AD-A265 710

(1)

ESL-TR-89-04

SUBSTITUTION OF WAX AND GREASE CLEANERS WITH BIO-DEGRADABLE SOLVENTS: PHASE I, PART V

P.M. WIKOFF, R.K. SCHOBER, T.L. HARRIS, D.F. SUCIU, R.E. McATEE, G.S. CARPENTER, P.A. PRYFOGLE, J.M. BELLER

EG&G IDAHO, INC.
P. O. BOX 1625
IDAHO FALLS ID 83415

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ELECTE
JUN 14 1993
S A D

SEPTEMBER 1989

FINAL REPORT

OCTOBER 1987 — SEPTEMBER 1988

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

93-13180

112 pg

93 6 14 006

AIR FORCE ENGINEERING & SERVICES CENTER
ENGINEERING & SERVICES LABORATORY
TYNDALL AIR FORCE BASE, FLORIDA 32403

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SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved OMB No 0704 0188

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release. Distribution unlimited.
2b DECLASSIFICATION/DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S) ESL-TR-89-04	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a NAME OF PERFORMING ORGANIZATION EG&G Idaho, Inc 6b OFFICE SYMBOL (If applicable) Chem Science	7a NAME OF MONITORING ORGANIZATION Air Force Engineering and Services Center
6c ADDRESS (City, State, and ZIP Code) P.O. Box 1625 Idaho Falls ID 83415	7b ADDRESS (City, State, and ZIP Code) HQ AFESC/RDVS Tyndall AFB FL 32403-6001
8a NAME OF FUNDING/SPONSORING ORGANIZATION 8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER Contract # DE-AC07-76ID01570
8c ADDRESS (City, State, and ZIP Code)	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO: 63723F PROJECT NO: 2054 TASK NO: 71 WORK UNIT ACCESSION NO: 04

11 TITLE (Include Security Classification)
Substitution of Wax and Grease Cleaners with Biodegradable Solvents, Phase I Report (UNCLASSIFIED) PART V

12 PERSONAL AUTHOR(S) P.M. Wikoff, R.K. Schober, T.L. Harris, D.F. Suciu, R.E. McAtee, G.S. Carpenter, P.A. Pryfogle, J.M. Beller,

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Final	FROM 10/87 TO 9/88	September 1989	524

16 SUPPLEMENTARY NOTATION
Availability of this report is specified on reverse of front cover.

17 COSATI CODES

FIELD	GROUP	SUB-GROUP
7	02	

18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
solvents, cleaners, halogenated, hydrocarbon, biodegradable, industrial wastewater, hazardous waste minimization

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

Methods have been tested for systematic evaluations of biodegradable solvents for aircraft parts cleaning, degreasing, and masking-wax removal processes. Screening tests have identified solvents that are biodegradable, can efficiently remove soils from aircraft parts in a dip tank, and meet the military specification requirement for corrosiveness (ANSI/ASTM) in processes used at the five Air Force Air Logistics Centers (ALCs). The database developed during Phase I, of this program identifies each process, the chemicals used, tank volumes, testing requirements, and alternative chemicals. To test solvent biodegrability, an ASTM method was modified and used to test a bench-scale activated sludge system by measuring chemical oxygen demand (COD) and adenosine triphosphate (ATP) over a 6-hour period to determine if the bacteria will reduce COD to below the limit established by the National Pollution Discharge Elimination System (NPDES). Solvents were categorized to identify any trends, and six were selected for in-depth pilot-scale testing.

20 DISTRIBUTION/AVAILABILITY OF ABSTRACT ☐ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21 ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED
22a NAME OF RESPONSIBLE INDIVIDUAL Mr. Charles J. Carpenter	22b TELEPHONE (Include Area Code) 904 2832942 22c OFFICE SYMBOL HQ AFESC/RDVS

DD Form 1473, JUN 86 Previous editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

PREFACE

This report was prepared by Idaho National Engineering Laboratory, EG&G Idaho, Inc., P.O. Box 1625 Idaho Falls, Idaho 83415 under Contract Number DE-AC07-76ID01570 for the Air Force Engineering and Services Center (AFESC), Tyndall Air Force Base, Florida 32403-6001. Mr Charles J. Carpenter was the Government technical program manager. This report summarizes work accomplished between 1 October 1987 and 30 March 1989.

This report has been reviewed by the Public Affairs Office and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the general public, including foreign nations.

This technical publication has been reviewed and is approved for publication.

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Project Officer

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Chief, Envirohics Division

KENNETH T. DENBLEYKER, Maj, USAF
Chief, Environmental Sciences Branch

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Deputy Director
Engineering and Services Laboratory

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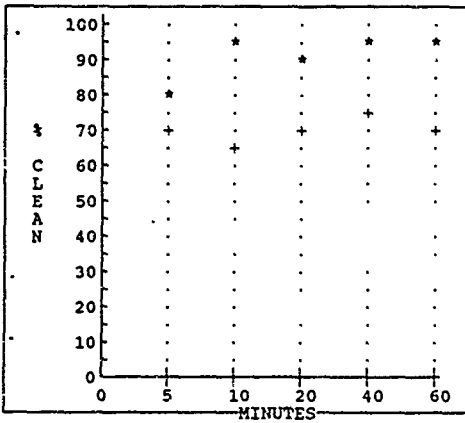
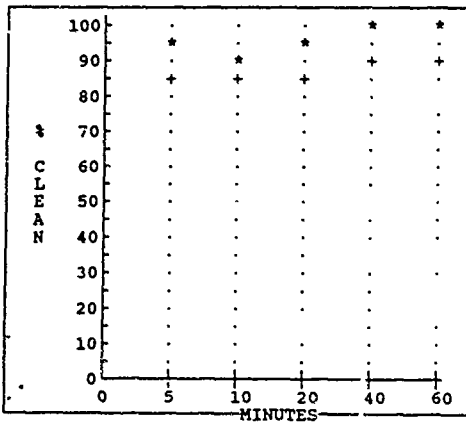


ORANGE-SOL INCORPERATED
DE-SOLV-IT
GREASE: CONCENTRATE AT 1
40 F
310S

* -- RINSED
\+ -- UNRINSED

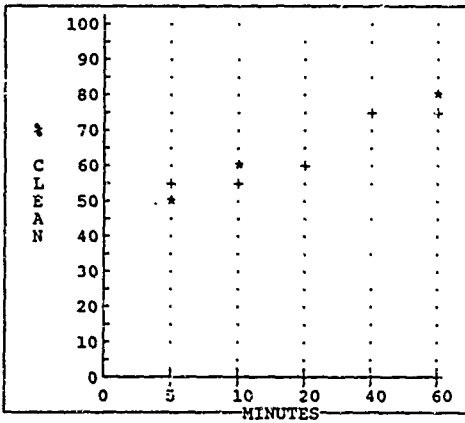
RINSED	UNRINSED
79%	71%
95%	67%
92%	72%
94%	75%
97%	71%



ORANGE-SOL INCORPERATED
DE-SOLV-IT
HYDRAULIC FLUID: CONCENT
RATE AT 140 F
A17075

* -- RINSED
\+ -- UNRINSED

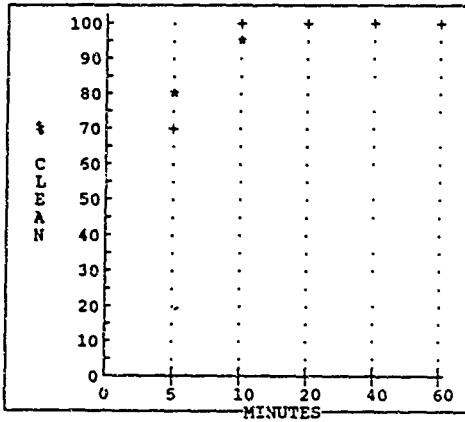
RINSED	UNRINSED
97%	85%
92%	84%
96%	87%
99%	92%
99%	89%



P-D-680
P-D-680
WAX: CONCENTRATE AT AMBIENT
MONEL K-500

* -- RINSED
\+ -- UNRINSED

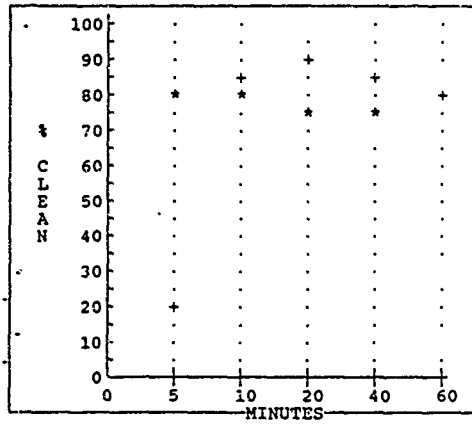
RINSED	UNRINSED
51%	54%
58%	55%
59%	58%
73%	74%
81%	73%



P-D-680
P-D-680
OIL/XYLENE: CONCENTRATE AT AMBIENT
INCONEL 750

* -- RINSED
\+ -- UNRINSED

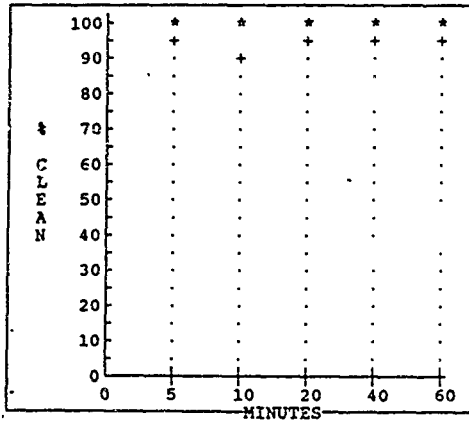
RINSED	UNRINSED
81%	70%
95%	99%
100%	99%
100%	100%
99%	99%



P-D-680
P-D-680
GREASE: CONCENTRATE AT A
MBIENT
310S

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
79%	22%
82%	87%
77%	88%
74%	84%
79%	79%



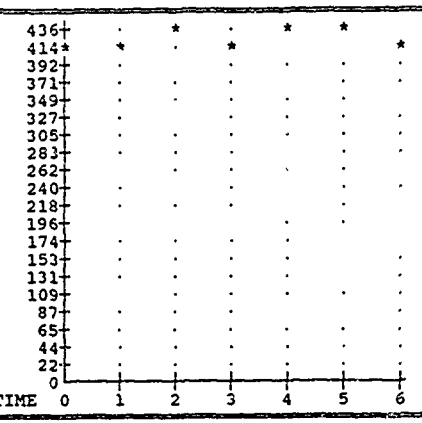
P-D-680
P-D-680
HYDRAULIC FLUID: CONCENT
RATE AT AMBIENT
310S

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
100%	95%
100%	90%
100%	94%
100%	97%
100%	97%

COMPANY - PACIFIC CHEMICAL
PRODUCT - B-82
TOC INIT- 0
TOC 2nd - 0
COD INIT- 170500
ANILINE PT - 0.0000
ATP ----- 30 E-8

SOLUBILITY DATA:



0- 414
1- 404
2- 428
3- 422
4- 436
5- 432
6- 410

DRY WEIGHT 0.0594

DATE - 06/28/88 COD vs TIME

PHENOL
06/28/88
ATP - 72 E-8

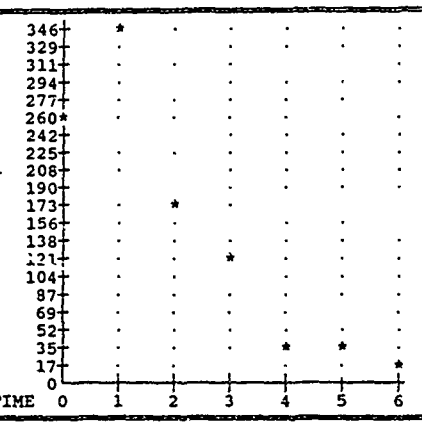
HYLUBE INC.
HYKLEEN 312

LEA MANUFACTURING CO.
CLEANOL

MEQQEM
MEQQEM-CLEAN 8512

MEQQEM
MEQQEM-CLEAN 8516

PACIFIC CHEMICAL
B-82



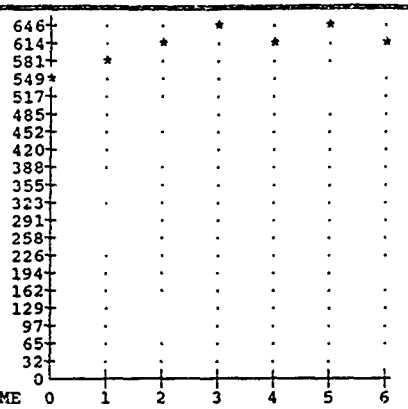
0- 266
1- 346
2- 174
3- 114
4- 28
5- 36
6- 12

DRY WEIGHT 0.0594

DATE - 06/28/88 COD vs TIME

COMPANY - PACIFIC CHEMICAL
PRODUCT - FIST
TOC INIT- 50374
TOC 2nd - 0
COD INIT- 650000
ANILINE PT - 0.0000
ATP ----- 7 E-8

SOLUBILITY DATA:



0- 561
1- 586
2- 604
3- 638
4- 622
5- 646
6- 600

DRY WEIGHT 0.0714

DATE - 06/29/88 COD vs TIME

PHENOL
06/29/88
ATP - 16 E-8

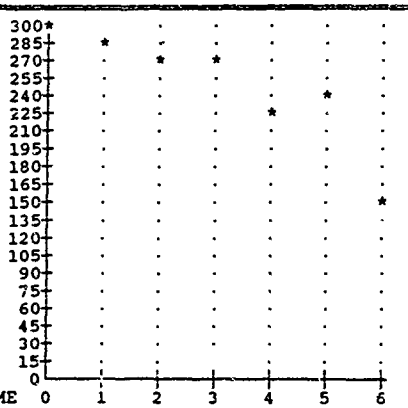
KLEER-FLO COMPANY
DEGREASOL 99R

KLEER-FLO COMPANY
HI-T DEGREASER

LAKE PRODUCTS CO. INC.
LAKE-97

%-OIL-FREE CO.
%-OIL-FREE #1000

PACIFIC CHEMICAL
FIST



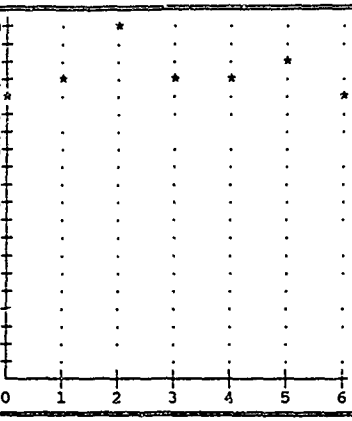
0- 300
1- 290
2- 266
3- 276
4- 232
5- 236
6- 150

DRY WEIGHT 0.0714

DATE - 06/29/88 COD vs TIME

COMPANY - PACIFIC CHEMICAL
PRODUCT - FIST
TOC INIT- 50374
TOC 2nd - 0
COD INIT- 650000
ANILINE PT - 0.0000
ATP ----- -9 E-8

SOLUBILITY DATA:



0- 585
1- 628
2- 730
3- 610
4- 606
5- 652
6- 568

DRY WEIGHT 0.0792

DATE - 07/07/88 COD vs TIME

PHENOL
07/07/88
ATP - -71 E-8

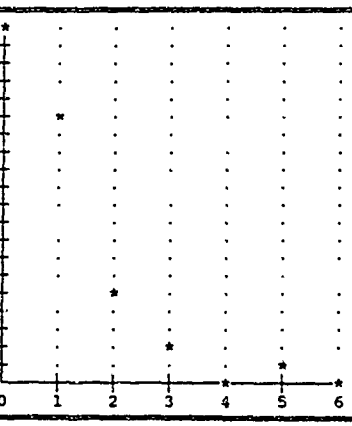
KLEER-FLO COMPANY
DEGREASOL 99R

KLEER-FLO COMPANY
HI-T DEGREASER

LAKE PRODUCTS CO. INC.
LAKE-97

M-OIL-FREE CO.
M-OIL-FREE #1000

PACIFIC CHEMICAL
FIST



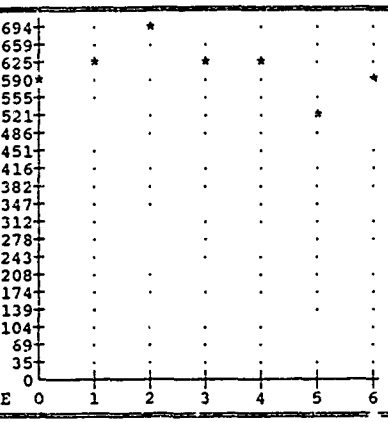
0- 264
1- 198
2- 69
3- 30
4- -6
5- 16
6- 0

DRY WEIGHT 0.0792

DATE - 07/07/88 COD vs TIME

COMPANY - PACIFIC CHEMICAL
PRODUCT - FIST
TOC INIT- 50374
TOC 2nd - 0
COD INIT- 650000
ANILINE PT - 0.0000
ATP ----- 16 E-8

SOLUBILITY DATA:



0- 582
1- 610
2- 694
3- 631
4- 610
5- 518
6- 606

DRY WEIGHT 0.0554

DATE - 10/11/88 COD vs TIME

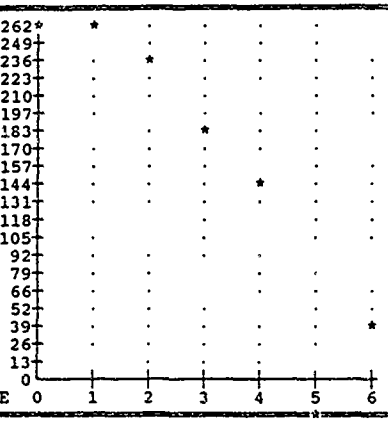
PHENOL
10/11/88
ATP - 79 E-8

M-OIL-FREE CO.
M-OIL-FREE #1000

M-OIL-FREE CO.
ULTRA 1

PACIFIC CHEMICAL
FIST

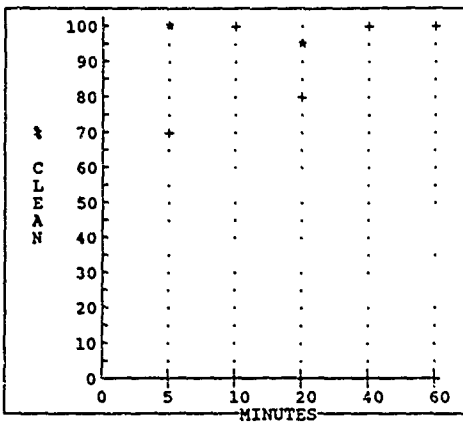
VAN STRAATEN CHEM CO.
3625



0- 258
1- 262
2- 236
3- 189
4- 140
5- -24
6- 36

DRY WEIGHT 0.0554

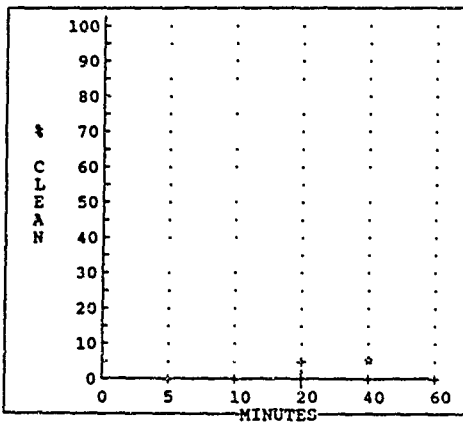
DATE - 10/11/88 COD vs TIME



PACIFIC CHEMICAL
FIST
GREASE: 6 OZ/GAL AT AMBIE
NT
INCONEL 750

* -- RINSED
\+ -- UNRINSED

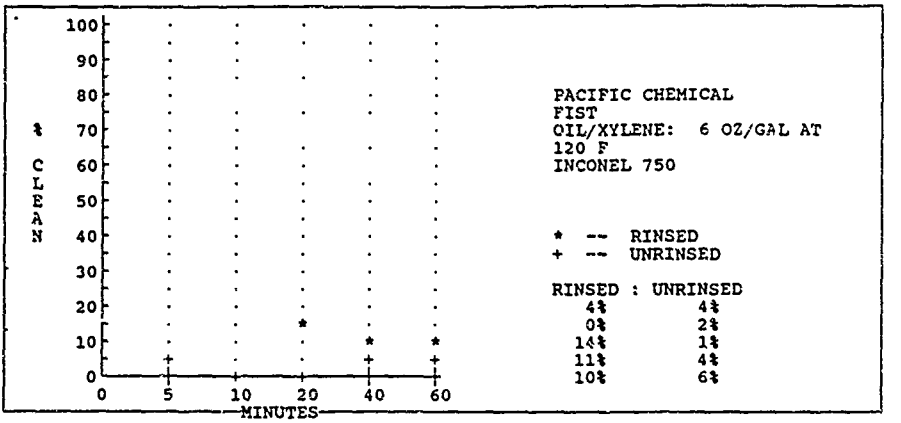
RINSED	UNRINSED
100%	70%
100%	100%
97%	81%
100%	100%
100%	100%



PACIFIC CHEMICAL
FIST
OIL & XYLENE: 6 OZ/GAL AT
AMBIENT
CDA433

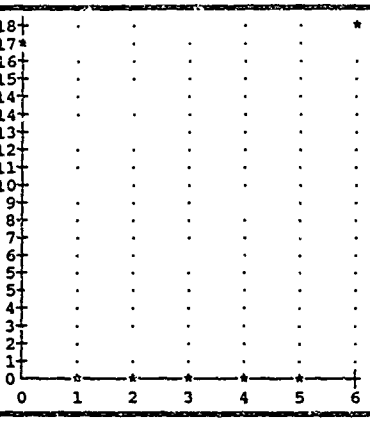
* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
0%	1%
2%	0%
4%	7%
4%	0%
0%	0%


100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
PACIFIC CHEMICAL
FIST
OIL/XYLENE: 6 OZ/GAL AT
120 F
INCONEL 750
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
4% 4%
0% 2%
14% 1%
11% 4%
10% 6%

COMPANY - PACIFIC CHEMICAL
PRODUCT - MASTER MHW
TOC INIT- 46771
TOC 2nd - 0
COD INIT- 25
ANILINE PT - 0.0000
ATP ----- -4 E-8

SOLUBILITY DATA:



0- 17
1- 0
2- 0
3- 0
4- 0
5- 0
6- 18

DRY WEIGHT 0.0543

DATE - 08/19/88 COD vs TIME

PHENOL
08/19/88
ATP - 385 E-8

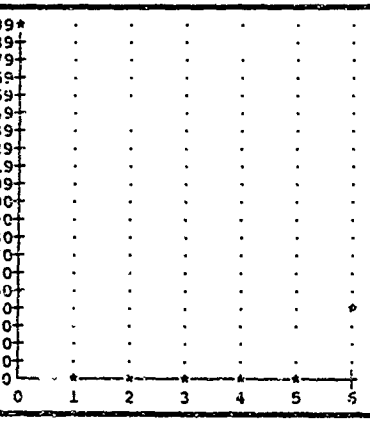
FREDERICK GUMM CHEM.
CLEPO 136-R

MAGNUSON PRODUCTS
PERMAG #404

OAKITE PRODUCTS INC.
RUST STRIPPER

PACIFIC CHEMICAL
MASTER MHW

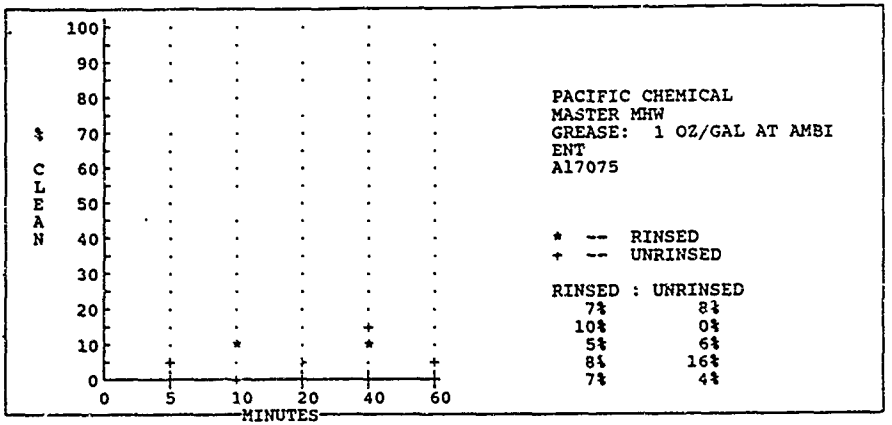
PACIFIC CHEMICAL
PACE S-L

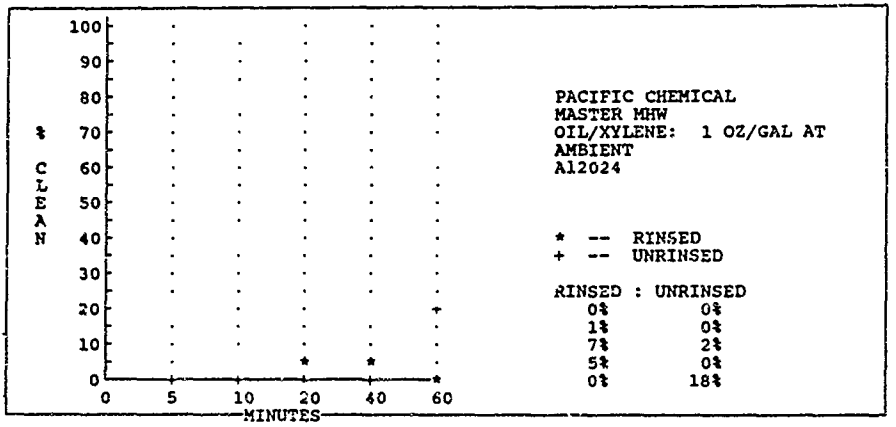


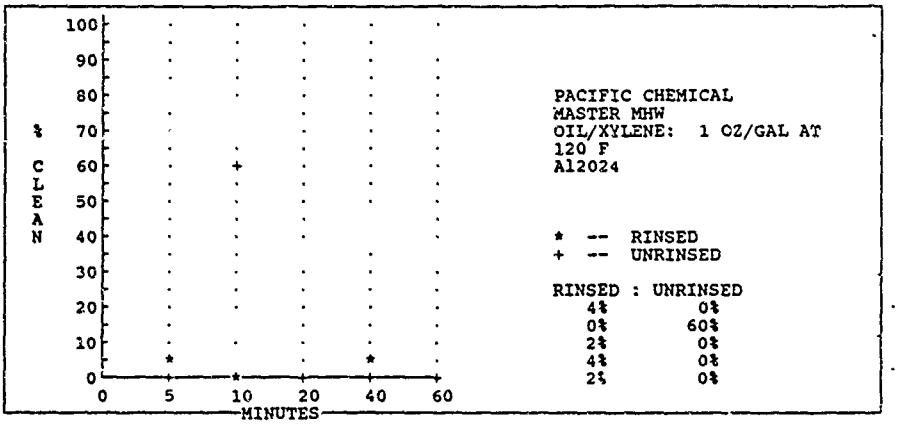
0- 199
1- 0
2- 0
3- 0
4- 0
5- 0
6- 38

DRY WEIGHT 0.0543

DATE - 08/19/88 COD vs TIME

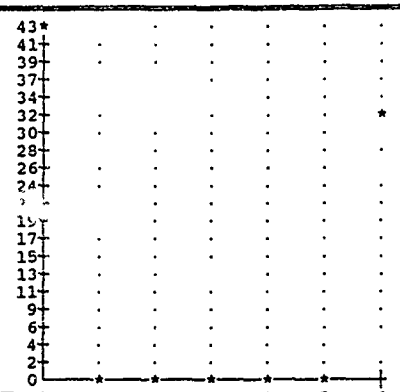

100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
PACIFIC CHEMICAL
MASTER MHW
GREASE: 1 OZ/GAL AT AMBI
ENT
A17075
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
7% 8%
10% 0%
5% 6%
8% 16%
7% 4%


100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
PACIFIC CHEMICAL
MASTER MHW
OIL/XYLENE: 1 OZ/GAL AT
AMBIENT
A12024
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
0% 0%
1% 0%
7% 2%
5% 0%
0% 18%


100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
PACIFIC CHEMICAL
MASTER MHW
OIL/XYLENE: 1 OZ/GAL AT
120 F
Al2024
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
4% 0%
0% 60%
2% 0%
4% 0%
2% 0%

COMPANY - PACIFIC CHEMICAL
PRODUCT - PACE S-L
TOC INIT- 113043
TOC 2nd - 0
COD INIT- 25
ANILINE PT - 0.0000
ATP ----- -140 E-8

SOLUBILITY DATA:



0- 43
1- 0
2- 0
3- 0
4- 0
5- 0
6- 33

DRY WEIGHT 0.0543

DATE - 08/19/88 COD vs TIME

PHENOL
08/19/88
ATP - 385 E-8

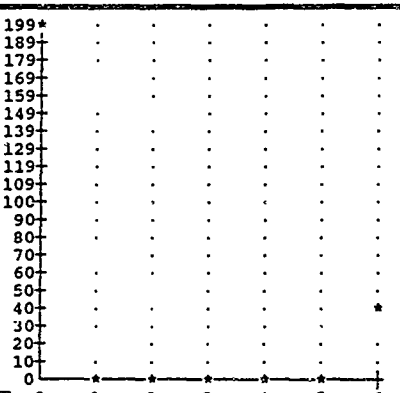
FREDERICK GUMM CHEM.
CLEPO 136-R

MAGNUSON PRODUCTS
PERMAG #404

OAKITE PRODUCTS INC.
RUST STRIPPER

PACIFIC CHEMICAL
MASTER MHW

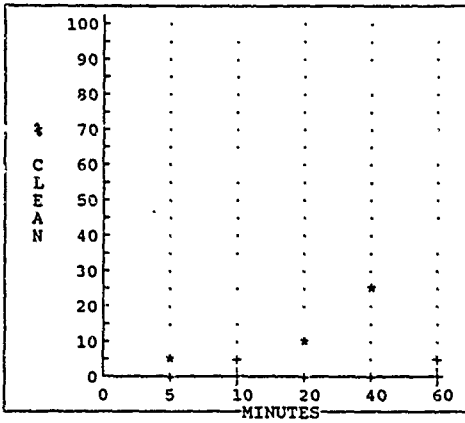
PACIFIC CHEMICAL
PACE S-L



0- 199
1- 0
2- 0
3- 0
4- 0
5- 0
6- 38

DRY WEIGHT 0.0543

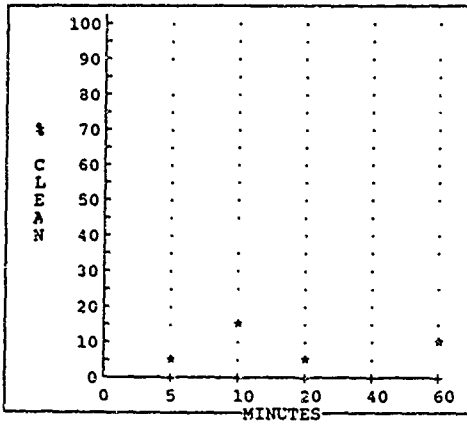
DATE - 08/19/88 COD vs TIME



PACIFIC CHEMICAL
PACE S-L
GREASE: 8 OZ/GAL AT AMBIENT
A17075

* -- RINSED
\+ -- UNRINSED

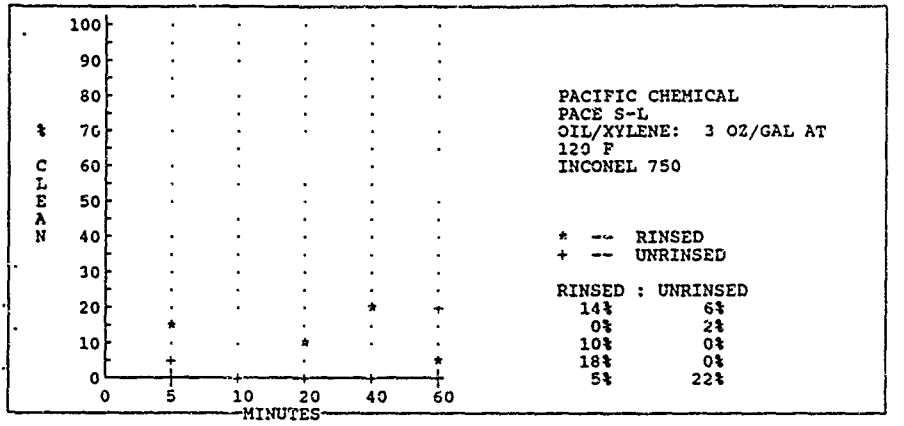
RINSED	UNRINSED
6%	0%
7%	6%
10%	1%
26%	1%
6%	2%



PACIFIC CHEMICAL
PACE S-L
OIL/XYLENE: 3 OZ/GAL AT AMBIENT
Az31B

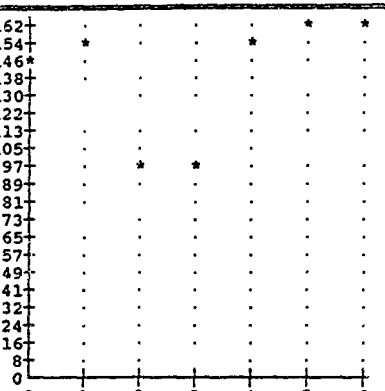
* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
3%	0%
14%	0%
3%	0%
0%	0%
11%	0%


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PACIFIC CHEMICAL
PACE S-L
OIL/XYLENE: 3 OZ/GAL AT
120 F
INCONEL 750
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
14% 6%
0% 2%
10% 0%
18% 0%
5% 22%

COMPANY - PACIFIC CHEMICAL
PRODUCT - RIDDALL
TOC INIT- 59257
TOC 2nd - 0
COD INIT- 2815000
ANILINE PT - 0.0000
ATP ----- -6 E-8

SOLUBILITY DATA:
1:4 @ AMBIE 0%
1:4 @ 140 3%



0- 149
1- 156
2- 96
3- 101
4- 151
5- 162
6- 160

DRY WEIGHT 0.0610

DATE - 03/17/88 COD vs TIME

PHENOL
03/17/88
ATP - 60 E-8

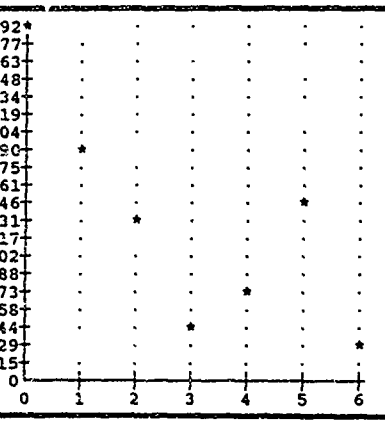
HYLUBE INC.
HYKLEEN 300

INTERNATIONAL PRODUCTS CO
MICRO

ORANGE-SOL INCORPERATED
DE-SOLV-IT

PACIFIC CHEMICAL
RIDDALL

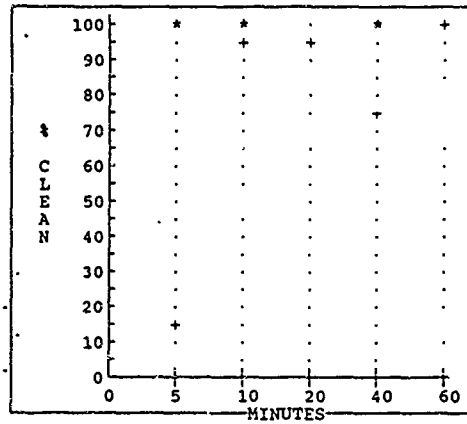
PANTHER CHEMICAL CO.
759



0- 292
1- 195
2- 135
3- 46
4- 76
5- 140
6- 32

DRY WEIGHT 0.0610

DATE - 03/17/88 COD vs TIME

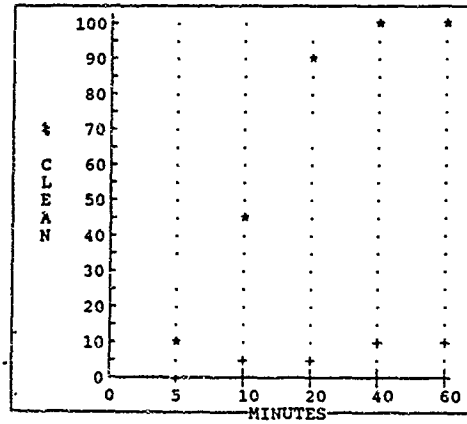


PACIFIC CHEMICAL
RIDDALL
GREASE: 1:4 AT AMBIENT

A12024

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
100%	16%
100%	96%
96%	94%
100%	75%
100%	100%

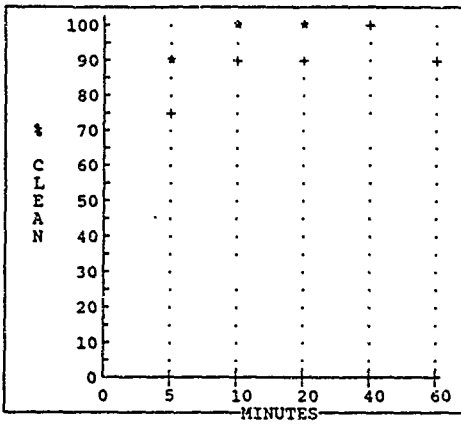


PACIFIC CHEMICAL
RIDDALL
OIL/XYLENE: 1:4 AT 120 F

310S

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
9%	2%
46%	5%
92%	3%
100%	8%
100%	12%



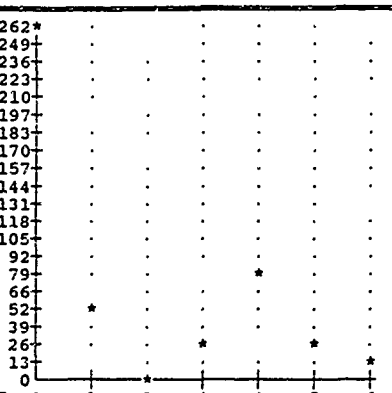
PACIFIC CHEMICAL
RIDDALL
HYDRAULIC FLUID: 1:4 AT
AMBIENT
MONEL K-500

* -- RINSED
+ -- UNRINSED

RINSED	UNRINSED
89%	73%
100%	89%
98%	89%
98%	100%
90%	89%

COMPANY - PANTHER CHEMICAL C
PRODUCT - 759
TOC INIT- 0
TOC 2nd - 0
COD INIT- 10000
ANILINE PT - 0.0000
ATP ----- 43 E-8

SOLUBILITY DATA:



0- 262
1- 56
2- -2
3- 25
4- 80
5- 30
6- 16

DRY WEIGHT 0.0610

DATE - 03/17/88 COD vs TIME

PHENOL
03/17/88
ATP - 60 E-8

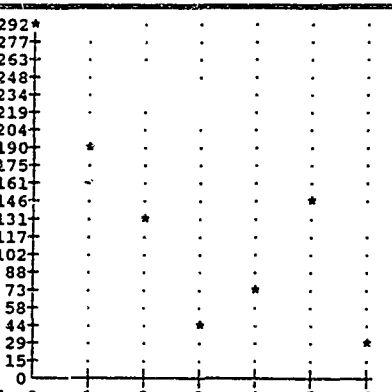
HYLUBE INC.
HYKLEEN 300

INTERNATIONAL PRODUCTS CO
MICRO

ORANGE-SOL INCORPERATED
DE-SOLV-IT

PACIFIC CHEMICAL
RIDDALL

PANTHER CHEMICAL CO.
759



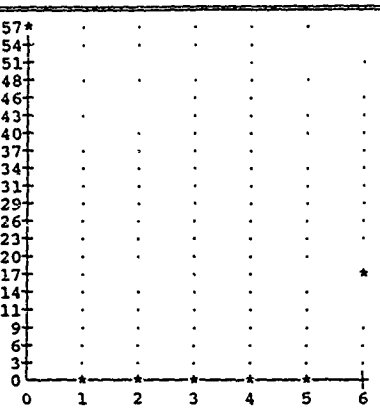
0- 292
1- 195
2- 135
3- 46
4- 76
5- 140
6- 32

DRY WEIGHT 0.0610

DATE - 03/17/88 COD vs TIME

COMPANY - PANTHER CHEMICAL C
PRODUCT - AS-33
TOC INIT- 34874
TOC 2nd - 0
COD INIT- 25
ANILINE PT - 0.0000
ATP ----- 60 E-8

SOLUBILITY DATA:



0- 57
1- 0
2- 0
3- 0
4- 0
5- 0
6- 16

DRY WEIGHT 0.0666

DATE - 08/24/88 COD vs TIME

PHENOL
08/24/88
ATP - 49 E-8

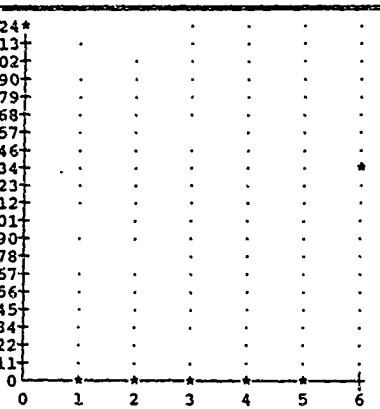
KIESOW INTERNATIONAL CORP
EKASIT E-231

PANTHER CHEMICAL CO.
AS-33

PANTHER CHEMICAL CO.
RR 50

PARKER CHEMICAL
PARCO CLEANER 2033

PARKER CHEMICAL
PARCO CLEANER 2053



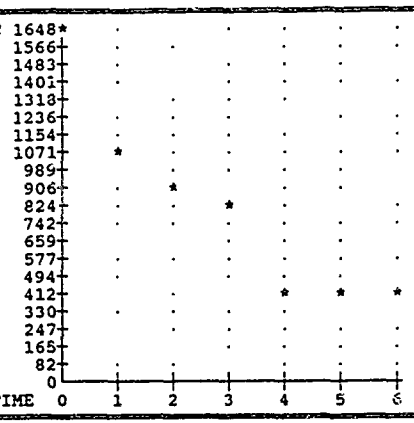
0- 224
1- 0
2- 0
3- 0
4- 0
5- 0
6- 132

DRY WEIGHT 0.0666

DATE - 08/24/88 COD vs TIME

COMPANY - PANTHER CHEMICAL C
PRODUCT - CR-138
TOC INIT- 0
TOC 2nd - 0
COD INIT- 5155000
ANILINE PT - 0.0000
ATP ----- -40 E-8

SOLUBILITY DATA:



0- 1648
1- 1055
2- 903
3- 830
4- 408
5- 428
6- 408

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

PHENOL
06/30/88
ATP ~ 108 E-8

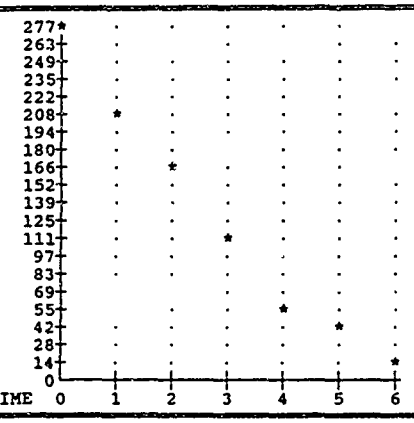
PANTHER CHEMICAL CO.
CR-138

PANTHER CHEMICAL CO.
CR-140

TWIN SPECIALTIES CORP.
TWIN CITRON CLEANER 100

UNITED LABORATORIES
UNITED 392

UNITED LABORATORIES
UNITED 395



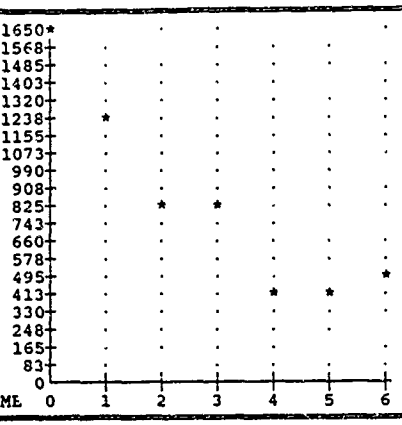
0- 277
1- 209
2- 170
3- 106
4- 58
5- 48
6- 12

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

COMPANY - PANTHER CHEMICAL C
PRODUCT - CR-140
TOC INIT- 0
TOC 2nd - 0
COD INIT- 5920000
ANILINE PT - 0.0000
ATP ----- -1 E-8

SOLUBILITY DATA:



0- 1650
1- 1214
2- 851
3- 824
4- 377
5- 403
6- 473

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

PHENOL
06/30/88
ATP - 108 E-8

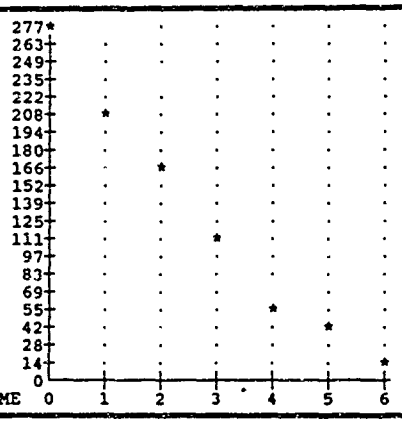
PANTHER CHEMICAL CO.
CR-138

PANTHER CHEMICAL CO.
CR-140

TWIN SPECIALTIES CORP.
TWIN CITRON CLEANER 100

UNITED LABORATORIES
UNITED 392

UNITED LABORATORIES
UNITED 395



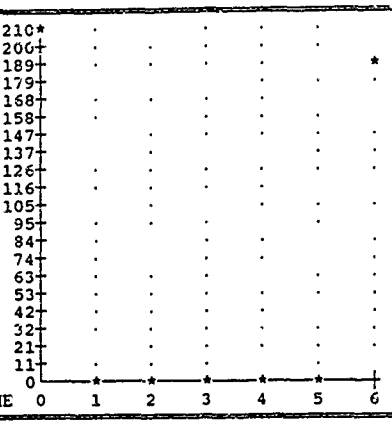
0- 277
1- 205
2- 170
3- 106
4- 58
5- 48
6- 12

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

COMPANY - PANTHER CHEMICAL C
PRODUCT - RR 50
TOC INIT- 14532
TOC 2nd - 0
COD INIT- 39950
ANILINE PT - 0.0000
ATP ----- -42 E-8

SOLUBILITY DATA:



0- 210
1- 0
2- 0
3- 0
4- 0
5- 0
6- 188

DRY WEIGHT 0.0666

DATE - 08/24/88 COD vs TIME

PHENOL
08/24/88
ATP - 49 E-8

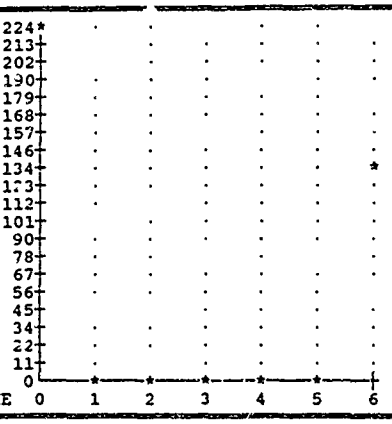
KIESOW INTERNATIONAL CORP
EKASIT E-231

PANTHER CHEMICAL CO.
AS 33

PANTHER CHEMICAL CO.
RR 50

PARKER CHEMICAL
PARCO CLEANER 2033

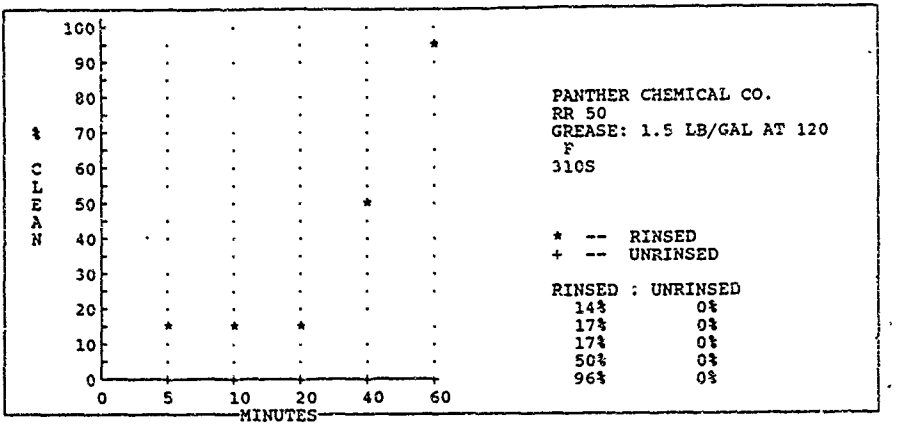
PARKER CHEMICAL
PARCO CLEANER 2053

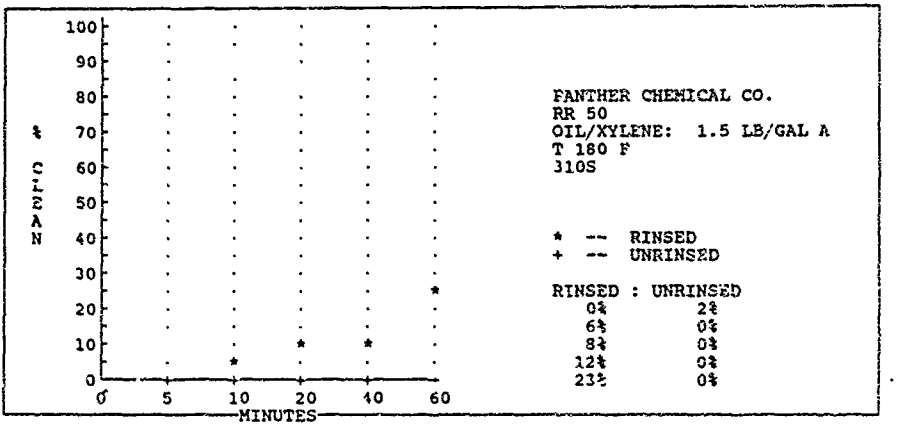


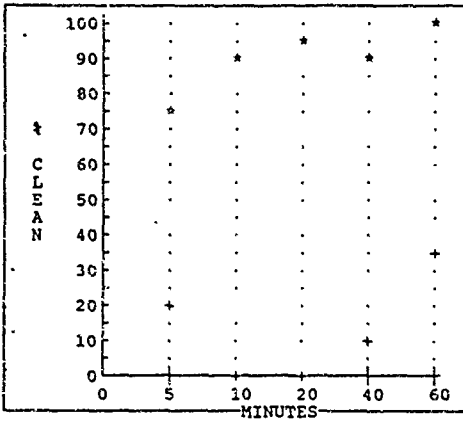
0- 224
1- 0
2- 0
3- 0
4- 0
5- 0
6- 132

DRY WEIGHT 0.0666

DATE - 08/24/88 COD vs TIME


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PANTHER CHEMICAL CO.
RR 50
GREASE: 1.5 LB/GAL AT 120 F
310S
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
14% 0%
17% 0%
17% 0%
50% 0%
96% 0%

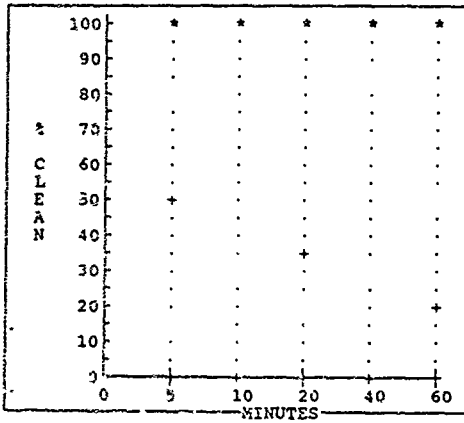

% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PANTHER CHEMICAL CO.
RR 50
OIL/XYLENE: 1.5 LB/GAL A
T 180 F
310S
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
0% 2%
6% 0%
8% 0%
12% 0%
23% 0%



PANTHER CHEMICAL CO.
RR 50
GREASE: 1.5 LB/GAL AT 18
0 F
310S

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
77%	19%
91%	0%
95%	0%
91%	10%
100%	33%



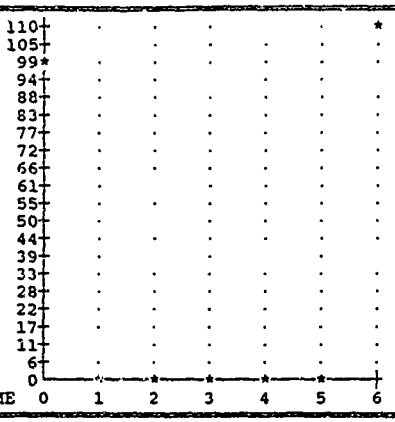
PANTHER CHEMICAL CO.
RR 50
HYDRAULIC FLUID: 1.5 LB/
GAL AT 180 F
C1020

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
100%	48%
100%	0%
100%	36%
100%	0%
100%	19%

COMPANY - PARKER CHEMICAL
PRODUCT - PARCO CLEANER 2033
TOC INIT- 113206
TOC 2nd - 0
COD INIT- 15900
ANILINE PT - 0.0000
ATP ----- -33 E-8

SOLUBILITY DATA:



0- 100
1- 0
2- 0
3- 0
4- 0
5- 0
6- 110

DRY WEIGHT 0.0666

DATE - 08/24/88 COD vs TIME

PHENOL
08/24/88
ATP - 49 E-8

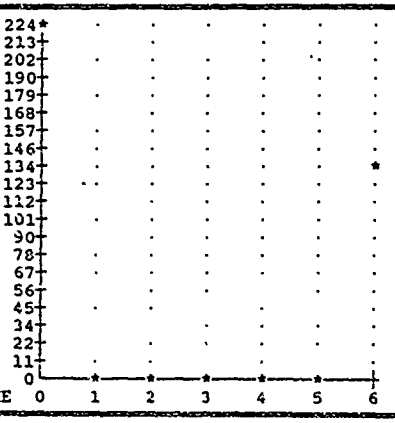
KIESOW INTERNATIONAL CORP
EKASIT E-231

PANTHER CHEMICAL CO.
AS-33

PANTHER CHEMICAL CO.
RR 50

PARKER CHEMICAL
PARCO CLEANER 2033

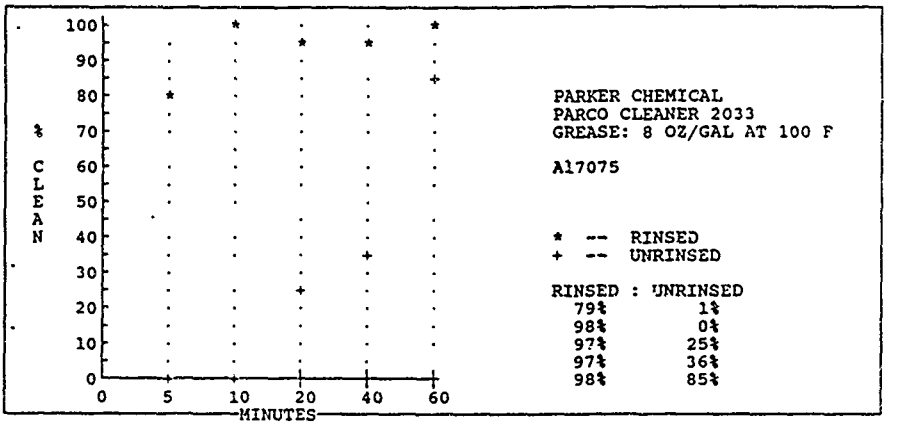
PARKER CHEMICAL
PARCO CLEANER 2053

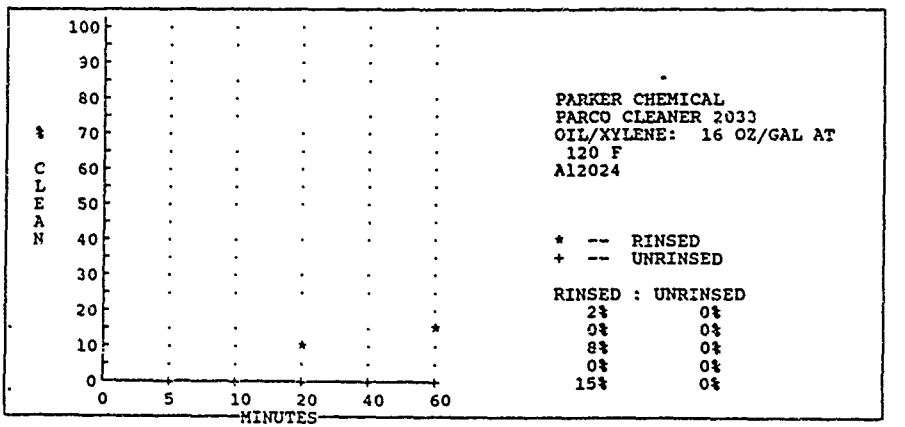


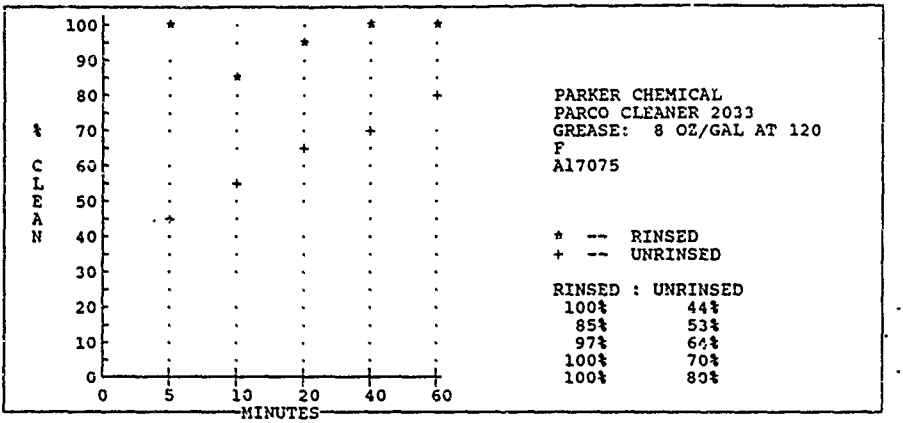
0- 224
1- 0
2- 0
3- 0
4- 0
5- 0
6- 132

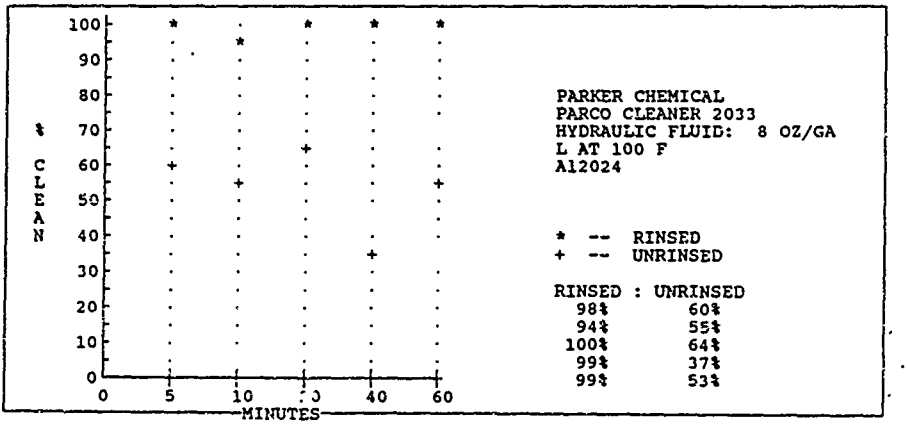
DRY WEIGHT 0.0666

DATE - 08/24/88 COD vs TIME


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PARKER CHEMICAL
PARCO CLEANER 2033
GREASE: 8 OZ/GAL AT 100 F
A17075
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
79% 1%
98% 0%
97% 25%
97% 36%
98% 85%

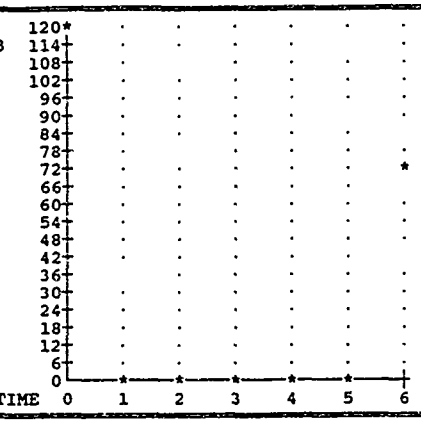

% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PARKER CHEMICAL
PARCO CLEANER 2033
OIL/XYLENE: 16 OZ/GAL AT
120 F
A12024
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
2% 0%
0% 0%
8% 0%
0% 0%
15% 0%


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PARKER CHEMICAL
PARCO CLEANER 2033
GREASE: 8 OZ/GAL AT 120 F
A17075
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
100% 44%
85% 53%
97% 66%
100% 70%
100% 80%


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PARKER CHEMICAL
PARCO CLEANER 2033
HYDRAULIC FLUID: 8 OZ/GAL AT 100 F
A12024
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
98% 60%
94% 55%
100% 64%
99% 37%
99% 53%

COMPANY - PARKER CHEMICAL
PRODUCT - PARCO CLEANER 2053
TOC INIT- 41813
TOC 2nd - 0
COD INIT- 8150
ANILINE PT - 0.0000
ATP ----- -58 E-8

SOLUBILITY DATA:



0- 120
1- 0
2- 0
3- 0
4- 0
5- 0
6- 70

DRY WEIGHT 0.0666

DATE - 08/24/88 COD vs TIME

PHENOL
08/24/88
ATP - 49 E-8

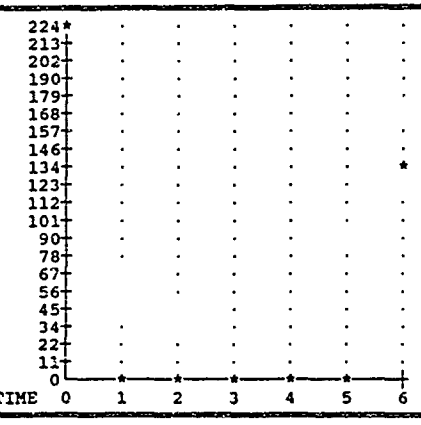
KIESOW INTERNATIONAL CORP
EKASIT E-231

PANTHER CHEMICAL CO.
AS-33

PANTHER CHEMICAL CO.
RR 50

PARKER CHEMICAL
PARCO CLEANER 2033

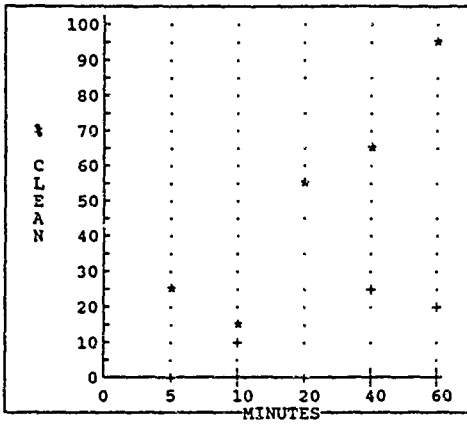
PARKER CHEMICAL
PARCO CLEANER 2053



0- 224
1- 0
2- 0
3- 0
4- 0
5- 0
6- 132

DRY WEIGHT 0.0666

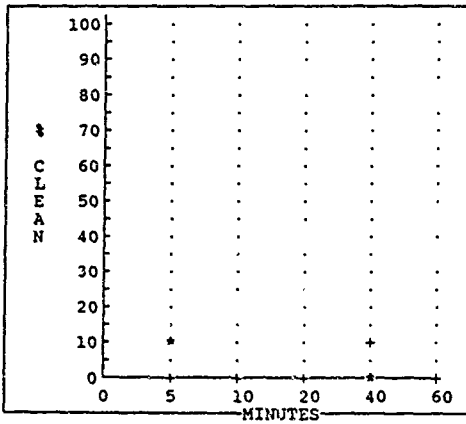
DATE - 08/24/88 COD vs TIME



PARKER CHEMICAL
PARCO CLEANER 2053
GREASE: 8 OZ/GAL AT 100 F
310S

* -- RINSED
\+ -- UNRINSED

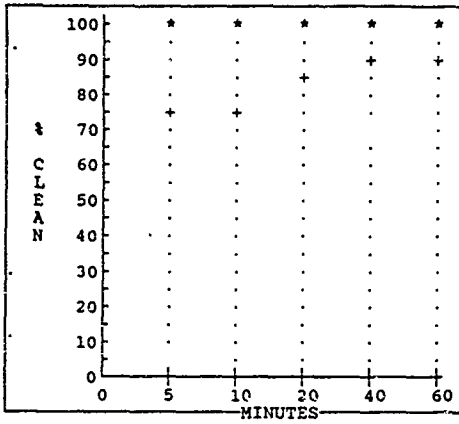
RINSED	UNRINSED
26%	1%
14%	11%
55%	2%
66%	25%
94%	22%



PARKER CHEMICAL
PARCO CLEANER 2053
OIL/XYLENE: 16 OZ/GAL AT 120 F
310S

* -- RINSED
\+ -- UNRINSED

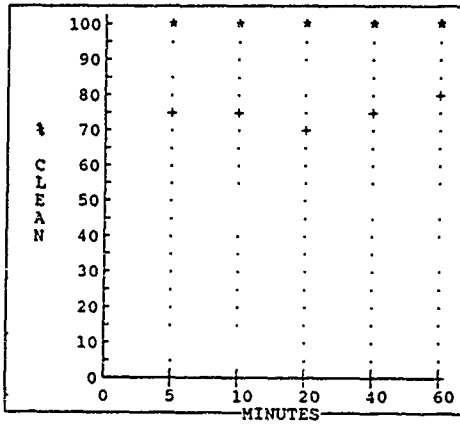
RINSED	UNRINSED
9%	0%
2%	0%
0%	0%
0%	12%
0%	1%



PARKER CHEMICAL
PARCO CLEANER 2053
GREASE: 8 OZ/GAL AT 120 F
310S

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
100%	75%
100%	75%
100%	85%
100%	89%
100%	89%



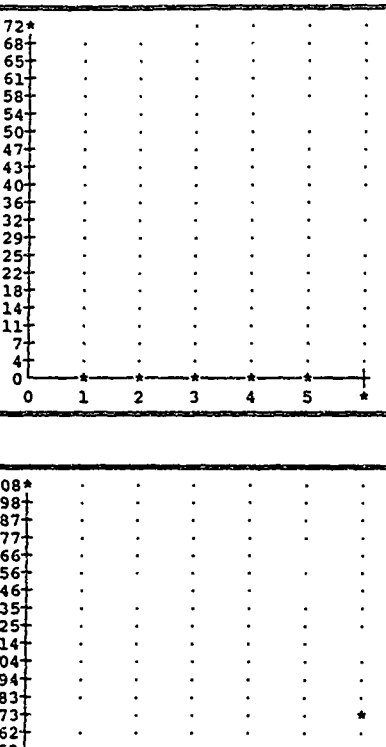
PARKER CHEMICAL
PARCO CLEANER 2053
HYDRAULIC FLUID: 8 OZ/GAL AT 120 F
310S

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
100%	77%
100%	77%
100%	71%
100%	74%
100%	80%

COMPANY - PATCLIN CHEMICAL C
PRODUCT - #309
TOC INIT- 22126
TOC 2nd - 0
COD INIT- 7700
ANILINE PT - 0.0000
ATP ----- -55 E-8

SOLUBILITY DATA:



0- 72
1- 0
2- 0
3- 0
4- 0
5- 0
6- -25

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME

PHENOL
08/23/88
ATP - 101 E-8

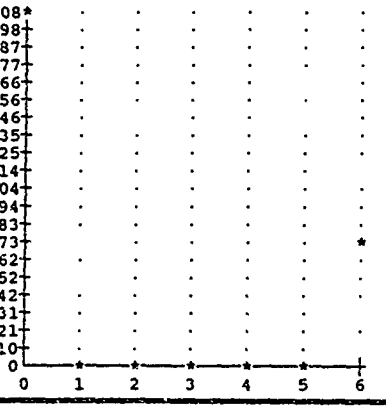
PATCLIN CHEMICAL CO.
#309

PATCLIN CHEMICAL CO.
#348

PATCLIN CHEMICAL CO.
#380

PATCLIN CHEMICAL CO.
359

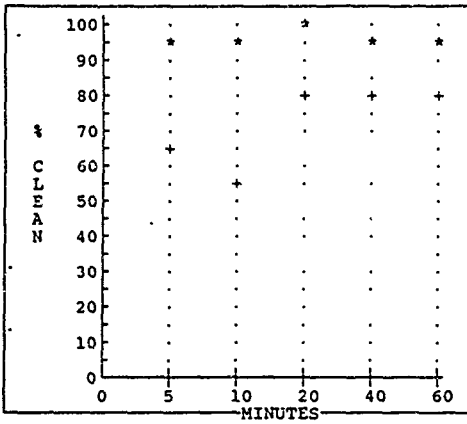
PATCLIN CHEMICAL CO.
396



0- 208
1- 0
2- 0
3- 0
4- 0
5- 0
6- 72

DRY WEIGHT 0.0544

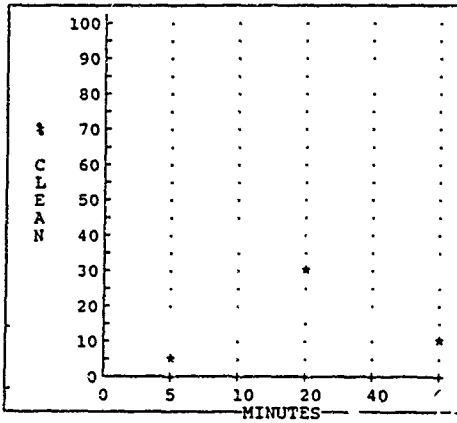
DATE - 08/23/88 COD vs TIME



PATCLIN CHEMICAL CO.
#309
GREASE: 12 OZ/GAL AT 120 F
310S

* -- RINSED
\+ -- UNRINSED

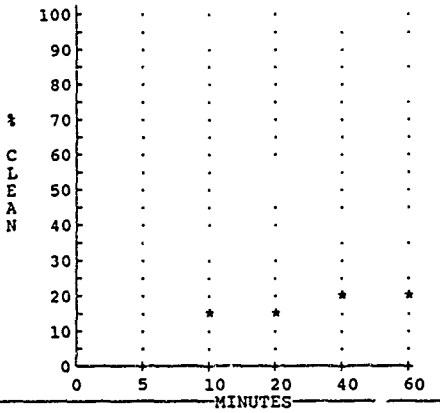
RINSED	UNRINSED
96%	66%
97%	56%
99%	79%
97%	82%
96%	79%



PATCLIN CHEMICAL CO.
#309
OIL/XYLENE: 12 OZ/GAL AT 160
A12024

* -- RINSED
\+ -- UNRINSED

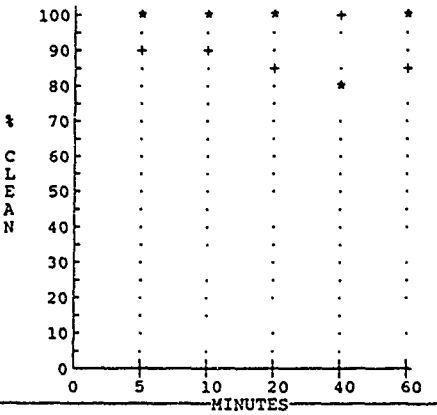
RINSED	UNRINSED
6%	0%
2%	0%
31%	0%
1%	0%
11%	0%



PATCLIN CHEMICAL CO.
#309
OIL/XYLENE: 12 OZ/GAL AT 200 F
Az31B

* -- RINSED
\+ -- UNRINSED

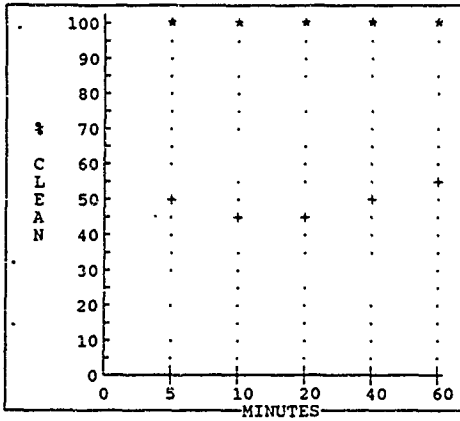
RINSED	UNRINSED
2%	0%
16%	0%
13%	0%
19%	0%
19%	0%



PATCLIN CHEMICAL CO.
#309
GREASE: 12 OZ/GAL AT 170 F
C1020

* -- RINSED
\+ -- UNRINSED

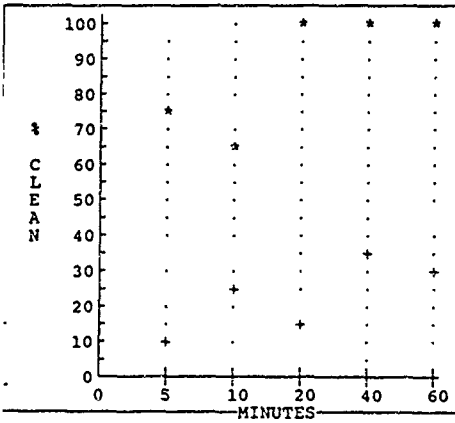
RINSED	UNRINSED
100%	88%
99%	90%
99%	87%
81%	99%
99%	87%



PATCLIN CHEMICAL CO.
#309
HYDRAULIC FLUID: 12 OZ/G
AL AT 170 F
CDA433

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
100%	49%
100%	45%
100%	47%
100%	49%
100%	57%



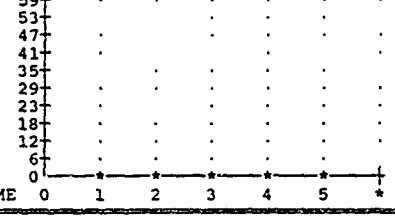
PATCLIN CHEMICAL CO.
#309
HYDRAULIC FLUID: 12 OZ/G
AL AT 120 F
CDA433

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
75%	11%
67%	23%
98%	17%
98%	33%
100%	31%

COMPANY - PATCLIN CHEMICAL C
PRODUCT - #348
TOC INIT- 71229
TOC 2nd - 0
COD INIT- 11450
ANILINE PT - 0.0000
ATP ----- -15 E-8

SOLUBILITY DATA:



0- 117
1- 0
2- 0
3- 0
4- 0
5- 0
6- -20

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME

PHENOL
08/23/88
ATP - 101 E-8

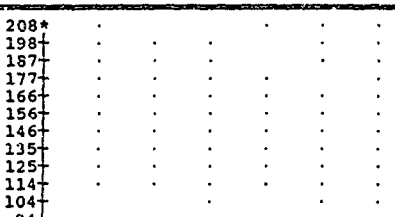
PATCLIN CHEMICAL CO.
#309

PATCLIN CHEMICAL CO.
#348

PATCLIN CHEMICAL CO.
#380

PATCLIN CHEMICAL CO.
359

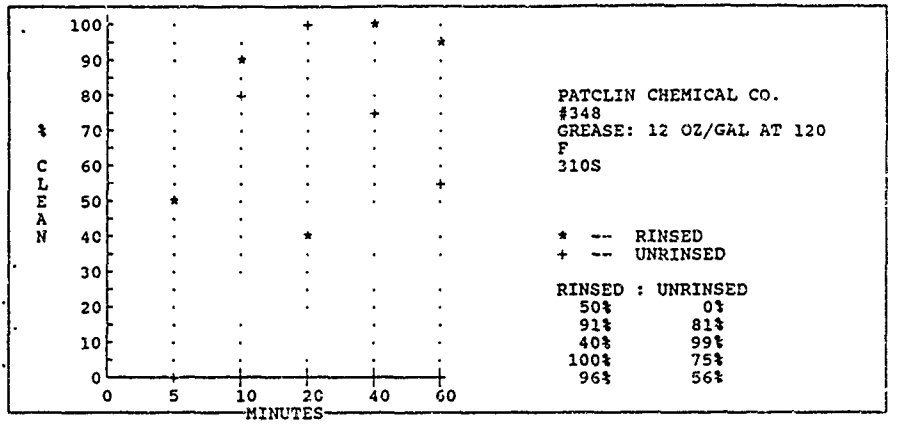
PATCLIN CHEMICAL CO.
396

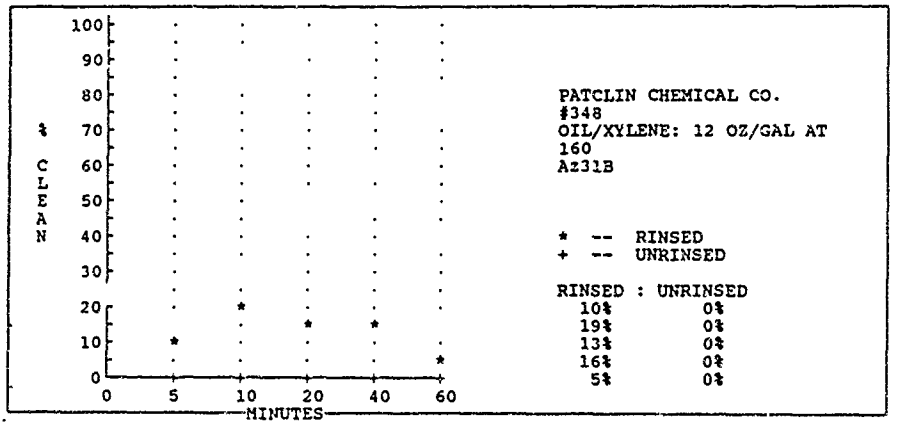


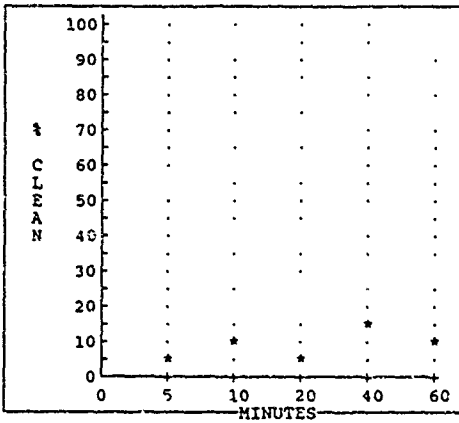
0- 208
1- 0
2- 0
3- 0
4- 0
5- 0
6- 72

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PATCLIN CHEMICAL CO.
#348
GREASE: 12 OZ/GAL AT 120 F
310S
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
50% 0%
91% 81%
40% 99%
100% 75%
96% 56%

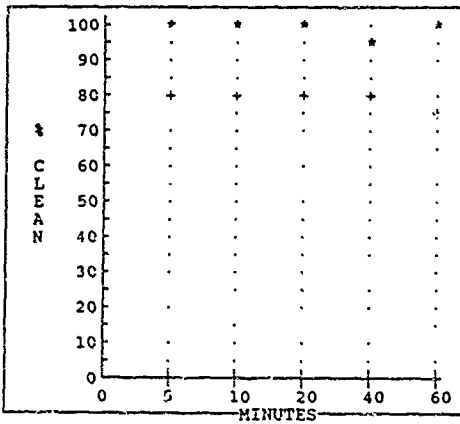

% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PATCLIN CHEMICAL CO.
#348
OIL/XYLENE: 12 OZ/GAL AT 160
Az31B
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
10% 0%
19% 0%
13% 0%
16% 0%
5% 0%



PATCLIN CHEMICAL CO.
#348
OIL/XYLENE: 12 OZ/GAL AT 200 F
Az31B

* -- RINSED
\+ -- UNRINSED

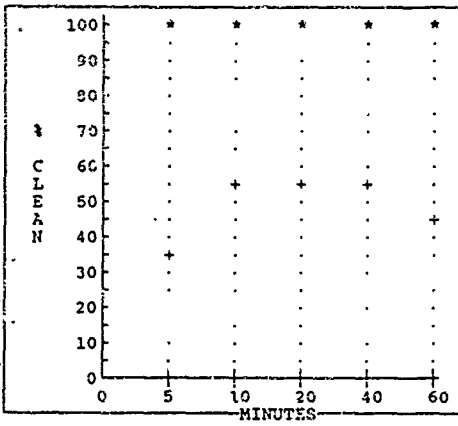
RINSED	UNRINSED
7%	0%
10%	0%
4%	0%
15%	0%
10%	0%



PATCLIN CHEMICAL CO.
#348
GREASF: 12 OZ/GAL AT 150 F
310S

* -- RINSED
\+ -- UNRINSED

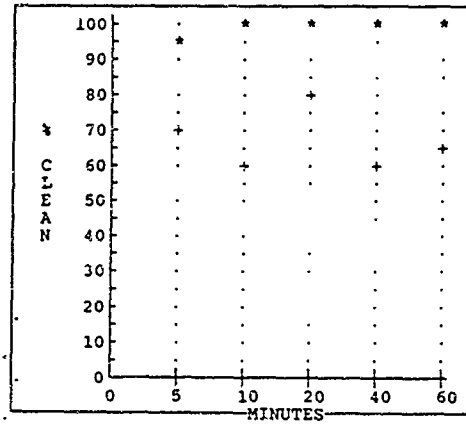
RINSED	UNRINSED
99%	82%
98%	80%
100%	81%
97%	79%
100%	77%



PATCLIN CHEMICAL CO.
#348
HYDRAULIC FLUID: 12 OZ/G
AL AT 120 F
CDA433

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSFD
100%	34%
100%	57%
100%	53%
99%	55%
100%	47%



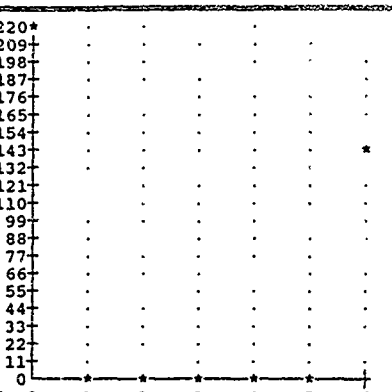
PATCLIN CHEMICAL CO.
#348
HYDRAULIC FLUID: 12 OZ/G
AL AT 120 F
C1020

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
97%	68%
100%	60%
100%	79%
99%	60%
100%	64%

COMPANY - PATCLIN CHEMICAL C
PRODUCT - #380
TOC INIT- 54483
TOC 2nd - 0
COD INIT- 73100
ANILINE PT - 0.0000
ATP ----- 21 E-8

SOLUBILITY DATA:



0- 220
1- 0
2- 0
3- 0
4- 0
5- 0
6- 142

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME

PHENOL
08/23/88
ATP - 101 E-8

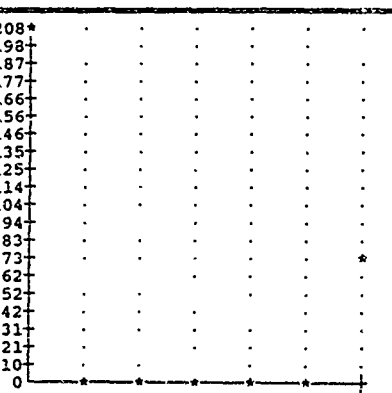
PATCLIN CHEMICAL CO.
#309

PATCLIN CHEMICAL CO.
#348

PATCLIN CHEMICAL CO.
#380

PATCLIN CHEMICAL CO.
359

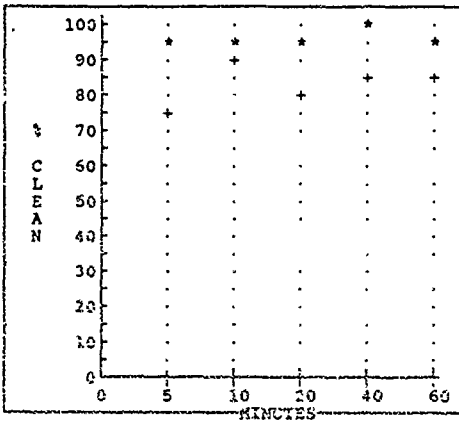
PATCLIN CHEMICAL CO.
396



0- 208
1- 0
2- 0
3- 0
4- 0
5- 0
6- 72

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME

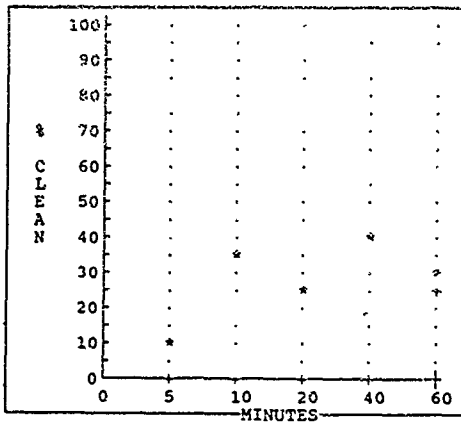


PATCLIN CHEMICAL CO.
#490
GREASE: 1:4 AT AMBIENT

310S

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
96%	75%
96%	92%
96%	80%
99%	87%
95%	87%

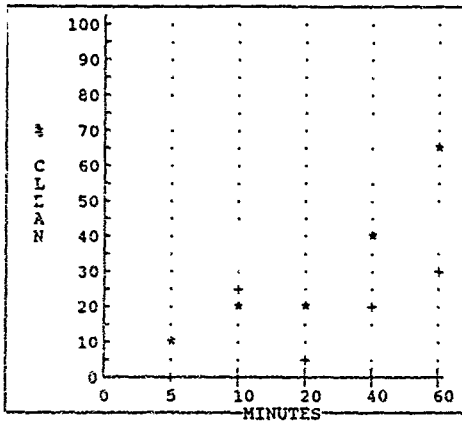


PATCLIN CHEMICAL CO.
#490
OIL/XYLENE: 1:10 AT 140 F

A12024

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
8%	0%
35%	0%
27%	0%
39%	1%
30%	26%



PATCLIN CHEMICAL CO.
#490
OIL/XYLENE: 1:4 AT 140 F

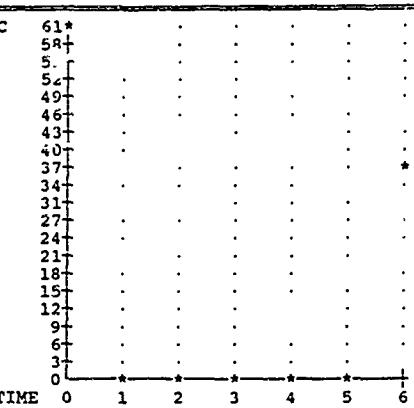
MONEL K-500

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
9%	0%
18%	24%
19%	4%
42%	19%
63%	29%

COMPANY - PATCLIN CHEMICAL C
PRODUCT - 359
TOC INIT- 0
TOC 2nd - 0
COD INIT- 0
ANILINE PT - 0.0000
ATP ----- -55 E-8

SOLUBILITY DATA:



0- 61
1- 0
2- 0
3- 0
4- 0
5- 0
6- 38

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME

PHENOL
08/23/88
ATP - 101 E-8

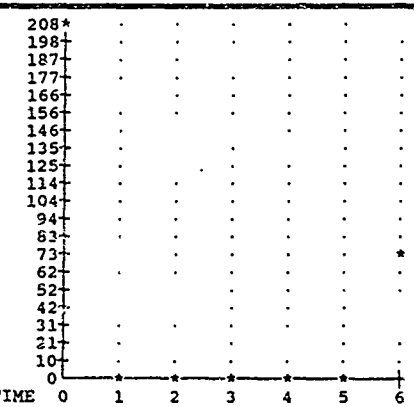
PATCLIN CHEMICAL CO.
#309

PATCLIN CHEMICAL CO.
#348

PATCLIN CHEMICAL CO.
#380

PATCLIN CHEMICAL CO
359

PATCLIN CHEMICAL CO.
396



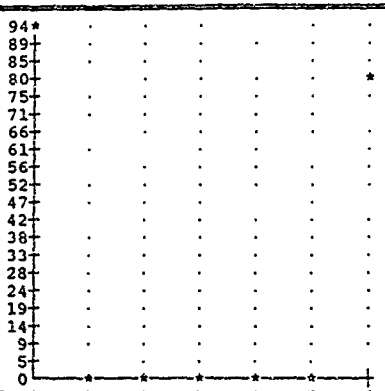
0- 208
1- 0
2- 0
3- 0
4- 0
5- 0
6- 72

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME

COMPANY - PATCLIN CHEMICAL C
PRODUCT - 396
TOC INIT- 0
TOC 2nd - 0
COD INIT- 0
ANILINE PT - 0.0000
ATP ----- -27 E-8

SOLUBILITY DATA:



0-	94
1-	0
2-	0
3-	0
4-	0
5-	0
6-	82

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME

PHENOL
08/23/88
ATP - 101 E-8

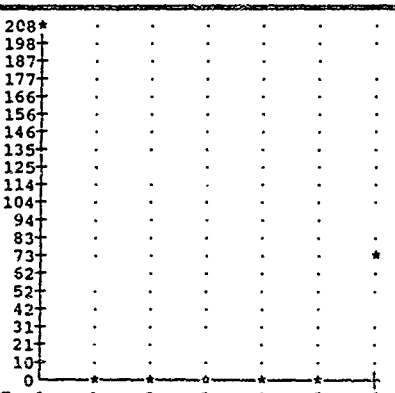
PATCLIN CHEMICAL CO.
#309

PATCLIN CHEMICAL CO.
#348

PATCLIN CHEMICAL CO.
#380

PATCLIN CHEMICAL CO.
359

PATCLIN CHEMICAL CO.
396



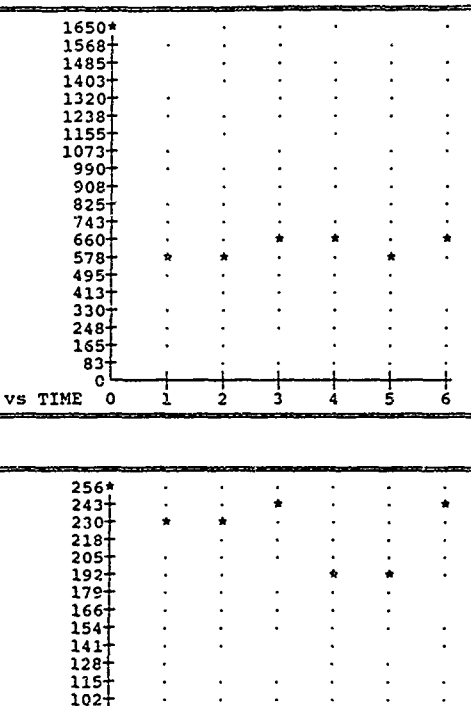
0-	208
1-	0
2-	0
3-	0
4-	0
5-	0
6-	72

DRY WEIGHT 0.0544

DATE - 08/23/88 COD vs TIME

COMPANY - PENETONE
PRODUCT - CITRI KLEEN
TOC INIT- 171485
TOC 2nd - 0
COD INIT- 1665000
ANILINE PT - 0.0000
ATP ----- -15 E-8

SOLUBILITY DATA:



0- 1650
1- 555
2- 560
3- 626
4- 673
5- 586
6- 640

DRY WEIGHT 0.0621

DATE - 07/06/88 COD vs TIME

PHENOL
07/06/88
ATP - 72 E-8

CITRI-KLEEN

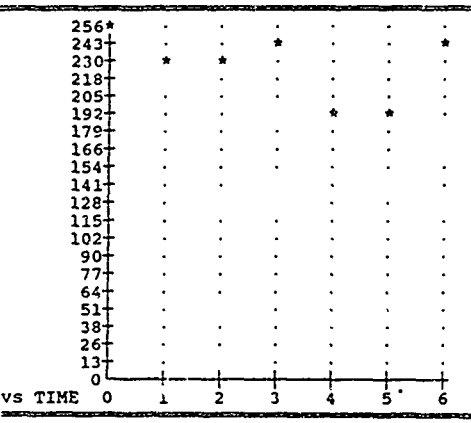
FREDERICK GUMM CHEM.
ELECTROSTRIP B

M-OIL-FREE CO.
ULTRA 1

MAN-GILL CHEMICAL
MAGNUSOL 728

PENETONE
CITRI KLEEN

TITAN CHEMICAL
OIL-FLO

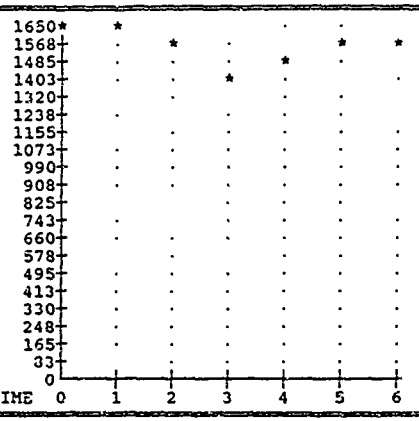


0- 256
1- 230
2- 228
3- 246
4- 194
5- 186
6- 244

DRY WEIGHT 0.0621

COMPANY - PENETONE
PRODUCT - CITRI KLEEN
TOC INIT- 171485
TOC 2nd - 0
COD INIT- 1665000
ANILINE PT - 0.0000
ATP ----- 145 E-8

SOLUBILITY DATA:



0- 1650
1- 1628
2- 1550
3- 1439
4- 1506
5- 1559
6- 1556

DRY WEIGHT 0.0702

DATE - 10/12/88 COD vs TIME

PHENOL
10/12/88
ATP - 132 E-8

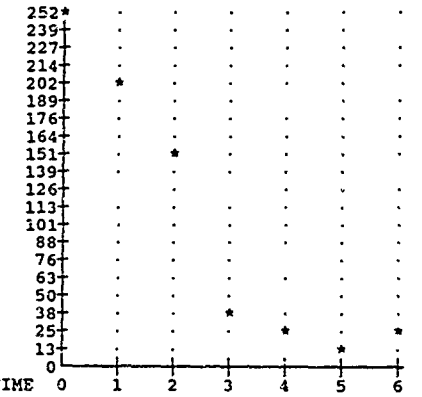
CITRI-KLEEN

PENETONE
CITRI KLEEN

PROGRESS CHEMICAL INC.
I-365

TITAN CHEMICAL
OIL-FLO

TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA



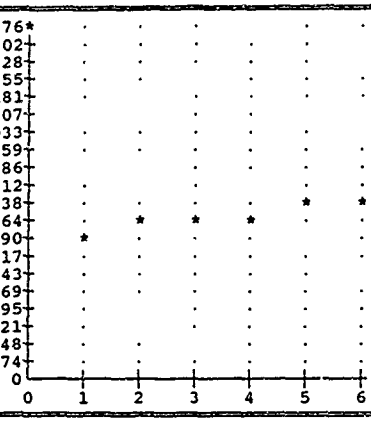
0- 252
1- 206
2- 148
3- 36
4- 30
5- 10
6- 20

DRY WEIGHT 0.0702

DATE - 10/12/88 COD vs TIME

COMPANY - PENETONE
PRODUCT - CITRI KLEEN
TOC INIT- 171485
TOC 2nd - 0
COD INIT- 1665000
ANILINE PT - 0.0000
ATP ----- 15 E-8

SOLUBILITY DATA:



0- 1476
1- 582
2- 637
3- 644
4- 669
5- 760
6- 720

DRY WEIGHT 0.0824

DATE - 10/13/88 COD vs TIME

PHENOL
10/13/88
ATP - 34 E-8

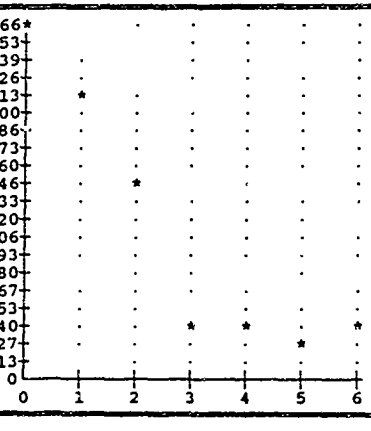
FINE ORGANICS CORP
COMPOUND CLEANING LIQUID

FINE ORGANICS CORP
SOLVENT EMULSION

KLEER-FLO COMPANY
DG-5

PENETONE
CITRI KLEEN

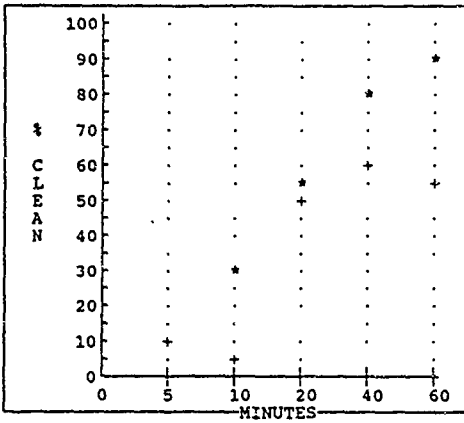
SUTTON CORP.
TOPSALL



0- 266
1- 210
2- 152
3- 43
4- 42
5- 28
6- 38

DRY WEIGHT 0.0824

DATE - 10/13/88 COD vs TIME

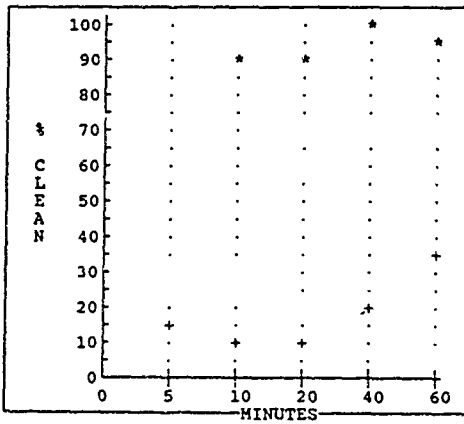


PENETONE
CITRI KLEEN
1:3 AT 120 F

310S

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
8%	9%
32%	6%
55%	49%
81%	62%
89%	53%

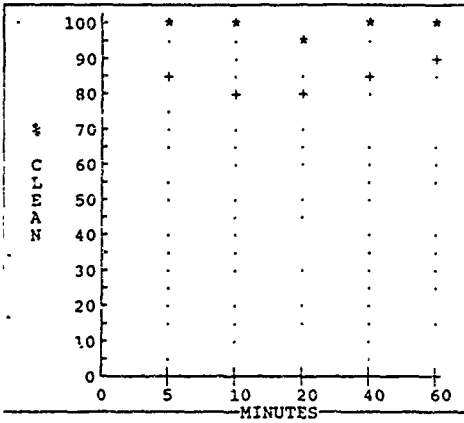


PENETONE
CITRI KLEEN
OIL/XYLENE: 1:3 AT 120 F

INCONEL 750

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
15%	13%
91%	8%
88%	11%
99%	19%
97%	36%

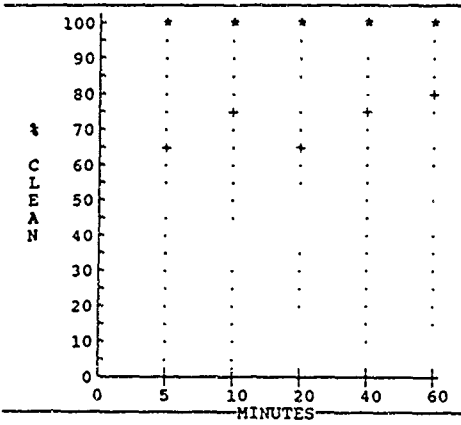


PENETONE
CITRI KLEEN
GREASE: 1:3 AT 120 F

MONEL K-500

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
100%	86%
100%	79%
97%	82%
100%	87%
98%	90%



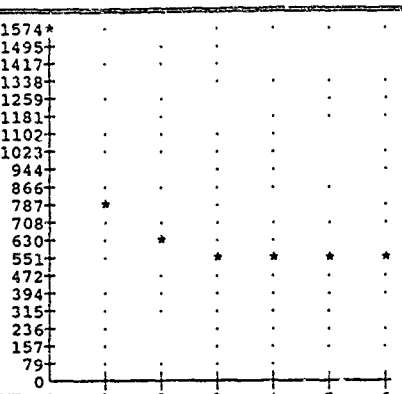
PENETONE
CITRI KLEEN
HYDRAULIC FLUID: 1:3 AT 120 F
MONEL K-500

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
98%	63%
100%	73%
99%	63%
100%	76%
100%	78%

COMPANY - PETROFIRM INC.
PRODUCT - BIOACT INDUSTRIAL
TOC INIT- 448598
TOC 2nd - 54
COD INIT- 4075000
ANILINE PT - 0.0000
ATP ----- -78 E-8

SOLUBILITY DATA:
CONCENT @ AMBIE 20%
CONCENT @ 0%
CONCENT @ 140 97%



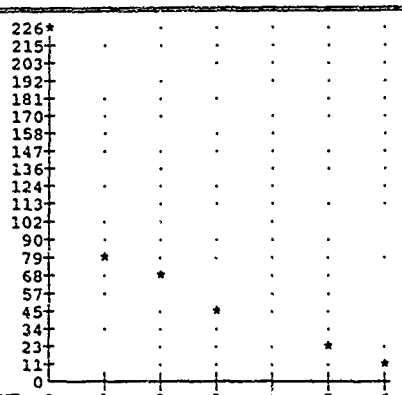
0- 1574
1- 786
2- 626
3- 561
4- 514
5- 518
6- 575

DRY WEIGHT 0.0024

DATE - 02/24/88 COD vs TIME

PHENOL
02/24/88
ATP - 294 E-8

PETROFIRM INC.
BIOACT INDUSTRIAL DG1



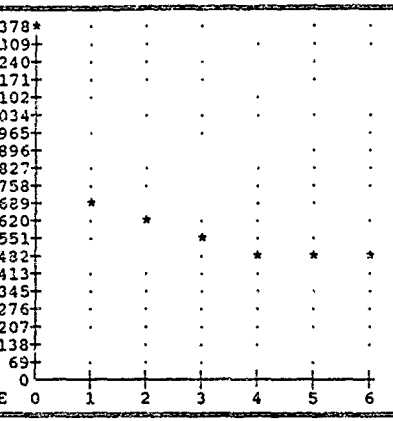
0- 226
1- 76
2- 66
3- 50
4- -10
5- 18
6- 11

DRY WEIGHT 0.0024

DATE - 02/24/88 COD vs TIME

COMPANY - PETROFIRM INC.
PRODUCT - BIOACT INDUSTRIAL
TOC INIT- 448598
TOC 2nd - 54
COD INIT- 4075000
ANILINE PT - 0.0000
ATP ----- -3 E-8

SOLUBILITY DATA:
CONCENT @ AMBIE 20%
CONCENT @ 0%
CONCENT @ 140 97%



0- 1378
1- 708
2- 610
3- 558
4- 505
5- 450
6- 506

DRY WEIGHT 0.0467

DATE - 03/21/88 COD vs TIME

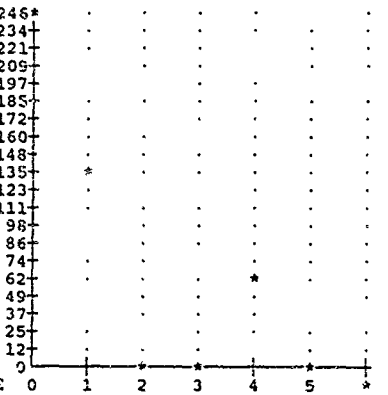
PHENOL
03/21/88
ATP - 82 E-8

PETROFIRM INC.
BIOACT INDUSTRIAL DG1

ROCHESTER MIDLAND
SE377C

U.S. POLYCHEMICAL CORP.
ST-21 POLY SPRAY JET

VAN STRAATEN CHEM CO.
21-271-A



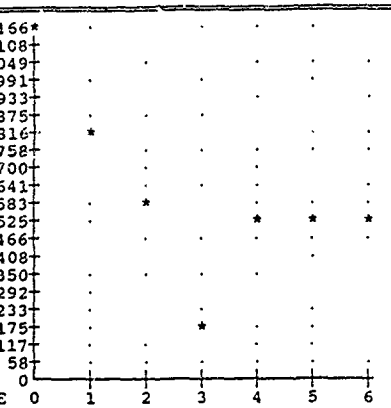
0- 246
1- 137
2- 6
3- 3
4- 56
5- -4
6- -14

DRY WEIGHT 0.0467

DATE - 03/21/88 COD vs TIME

COMPANY - PETROFIRM INC.
PRODUCT - BIOACT INDUSTRIAL
TOC INIT- 448598
TOC 2nd - 54
COD INIT- 4075000
ANILINE PT - 0.0000
ATP ----- -10 E-8

SOLUBILITY DATA:
CONCENT @ AMBIE 20%
CONCENT @ 0%
CONCENT @ 140 97%



0- 1166
1- 816
2- 563
3- 160
4- 507
5- 516
6- 520

DRY WEIGHT 0.0550

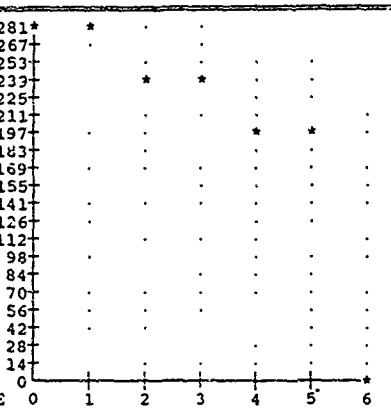
DATE - 10/04/88 COD vs TIME

PHENOL,
10/04/88
ATP - 673 E-8

HUNTINGTON
LHTS

KLEER-FLO COMPANY
LEGREASOL 99R

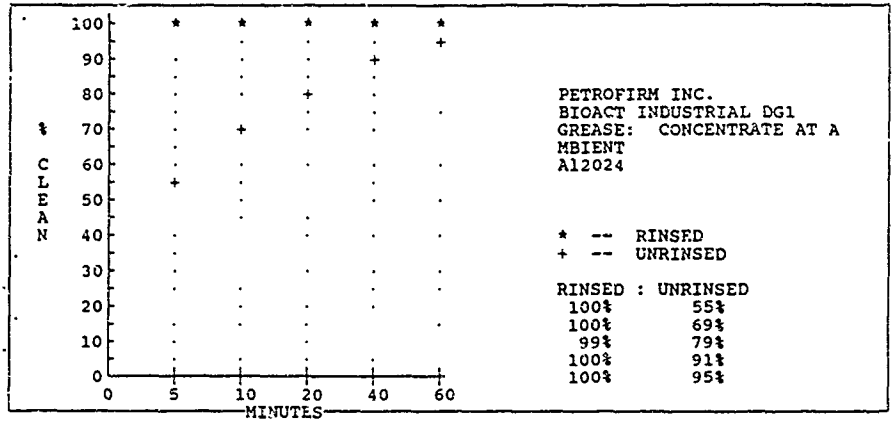
PETROFIRM INC.
BIOACT INDUSTRIAL DG1

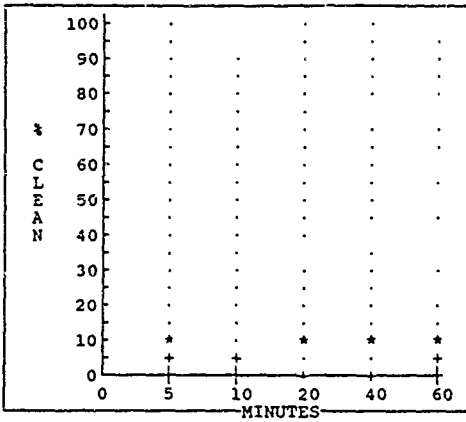


0- 274
1- 281
2- 244
3- 244
4- 200
5- 193
6- 0

DRY WEIGHT 0.0550

DATE - 10/04/88 COD vs TIME

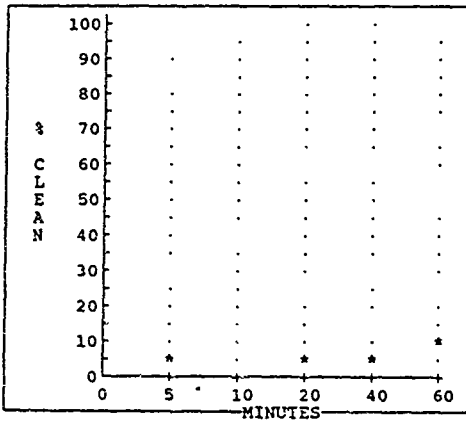

% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
PETROFIRM INC.
BIOACT INDUSTRIAL DG1
GREASE: CONCENTRATE AT A
MBIENT
A12024
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
100% 55%
100% 69%
99% 79%
100% 91%
100% 95%



PROGRESS CHEMICAL INC.
#611
GREASE: 4 OZ/GAL AT AMBI
ENT
CDA433

* -- RINSED
\+ -- UNRINSED

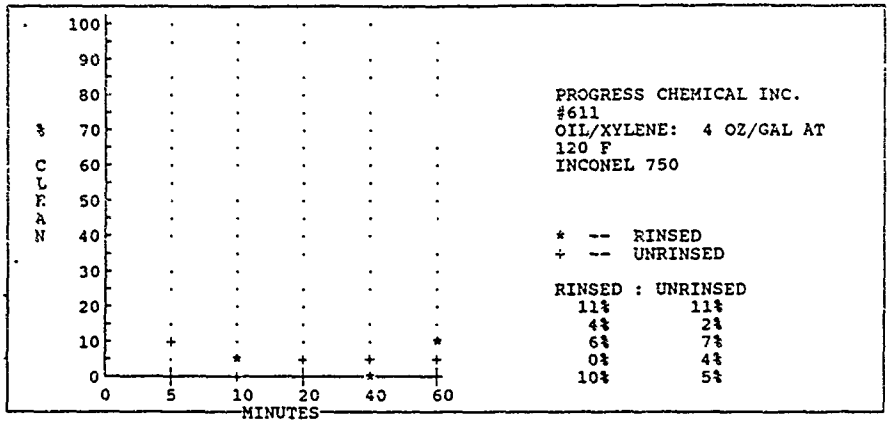
RINSED	UNRINSED
9%	4%
7%	6%
10%	0%
12%	2%
10%	4%

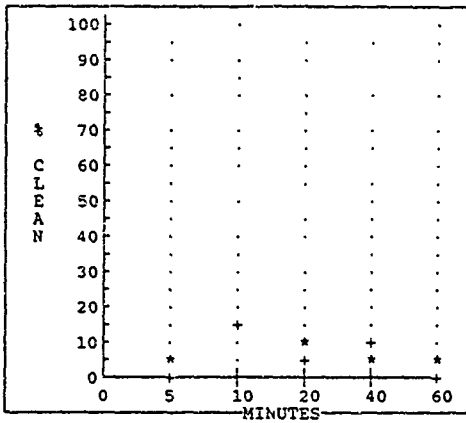


PROGRESS CHEMICAL INC.
#611
OIL/XYLENE: 4 OZ/GAL AT
AMBIENT
MONEL K-500

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
7%	0%
1%	0%
4%	0%
5%	0%
10%	0%

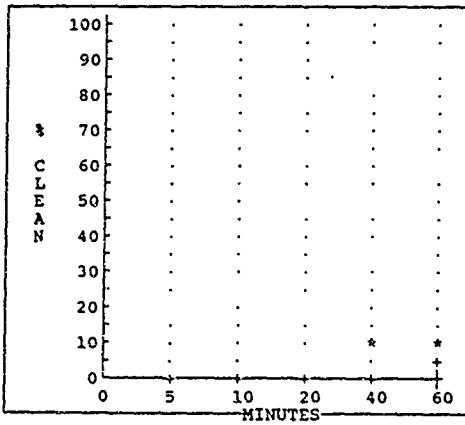

100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
PROGRESS CHEMICAL INC.
#611
OIL/XYLENE: 4 OZ/GAL AT
120 F
INCONEL 750
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
11% 11%
4% 2%
6% 7%
0% 4%
10% 5%



PROGRESS CHEMICAL INC.
#65
GREASE: 3 OZ/GAL AT AMBIENT
CDA433

* -- RINSED
\+ -- UNRINSED

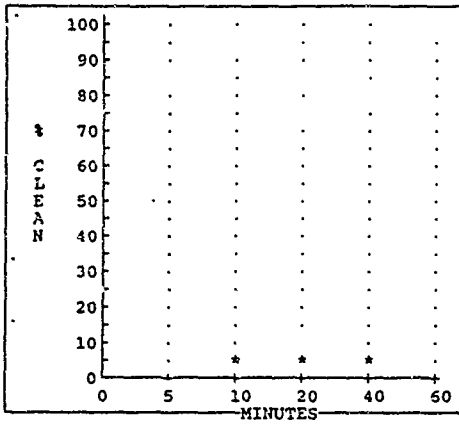
RINSED	UNRINSED
8%	0%
13%	13%
10%	4%
6%	9%
4%	1%



PROGRESS CHEMICAL INC.
#65
OIL/XYLENE: 3 OZ/GAL AT AMBIENT
MONEL K-500

* -- RINSED
\+ -- UNRINSED

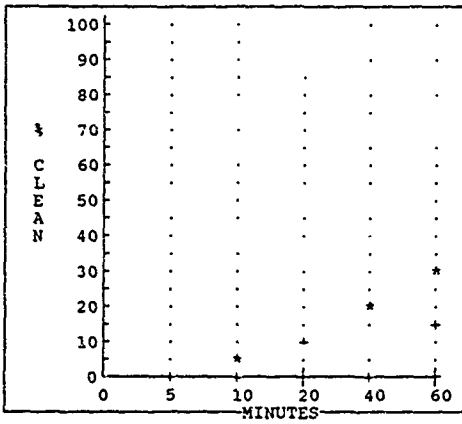
RINSED	UNRINSED
1%	0%
1%	0%
0%	1%
12%	2%
10%	3%



PROGRESS CHEMICAL INC.
#65
OIL/XYLENE: 3 OZ/GAL AT 1
20 F
A17075

* -- RINSED
\+ -- UNRINSED

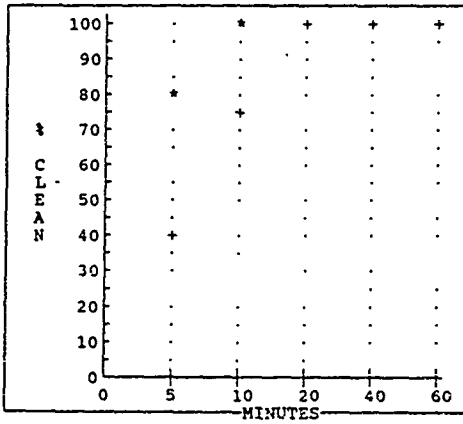
RINSED	UNRINSED
0%	0%
3%	0%
4%	0%
6%	0%
0%	0%



PROGRESS CHEMICAL INC.
AC-1
OIL/XYLENE: 8 OZ/GAL AT 180 F
A17075

* -- RINSED
\+ -- UNRINSED

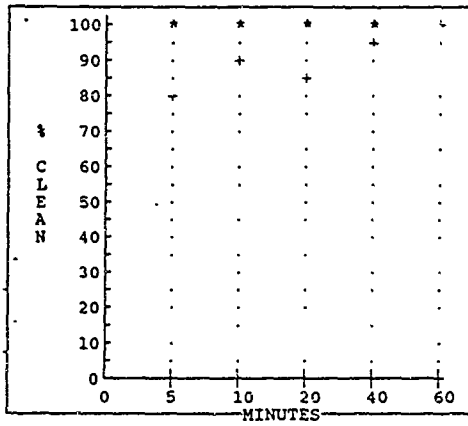
RINSED	UNRINSED
0%	0%
3%	0%
11%	11%
18%	1%
30%	13%



PROGRESS CHEMICAL INC.
AC-1
GREASE: 8 OZ/GAL AT 180 F
A17075

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
78%	38%
100%	76%
100%	100%
100%	100%
100%	100%



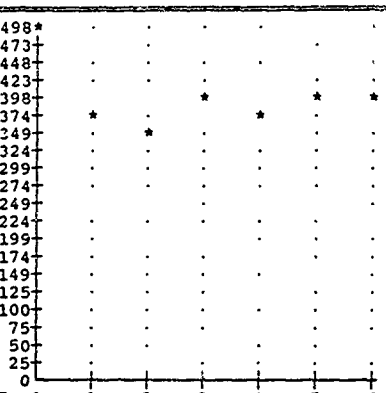
PROGRESS CHEMICAL INC.
AC-1
HYDRAULIC FLUID: 8 OZ/GAL AT 180 F
Al2024

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
100%	81%
98%	89%
100%	86%
100%	97%
100%	98%

COMPANY - PROGRESS CHEMICAL
PRODUCT - L-365
TOC INIT- 15063
TOC 2nd - 0
COD INIT- 590500
ANILINE PT - 0.0000
ATP ----- 55 E-8

SOLUBILITY DATA:



0- 498
1- 384
2- 360
3- 390
4- 385
5- 388
6- 396

DRY WEIGHT 0.0819

DATE - 07/08/88 COD vs TIME

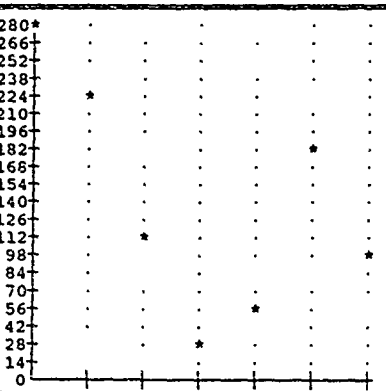
PHENOL
07/08/88
ATP - 33 E-8

PROGRESS CHEMICAL INC.
L-365

SUTTON CORP.
TOPSALL

TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA

VAN STRAATEN CHEM CO.
3625



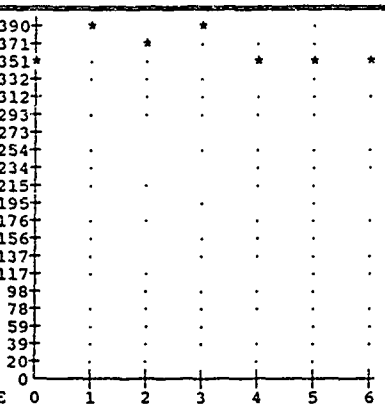
0- 280
1- 222
2- 115
3- 32
4- 59
5- 180
6- 97

DRY WEIGHT 0.0819

DATE - 07/08/88 COD vs TIME

COMPANY - PROGRESS CHEMICAL
PRODUCT - L-365
TOC INIT- 15063
TOC 2nd - 0
COD INIT- 590500
ANILINE PT - 0.0000
ATP ----- -7 E-8

SOLUBILITY DATA:



0- 356
1- 390
2- 367
3- 382
4- 354
5- 354
6- 358

DRY WEIGHT 0.0702

DATE - 10/12/88 COD vs TIME

PHENOL
10/12/88
ATP - 132 E-8

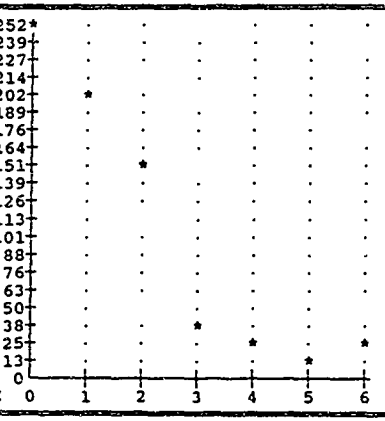
CITRI-KLEEN

PENETONE
CITRI KLEEN

PROGRESS CHEMICAL INC.
L-365

TITAN CHEMICAL
OIL-FLO

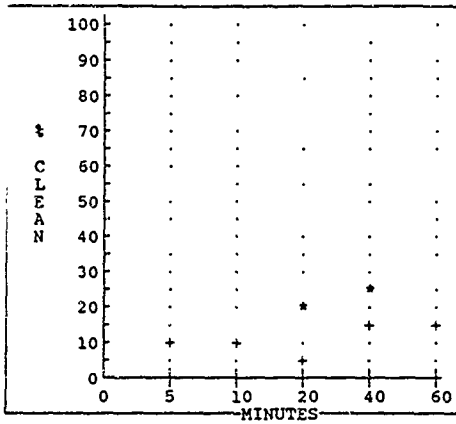
TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA



0- 252
1- 206
2- 148
3- 36
4- 30
5- 10
6- 20

DRY WEIGHT 0.0702

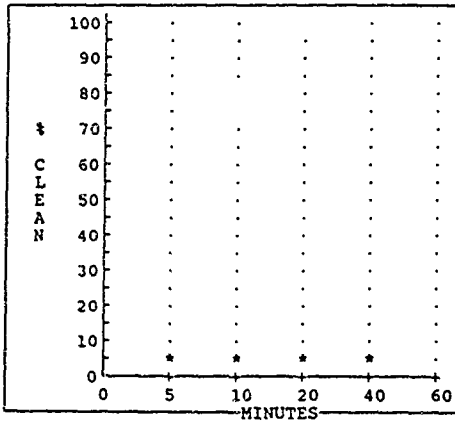
DATE - 10/12/88 COD vs TIME



PROGRESS CHEMICAL INC.
L-365
GREASE: 3 OZ/GAL AT AMBIE
NT
CDA433

* -- RINSED
+ -- UNRINSED

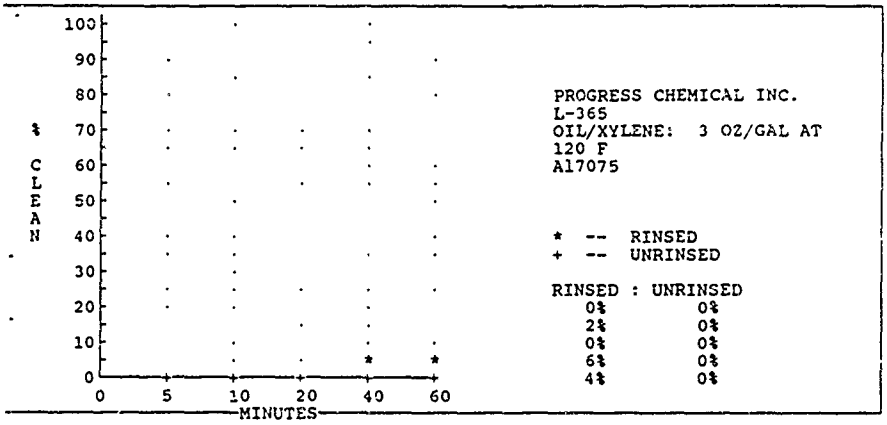
RINSED	UNRINSED
8%	10%
8%	8%
18%	6%
24%	13%
17%	15%



PROGRESS CHEMICAL INC.
L-365
OIL/XYLENE: 3 OZ/GAL AT
AMBIENT
MONEL K-500

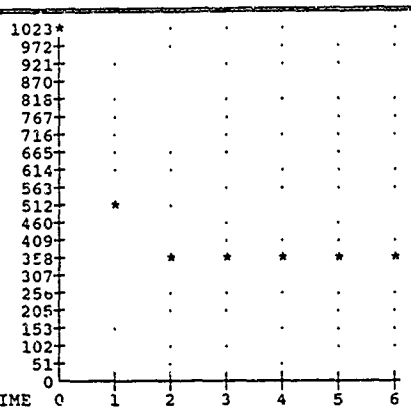
* -- RINSED
+ -- UNRINSED

RINSED	UNRINSED
3%	0%
3%	0%
5%	0%
4%	0%
0%	0%


100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
PROGRESS CHEMICAL INC.
L-365
OIL/XYLENE: 3 OZ/GAL AT
120 F
A17075
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
0% 0%
2% 0%
0% 0%
6% 0%
4% 0%

COMPANY - ROCHESTER MIDLAND
PRODUCT - SE-354
TOC INIT- 0
TOC 2nd - 0
COD INIT- 2180000
ANILINE PT - 0.0000
ATP ----- -37 E-8

SOLUBILITY DATA:



0- 1023
1- 537
2- 354
3- 366
4- 338
5- 361
6- 343

DRY WEIGHT 0.0869

DATE - 09/01/88 COD vs TIME

PHENOL
09/01/88
ATP - 122 E-8

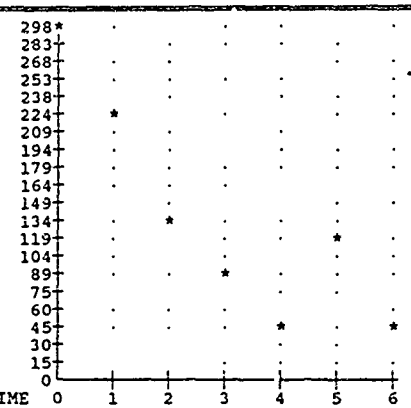
GOLDENWEST
WBS

MEASURY COL.
MYCO

ROCHESTER MIDLAND
SE-354

ROCHESTER MIDLAND
SE-358

ROCHESTER MIDLAND
SE-374



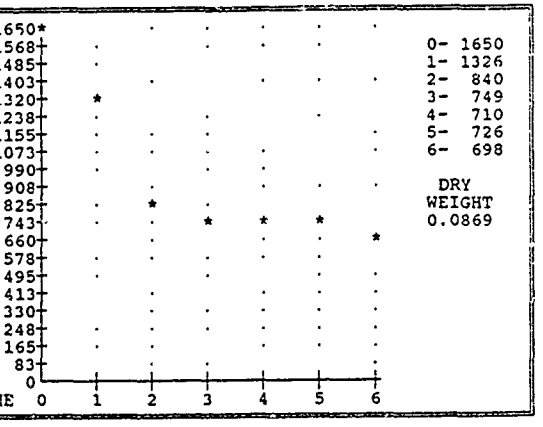
0- 298
1- 228
2- 140
3- 83
4- 39
5- 115
6- 44

DRY WEIGHT 0.0869

DATE - 09/01/88 COD vs TIME

COMPANY - ROCHESTER MIDLAND
PRODUCT - SE-358
TOC INIT- 0
TOC 2nd - 0
COD INIT- 25050000
ANILINE PT - 0.0000
ATP ----- -6 E-8

SOLUBILITY DATA:



DATE - 09/01/88 COD vs TIME

PHENOL
09/01/88
ATP - 122 E-8

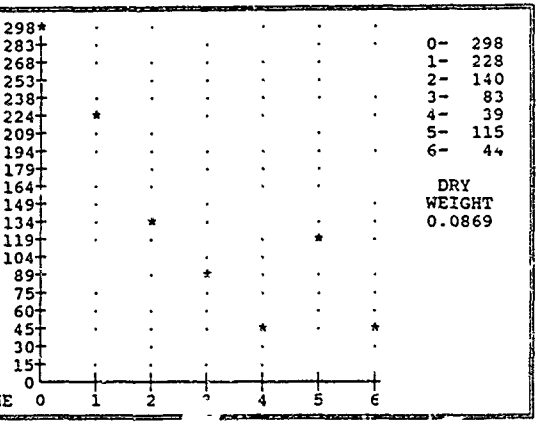
GOLDENWEST
WBS

MEASURY COL.
MYCO

ROCHESTER MIDLAND
SE-354

ROCHESTER MIDLAND
SE-358

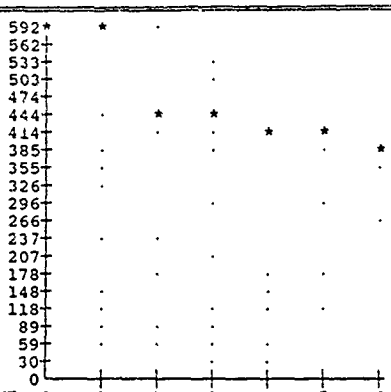
ROCHESTER MIDLAND
SE-374



DATE - 09/01/88 COD vs TIME

COMPANY - ROCHESTER MIDLAND
PRODUCT - SE-374
TOC INIT- 0
TOC 2nd - 0
COD INIT- 2015000
ANILINE PT - 0.0000
ATP ----- -26 E-8

SOLUBILITY DATA:



0- 592
1- 588
2- 452
3- 442
4- 420
5- 411
6- 398

DRY WEIGHT 0.0869

DATE - 09/01/88 COD vs TIME

PHENOL
09/01/88
ATP - 122 E-8

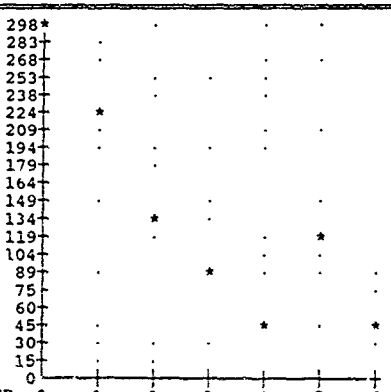
GOLDENWEST
WBS

MEASURY COL.
MYCO

ROCHESTER MIDLAND
SE-354

ROCHESTER MIDLAND
SE-358

ROCHESTER MIDLAND
SE-374



0- 298
1- 228
2- 140
3- 83
4- 39
5- 115
6- 44

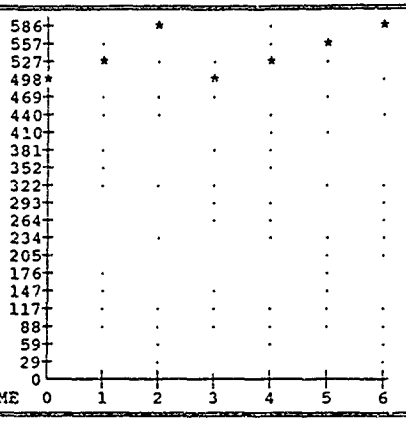
DRY WEIGHT 0.0869

DATE - 09/01/88 COD vs TIME

COMPANY - ROCHESTER MIDLAND
PRODUCT - SE377C
TOC INIT- 238563
TOC 2nd - 0
COD INIT- 1200000
ANILINE PT - 0.0000
ATP ----- -11 E-8

SOLUBILITY DATA:

1:2	@ AMBIE	13%
1:2	@ 140	32%
1:4	@ 140	44%



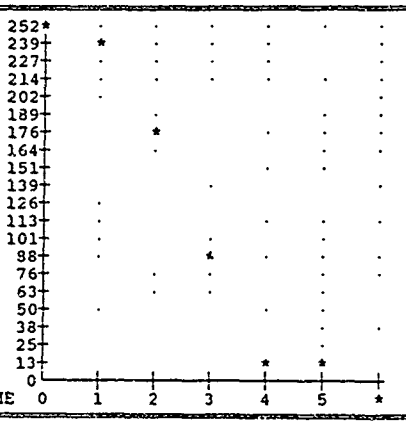
0-	502
1-	514
2-	586
3-	508
4-	521
5-	562
6-	574

DRY WEIGHT 0.0018

DATE - 02/09/88 COD vs TIME

PHENOL
02/09/88
ATP - 272 E-8

ROCHESTER MIDLAND
SE377C



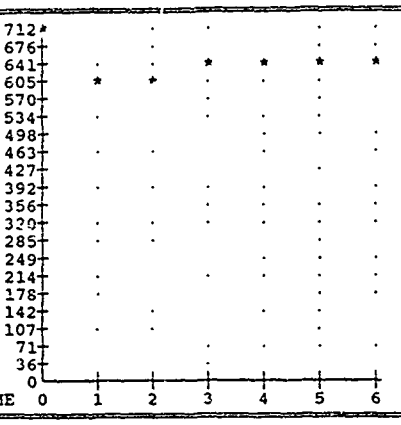
0-	252
1-	236
2-	175
3-	84
4-	12
5-	16
6-	-7

DRY WEIGHT 0.0018

DATE - 02/09/88 COD vs TIME

COMPANY - ROCHESTER MIDLAND
PRODUCT - SE377C
TOC INIT- 238563
TOC 2nd - 0
COD INIT- 1200000
ANILINE PT - 0.0000
ATP ----- -11 E-8

SOLUBILITY DATA:
1:2 @ AMBIE 13%
1:2 @ 140 32%
1:4 @ 140 44%



0- 712
1- 592
2- 616
3- 650
4- 648
5- 638
6- 630

DRY WEIGHT 0.0467

DATE - 03/21/88 COD vs TIME

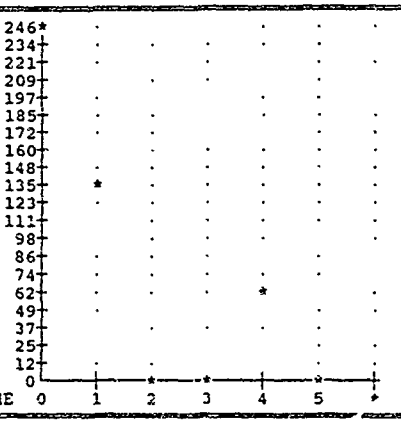
PHENOL
03/21/88
ATP - 82 E-8

PETROFIRM INC.
BIOACT INDUSTRIAL DG1

ROCHESTER MIDLAND
SE377C

U.S. POLYCHEMICAL CORP.
ST-21 POLY SPRAY JET

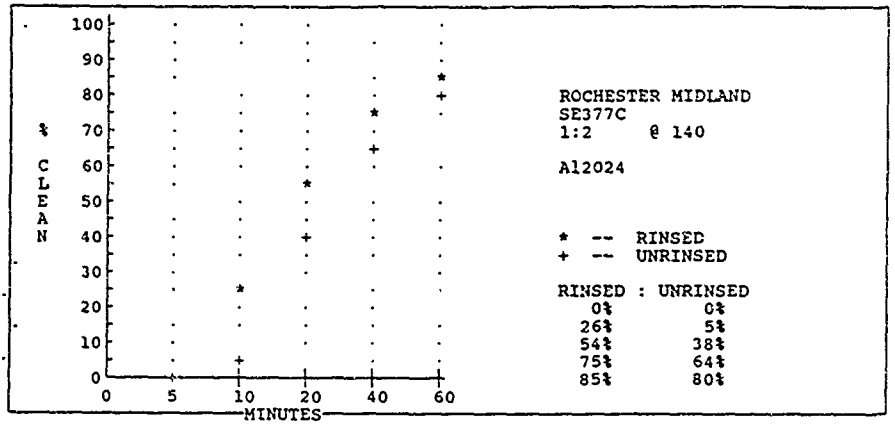
VAN STRAATEN CHEM CO.
21-271-A

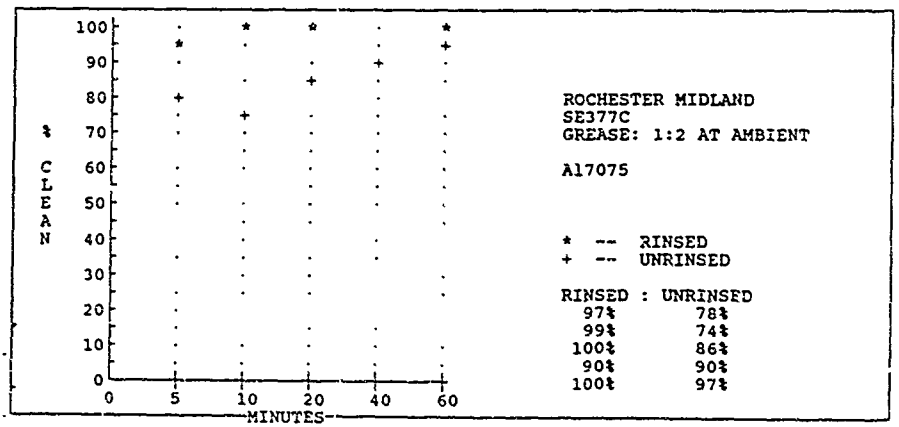


0- 246
1- 137
2- 6
3- 3
4- 66
5- -4
6- -14

DRY WEIGHT 0.0467

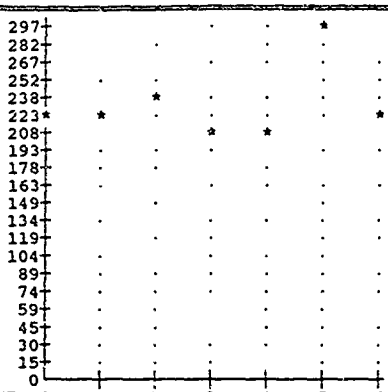
DATE - 03/21/88 COD vs TIME


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
ROCHESTER MIDLAND
SE377C
1:2 @ 140
A12024
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
0% 0%
26% 5%
54% 38%
75% 64%
85% 80%


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
ROCHESTER MIDLAND
SE377C
GREASE: 1:2 AT AMBIENT
A17075
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
97% 78%
99% 74%
100% 86%
90% 90%
100% 97%

COMPANY - SUTTON CORP.
PRODUCT - TOPSALL
TOC INIT- 61914
TOC 2nd - 0
COD INIT- 70500
ANILINE PT - 0.0000
ATP ----- -8 E-8

SOLUBILITY DATA:



0- 216
1- 220
2- 237
3- 212
4- 210
5- 297
6- 228

DRY WEIGHT 0.0819

DATE - 07/08/88 COD vs TIME

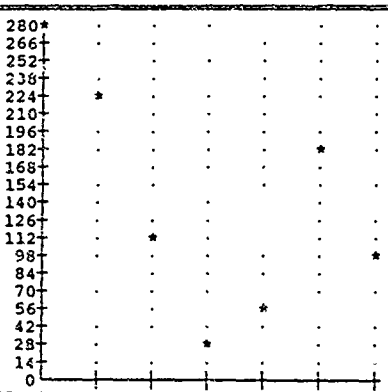
PHENOL
07/08/88
ATP - 33 E-8

PROGRESS CHEMICAL INC.
L-365

SUTTON CORP.
TOPSALL

TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA

VAN STRAATEN CHEM CO.
3625



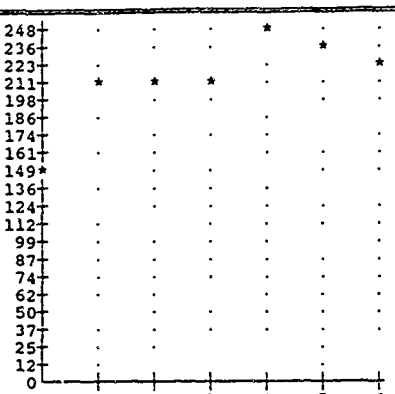
0- 280
1- 222
2- 115
3- 32
4- 59
5- 180
6- 97

DRY WEIGHT 0.0819

DATE - 07/08/88 COD vs TIME

COMPANY - SUTTON CORP.
PRODUCT - TOPSALL
TOC INIT- 61914
TOC 2nd - 0
COD INIT- 70500
ANILINE PT - 0.0000

SOLUBILITY DATA:



0- 146
1- 215
2- 210
3- 210
4- 248
5- 232
6- 224

DRY WEIGHT 0.0824

DATE - 10/13/88 COD vs TIME

PHENOL
10/13/88
ATP - 34 E-8

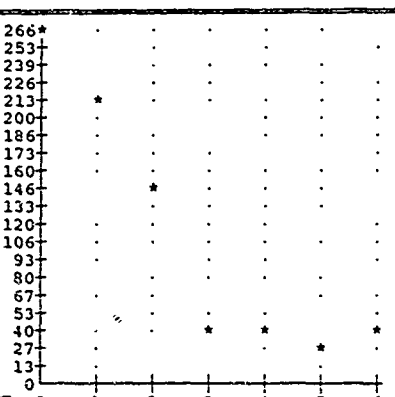
FINE ORGANICS CORP
COMPOUND CLEANING LIQUID

FINE ORGANICS CORP
SOLVENT EMULSION

KLEER-FLO COMPANY
DG-5

PENETONE
CITRI KLEEN

SUTTON CORP.
TOPSALL



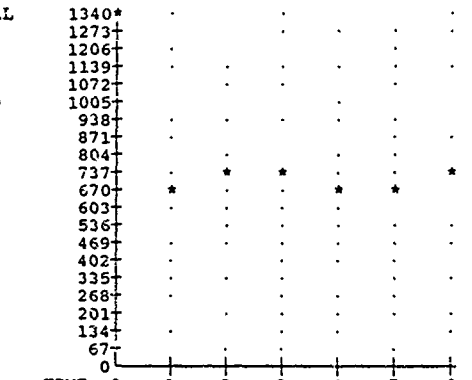
0- 266
1- 210
2- 152
3- 43
4- 42
5- 28
6- 38

DRY WEIGHT 0.0824

DATE - 10/13/88 COD vs TIME

COMPANY - TITAN CHEMICAL
PRODUCT - OIL-FLO
TOC INIT- 0
TOC 2nd - 0
COD INIT- 1850000
ANILINE PT - 0.0000
ATP ----- -25 E-8

SOLUBILITY DATA:



0- 1340
1- 696
2- 728
3- 759
4- 680
5- 692
6- 704

DRY WEIGHT 0.0621

DATE - 07/06/88 COD vs TIME

PHENOL
07/06/88
ATP - 72 E-8

CITRI-KLEEN

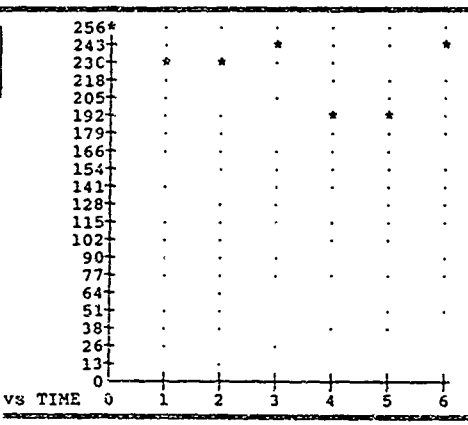
FREDERICK GUMM CHEM.
ELECTROSTRIP B

M-OIL-FREE CO.
ULTRA 1

MAN-GILL CHEMICAL
MAGNUSOL 728

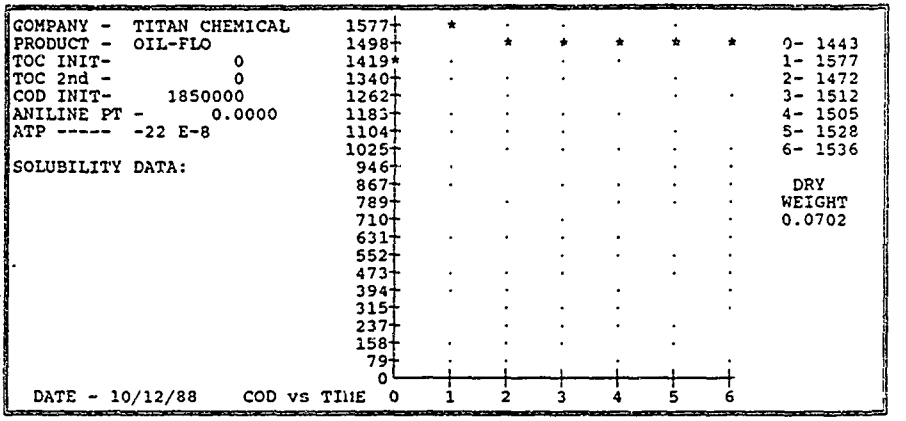
PENETONE
CITRI KLEEN

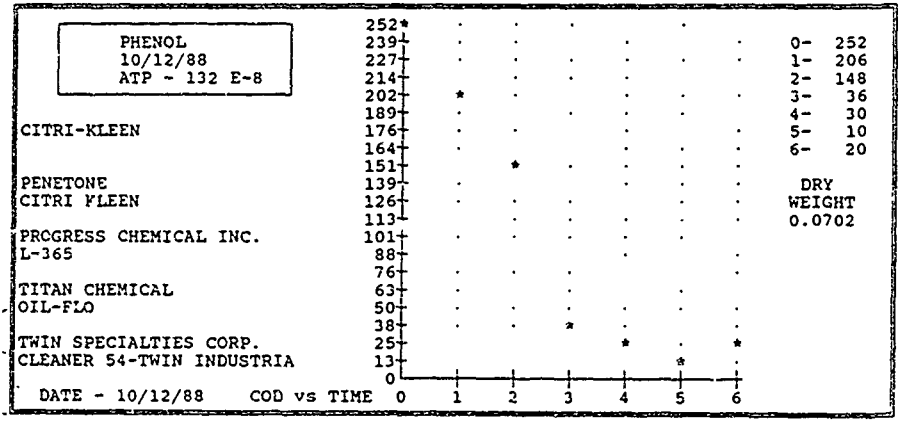
TITAN CHEMICAL
OIL-FLO

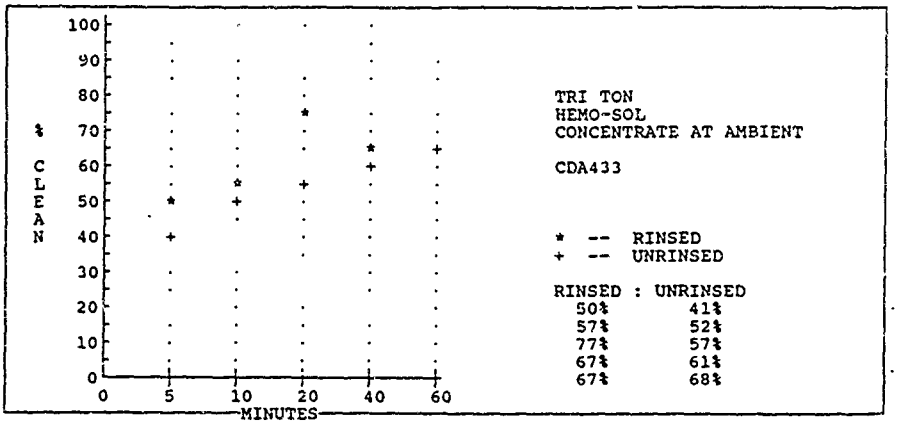


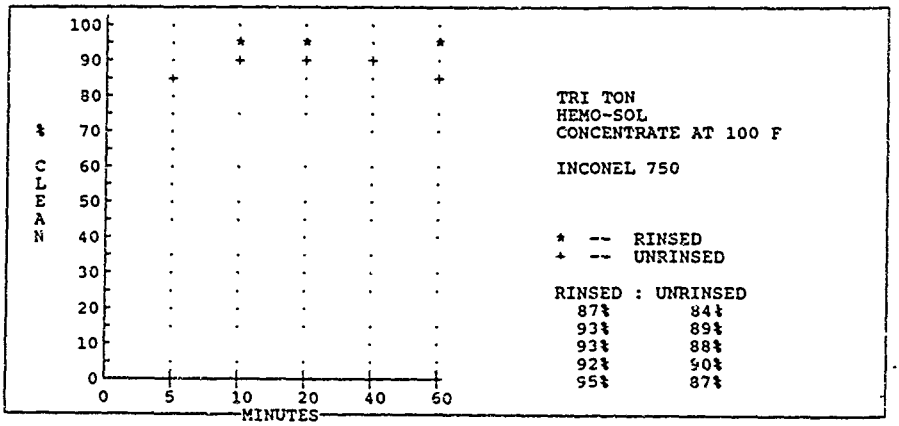
0- 256
1- 230
2- 228
3- 246
4- 194
5- 186
6- 244

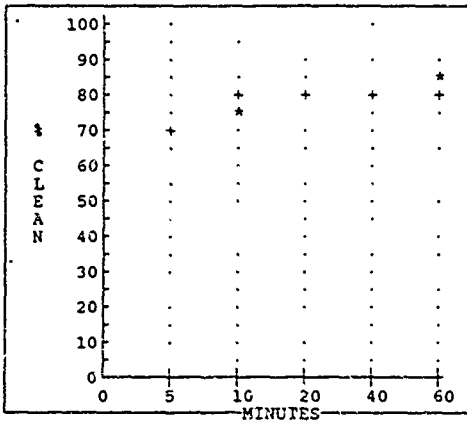
DRY WEIGHT 0.0621


COMPANY - TITAN CHEMICAL
PRODUCT - OIL-FLO
TOC INIT- 0
TOC 2nd - 0
COD INIT- 1850000
ANILINE PT - 0.0000
ATP ----- -22 E-8
SOLUBILITY DATA:
1577
1498
1419
1340
1262
1183
1104
1025
946
867
789
710
631
552
473
394
315
237
158
79
0
0 1 2 3 4 5 6
0- 1443
1- 1577
2- 1472
3- 1512
4- 1505
5- 1528
6- 1536
DRY WEIGHT 0.0702
DATE - 10/12/88 COD vs TIME


PHENOL
10/12/88
ATP - 132 E-8
CITRI-KLEEN
PENETONE
CITRI KLEEN
PROGRESS CHEMICAL INC.
L-365
TITAN CHEMICAL
OIL-FLO
TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA
252
239
227
214
202
189
176
164
151
139
126
113
101
88
76
63
50
38
25
13
0
0 1 2 3 4 5 6
0- 252
1- 206
2- 148
3- 36
4- 30
5- 10
6- 20
DRY WEIGHT 0.0702
DATE - 10/12/88 COD vs TIME


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
TRI TON
HEMO-SOL
CONCENTRATE AT AMBIENT
CDA433
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
50% 41%
57% 52%
77% 57%
67% 61%
67% 68%

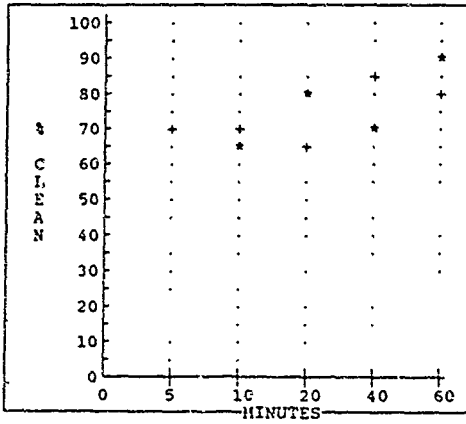

% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
TRI TON
HEMO-SOL
CONCENTRATE AT 100 F
INCONEL 750
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
87% 84%
93% 89%
93% 88%
92% 90%
95% 87%



TRI TON
HEMO-SOL
CONCENTRATE AT AMBIENT WI
TH STIRRING
A12024

* -- RINSED
\+ -- UNRINSED

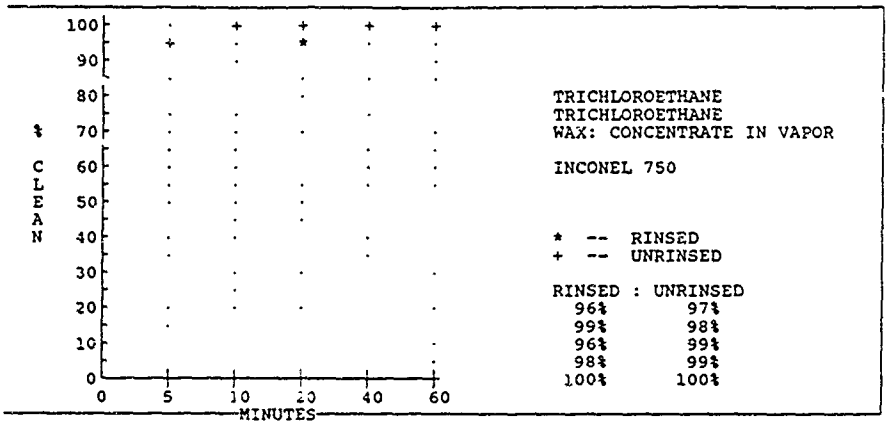
RINSED	UNRINSED
69%	70%
76%	81%
79%	79%
81%	79%
85%	81%

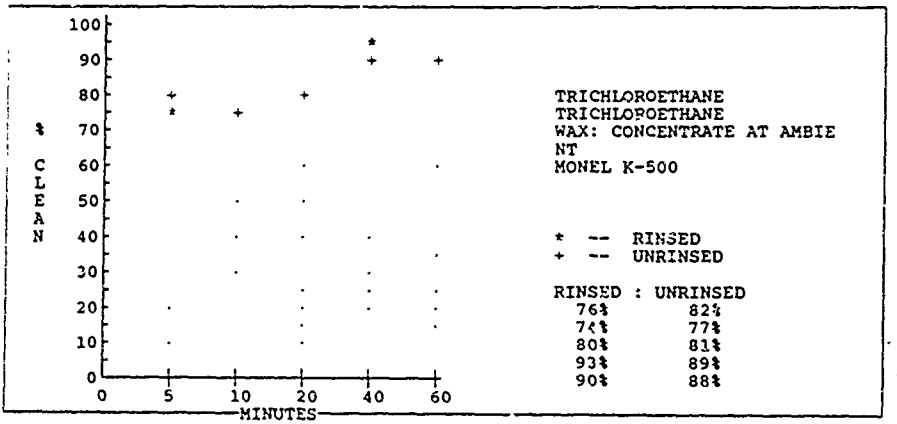


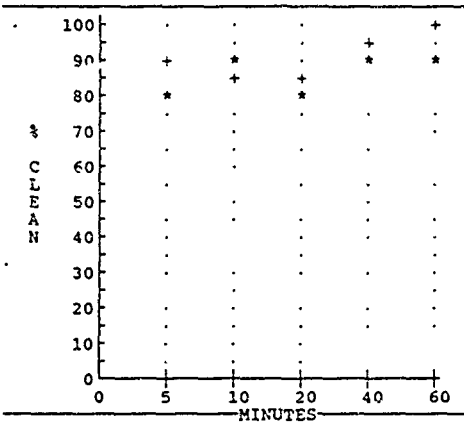
TRI TON
HEMO-SOL
GREASE: CONCENTRATE AT AM
BIENT
A17075

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
68%	70%
67%	68%
80%	67%
71%	86%
89%	78%


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
TRICHLOROETHANE
TRICHLOROETHANE
WAX: CONCENTRATE IN VAPOR
INCONEL 750
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
96% 97%
99% 98%
96% 99%
98% 99%
100% 100%

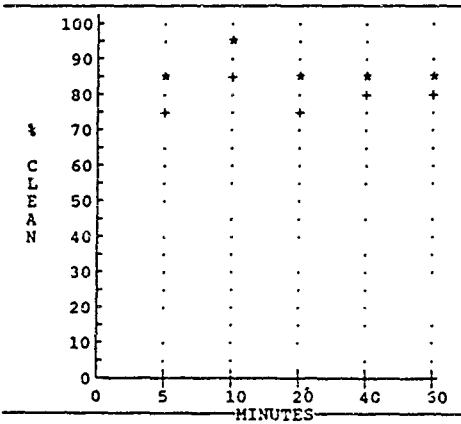

% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
TRICHLOROETHANE
TRICHLOROETHANE
WAX: CONCENTRATE AT AMBIE
NT
MONEL K-500
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
76% 82%
74% 77%
80% 81%
93% 89%
90% 88%



TRICHLOROETHANE
TRICHLOROETHANE
OIL/XYLENE: CONCENTRATE
AT VAPOR
INCONEL 750

* -- RINSED
\+ -- UNRINSED

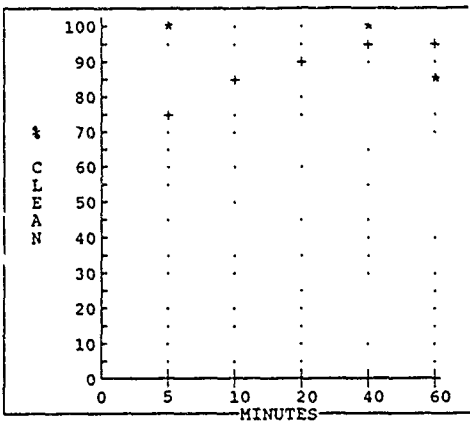
RINSED	UNRINSED
79%	92%
92%	84%
81%	84%
92%	93%
91%	98%



TRICHLOROETHANE
TRICHLOROETHANE
GREASE: CONCENTRATE AT V
APOR
310S

* -- RINSED
\+ -- UNRINSED

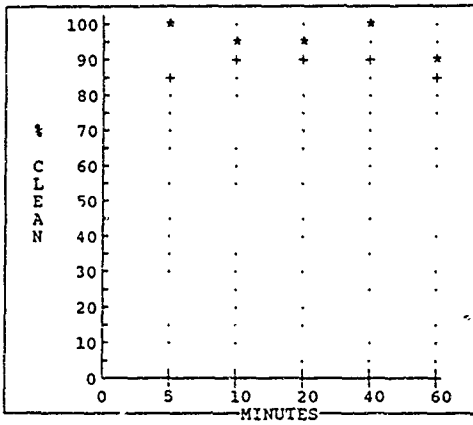
RINSED	UNRINSED
84%	74%
96%	86%
86%	75%
86%	82%
85%	80%



TRICHLOROETHANE
TRICHLOROETHANE
GREASE: CONCENTRATE AT A
MBIENT
310S

* -- RINSED
\+ -- UNRINSED

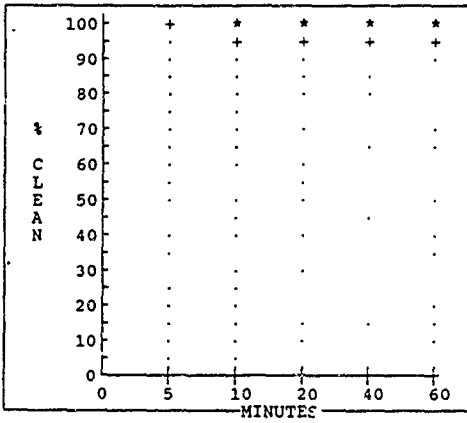
RINSED	UNRINSED
99%	76%
84%	87%
88%	90%
98%	94%
86%	93%



TRICHLOROETHANE
TRICHLOROETHANE
HYDRAULIC FLUID: CONCENT
RATE AT VAPOR
INCONEL 750

* -- RINSED
\+ -- UNRINSED

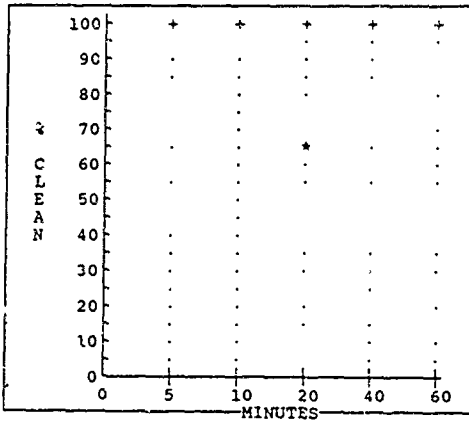
RINSED	UNRINSED
98%	87%
96%	92%
97%	91%
100%	90%
90%	87%



TRICHLOROETHANE
TRICHLOROETHANE
HYDRAULIC FLUID: CONCENT
RATE AT AMBIENT
310S

* -- RINSED
+ -- UNRINSED

RINSED	UNRINSED
99%	100%
99%	94%
98%	96%
100%	97%
100%	97%



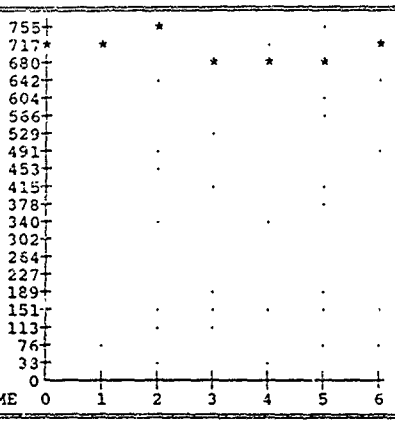
TRICHLOROETHANE
TRICHLOROETHANE
OIL/XYLENE: CONCENTRATE
AT AMBIENT
INCONEL 750

* -- RINSED
+ -- UNRINSED

RINSED	UNRINSED
99%	100%
100%	100%
63%	100%
100%	99%
100%	99%

COMPANY - TWIN SPECIALTIES C
PRODUCT - CLEANER 54-TWIN IN
TOC INIT- 70953
TOC 2nd - 0
COD INIT- 445000
ANILINE PT - 0.0000
ATP ----- 55 E-8

SOLUBILITY DATA:



0- 712
1- 711
2- 755
3- 694
4- 680
5- 686
6- 701

DRY WEIGHT 0.0819

DATE - 07/08/88 COD vs TIME

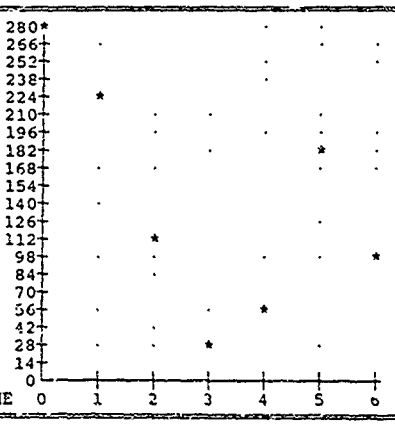
PHENOL
07/08/88
ATP - 33 E-8

PROGRESS CHEMICAL INC.
L-365

SUTTON CORP.
TOPSALL

TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA

VAN STRAATEN CHEM CO.
3625



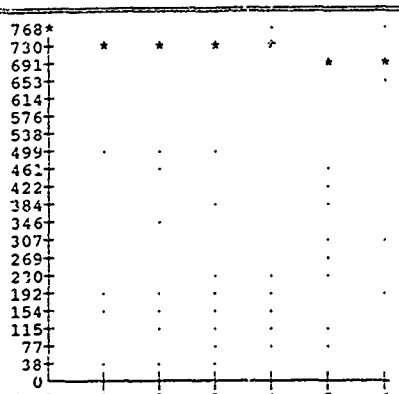
0- 280
1- 222
2- 115
3- 32
4- 59
5- 180
6- 97

DRY WEIGHT 0.0819

DATE - 07/08/88 COD vs TIME

COMPANY - TWIN SPECIALTIES C
PRODUCT - CLEANER 54-TWIN IN
TOC INIT- 70953
TOC 2nd - 0
COD INIT- 445000
ANILINE PT - 0.0000
ATP ----- 36 E-8

SOLUBILITY DATA:



0- 768
1- 732
2- 725
3- 726
4- 719
5- 709
6- 700

DRY WEIGHT 0.0702

DATE - 10/12/88 COD vs TIME

PHENOL
10/12/88
ATP - 132 E-8

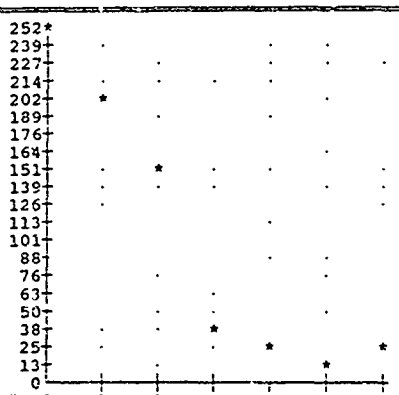
CITRI-KLEEN

PENETONE
CITRI KLEEN

PROGRESS CHEMICAL INC.
L-365

TITAN CHEMICAL
OIL-FLO

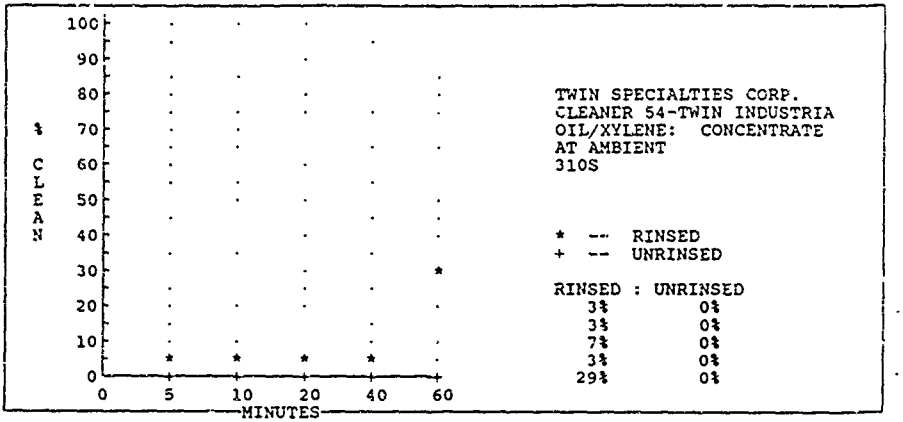
TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA



0- 252
1- 206
2- 148
3- 36
4- 30
5- 10
6- 20

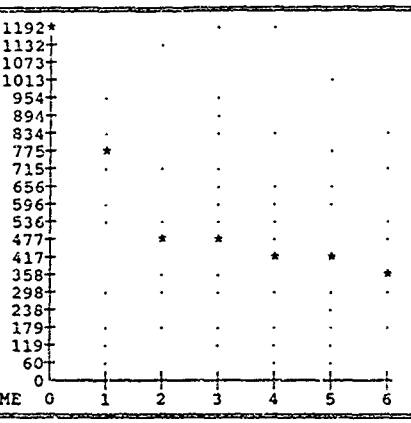
DRY WEIGHT 0.0702

DATE - 10/12/88 COD vs TIME


100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA
OIL/XYLENE: CONCENTRATE
AT AMBIENT
310S
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
3% 0%
3% 0%
7% 0%
3% 0%
29% 0%

COMPANY - TWIN SPECIALTIES C
PRODUCT - TWIN CITRON CLEANE
TOC INIT- 0
TOC 2nd - 0
COD INIT- 1470000
ANILINE PT - 0.0000
ATP ----- 108 E-8

SOLUBILITY DATA:



0- 1192
1- 778
2- 454
3- 468
4- 410
5- 427
6- 366

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

PHENOL
06/30/88
ATP - 108 E-8

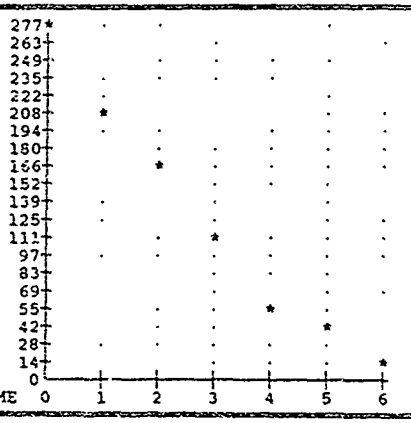
PANTHER CHEMICAL CO.
CR-138

PANTHER CHEMICAL CO.
CR-140

TWIN SPECIALTIES CORP.
TWIN CITRON CLEANER 100

UNITED LABORATORIES
UNITED 392

UNITED LABORATORIES
UNITED 395



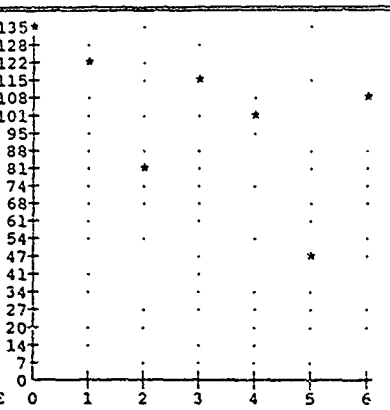
0- 277
1- 205
2- 170
3- 106
4- 56
5- 48
6- 12

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

COMPANY - U.S. POLYCHEMICAL
PRODUCT - ST-21 POLY SPRAY J
TOC INIT- 37776
TOC 2nd - 0
COD INIT 620000
ANILINE P^ - 0.0000
ATP ----- -29 E-8

SOLUBILITY DATA:
1:10 @ AMBIE 0%



0- 135
1- 120
2- 82
3- 116
4- 102
5- 45
6- 109

DRY WEIGHT 0.0467

DATE - 03/21/88 COD vs TIME

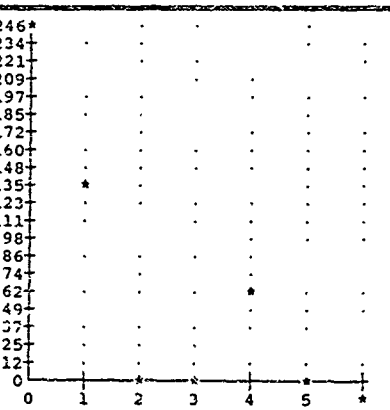
PHENOT
03/21/88
ATP - 8% E-8

PETROFIRM INC.
BIOACT INDUSTRIAL DG1

ROCHESTER MIDLAND
SE377C

U.S. POLYCHEMICAL CORP.
ST-21 POLY SPRAY JET

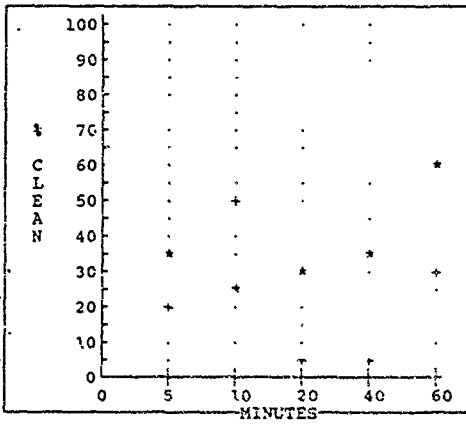
VAN STRAATEN CHEM CO.
21-271-A



0- 246
1- 137
2- 6
3- 3
4- 66
5- -4
6- -14

DRY WEIGHT 0.0467

DATE - 03/21/88 COD vs TIME

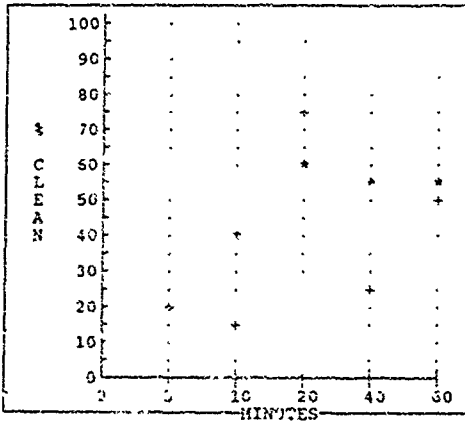


U.S. POLYCHEMICAL CORP.
ST-21 POLY SPRAY JET
GREASE: 1:10 AT AMBIENT

A17075

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
33%	22%
23%	50%
29%	6%
33%	6%
62%	30%

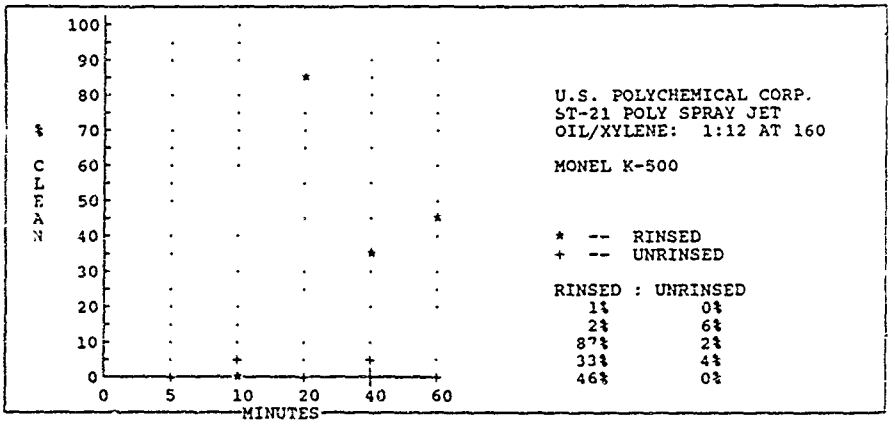


U.S. POLYCHEMICAL CORP.
ST-21 POLY SPRAY JET
GREASE: 1:12 AT 160 F

MONFL K-500

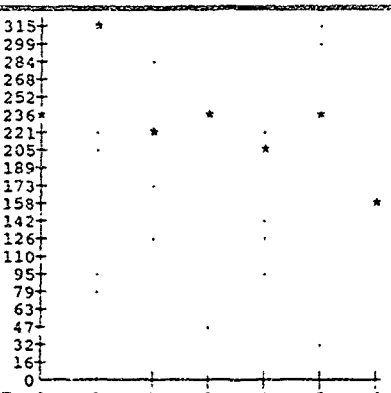
* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
19%	20%
39%	16%
58%	75%
57%	27%
53%	51%


100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
U.S. POLYCHEMICAL CORP.
ST-21 POLY SPRAY JET
OIL/XYLENE: 1:12 AT 160
MONEL K-500
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
1% 0%
2% 6%
87% 2%
33% 4%
46% 0%

COMPANY - UNITED LABORATORIE
PRODUCT - UNITED 392
TOC INIT- 12609
TOC 2nd - 0
COD INIT- 1950000
ANILINE PT - 0.0000
ATP ----- 48 E-8

SOLUBILITY DATA:



0- 232
1- 315
2- 223
3- 238
4- 202
5- 234
6- 153

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

PHENOL
06/30/88
ATP - 108 E-8

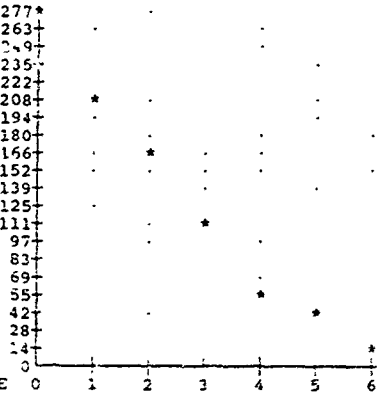
PANTHER CHEMICAL CO.
CR-138

PANTHER CHEMICAL CO.
CR-140

TWIN SPECIALTIES CORP.
TWIN CITRON CLEANER 100

UNITED LABORATORIES
UNITED 392

UNITED LABORATORIES
UNITED 395



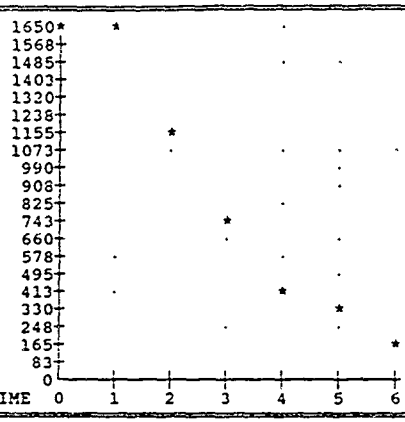
0- 277
1- 205
2- 170
3- 106
4- 58
5- 48
6- 12

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

COMPANY - UNITED LABORATORIE
PRODUCT - UNITED 395
TOC INIT- 0
TOC 2nd - 0
COD INIT- 1950000
ANILINE PT - 0.0000
ATP ----- -61 E-8

SOLUBILITY DATA:



0- 1650
1- 1650
2- 1142
3- 732
4- 373
5- 300
6- 176

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

PHENOL
06/30/88
ATP - 108 E-8

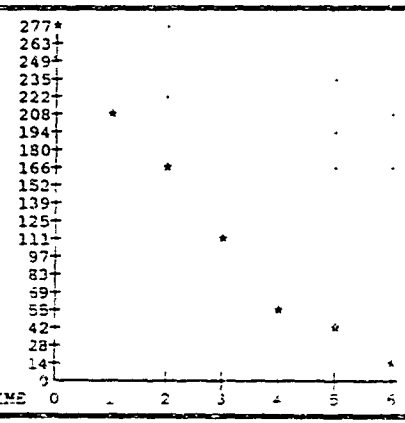
PANTHER CHEMICAL CO.
CR-138

PANTHER CHEMICAL CO.
CR-140

TWIN SPECIALTIES CORP.
TWIN CITRON CLEANER 100

UNITED LABORATORIES
UNITED 392

UNITED LABORATORIES
UNITED 395



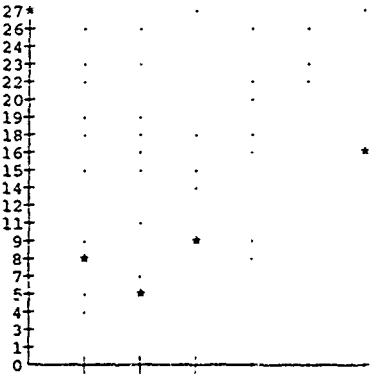
0- 277
1- 205
2- 170
3- 106
4- 58
5- 48
6- 12

DRY WEIGHT 0.0975

DATE - 06/30/88 COD vs TIME

COMPANY - VAN STRAATEN CHEM
PRODUCT - 21-271-A
TOC INIT- 79505
TOC 2nd - 0
COD INIT- 1770000
ANILINE PT - 0.0000
ATP ----- -101 E-8

SOLUBILITY DATA:
6 OZ/G @ AMBIE 4%
10 OZ/G @ 180 0%
2 OZ/G @ 180 4%
10 OZ/G @ 100 0%



0- 27
1- 8
2- 6
3- 10
4- -25
5- -21
6- 16

DRY WEIGHT 0.0467

DATE - 03/21/88 COD vs TIME

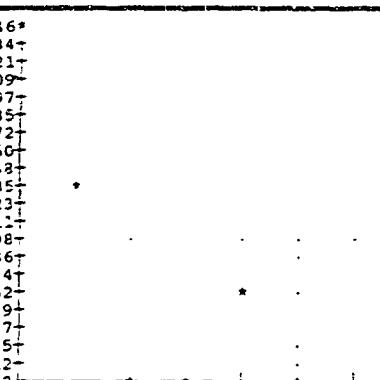
PHENOL
03/21/88
ATP - 82 E-8

PETROFIRM INC.
BIOACT INDUSTRIAL DG1

ROCHESTER MIDLAND
SE377C

U.S. POLYCHEMICAL CORP.
ST-21 POLY SPRAY JET

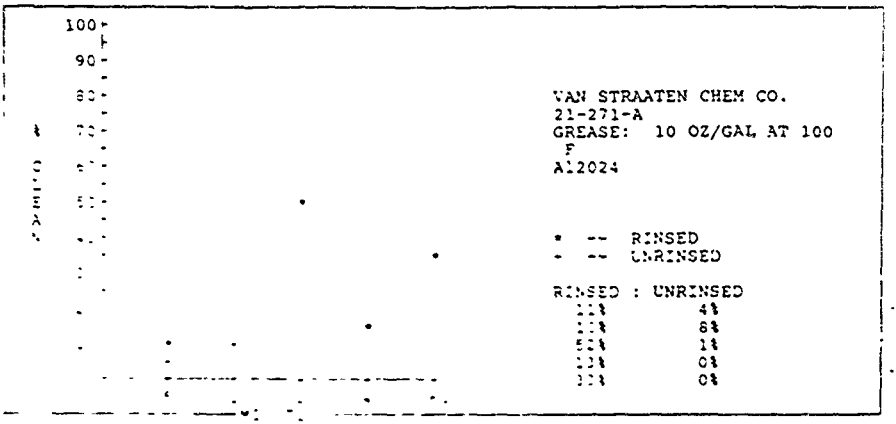
VAN STRAATEN CHEM CO.
21-271-A

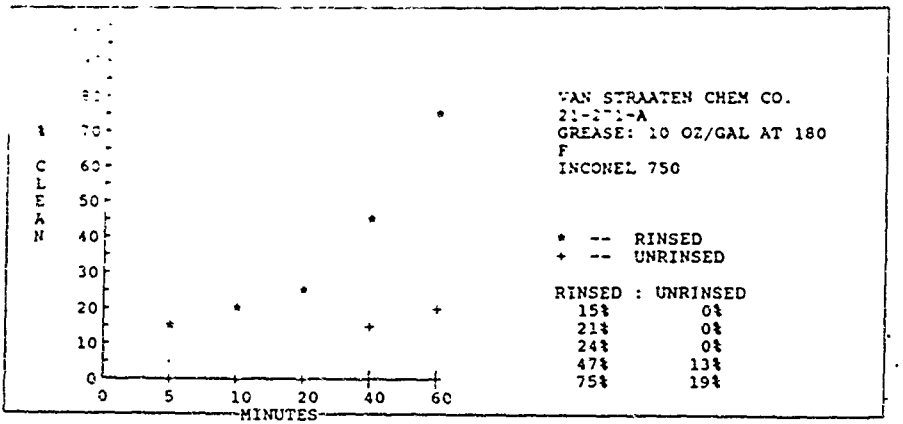


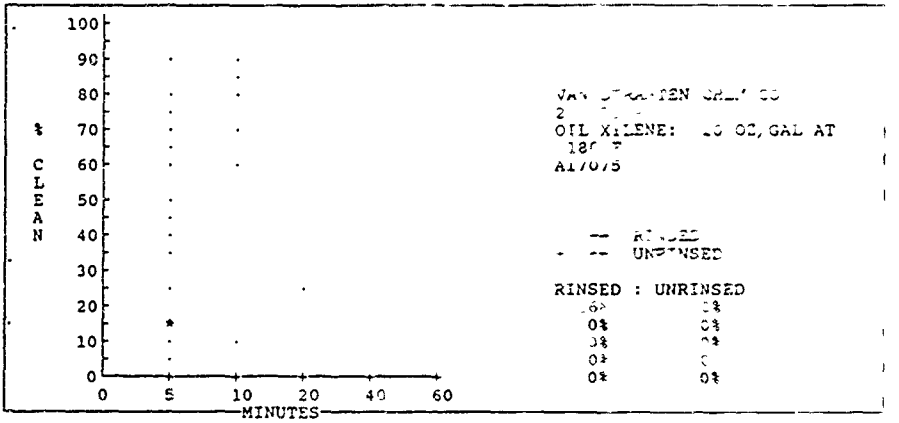
0- 24
1- 1
2- 6
3- 3
4- 66
5- -4
6- -14

DRY WEIGHT 0.0467

DATE - 03/21/88 COD vs TIME

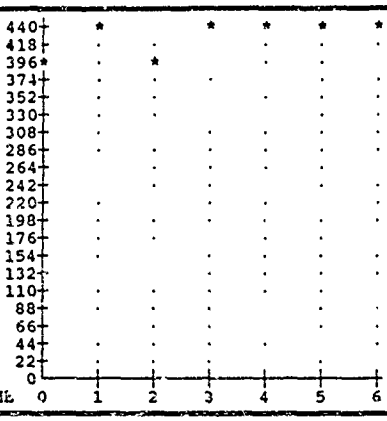

100
90
80
70
60
50
VAN STRAATEN CHEM CO.
21-271-A
GREASE: 10 OZ/GAL AT 100 F
A12024
* -- RINSED
- -- UNRINSED
RINSED : UNRINSED
4%
8%
1%
0%
0%


% CLEAN
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
VAN STRAATEN CHEM CO.
21-271-A
GREASE: 10 OZ/GAL AT 180 F
INCONEL 750
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
15% 0%
21% 0%
24% 0%
47% 13%
75% 19%


100
90
80
70
60
50
40
30
20
10
0
% CLEAN
0
5
10
20
40
60
MINUTES
OIL XYLENE:
A17075
RINSED
UNRINSED
RINSED : UNRINSED
0%
0%
0%
0%
0%

COMPANY - VAN STRAATEN CHEM
PRODUCT - 3625
TOC INIT- 4687
TOC 2nd - 0
COD INIT- 153000
ANILINE PT - 0.0000
ATP ----- -17 E-8

SOLUBILITY DATA:



0- 401
1- 430
2- 390
3- 440
4- 432
5- 439
6- 434

DRY WEIGHT 0.0819

DATE - 07/08/88 COD vs TIME

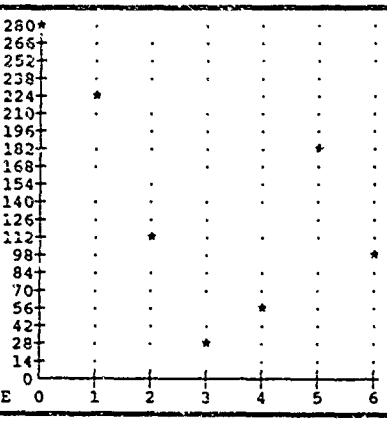
PHENOL
07/08/88
ATP - 33 E-8

PROGRESS CHEMICAL INC.
L-365

SUTTON CORP
TOPSALL

TWIN SPECIALTIES CORP.
CLEANER 54-TWIN INDUSTRIA

VAN STRAATEN CHEM CO.
3625



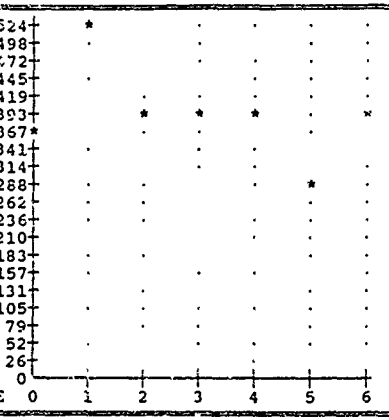
0- 280
1- 222
2- 115
3- 32
4- 59
5- 180
6- 97

DRY WEIGHT 0.0819

DATE - 07/08/88 COD vs TIME

COMPANY - VAN STRAATEN CHEM
PRODUCT - 3625
TOC INIT- 46877
TOC 2nd - 0
COD INIT- 153000
ANILINE PT - 0.0000
ATP ----- -31 E-8

SOLUBILITY DATA:



0- 358
1- 524
2- 401
3- 402
4- 390
5- 296
6- 394

DRY WEIGHT 0.0554

DATE - 10/11/88 COD vs TIME

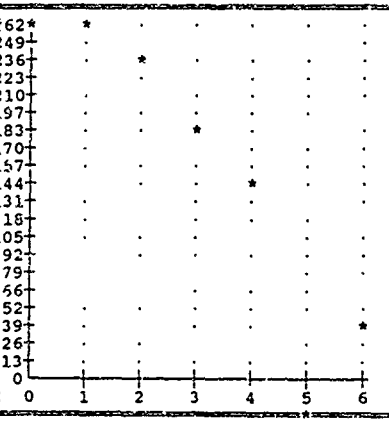
PHENOL
10/11/88
ATP - 79 E-8

M-OIL-FPEE CO.
M-OIL-FREE #1000

M-OIL-FREE CO.
ULTRA 1

PACIFIC CHEMICAL
FIST

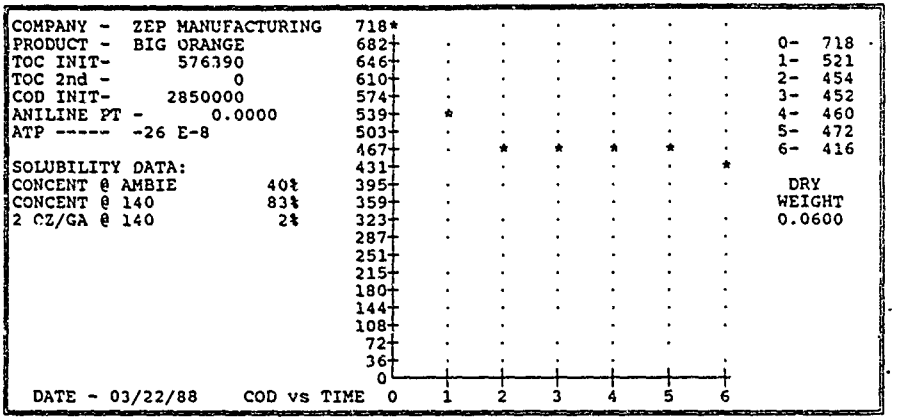
VAN STRAATEN CHEM CO.
3625

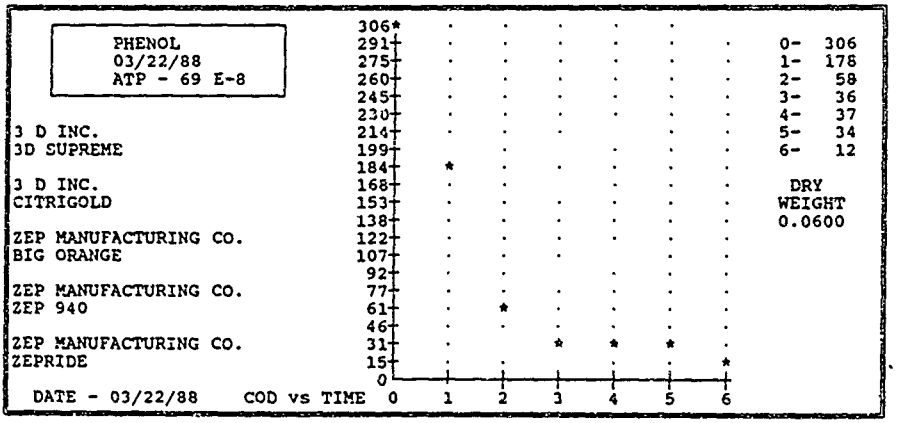


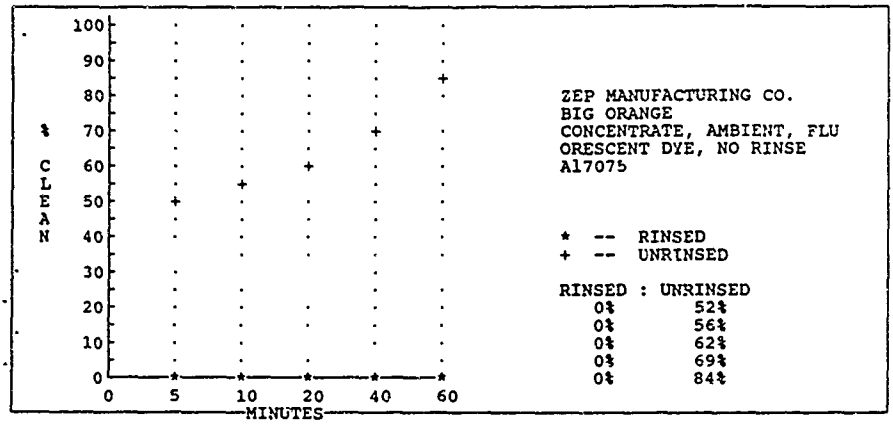
0- 258
1- 262
2- 236
3- 189
4- 140
5- -24
6- 36

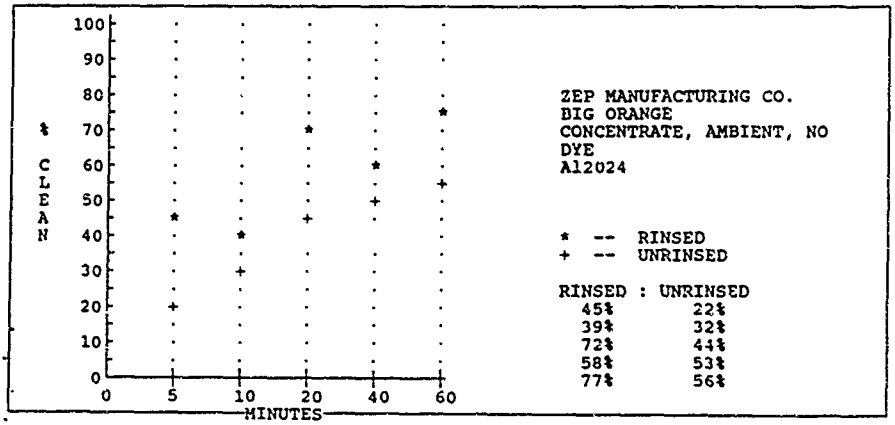
DRY WEIGHT 0.0554

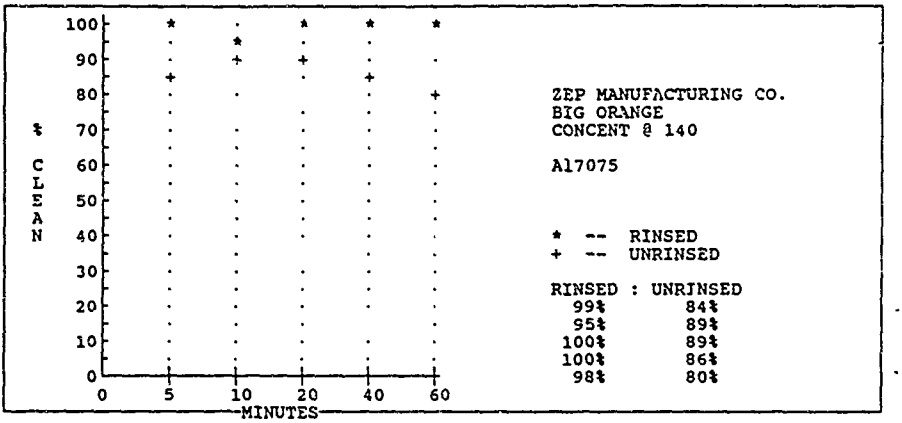
DATE - 10/11/88 COD vs TIME

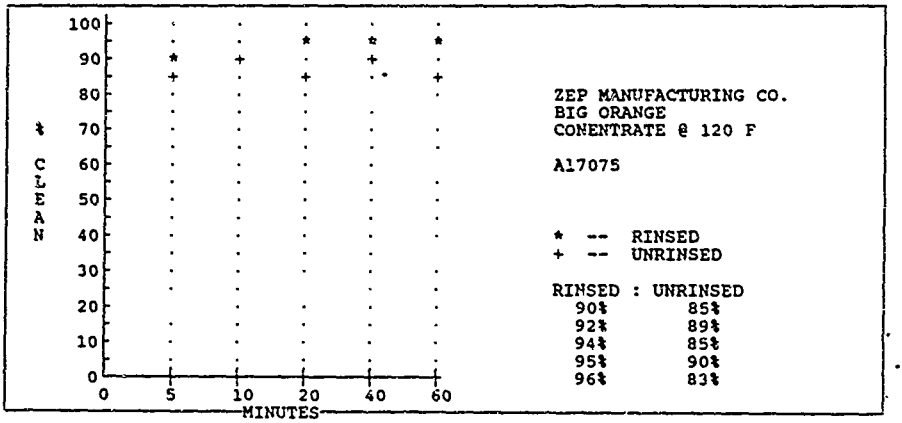

COMPANY - ZEP MANUFACTURING
PRODUCT - BIG ORANGE
TOC INIT- 576390
TOC 2nd - 0
COD INIT- 2850000
ANILINE PT - 0.0000
ATP ----- -26 E-8
SOLUBILITY DATA:
CONCENT @ AMBIE 40%
CONCENT @ 140 83%
2 OZ/GA @ 140 2%
718
682
646
610
574
539
503
467
431
395
359
323
287
251
215
180
144
108
72
36
0
0- 718
1- 521
2- 454
3- 452
4- 460
5- 472
6- 416
DRY
WEIGHT
0.0600
DATE - 03/22/88 COD vs TIME
0 1 2 3 4 5 6


PHENOL
03/22/88
ATP - 69 E-8
3 D INC.
3D SUPREME
3 D INC.
CITRIGOLD
ZEP MANUFACTURING CO.
BIG ORANGE
ZEP MANUFACTURING CO.
ZEP 940
ZEP MANUFACTURING CO.
ZEPRIDE
306
291
275
260
245
230
214
199
184
168
153
138
122
107
92
77
61
46
31
15
0
0- 306
1- 178
2- 58
3- 36
4- 37
5- 34
6- 12
DRY
WEIGHT
0.0600
DATE - 03/22/88 COD vs TIME
0 1 2 3 4 5 6


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
ZEP MANUFACTURING CO.
BIG ORANGE
CONCENTRATE, AMBIENT, FLU
ORESCENT DYE, NO RINSE
A17075
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
0% 52%
0% 56%
0% 62%
0% 69%
0% 84%

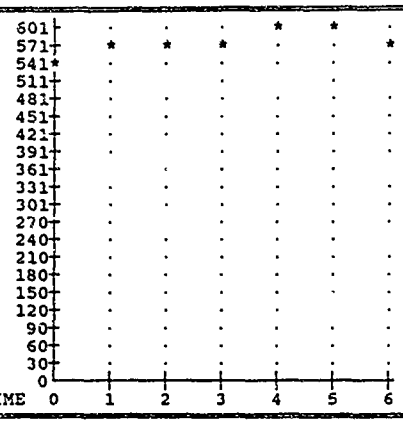

% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
ZEP MANUFACTURING CO.
BIG ORANGE
CONCENTRATE, AMBIENT, NO
DYE
A12024
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
45% 22%
39% 32%
72% 44%
58% 53%
77% 56%


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
ZEP MANUFACTURING CO.
BIG ORANGE
CONCENT @ 140
A17075
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
99% 84%
95% 89%
100% 89%
100% 86%
98% 80%


% CLEAN
100
90
80
70
60
50
40
30
20
10
0
0
5
10
20
40
60
MINUTES
ZEP MANUFACTURING CO.
BIG ORANGE
CONENTRATE @ 120 F
A17075
* -- RINSED
+ -- UNRINSED
RINSED : UNRINSED
90% 85%
92% 89%
94% 85%
95% 90%
96% 83%

COMPANY - ZEP MANUFACTURING
PRODUCT - ZEP 940
TOC INIT- 52041
TOC 2nd - 106
COD INIT- 196000
ANILINE PT - 0.0000
ATP ----- -22 E-8

SOLUBILITY DATA:
4 OZ/GA @ AMBIE 0%
8 OZ/GA @ AMBIE 0%
12 OZ/G @ AMBIE 0%
12 OZ/G @ 100 0%
12 OZ/G @ 140 0%



0- 534
1- 568
2- 578
3- 585
4- 597
5- 601
6- 578

DRY WEIGHT 0.0600

DATE - 03/22/88 COD vs TIME

PHENOL
03/22/88
ATP - 69 E-8

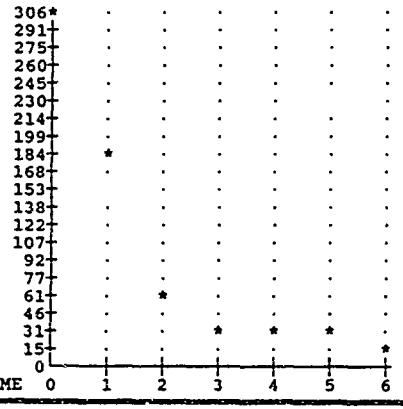
3 D INC.
3D SUPREME

3 D INC.
CITRIGOLD

ZEP MANUFACTURING CO.
BIG ORANGE

ZEP MANUFACTURING CO.
ZEP 940

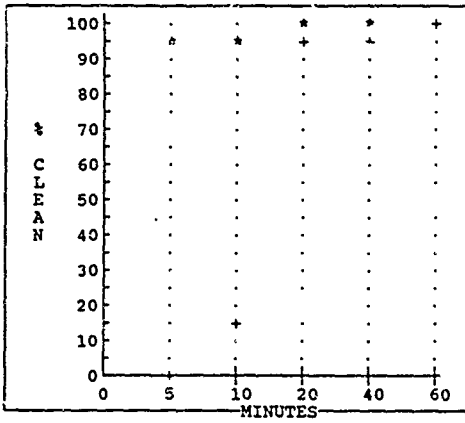
ZEP MANUFACTURING CO.
ZEPRIDE



0- 306
1- 178
2- 58
3- 36
4- 37
5- 34
6- 12

DRY WEIGHT 0.0600

DATE - 03/22/88 COD vs TIME



ZEP MANUFACTURING CO.
ZEP 940
GREASE: 12 OZ/GAL AT AMBIENT
A12024

* -- RINSED
\+ -- UNRINSED

RINSED	UNRINSED
97%	2%
97%	15%
100%	95%
100%	97%
100%	100%

APPENDIX H

CORRSICN DATA

This appendix contains the data on the solvents tested for corrosion. The data was collected using the ANSI/ASTM F 483-77 (Reference 1), method for immersion corrosion testing of aircraft maintenance chemicals.

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CROWLEY METHYLNAPHTHALENE #5

DATE	COUPON	CORROSION RATE	TEMP.	COMMENTS
3-30-88	AL2024-111	0	50 C	LIKE ORIGINAL
3-30-88	AL7075-111	0.086	50 C	CORROSIVE TOP BACK SURFACE
3-30-88	C1020-021	0.073	50 C	SCATTERED BROWN SPOTS
3-30-88	CDA443-038	0.023	50 C	LIKE ORIGINAL
3-30-88	C4340-091	0	50 C	EDGE CORROSION
3-30-88	IX750-091	0.013	50 C	LIKE ORIGINAL
3-30-88	WASPALOY-041	0	50 C	LIKE ORIGINAL
3-30-88	410-111	0.133	50 C	LIKE ORIGINAL
3-30-88	MAG-101		50 C	TARNISH ON BOTH SURFACES-???
3-30-88	CDA110-051		50 C	LIKE ORIGINAL
3-30-88	N200-091		50 C	LIKE ORIGINAL
3-30-88	3105-111		50 C	LIKE ORIGINAL
3-30-88	MK500-26		50 C	SCATTERED BROWN SPOTS ON BACK
3-30-88	AL1100-111	0.053	50 C	LIKE ORIGINAL
3-30-88	Ti2-101	0.023	50 C	BROWN SPECS ON BACK SURFACE

EXXON, EXXATE 1300

DATE	COUPON	CORROSION RATE	TEMP.	COMMENTS
4-6-88	AL2024-084	0.036	60 C	
4-6-88	AL7075-004	0.061	60 C	
4-6-88	MAG-105	0.017	60 C	
4-6-88	CDA110-055	0.016	50 C	
4-6-88	CDA443-001	0.013	60 C	
4-6-88	N200-054	0.02	60 C	
4-6-88	IX750-082	0.011	60 C	
4-6-88	WASPALOY-054	0.035	60 C	
4-6-88	Ti2-118	0.005	60 C	
4-6-88	MK500-1	0.026	60 C	
4-6-88	C1020-27		60 C	TEST VOIDED DUE TO SPILL
4-6-88	C4340-037		60 C	ACID CLEANED IN WRONG SOLUTION
4-6-88	3105-117	0.013	60 C	
4-6-88	410-101	0.013	60 C	
4-6-88	AL2024-120		60 C	BLANK
4-6-88	AL7075-117		60 C	BLANK
4-6-88	AL1100-120		60 C	BLANK
4-6-88	CDA443-010		60 C	BLANK
4-6-88	CDA110-020		60 C	BLANK
4-6-88	N200-114		60 C	BLANK
4-6-88	IX750-100		60 C	BLANK
4-6-88	WASPALOY 050		60 C	BLANK
4-6-88	Ti2-100		60 C	BLANK
4-6-88	MK500-10		60 C	BLANK
4-6-88	C1020-040		60 C	BLANK, ACID CLEANED IN WRONG SOLN
4-6-88	C4340-011		60 C	BLANK, ACID CLEANED IN WRONG SOLN
4-6-88	3105-100		60 C	BLANK, ACID CLEANED IN WRONG SOLN
4-6-88	410-117		60 C	BLANK
4-6-88	MAG-114		60 C	BLANK

BIO-TEK 134 HI-SOL

4-19-88	AL1100-003	0.027	65 C	LIKE ORIGINAL
4-19-88	AL2024-071	0.01	65 C	LIKE ORIGINAL
4-19-88	AL7075-037	0	65 C	LIKE ORIGINAL
4-19-88	C1020-015	0.017	65 C	RUST/RED-BROWN SCALE ON SURFACE
4-19-88	C4340-016	0	65 C	RUST/RED-BROWN SCALE ON SURFACE
4-19-88	CDA110-031	0.047	65 C	LIKE ORIGINAL
4-19-88	CDA443-013	0.01	65 C	LIKE ORIGINAL
4-19-88	IX750-118	0.023	65 C	LIKE ORIGINAL
4-19-88	MK500-036	0.03	65 C	LIKE ORIGINAL
4-19-88	N200-008	0.017	65 C	LIKE ORIGINAL
4-19-88	Ti2-041	0.063	65 C	LIKE ORIGINAL
4-19-88	WASPALOY-038	0.057	65 C	LIKE ORIGINAL
4-19-88	310S-008	0.007	65 C	LIKE ORIGINAL
4-19-88	410-031	0	65 C	LIKE ORIGINAL

ORANGE SOL DESOLVIT

4-21-88	AL1100-011	0.123	60 C	LIKE ORIGINAL COUPON
4-21-88	AL2024-114	0.016	60 C	LIKE ORIGINAL COUPON
4-21-88	AL7075-118	0.05	60 C	LIKE ORIGINAL COUPON
4-21-88	C1020-031	0.03	60 C	LIKE ORIGINAL COUPON
4-21-88	C4340-094	0.053	60 C	SLIGHT RED/BROWN DISCOLORATION
4-21-88	CDA110-011	0.023	60 C	LIKE ORIGINAL COUPON
4-21-88	CDA443-005	0.04	60 C	COLOR CHANGE-GREENISH TINT
4-21-88	IX750-101	0.01	60 C	LIKE ORIGINAL COUPON
4-21-88	MAG-047	0.04	60 C	LIKE ORIGINAL COUPON
4-21-88	MK500-16	0.04	60 C	SLIGHT RED/BROWN DISCOLORATION
4-21-88	N200-051	0.026	60 C	LIKE ORIGINAL COUPON
4-21-88	TI2-107		60 C	DATA NOT LEGIBLE, LIKE ORIGINAL
4-21-88	WASPALOY-044	0.02	60 C	LIKE ORIGNIAL COUPON
4-21-88	3105-114	0.016	60 C	LIKE ORIGNIAL COUPON
4-21-88	4105-118	0.006	60 C	SLIGHT RED/BRCWN DISCOLORATION

EXXON EXXATE 800

4-28-88	AL1100-008	0.043	60 C	LIKE ORIGINAL
4-28-88	AL2024-088	0.01	60 C	LIKE ORIGINAL
4-28-88	AL7075-018	0.08	60 C	LIKE ORIGINAL
4-28-88	C1020-77	0.017	60 C	LIKE ORIGINAL
4-28-88	C4340-098	0.037	60 C	LIKE ORIGINAL
4-28-88	CDA110-038	0.027	60 C	LIKE ORIGINAL
4-28-88	CDA443-081	0.037	60 C	LIKE ORIGINAL
4-28-88	IX750-094	0.013	60 C	LIKE ORIGINAL
4-28-88	MK500-023	0.003	60 C	LIKE ORIGINAL
4-28-88	N200-031	0.047	60 C	LIKE ORIGINAL
4-28-88	Ti2-091	0.02	60 C	LIKE ORIGINAL
4-28-88	WASPALOY-031	0.007	60 C	LIKE ORIGINAL
4-28-88	3105-094	0.013	60 C	LIKE ORIGINAL
4-28-88	410-001	0.08	60 C	LIKE ORIGINAL
4-28-88	MAG-118	0	60 C	LIKE ORIGINAL

TRITON HEMO-SOL

5-5-88	AL1100-114	0.037	40 C	
5-5-88	AL2024-098	0.027	40 C	
5-5-88	AL7075-001	0	40 C	
5-5-88	C1020-011	0.05	40 C	
5-5-88	C4340-061		40 C	DATA NOT LEGIBLE
5-5-88	CDA110-111		40 C	DATA NOT LEGIBLE
5-5-88	CDA443-035		40 C	DATA NOT LEGIBLE
5-5-88	IX750-097		40 C	DATA NOT LEGIBLE
5-5-88	MAG-044		40 C	DATA NOT LEGIBLE
5-5-88	MK500-003		40 C	DATA NOT LEGIBLE
5-5-88	N200-115		40 C	DATA NOT LEGIBLE
5-5-88	TI2-104		40 C	DATA NOT LEGIBLE
5-5-88	WASPALOY-051		40 C	DATA NOT LEGIBLE
5-5-88	310S-091		40 C	DATA NOT LEGIBLE

BIO-TEK SAFETY SOLVENT DEGREASER

5-12-88	AL1100-048	0.037	65 C
5-12-88	AL2024-085	0.07	65 C
5-12-88	AL7075-008	0.02	65 C
5-12-88	C1020-051	0.063	65 C
5-12-88	C4340-031	0	65 C
5-12-88	CDA110-114	0.003	65 C
5-12-88	CDA443-031	0	65 C
5-12-88	IX750-071	0	65 C
5-12-88	MK500-006	0	65 C
5-12-88	N200-118	0.03	65 C
5-12-88	Ti2-094	0.01	65 C
5-12-88	WASPALOY-032	0.007	65 C
5-12-88	310S-011	0.003	65 C
5-12-88	410-051	0.053	65 C

EXXON EXXATE 1000

6-6-88	AL1100-041	0.043	60 C	LIKE ORIGINAL
6-6-88	AL2024-074	0.01	60 C	LIKE ORIGINAL
6-6-88	AL7075-G31	0.06	60 C	RECEIVED SCRATCHED
6-6-88	C1020-048	0.023	60 C	LIKE ORIGINAL
6-6-88	C4340-034	0	60 C	LIKE ORIGINAL
6-6-88	CDA110-117	0.017	60 C	LIKE ORIGINAL
6-6-88	CDA443-084	0.03	60 C	LIKE ORIGINAL
6-6-88	IX750-115	0.027	60 C	LIKE ORIGINAL
6-6-88	MAG-091	0.17	60 C	LIKE ORIGINAL
6-6-88	MK500-076	0	60 C	LIKE ORIGINAL
6-6-88	NZ00-061	0.023	60 C	LIKE ORIGINAL
6-6-88	TIZ-048	0.023	60 C	LIKE ORIGINAL
6-6-88	WASPALOY-118	0.027	60 C	LIKE ORIGINAL
6-6-88	310S-085	0.017	60 C	LIKE ORIGINAL
6-6-88	410-004	0.013	60 C	LIKE ORIGINAL

EXXON EXXATE 900

6-14-88	AL1100-004	32.89	60 C	LIKE ORIGINAL
6-14-88	AL2024-077	27.62	60 C	LIKE ORIGINAL
6-14-88	AL7075-034	27.04	60 C	LIKE ORIGINAL
6-14-88	C1020-041	29.51	60 C	RUST DEPOSITS NEEDS ACID CLEANING
6-14-88	C4340-018	31.76	60 C	RUST DEPOSITS NEEDS ACID CLEANING
6-14-88	CDA110-101	33.16	60 C	LIKE ORIGINAL
6-14-88	CDA443-087	30.8	60 C	LIKE ORIGINAL
6-14-88	IX750-111	28.39	60 C	LIKE ORIGINAL
6-14-88	MAG-094	14.35	60 C	CORRODED BEYOND RECOGNITION
6-14-88	MK500-011	33.63	60 C	LIKE ORIGINAL
6-14-88	N200-004	29.72	60 C	LIKE ORIGINAL
6-14-88	Ti2-031	33.38	60 C	LIKE ORIGINAL
6-14-88	WASPALOY-115	48.7	60 C	LIKE ORIGINAL
6-14-88	310S-081	33.69	60 C	LIKE ORIGINAL
6-14-88	410-007	32.22	60 C	LIKE ORIGINAL

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