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SUBMISSION #

129011
SHAUGHNESSY NO.

REVIEW NO.

EEB REVIEW

DATE: IN 11-26-91

DATE: OUT 3-29-93

FILE OR ID NO. MRID 418750-07

PETITION OR EXP. NO. _____

DATE OF SUBMISSION 10-28-91

DATE RECEIVED BY EFED 11-26-91

RD REQUESTED COMPLETION DATE 5-5-92

EEB ESTIMATED COMPLETION DATE 03-15-93

RD ACTION CODE/TYPE OF REVIEW Data Evaluation Record

Freshwater Invertebrate

Life-Cycle -- Daphnia magna

TYPE OF PRODUCT(S) : I,D,H,F,N,R,S Fungicide

DATA ACCESSION NO(S). _____

PRODUCT MANAGER (NO.) Cynthia Giles-Parker

PRODUCT NAME(S) Fenbuconazole, RH7592, Fenethanil, Indar, RH-57,592

COMPANY NAME Rohm and Haas

SUBMISSION PURPOSE Meet EEB Study requirements

SHAUGHNESSY NO.	CHEMICAL & FORMULATION(S)	% A.I.
<u>129011</u>	<u>Fenbuconazole</u>	<u>98.3</u>
_____	<u>Inert</u>	<u>1.7</u>

DATA EVALUATION RECORD

1. **CHEMICAL:** RH-7592.
Shaughnessey No. 129011.
2. **TEST MATERIAL:** RH-7592 Technical; Lot No. BPP-3-1786R;
96.7% active ingredient; a white powder.
3. **STUDY TYPE:** 72-4. Freshwater Invertebrate Flow-Through
Life-Cycle Toxicity Test. Species Tested: *Daphnia magna*.
4. **CITATION:** Blakemore, G.C. and D. Burgess. 1991. Chronic
Toxicity of RH-7592 to *Daphnia magna* Under Flow-Through Test
Conditions. Final Report No. 38143. Rohm and Haas Report
No. 89RC-0084. Prepared by Analytical Bio-Chemical
Laboratories, Inc., Columbia, MO. Submitted by Rohm and
Haas Company, Spring House, PA. EPA MRID No. 418750-07.

5. **REVIEWED BY:**

Louis M. Rifici, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature:

Louis M Rifici

Date:

12/3/92

6. **APPROVED BY:**

Rosemary Graham Mora, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature:

Rosemary Graham Mora

Date:

12/8/92

Henry T. Craven, M.S.
Supervisor, EEB/EFED
USEPA

Signature:

H. T. Craven 3/22/93

Date:

Henry T. Craven 4/19/93

7. **CONCLUSIONS:** This study is scientifically sound and meets
the guideline requirements for a chronic, flow-through
toxicity test using the freshwater invertebrate, *Daphnia*
magna. The 21-day EC₅₀ was 0.10 mg a.i./l mean measured
concentration. The MATC was >0.078 and <0.15 mg a.i./l
(geometric mean MATC = 0.11 mg a.i./l).

8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**

10. DISCUSSION OF INDIVIDUAL TESTS: N/A.

11. MATERIALS AND METHODS:

- A. Test Animals: *Daphnia magna* (<24 hours old) were obtained from in-house cultures. The primary culture was obtained from the Columbia National Fisheries Research Laboratory in Columbia, MO. The cultures were housed in a temperature-controlled area ($20 \pm 2^\circ\text{C}$) on a 16-hour daylight photoperiod with 30-minute dawn and dusk simulations. The light intensity was maintained at 40-80 ft-candles using cool white fluorescent tubes.

Adult daphnids were fed a suspension of algae (*Selenastrum capricornutum* and *Ankistrodesmus falcatus*) supplemented with a trout chow and yeast suspension. The adults were approximately 21-days old with many prior broods.

- B. Test System: A 0.5-1 proportional diluter intermittently delivered an average of 3.6 ml/chamber/minute (or 5.1 volume replacements per day) to each of four replicate test vessels per concentration. Flow splitting boxes were used to mix and divide each test solution. To minimize turbulence, the solutions were introduced into the test vessels using 14-gauge hypodermic needles. The test material was allowed to run through the system for 7 days before use. Diluter operation was observed twice daily during the study.

The test vessels were 1-liter glass beakers with notched drains covered by 50-mesh stainless steel screen. Test solution depth was 11.5 cm. The test chambers were positioned in a temperature-controlled water bath set to maintain $20 \pm 2^\circ\text{C}$. The photoperiod was 16-hour light/8-hour dark with 30-minute low light transitions between light and dark. The light intensity of the cool-white fluorescent tubes was 49-53 ft-candles.

The dilution water was a mixture of soft-blended water and well water with a final hardness of 156-176 mg/l as CaCO_3 , an alkalinity of 160-200 mg/l as CaCO_3 , a pH of 8.0-8.4, and a conductivity of 320-440 $\mu\text{mhos/cm}$.

The test substance was dissolved in acetone and mixed thoroughly. The resulting stock solution (10,000 mg a.i./l) was delivered to the diluter using a syringe

dispenser. Two stock solutions were prepared during the test. Unused portions were stored in a freezer.

- C. **Dosage:** Twenty-one-day, flow-through, toxicity test. Based on a preliminary test, five nominal concentrations (0.06, 0.12, 0.25, 0.50, and 1.0 mg a.i./l), a dilution water control, and a solvent control (0.05 ml/l) were selected for the test.
- D. **Design:** Four chambers were used for each concentration with ten randomly-placed daphnids per chamber. The loading was approximately 1 daphnid per 100 ml of solution. All chambers were observed daily for mortality, abnormal effects, and the release of the first brood. Young were counted every Monday, Wednesday, and Friday by removing the adult with a smooth glass pipet and pouring the test solution through a 50-mesh stainless steel screen. The collected young were placed in sample jars, counted, and discarded. The solution was collected and replaced along with the adult daphnids back into the chamber. The test chambers were cleaned on each counting day. At test termination, the daphnids were measured using a binocular dissecting scope and eyepiece micrometer.

The daphnids were uniformly fed an algal suspension (*Selenastrum capricornutum* and *Ankistrodesmus falcatus*) providing at least 4×10^8 cells/l to each replicate. Each replicate was also supplemented twice daily with 1 ml of a trout chow/yeast suspension (2.5 mg solids/ml) giving a final suspended solids concentration of 5 mg/l.

The dissolved oxygen concentration (DO), temperature, and pH were measured in alternating, duplicate replicates of the dilution water control, solvent control, low, middle, and high concentrations on days 0, 3, 7, 14, and 21. The temperature of the water bath was recorded continuously with a data logger. The temperature, hardness, DO, pH, alkalinity, and conductivity of the dilution water were determined daily.

Measured concentrations of RH-7592 were determined using high performance liquid chromatography. Water samples were collected on days 0, 3, 7, 14, and 21.

- E. **Statistics:** Daphnid survival, growth (length), and reproduction (time to first brood and young/adult reproductive days) were analyzed statistically.

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Survival was analyzed using frequency analysis to compare the concentrations to the control and a one-tailed Fisher's Exact test and the Chi-Square statistic to determine which test concentrations exhibited a response significantly less than the control. Reproduction data were compared using Dunnett's test to determine exposure levels significantly different from the control. Daphnid length data were tested for normal distribution (Shapiro-Wilk's). One-way analysis of variance (ANOVA) and Dunnett's test were used to determine significant differences from the controls. The level of significance in all tests was $P \leq 0.05$. The dilution water control and solvent control data were pooled when comparison by t-test indicated no significant difference. The 21-day EC_{50} was calculated using a computer program developed by Stephan et al. (1978).

12. **REPORTED RESULTS:** A water pump malfunction occurring on days 2 and 3 caused the turnover rates in the aquaria to fall to 4.8 and 3.7 per day, respectively. The mean measured concentrations were 0.078, 0.15, 0.34, 0.57, and 1.2 mg a.i./l (Table 2, attached). These values averaged $125 \pm 8.5\%$ of nominal concentrations. There was no noticeable precipitate in the mixing box, test beakers, or stock solution during the test.

Survival of daphnids in the four highest concentrations (0.15-1.2 mg a.i./l) was significantly affected compared to the pooled controls (Table 4, attached). Survival in the control and solvent control averaged 87.5 and 77%, respectively. The authors explained that solvent control survival was below the acceptable criterion set in the study protocol but was above the limit (70%) given in the SEP (1986). The 21-day EC_{50} , based on immobilization, was 0.10 mg a.i./l (95% C.I. = 0.094-0.11 mg a.i./l) using the moving average method.

The number of days to first brood release for the controls and 0.078 and 0.15 mg a.i./l test concentrations was 7 (Table 5, attached). The number of days until first brood release at 0.34 mg a.i./l was 9 and was significantly increased compared to pooled control data. No neonates were released in the two highest concentrations. Dilution water control and solvent control reproduction averaged 9.48 and 11.05 young per adult reproductive day, respectively. Reproduction was significantly reduced at 0.15 and 0.34 mg a.i./l when compared to the solvent control. All young produced during the study appeared normal.

Adult daphnid lengths at 0.15 and 0.34 mg a.i./l were significantly lower than those of the pooled controls (Table 4, attached). There was 100% mortality at the two highest test concentrations so no length data were available for these levels.

The results of water quality monitoring were presented in Table 6 (attached). The pH of the test solutions ranged from 8.1 to 8.4. Dissolved oxygen saturation ranged from 77 to 104% at 22 and 21°C, respectively. The temperature of the test solutions at the daily recordings was 20-22°C during the study.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**

The maximum acceptable toxicant concentration (MATC) limits were estimated to be >0.078 and <0.15 mg a.i./l (mean measured concentrations) resulting in a geometric mean MATC of 0.108 mg a.i./l.

Quality Assurance and GLP Compliance Statements were included in the report indicating adherence to USEPA GLP Regulations (40 CFR 160).

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:**

A. **Test Procedure:** Since an SEP for conducting daphnid flow-through chronic tests are not available at the present time, ASTM guidelines were used in the data validation process. The test procedures were generally in accordance with the ASTM (1992), but deviated as follows:

Dry weight is the appropriate growth measure rather than length measurements. The authors used length as the growth endpoint in this test.

At least once during the test, the hardness, alkalinity, and conductivity of the highest test concentration should have been measured.

B. **Statistical Analysis:** Survival after 21 days was analyzed using one-way ANOVA and Dunnett's test (Toxstat Version 3.3). Survival at 0.15 and 0.34 mg a.i./l was significantly lower than survival in the solvent control (see attached printout 1). No daphnids survived to test termination in the two highest concentrations. Solvent control survival was significantly lower than dilution water control survival. The 21-day EC₅₀ was determined using EPA's

Toxanal program. The results were the same as the authors' (see attached printout 2).

The reviewer used Williams' test (Toxstat Version 3.3) to analyze the average number of young produced per adult reproductive day after 21 days. Reproduction was not affected by the concentrations of RH-7592 <0.15 mg a.i./l (see attached printout 3). Dilution water control reproduction was significantly lower than solvent control reproduction. The number of days to first brood release was not analyzed by the reviewer.

One-hundred percent mortality occurred in several replicates of the two highest concentrations. Therefore, adult daphnid length was analyzed using one-way ANOVA (Crunch Version 3) and Bonferroni's test rather than two-way ANOVA. Length was significantly reduced at 0.15 and 0.34 mg a.i./l (see attached printout 4). There was no statistical difference between dilution water control and solvent control lengths.

C. **Discussion/Results:** This study is scientifically sound but does not meet the guideline requirements for a chronic, flow-through toxicity test using the freshwater invertebrate, *Daphnia magna*. This study only measured length for an estimate of growth. Length is not a good predictor of arthropod growth due to the characteristics of arthropod moult, a more appropriate measurement would have been to use dry weight. A repeat study is not required, even though the study is supplemental it is acceptable for the purpose of a risk assessment. The 21-day EC₅₀ was 0.10 mg a.i./l mean measured concentration. The MATC was >0.078 and <0.15 mg a.i./l (geometric mean MATC = 0.11 mg a.i./l).

D. **Adequacy of the Study:**

- (1) **Classification:** Supplemental.
- (2) **Rationale:** Dry weight should have been measured instead of length to determine growth.
- (3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER FOR STUDY:** Yes, 11-30-92.

REFERENCES: ASTM. 1992. Proposed Standard Guide for Conducting *Daphnia magna* Chronic Toxicity Tests in a Flow-Through System. Draft No. 5.

RIN 347795

EEB FENBUCONAZOLE REVIEW

Page _____ is not included in this copy.

Pages 8 through 11 are not included.

The material not included contains the following type of information:

- Identity of product inert ingredients.
- Identity of product impurities.
- Description of the product manufacturing process.
- Description of quality control procedures.
- Identity of the source of product ingredients.
- Sales or other commercial/financial information.
- A draft product label:
- The product confidential statement of formula.
- Information about a pending registration action.
- FIFRA registration data.
- The document is a duplicate of page(s) _____.
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418750-07, RH-7592, daphnid survival after 21 days
 File: a:41875007.dt1 Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro Wilks test for normality

D = 0.182
 W = 0.949
 Critical W (P = 0.05) (n = 20) = 0.905
 Critical W (P = 0.01) (n = 20) = 0.868

Data PASS normality test at P=0.01 level. Continue analysis.

Bartlett's test for homogeneity of variance

Calculated B statistic = 3.32
 Table Chi-square value = 13.28 (alpha = 0.01)
 Table Chi-square value = 9.49 (alpha = 0.05)
 Average df used in calculation ==> df (avg n - 1) = 3.00
 Used for Chi-square table value ==> df (#groups-1) = 4

Data PASS homogeneity test at 0.01 level. Continue analysis.

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CTRL) MEAN = 1.0492 CALCULATED t VALUE = -3.3705
 GRP2 (BLANK CTRL) MEAN = 1.2136 DEGREES OF FREEDOM = 6
 DIFFERENCE IN MEANS = -0.1644

TABLE t VALUE (0.05 (2), 6) = 2.447** SIGNIFICANT DIFFERENCE at alpha=0.05
 TABLE t VALUE (0.01 (2), 6) = 3.707 NO significant difference at alpha=0.01

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	4	3.584	0.896	74.009
Within (Error)	15	0.182	0.012	
Total	19	3.765		

Critical F value = 3.06 (0.05,4,15)
 Since F > Critical F REJECT Ho:All groups equal

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	solvent control	1.049	0.750		
2	dilution contrl	1.214	0.875	-2.113	
3	0.078	1.178	0.850	-1.657	
4	0.15	0.235	0.050	10.465	*
5	0.34	0.352	0.125	8.962	*

Dunnnett table value = 2.36 (1 Tailed Value, P=0.05, df=15,4)

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	solvent control	4			
2	dilution contrl	4	0.172	22.9	-0.125
3	0.078	4	0.172	22.9	-0.100
4	0.15	4	0.172	22.9	0.700
5	0.34	4	0.172	22.9	0.625

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NOTE: BECAUSE THERE WAS CONTROL MORTALITY, AND NONE OF THE LOWER CONCENTRATIONS PRODUCED ZERO MORTALITY, THE DATA HAS BEEN SUBJECTED TO ABBOTT'S CORRECTION.

RIFICI RH-7592 DAPHNIA MAGNA 11-30-92

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
1.2	30.76923	30.76923	100	4.656613E-08
.57	30.76923	30.76923	100	4.656613E-08
.34	30.76923	25.76923	83.75	9.609761E-03
.15	30.76923	28.76923	93.5	2.314337E-05
.078	40	6	15	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS .103201

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS
1	7.051465E-02	.103201	9.434739E-02 - 0.1128009

.1128009 LMC 11/30/92

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	1.856116	7.298115	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.524496
 95 PERCENT CONFIDENCE LIMITS = -1.277255 AND 8.326246

LC50 = .1173972
 95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = 5.120617E-02
 95 PERCENT CONFIDENCE LIMITS = 0 AND .1161218

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418750-07, RH-7592, daphnid young/reproductive day
 File: a:41875007.dt2 Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

 D = 9.793
 W = 0.978
 Critical W (P = 0.05) (n = 20) = 0.905
 Critical W (P = 0.01) (n = 20) = 0.868

Data PASS normality test at P=0.01 level. Continue analysis.

Bartlett's test for homogeneity of variance

 Calculated B statistic = 3.59
 Table Chi-square value = 13.28 (alpha = 0.01)
 Table Chi-square value = 9.49 (alpha = 0.05)
 Average df used in calculation ==> df (avg n - 1) = 3.00
 Used for Chi-square table value ==> df (#groups-1) = 4

Data PASS homogeneity test at 0.01 level. Continue analysis.

t-test of Solvent and Blank Controls Ho: GRP1 MEAN = GRP2 MEAN

 GRP1 (SOLVENT CTRL) MEAN = 11.0500 CALCULATED t VALUE = 2.6823
 GRP2 (BLANK CTRL) MEAN = 9.4750 DEGREES OF FREEDOM = 6
 DIFFERENCE IN MEANS = 1.5750

TABLE t VALUE (0.05 (2), 6) = 2.447** SIGNIFICANT DIFFERENCE at alpha=0.05
 TABLE t VALUE (0.01 (2), 6) = 3.707 NO significant difference at alpha=0.01

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	solvent control	4	11.050	11.050	11.050
2	dilution contrl	4	9.475	9.475	10.350
3	0.078	4	11.225	11.225	10.350
4	0.15	4	5.300	5.300	5.513
5	0.34	4	5.725	5.725	5.513

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
solvent control	11.050				
dilution contrl	10.350	1.225		1.75	k= 1, v=15
0.078	10.350	1.225		1.84	k= 2, v=15
0.15	5.513	9.692	*	1.87	k= 3, v=15
0.34	5.513	9.692	*	1.88	k= 4, v=15

s = 0.808

Note: df used for table values are approximate when v > 20.

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Analysis of Variance

File: rh

Date: 11-30-1992

N's, means and standard deviations based on dependent variable: LENGTH

* Indicates statistics are collapsed over this factor

Factors: T	N	Mean	S.D.
*	106	4.3425	0.2445
1	30	4.4083	0.1876
2	35	4.4143	0.1678
3	34	4.3294	0.1523
4	2	3.8750	0.7425
5	5	3.7200	0.2706

Fmax for testing homogeneity of between subjects variances: 23.76
 Number of variances= 5 df per variance= 5.

Analysis of Variance		Dependent variable: LENGTH			
Source	df	SS (H)	MSS	F	P
Between Subjects	105	6.2790			
T (TRT)	4	2.6909	0.6727	18.936	0.0000
Subj w Groups	101	3.5881	0.0355		

Post-hoc tests for factor T (TRT)

Level	Mean	
1	4.408	solvent control
2	4.414	dilution water control
3	4.329	0.078 mg/L
4	3.875	0.15
5	3.720	0.24

Comparison	Bonferroni	Dunnnett
1 < 2		
1 > 3		
1 > 4	0.0020	0.0100
1 > 5	0.0000	0.0100
2 > 3		N.A.
2 > 4	0.0016	N.A.
2 > 5	0.0000	N.A.
3 > 4	0.0130	N.A.
3 > 5	0.0000	N.A.
4 > 5		N.A.

For Dunnnett's test only the P-values .05 and .01 are possible and only for comparisons with the control mean (level 1).

TITLE: 418750-07, RH-7592, daphnid survival after 21 days
 FILE: a:41875007.dt1
 TRANSFORM: ARC SINE(SQUARE ROOT(Y)) NUMBER OF GROUPS: 5

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	solvent control	1	0.7000	0.9912
1	solvent control	2	0.7000	0.9912
1	solvent control	3	0.8000	1.1071
1	solvent control	4	0.8000	1.1071
2	dilution contrl	1	0.9000	1.2490
2	dilution contrl	2	0.9000	1.2490
2	dilution contrl	3	0.9000	1.2490
2	dilution contrl	4	0.8000	1.1071
3	0.078	1	0.8000	1.1071
3	0.078	2	0.8000	1.1071
3	0.078	3	0.9000	1.2490
3	0.078	4	0.9000	1.2490
4	0.15	1	0.0000	0.1588
4	0.15	2	0.0000	0.1588
4	0.15	3	0.0000	0.1588
4	0.15	4	0.2000	0.4636
5	0.34	1	0.2000	0.4636
5	0.34	2	0.2000	0.4636
5	0.34	3	0.0000	0.1588
5	0.34	4	0.1000	0.3218

TITLE: 418750-07, RH-7592, daphnid young/reproductive day
 FILE: a:41875007.dt2
 TRANSFORM: NO TRANSFORMATION NUMBER OF GROUPS: 5

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	solvent control	1	11.9000	11.9000
1	solvent control	2	11.8000	11.8000
1	solvent control	3	10.6000	10.6000
1	solvent control	4	9.9000	9.9000
2	dilution contrl	1	10.3000	10.3000
2	dilution contrl	2	8.8000	8.8000
2	dilution contrl	3	9.7000	9.7000
2	dilution contrl	4	9.1000	9.1000
3	0.078	1	10.8000	10.8000
3	0.078	2	11.1000	11.1000
3	0.078	3	11.7000	11.7000
3	0.078	4	11.3000	11.3000
4	0.15	1	4.5000	4.5000
4	0.15	2	5.4000	5.4000
4	0.15	3	6.0000	6.0000
4	0.15	4	5.3000	5.3000
5	0.34	1	4.5000	4.5000
5	0.34	2	5.4000	5.4000
5	0.34	3	7.3000	7.3000
5	0.34	4	5.7000	5.7000

Data listing

File: rh

Date: 11-30-1992

FILTER: None

Obs.	TRT	REP	LENGTH
1	1	1	4.55
2	1	1	4.55
3	1	1	4.60
4	1	1	4.25
5	1	1	4.40
6	1	1	4.45
7	1	1	4.35
8	1	2	4.10
9	1	2	4.65
10	1	2	4.55
11	1	2	4.65
12	1	2	4.50
13	1	2	4.55
14	1	2	4.25
15	1	3	4.65
16	1	3	4.50
17	1	3	4.60
18	1	3	4.50
19	1	3	4.40
20	1	3	4.05
21	1	3	4.65
22	1	3	4.25
23	1	4	4.15
24	1	4	4.40
25	1	4	4.10
26	1	4	4.25
27	1	4	4.30
28	1	4	4.25
29	1	4	4.60
30	1	4	4.20
31	2	1	4.60
32	2	1	4.50
33	2	1	4.45
34	2	1	4.60
35	2	1	4.60
36	2	1	4.55
37	2	1	4.10
38	2	1	4.65
39	2	1	4.50
40	2	2	4.15
41	2	2	4.50
42	2	2	4.40
43	2	2	4.45
44	2	2	4.20
45	2	2	4.10
46	2	2	4.55
47	2	2	4.40
48	2	2	4.60
49	2	3	4.40
50	2	3	4.50
51	2	3	4.30
52	2	3	4.55
53	2	3	4.40
54	2	3	4.25
55	2	3	4.45
56	2	3	4.20
57	2	3	4.40
58	2	4	4.35
59	2	4	4.05
60	2	4	4.45
61	2	4	4.25
62	2	4	4.65
63	2	4	4.50
64	2	4	4.60

65	2	4	4.30
66	3	1	4.30
67	3	1	4.50
68	3	1	4.05
69	3	1	4.45
70	3	1	4.50
71	3	1	4.35
72	3	1	4.25
73	3	1	4.30
74	3	2	4.35
75	3	2	4.30
76	3	2	4.25
77	3	2	4.05
78	3	2	4.50
79	3	2	4.40
80	3	2	4.20
81	3	2	4.50
82	3	3	4.50
83	3	3	4.55
84	3	3	4.25
85	3	3	4.00
86	3	3	4.35
87	3	3	4.30
88	3	3	4.45
89	3	3	4.15
90	3	3	4.55
91	3	4	4.20
92	3	4	4.25
93	3	4	4.40
94	3	4	4.55
95	3	4	4.25
96	3	4	4.15
97	3	4	4.25
98	3	4	4.50
99	3	4	4.30
100	4	3	3.35
101	4	3	4.40
102	5	1	3.40
103	5	1	3.90
104	5	3	3.90
105	5	4	3.95
106	5	4	3.45

