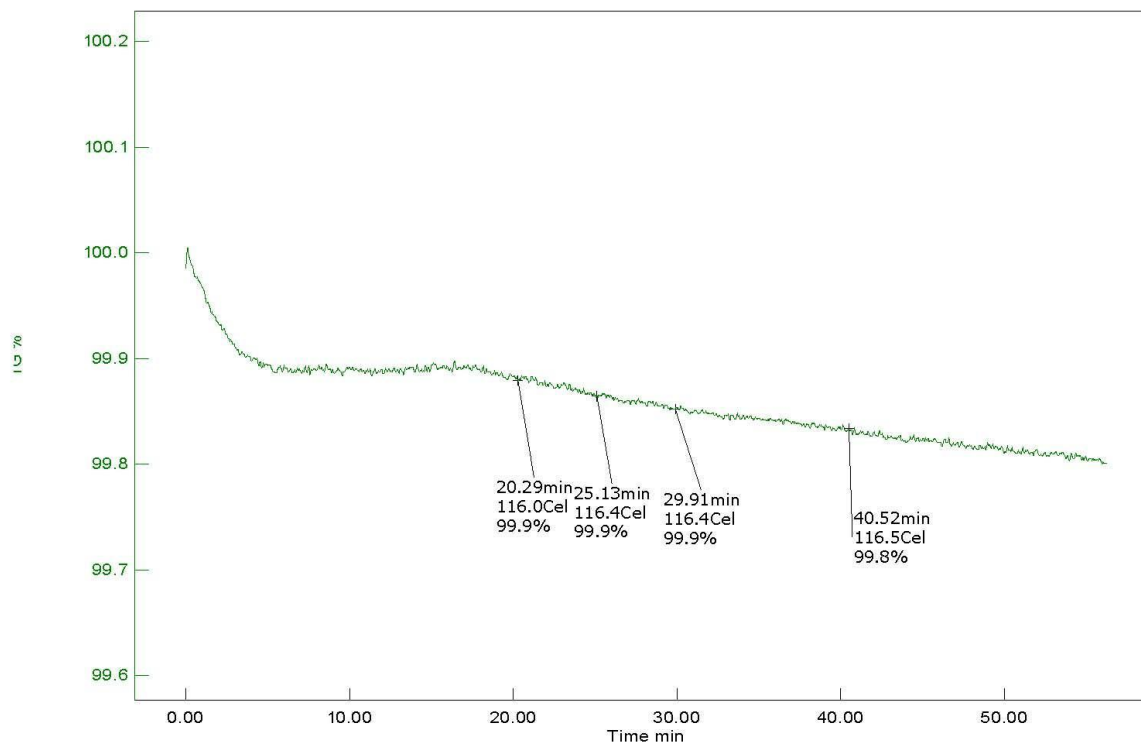
- Develop new Low VOC Technology.
- Based on Green Renewable Resources.
- SCAQMD Rule 1144 Super Compliant.
- Free of Chlorinated Paraffin's.
- Fully Recyclable.
- Must be Fit for Function.
- Equal Process Performance to Incumbent products.
- Cost Competitive with current market.

VOC Profile

Module: TG/DTA
Data Name: 9090001A
Measurement Date: 7/6/2009
Sample Name:
Sample Weight: 10.7519 mg
Reference Name: Aluminum pan
Reference Weight: 0 mg

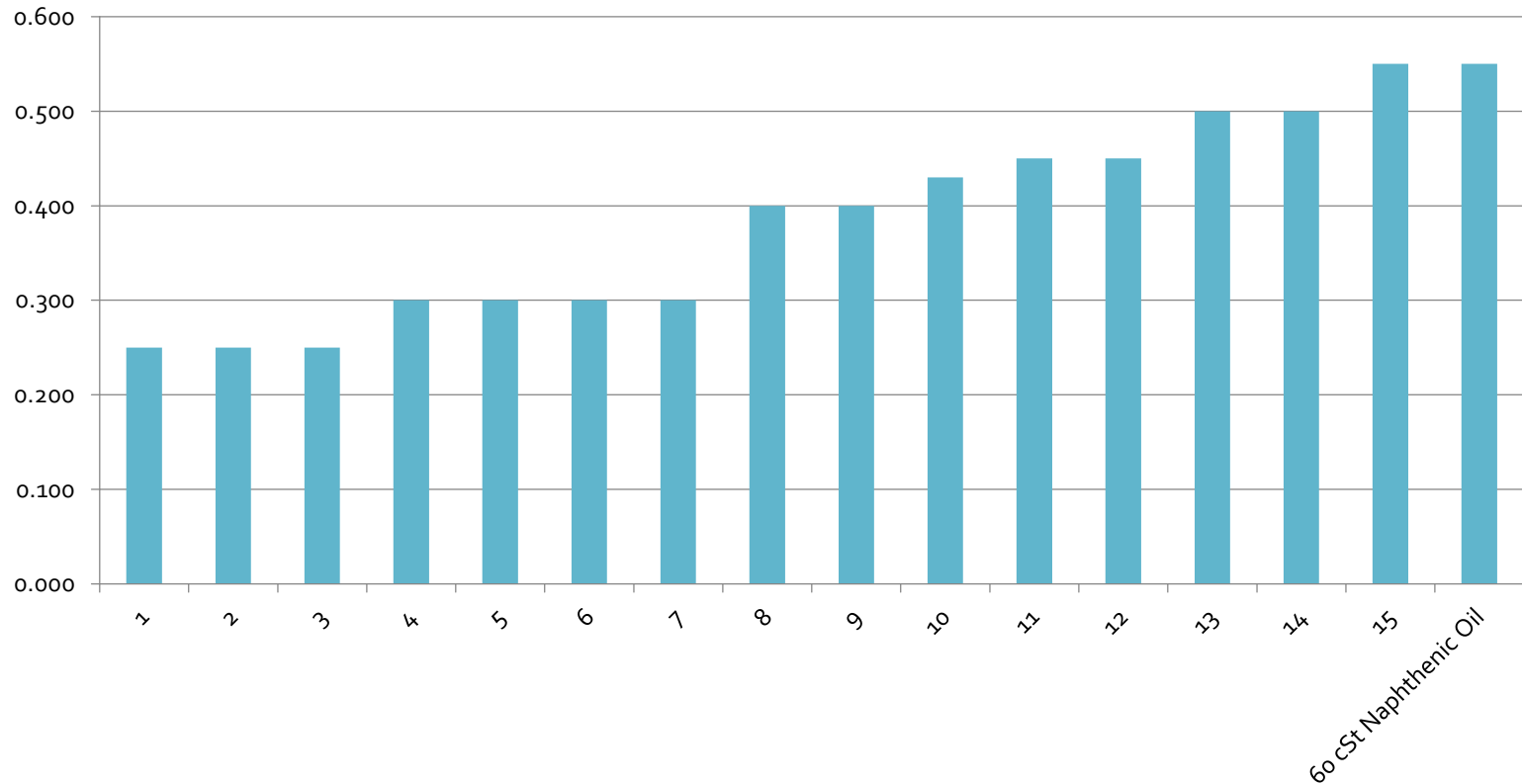
Comment:
Operator: MML
American Research Products
Nitrogen flow 60

Temperature Program:
Cel Cel Cel/min min s
1* 35 115 5 80 0.5



4 Ball Test Results

4-Ball Test Summary: Wear Scar Diameter (mm)



Case Study #1 AF



Case Study #1 AF

- Trial started Oct-20th-2009.
- Application: Tapping.
- Material: 7050 Aluminum Alloy
- Same production parameters as current.
- Initial results indicate normal tap life.
- Oct-22-09 1st shift logged 13,422 on tap.
- Thread quality good.
- Thread finish good.
- Productivity normal.
- Total production during trial 874,000 parts.

Case Study #2 AF



Case Study #2 AF



Case Study #2 AF

- Trial started February, 2010
- Application: Turning, Drilling
- Material: Titanium Grade 5 & Grade 9
- Same set-up and operation.
- Normal tool life recorded on all stations.
- Drills logged 120,000 parts per drill.
- Operators reported parting cut-off tool required 50% fewer adjustments per shift.
- Total production during trial 502,000

Case Study #3 AF



Case Study #3 AF

- Trial started March, 2010
- Application: Tapping.
- Material: Inconel, A286 S.S
- Same set-up and operation.
- 4 flute tap, Ti-Nitride coated.
- Tap sizes: $\frac{5}{8}$ -18.... $\frac{3}{4}$ -16....1"-12
- Total Produced in trial: 2,441

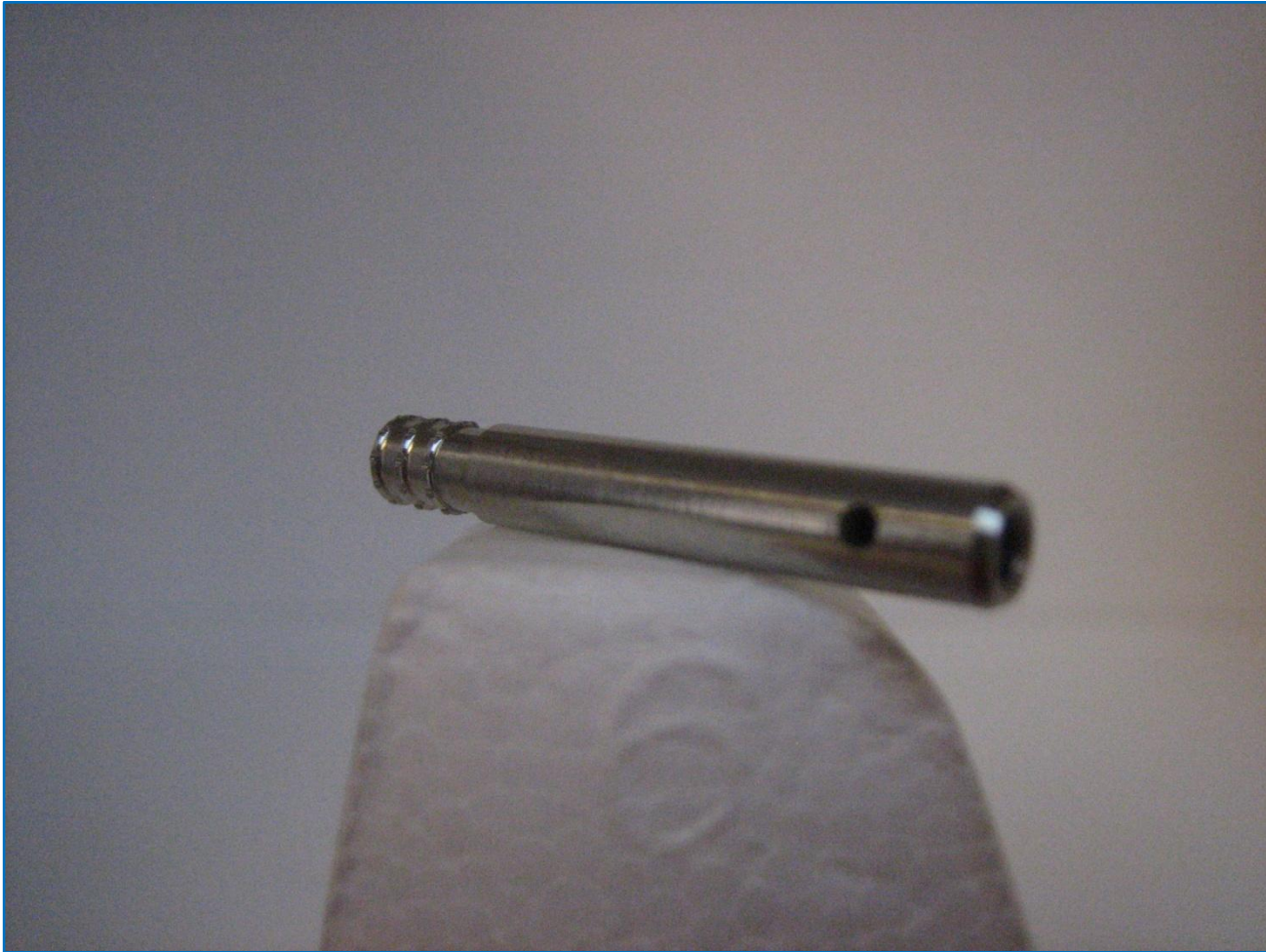
Case Study #4 AMF



Case Study #4 AMF

- Trial started April, 2011
- Aerospace and Marine Fasteners
- Application: Centerless Grinding
- Material: 17-4 S.S, 4130, 2024, 6061
- Same set-up and operation.
- Bar Grinder, high metal removal.
- Excellent settling of fines.
- Equal wheel & sump life.
- Better finish on aluminum material.

Case Study #5 AMF



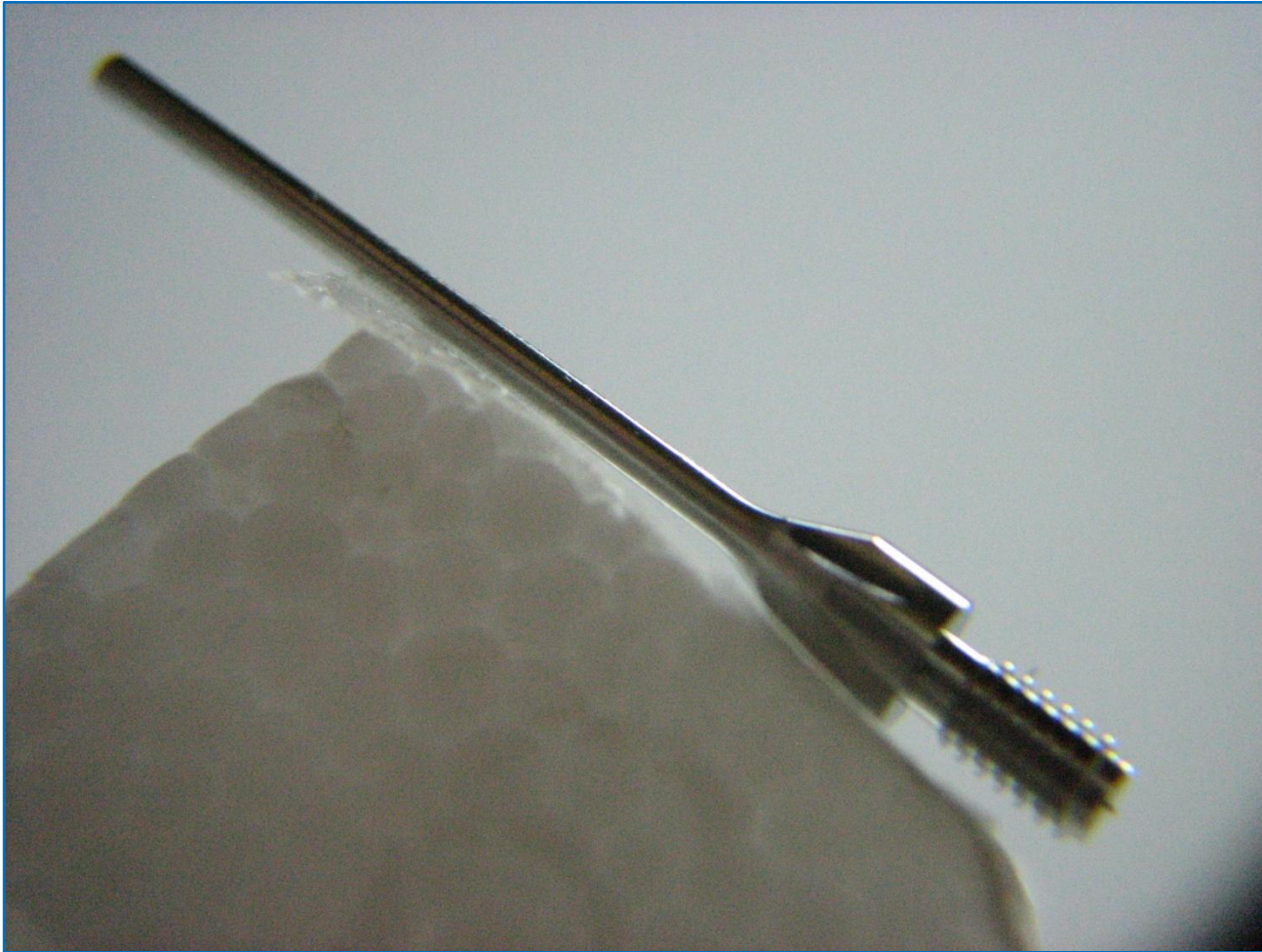
Case Study #5 AMF

- Trial started May, 2011
- Application: Swiss Screw Machine.
- Material: 17-4 S.S, 4130 Steel
- Same set-up and operation.
- Tooling: Carbide Gun Drills, reamers etc.
- High pressure oil delivery.
- Total Produced in trial: 9,600
- Equal performance and lower cost.

Case Study #6 AGI

- Trial started October, 2010
- Application: Cold Heading.
- Machine: SACMA
- Material: 1018, 1022 CRS, 303 S.S
- Same set-up and operation.
- Tooling: Carbide, Ti-Nitride coated.
- Total Produced in trial: 3,037,000
- Equal performance and cost.

Case Study #7 MD



Case Study #7 MD

- Trial started February, 2010
- Company: Opti-Surgical Inc.
- Application: Swiss Screw Machine.
- Machine: Citizen Cincom B12
- Material: Titanium, Grade 5
- Tooling: Carbide
- Total Produced in trial: 200,000
- Tool life increased 15-20%
- Better performance and lower cost.

Case Study #8 ST

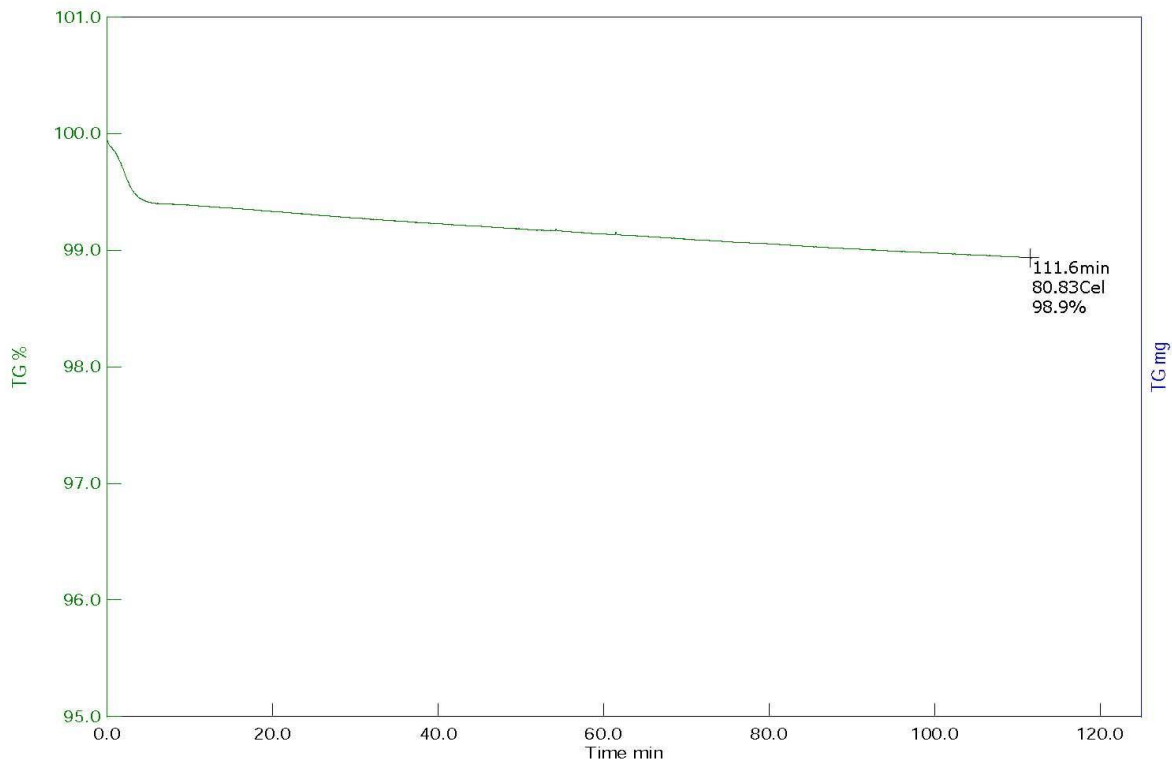


VOC Profile

Module: TG/DTA
Data Name: 10091001a5
Measurement Date: 10/8/2010
Sample Name: 10091001a5
Sample Weight: 9.5501 mg
Reference Name: PT
Reference Weight: 35 mg

Comment:
Operator: web

Temperature Program:
Cel Cel Cel/min min s
1* 35 81 25 110 0.5



Case Study #8 ST

- Trial Started February, 2009
- Company: Vest Incorporated.
- Product: 2"x"2 Sq.
- Machine: Yoder M-2
- Material: Hot Rolled P&O, CRS
- Duration of test: 12 months +
- Better performance and lower cost.

Summary

- All Products meet SUPER COMPLIANT
- 4 Industrial Segments
- 11 Applications
- 12 Metal Alloys
- No Process Changes Required
- Over 4 million Parts Produced
- Statistically Equivalent in Performance
- Highly Cost Competitive
- Successfully Met Design Charter.
- Aligns with CA GCI, CA GHG & SCAQMD

Q & A



American Research Specialty Products Inc.

Ph: 714-206-2617

E-mail: pf@americanresearchproducts.com

www.americanresearchproducts.com

Thank You