CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2024
DateRun:	04/05/2024
Experimenters:	Amelia Wagner
ClientType:	Chemical Company
ProjectNumber:	Project #1
Substrates:	Stainless Steel
PartType:	Coupon
Contaminants:	Rust/Scale
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Gravimetric, Visual
Purpose:	To test the efficacy of two products in removing unaged and aged flash rust from stainless steel.

Experimental Procedure:

Stainless steel coupons were chosen for this testing. A 2 in by 2 in section of each coupon was scratched with a sharp metal tool in order to scratch away at the protective coating of the surface. Coupons were then weighed and had their initial weights recorded. White vinegar was poured on the scratched sections of the coupons and were allowed to air dry in order to start the process of oxidation. After drying, a mixture of white vinegar, hydrogen peroxide, and table salt was poured on the scratched sections of the coupons and were left to air dry. Once dried, it was evident that flash rust had formed on the surface of each coupon. The dirty weights of the coupons were then recorded. The visual rankings of dirtiness were also recorded according to the visual observation criteria listed below. Half of the coupons were cleaned immediately using the Picklex Degreaser by method of heated immersion at 125 F for 90 seconds. The other half of the coupons were left to sit for one week in order for the rust to age. After one week, these coupons were cleaned using the Picklex 20 spray (ambient temp) by spraying the product onto their surface and allowing a 90 second contact time before wiping the surface with a paper towel (single wipe). Each coupon was then rinsed with cold tap water for 60 seconds. After cleaning steps, the coupons were then left to air dry before their clean weights were recorded, and clean visual rankings were made.

Visual Ranking criteria:

1= 100% soil removed (most clean)

2= 75% soil removed

3= 50% soil removed

4= 25% soil removed

5= 0% soil removed (most dirty)

Results:

Cleaner	Contaminant	Initial wt of cont.	Final wt of cont.	%Cont Removed	AVG % Removed	Overall % Removed
Picklex Degreaser	Flash Rust (no ageing)	0.0682	0.0001	99.85	97.20	95.93
		0.0182	0.0015	91.76		
		0.0268	0.0000	100.00		
	Flash Rust (aged one week)	0.0178	0.0002	98.88	94.65	
		0.0143	0.0015	89.51		
		0.0203	0.0009	95.57		
Picklex 20 spray	Flash Rust (no ageing)	0.0217	0.0000	100.00	100.00	97.75
		0.0189	0.0000	100.00		
		0.0225	0.0000	100.00		
	Flash Rust (aged one week)	0.0090	0.0003	96.67	95.50	
		0.0237	0.0012	94.94		
		0.0098	0.0005	94.90		

Cleaner	Contaminant	Dirty Visual Rankings	Clean Visual Rankings	AVG Clean Visual Rankings	Overall Clean Rankings
Picklex Degreaser	Flash Rust (no ageing)	5	1	1	1
		5	1		
		5	1		
	Flash Rust (aged one week)	5	1	1	
		5	1		

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		5	1		
Picklex 20 spray	Flash Rust (no ageing)	5	1	1	1
		5	1		
		5	1		
	Flash Rust (aged one week)	5	1	1	
		5	1		
		5	1		

General observations:

The Picklex 20 spray began to foam immediately upon contacting the surface of the coupons and finished foaming well before the 90 second contact time was up. This product likely did not need the full 90 second contact time in order to effectively clean.

Summary:

Substrates:	Stainless Steel				
Contaminants:	Rust/Scale				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
International Chemical Products Inc	Picklex	RTU	95.00	☐	

Conclusion:

Both products were highly effective in removing flash rust from stainless steel, although both products were observed to have a slightly higher efficacy in removing unaged flash rust as opposed to aged flash rust. This difference is very small and was only observed using gravimetric analysis (not visually observable).