

Ultra-Low-Flush Toilets

Customer Satisfaction Survey



The Metropolitan Water District of Southern California
December 1999

The following study of residential ultra-low-flush toilets
was sponsored in its entirety by the
Metropolitan Water District of Southern California

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ULTRA-LOW-FLUSH TOILET PROGRAM

1999 Residential Customer Satisfaction Survey

**Prepared for
Metropolitan Water District of Southern California**

December 1999

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EXECUTIVE SUMMARY

OVERVIEW

Continuing with our tradition of supporting water and energy conservation programs, Honeywell DMC Services Inc. (HDMC) is pleased to provide this report documenting the findings of the *1999 Ultra-Low-Flush (ULF) Toilet Customer Satisfaction Survey*.

The purpose of the Customer Satisfaction Survey was to gather feedback from customers within the Metropolitan Water District of Southern California's (MWD) service area who received and installed one or more ULF toilets through either rebate or distribution programs. Customers surveyed are those who installed new ULF toilets in 1998 and 1999. Overall, thirteen ULF toilet models were surveyed. The objectives of the survey were to:

- 1) *gather feedback and opinions of the new ULF toilets;*
- 2) *determine customer satisfaction levels with each model surveyed and;*
- 3) *compare and rank the ULF toilet models based on customer-provided information.*

Both mail-back and phone questionnaires were employed to gather customer feedback. The responses of 1,300 survey participants from both venues have been tabulated for this report.

REPORT ORGANIZATION

The report is designed to first give an overview of the program, including key findings. Next, detailed findings are grouped by four large categories, then answers for each questionnaire item are tabulated. Percentages and raw data have equal value throughout since a sample of 100 customers per toilet model was chosen for this survey. Conclusions are provided at the end of the report. Within the appendices can be found: a listing of water agencies involved; the study methodology and operations; the cover letter for the mail-back survey and the two questionnaires and; response rates.

KEY FINDINGS

Toilet models were ranked according to customer responses on a scale of 1 to 10 with "10" being excellent. This method was used to determine model satisfaction.

- As indicated in Table 1 below, the American Standard Cadet 2164.1 was the top-rated toilet with a satisfaction level of 8.37. Closely following is the Toto CST703/CST704 with a rating of 8.25.
- The toilet with the lowest satisfaction rating is the Eljer Patriot with a rating of 5.91 followed by the Niagara N2202TP which had an average rating of 6.72.
- Refer to the 95% Confidence Intervals on page 7 for a closer look at the confidence intervals associated with each model.

**Table 1 - Average Overall Rating
(Highest to Lowest)**

Toilet Brand	Average Rating
American Standard Cadet 2164.1	8.37
Toto CST703/CST704	8.25
Mansfield Alto 130-160	7.88
Western Pottery Aris	7.82
St. Thomas Marathon #6201.0	7.70
Sterling Windham	7.48
Kohler Wellworth Lite	7.43
Universal-Rundle Atlas	7.42
Kohler Rialto K-3386	7.37
Briggs Altima	7.18
Briggs Abingdon	6.97
Niagara N2202TP	6.72
Eljer Patriot	5.91

Another means to determine model satisfaction is based on tabulating how many customers per brand rated their ULF toilets highly using the same scale, with "high" being a rating of "8", "9", or "10".

- Data indicates that the Toto CST703/CST704 ranked the highest based on this criteria followed closely by the American Standard Cadet 2164.1.
- The Eljer Patriot received the lowest number of "highly satisfied" responses.

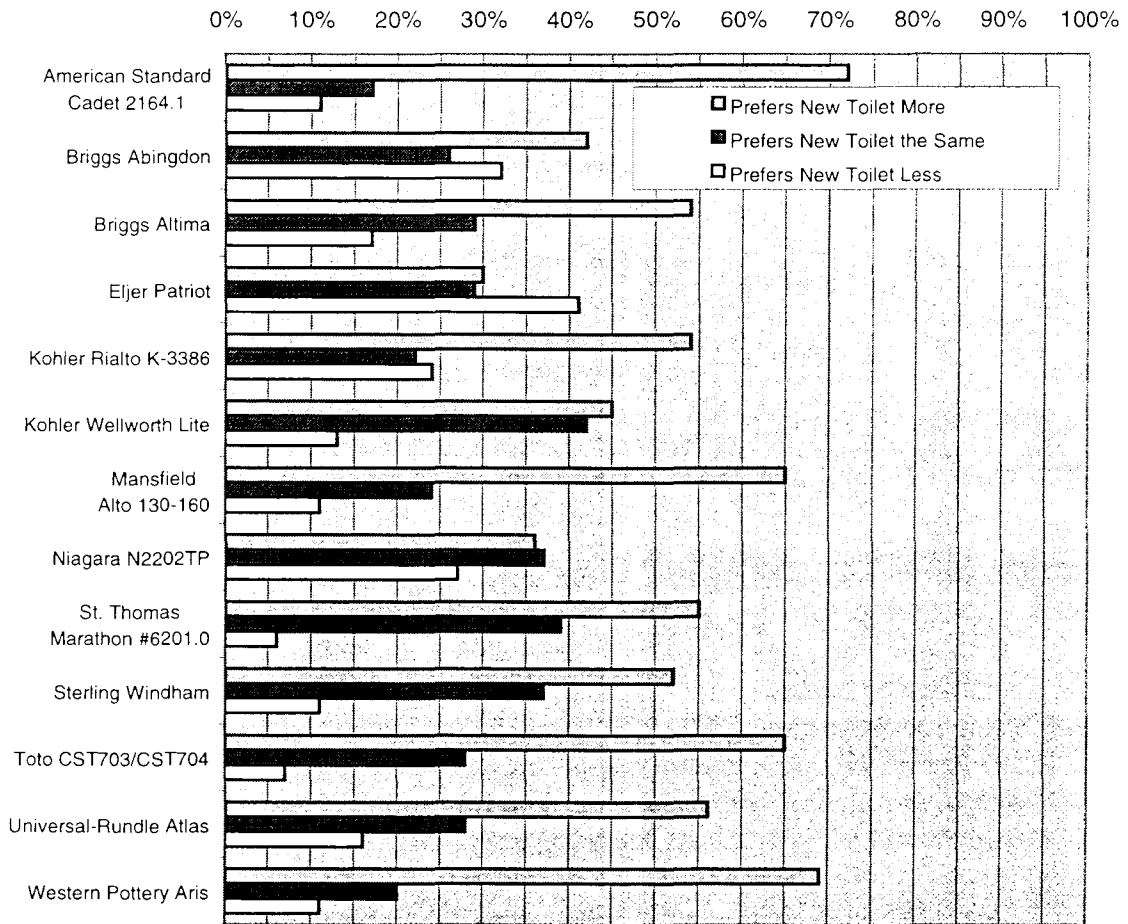
Table 2 - Percentage of Models Rated from 8 - 10

Toilet Brand	%
Toto CST703/CST704	78
American Standard Cadet 2164.1	76
Western Pottery Aris	74
Mansfield Alto 130-160	71
St. Thomas Marathon #6201.0	66
Kohler Rialto K-3386	63
Universal-Rundle Atlas	63
Kohler Wellworth Lite	60
Sterling Windham	55
Briggs Abingdon	54
Briggs Altima	52
Niagara N2202TP	50
Eljer Patriot	39

New ULF toilets were also compared to old toilets to measure relative satisfaction.

- Overall, most customers prefer their new ULF toilets to their old toilets.
- The American Standard Cadet 2164.1 ranked the highest with 72% of respondents reporting that they preferred their new ULF toilet over their old toilet. Western Pottery Aris followed with 69%. The Toto CST703/CST704 and Mansfield Alto 130-160 both had 65% of customers preferring them to their old toilets.
- The Eljer Patriot is the only toilet where some customers (41%) found their new ULF toilet less desirable than their old toilet.
- Customers exhibited a noticeable indifference toward the Kohler Wellworth Lite and the Niagara N2202TP with a high percentage for each responding that they like their new ULF toilet the same as their old toilet.
- Figure 1 on the following page shows how customers responded to each toilet model surveyed.

Fig. 1 - Preference of New Toilet Compared to Old Toilet



DETAILED FINDINGS

The table below contains the average rating and its associated 95% confidence limits for all models surveyed using a scale of 1-10. Findings include information calculated from the sample data only.

**Table 3 - Distributions of Sample and Upper and Lower 95% Confidence Ratings
(Highest Average to Lowest Average)**

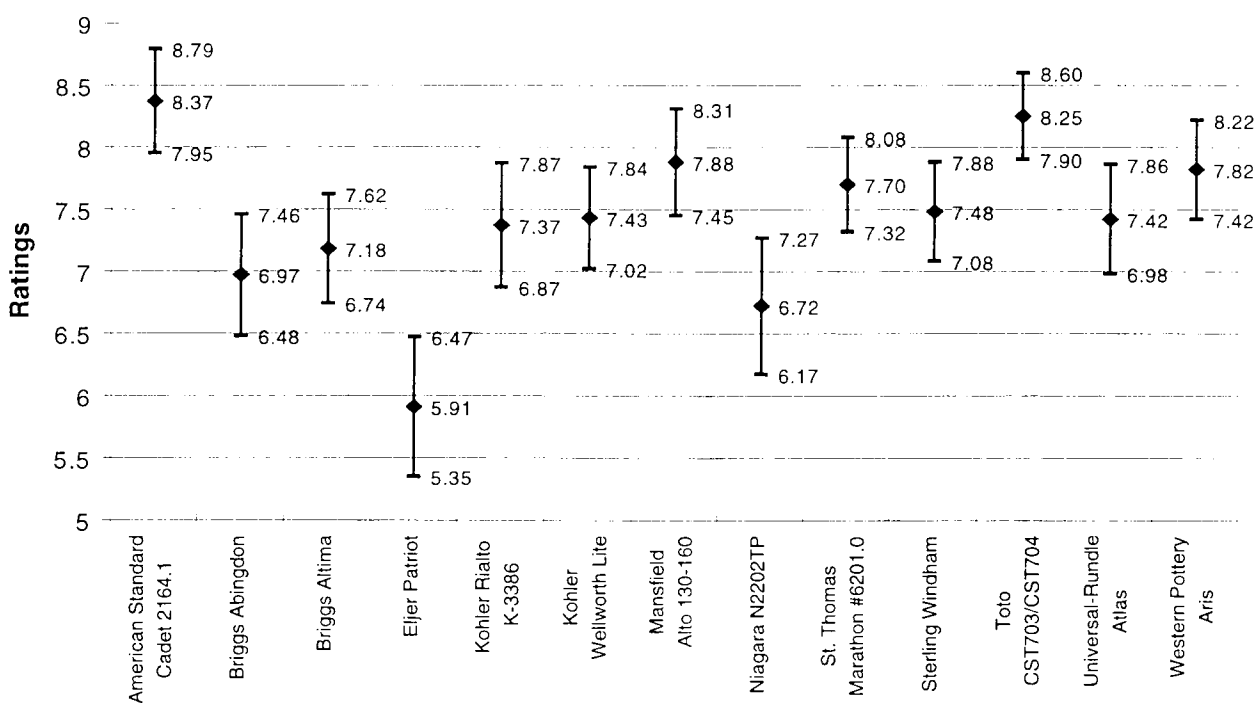
Toilet Brand	Source Agency	Sample Size	Average Rating	Lower 95% Limit	Upper 95% Limit
Am. Standard Cadet 2164.1	L.A. Dept. of W & P	100	8.37	8.37	8.79
Toto CST703/CST704	City of Tustin	100	8.25	7.90	8.60
Mansfield Alto 130-160	City of San Diego	100	7.88	7.45	8.31
Western Pottery Aris	Mesa Consolidated W.D.	16	7.82	7.42	8.22
	Other*	84			
St. Thomas Marathon #6201.0	L.A. Dept. of W & P	100	7.70	7.32	8.08
Sterling Windham	L.A. Dept. of W & P	100	7.48	7.08	7.88
Kohler Wellworth Lite	L.A. Dept. of W & P	100	7.43	7.02	7.84
Universal-Rundle Atlas	L.A. Dept. of W & P	100	7.42	6.98	7.86
Kohler Rialto K-3386	L.A. Dept. of W & P	100	7.37	6.87	7.87
Briggs Altima	City of Westminster	100	7.18	6.74	7.62
	City of Garden Grove	18			
Briggs Abingdon	City of Anaheim	17	6.97	6.48	7.46
	Other*	65			
Niagara N2202TP	So. Cal. Water Co.	100	6.72	6.17	7.27
	City of Huntington Beach	12			
Eljer Patriot	City of Garden Grove	11	5.91	5.35	6.47
	City of Orange	10			
	Other*	67			

* Other agencies contributed less than 10 completed surveys each.

The graph below displays the average rating and 95% confidence intervals in the form of a graph to facilitate brand comparison. The vertical lines represent the 95% confidence intervals for the average rating of each model. Average ratings are centered on the vertical lines.

The comparison of the ULF toilet brand rating information is based on the principles of "overlapping" and "non-overlapping" intervals. When the intervals of two brands overlap, it must be concluded there is no significant difference in the average rating of the two brands. Conversely, if the intervals of two brands are non-overlapping, it must be concluded that they have significantly different average satisfaction ratings. For example, the 95% interval for the American Standard Cadet 2164.1 does not overlap with the Briggs Abingdon; therefore, the two brands have significantly different average ratings. The American Standard Cadet 2164.1 is considered superior to the Briggs Abingdon since its lower interval limit is higher than the Briggs Abingdon's upper interval limit.

Fig. 2 - Average Rating and 95% Confidence Intervals for Each Model



Results of ULFT Model Comparison

- The American Standard Cadet 2164.1 is not rated significantly higher than the Toto CST703/CST704.
- Statistically, the Mansfield Alto130-160, Western Pottery Aris, and the St. Thomas Marathon are not significantly different from the two top rated toilets.

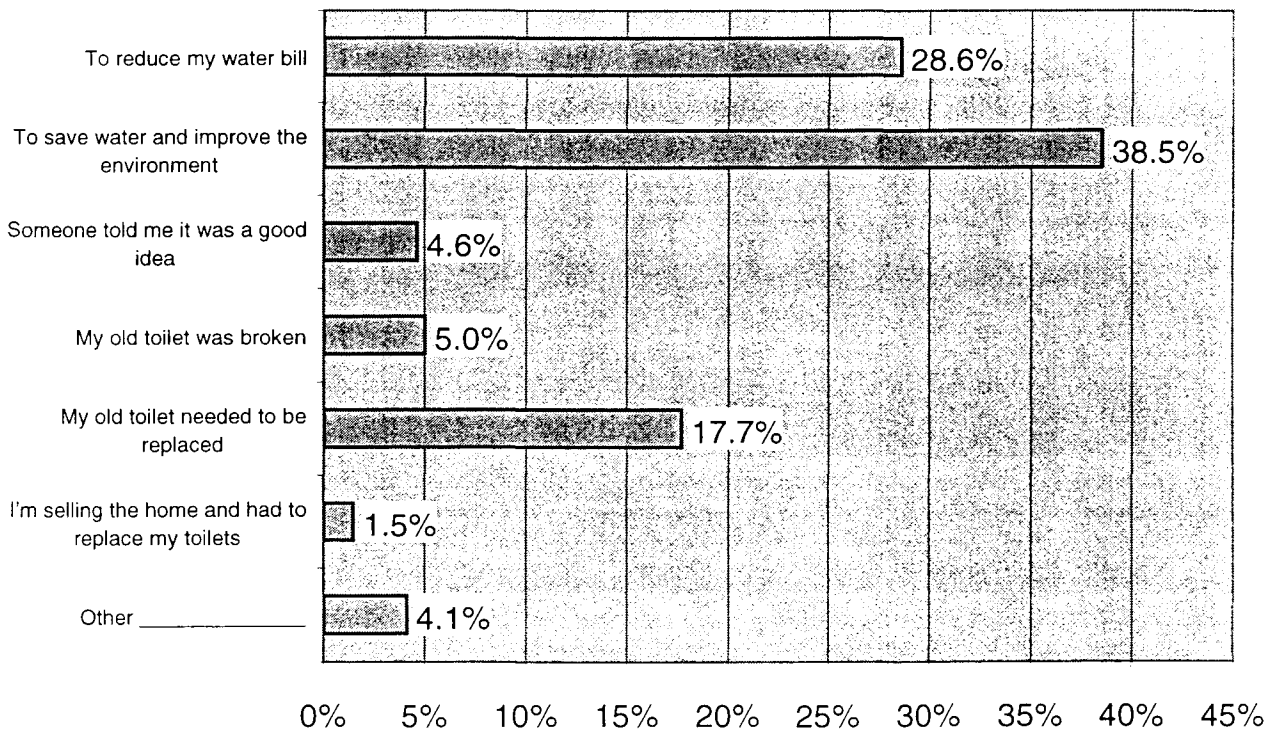
REASON NEW TOILET WAS INSTALLED

Question 1: Why did you decide to install the new low-flow toilet?

The figure below represents the collective responses for all thirteen models since customers did not necessarily choose the brand or model of toilet to be installed. This question was designed to establish the reasons why customers chose to install a new ULF toilet regardless of brand and model.

Customers were encouraged to check all applicable reasons for installing a new ULF toilet, and many respondents did cite more than one reason. The numbers in the chart below indicate the percentages of the total number of responses collected for this question, *not* the percentages of the total number of customers surveyed. The 1,300 customers polled provided a total of 2,133 responses. For example, 38.5% of the 2,133 total responses indicated that saving water and improving the environment contributed at least in part to the decision to install a new ULF toilet.

Fig. 3 - Reason For Installation

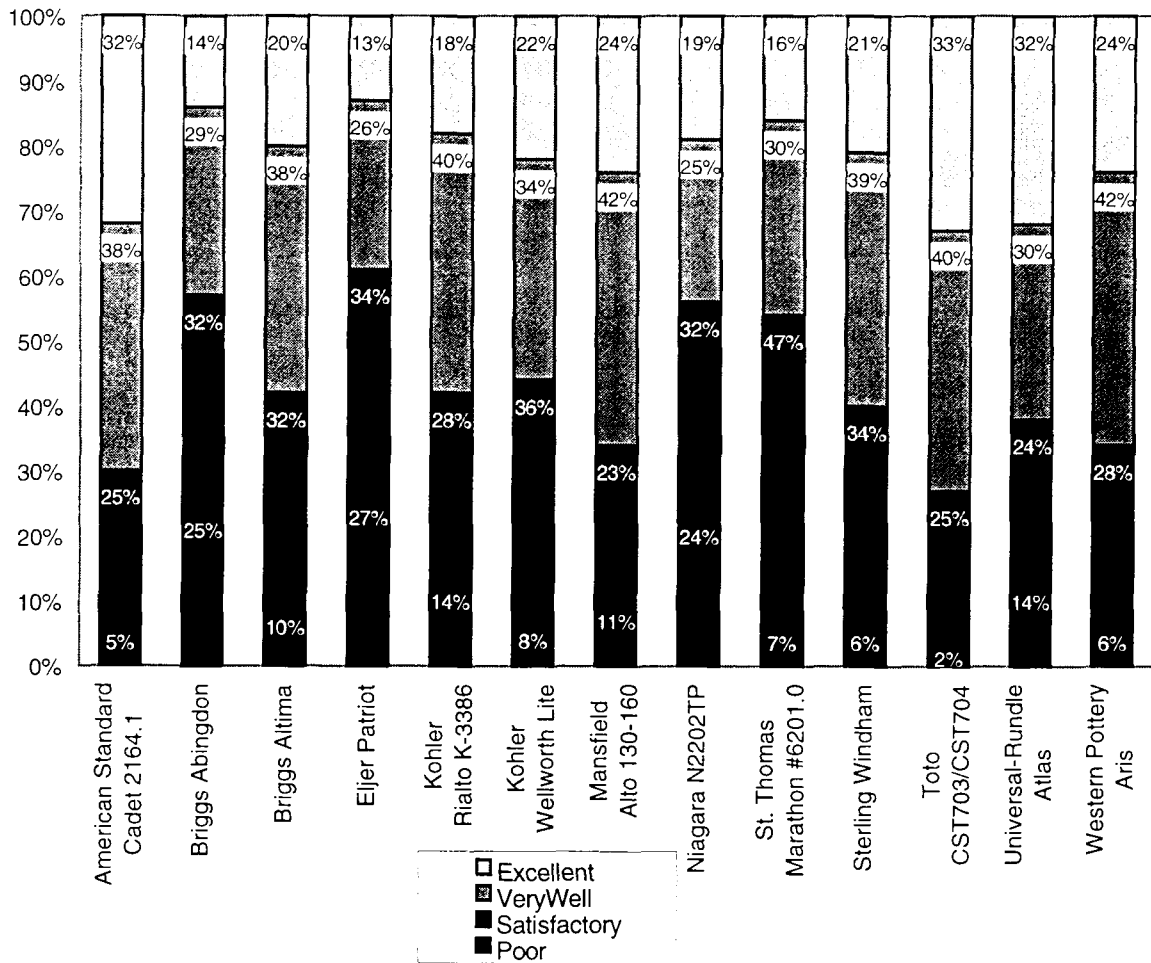


PERFORMANCE AND INSTALLATION

Question 2a: How well does the new low-flow toilet clear out the bowl on each flush?

This question refers primarily to how well the new ULF toilet removes solid waste from the bowl upon flushing. Clarification was provided to phone-survey respondents when requested.

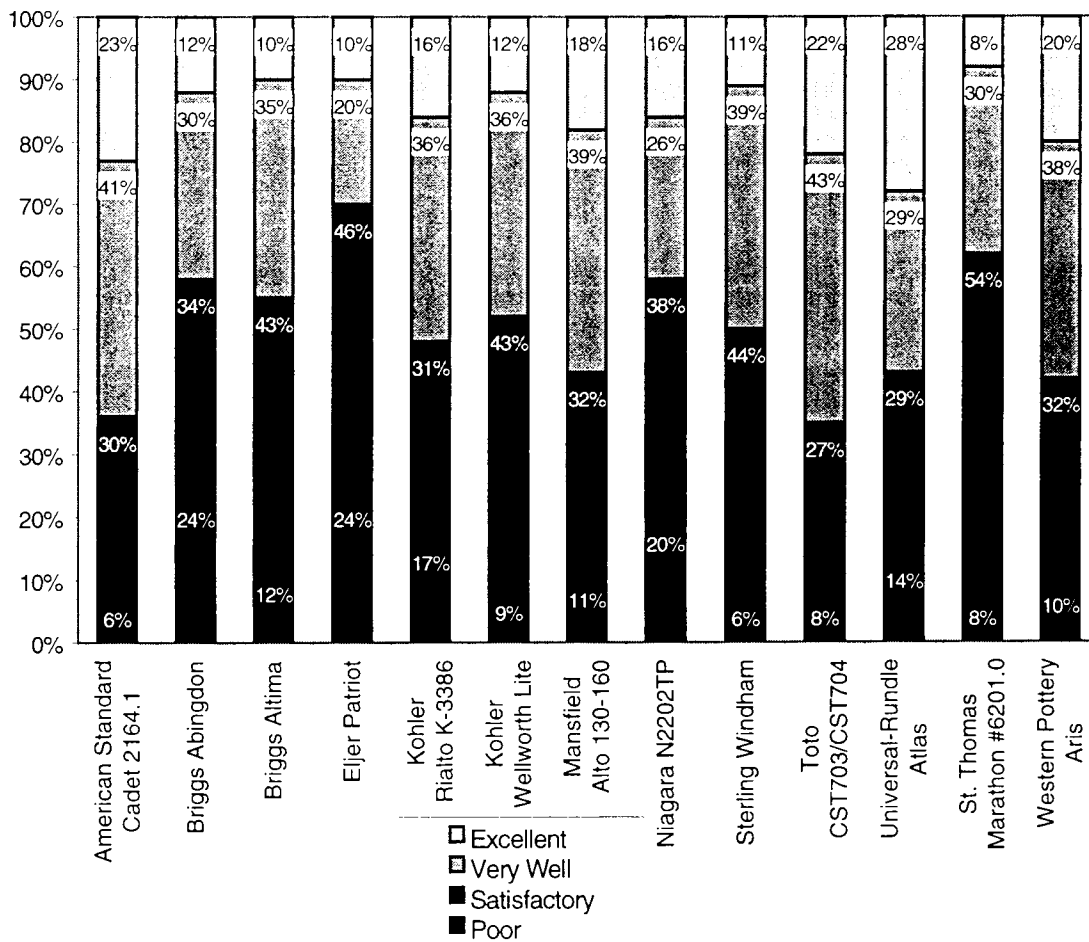
Fig. 4 - Clearing the Bowl



Question 2b: Using the same scale, how would you rate how well the toilet cleans the sides of the bowl?

Customers were asked to rate how well their new low-flow toilet removes solid wastes from the sides of the bowl. If clarification was needed, telemarketing staff asked respondents whether or not the use of toilet bowl brushes or other cleaning agents were required after flushing.

Fig. 5 - Cleaning the Bowl





Question 3: How often do you experience blocking or clogging - half of the time, a quarter of the time, once a month, or never?

This question is designed to gather feedback on toilet performance. Phone-survey customers who needed clarification on this question were asked how often they had to use a plunger or other means to unclog the toilet if it backed-up or overflowed.

Table 4 - Frequency of Blocking or Clogging

Toilet Brand Model	Half of the time	A quarter of the time	Once a month	Never
American Standard Cadet 2164.1	3	12	30	55
Briggs Abingdon	10	14	31	45
Briggs Altima	3	12	26	59
Eljer Patriot	19	19	37	25
Kohler Rialto K-3386	3	4	28	65
Kohler Wellworth Lite	5	8	33	54
Mansfield Alto 130-160	9	11	23	57
Niagara N2202TP	14	14	38	34
St. Thomas Marathon #6201.0	2	7	17	74
Sterling Windham	3	14	24	59
Toto CST703/CST704	0	6	28	66
Universal-Rundle Atlas	6	14	33	47
Western Pottery Aris	2	6	28	64

Question 4a: How often do you have to "double flush" to clear the bowl - half of the time, a quarter of the time, once a month, or never?*

Table 5 - Frequency of Double Flushing to Clear the Bowl

Toilet Brand Model	Half of the time	A quarter of the time	Once a month	Never
American Standard Cadet 2164.1	11	14	25	50
Briggs Abingdon	27	18	26	29
Briggs Altima	15	25	26	34
Eljer Patriot	34	30	26	10
Kohler Rialto K-3386	18	26	32	24
Kohler Wellworth Lite	10	19	33	38
Mansfield Alto 130-160	13	19	39	29
Niagara N2202TP	23	17	43	17
Sterling Windham	12	20	32	36
Toto CST703/CST704	4	21	37	38
Universal-Rundle Atlas	5	24	29	42
St. Thomas Marathon #6201.0	12	15	25	48
Western Pottery Aris	12	20	35	33

*Refers to solid waste

Question 4b: How often do you have to "double flush" to clean the sides of the bowl - half of the time, a quarter of the time, once a month, or never?

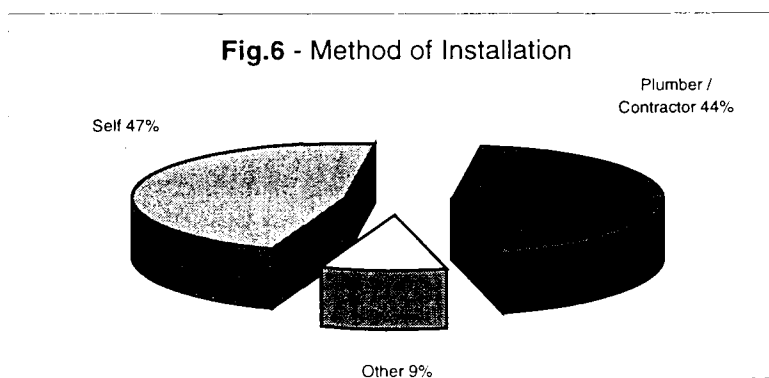
If prompting was required, customers were asked how often they had to flush to remove solid waste residue.

Table 6 - Frequency of Double Flushing to Clean the Bowl

Toilet Brand Model	Half of the time	A quarter of the time	Once a month	Never
American Standard Cadet 2164.1	6	12	31	51
Briggs Abingdon	23	17	25	35
Briggs Altima	17	16	32	35
Eljer Patriot	28	28	29	15
Kohler Rialto K-3386	13	27	29	31
Kohler Wellworth Lite	9	16	29	46
Mansfield Alto 130-160	12	19	36	33
Niagara N2202TP	19	14	39	28
St. Thomas Marathon #6201.0	7	16	24	53
Sterling Windham	6	22	28	44
Toto CST703/CST704	4	17	36	43
Universal-Rundle Atlas	9	16	28	47
Western Pottery Aris	11	20	31	38

Question 5a: Who installed your new low-flow toilet?

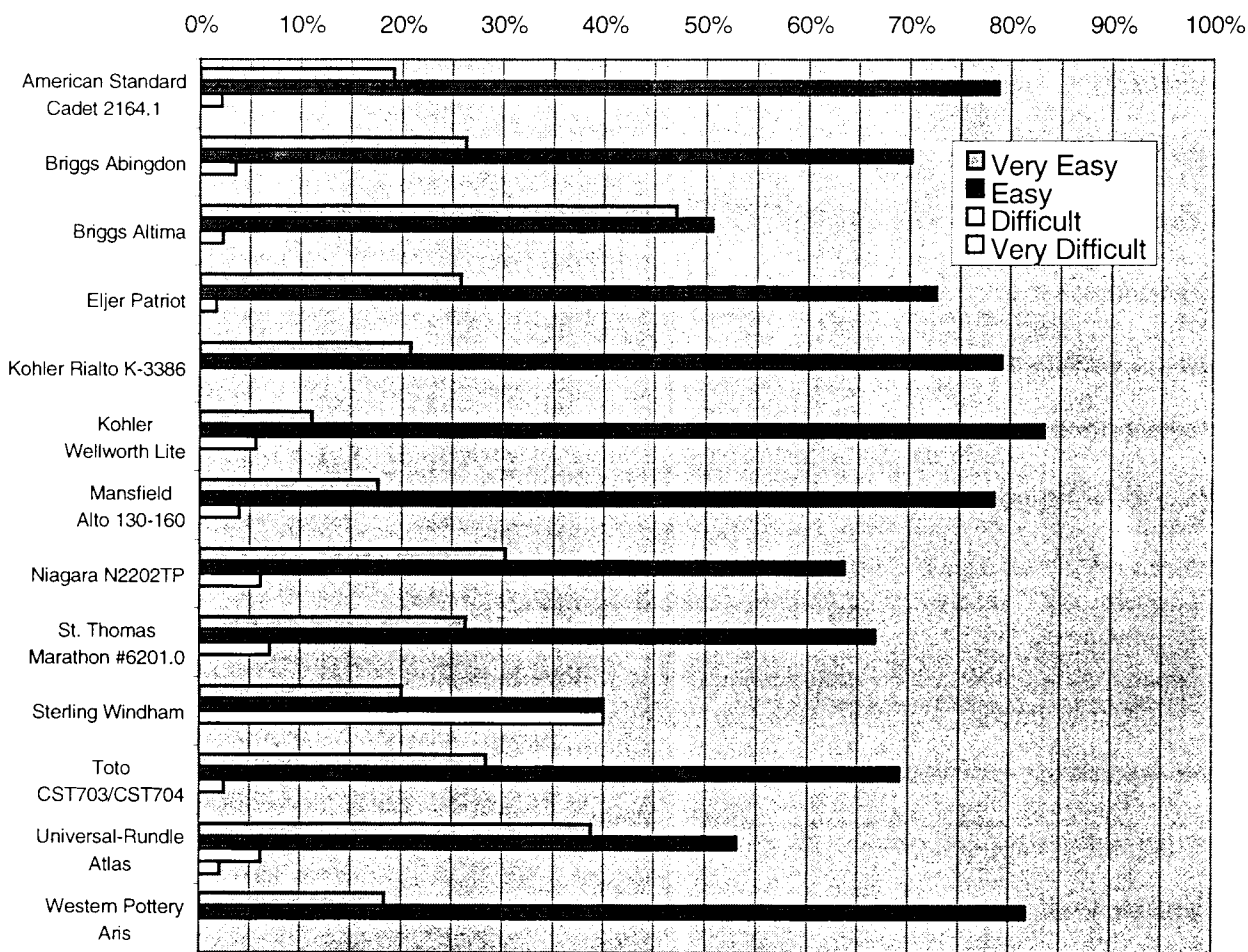
Most customers surveyed installed their new toilets themselves. The category "Other" refers to friends, volunteers, and other non-professionals.



Question 5b: If you installed the toilet yourself, how did you find the ease of installation?

As indicated below, most of the customers who installed their own ULF toilets found them easy to install. The only toilet for which any customers reported that installation was "Very Difficult" is the Universal-Rundle Atlas. Also, 40% of the Sterling Windham customers reported that their new ULF toilets were difficult to install.

Fig. 7 - Ease of Installation Per Model



OLD TOILET VS. NEW TOILET

Question 6: Compared to the old toilet, do you like your new toilet more, the same, or less than your old toilet?

Please refer the Figure 1 on page 4 for more details.

The following three tables rank toilet models from best to worst based on the column labeled "Less".

Question 7a: Compared to your old toilet, your new toilet clogs more, the same, or less than your old toilet?

**Table 7 - Frequency of Clogging Compared to Old Toilet
(Percentages)**

Toilet Brand Model	More	Same	Less	Total
St. Thomas Marathon #6201.0	11	21	68	100
Sterling Windham	16	22	62	100
American Standard Cadet 2164.1	14	25	61	100
Universal-Rundle Atlas	13	29	58	100
Briggs Altima	16	27	57	100
Western Pottery Aris	16	27	57	100
Mansfield Alto 130-160	22	23	55	100
Toto CST703/CST704	15	32	53	100
Niagara N2202TP	22	26	52	100
Briggs Abingdon	35	21	44	100
Kohler Rialto K-3386	34	30	36	100
Kohler Wellworth Lite	27	37	36	100
Eljer Patriot	48	23	29	100

Question 7b: Compared to your old toilet, your new toilet requires double-flushing more, the same, or less than your old toilet?

**Table 8 - Frequency of Double Flushing Compared to Old Toilet
(Percentages)**

Toilet Brand Model	More	Same	Less	Total
American Standard Cadet 2164.1	13	26	61	100
Universal-Rundle Atlas	20	20	60	100
Sterling Windham	24	18	58	100
St. Thomas Marathon #6201.0	27	15	58	100
Niagara N2202TP	32	16	52	100
Mansfield Alto 130-160	30	21	49	100
Western Pottery Aris	24	27	49	100
Briggs Altima	31	23	46	100
Toto CST703/CST704	33	26	41	100
Briggs Abingdon	42	19	39	100
Kohler Rialto K-3386	47	20	33	100
Kohler Wellworth Lite	31	38	31	100
Eljer Patriot	56	19	25	100

Question 7c: Compared to your old toilet, your new toilet requires bowl cleansing more, the same, or less than your old toilet?:*

**Table 9 - Frequency of Bowl Cleansing Compared to Old Toilet
(Percentages)**

Toilet Brand Model	More	Same	Less	Total
American Standard Cadet 2164.1	10	31	59	100
St. Thomas Marathon #6201.0	12	37	51	100
Universal-Rundle Atlas	13	37	50	100
Briggs Altima	14	38	48	100
Toto CST703/CST704	16	51	33	100
Niagara N2202TP	22	46	32	100
Kohler Rialto K-3386	33	37	30	100
Sterling Windham	12	59	29	100
Western Pottery Aris	13	61	26	100
Kohler Wellworth Lite	19	61	20	100
Mansfield Alto 130-160	16	64	20	100
Eljer Patriot	25	61	14	100
Briggs Abingdon	20	71	9	100

*e.g., using toilet bowl brush

OVERALL SATISFACTION

Question 8: Would you recommend your toilet to others?

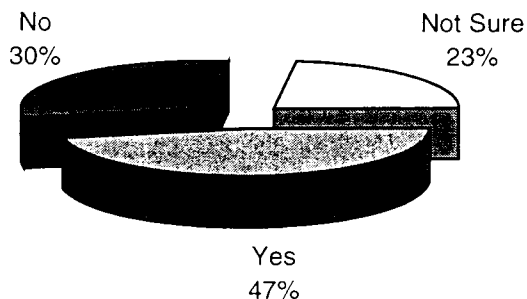
Table 10 ranks toilet models from best to worst based on the column labeled "Yes".

Table 10 - Percentage of Toilet Recommendations Per Model

Toilet Brand Model	Yes	No	Not Sure	Total
American Standard Cadet 2164.1	88	4	8	100
Toto CST703/CST704	87	2	11	100
Western Pottery Aris	83	12	5	100
St. Thomas Marathon #6201.0	82	4	14	100
Kohler Wellworth Lite	78	10	12	100
Kohler Rialto K-3386	77	16	7	100
Mansfield Alto 130-160	76	9	15	100
Universal-Rundle Atlas	76	12	12	100
Sterling Windham	69	5	26	100
Briggs Altima	69	12	19	100
Briggs Abingdon	61	26	13	100
Niagara N2202TP	59	24	17	100
Eljer Patriot	44	36	20	100

Question 9: Would you have purchased a new toilet if a free toilet (or rebate) were not available?

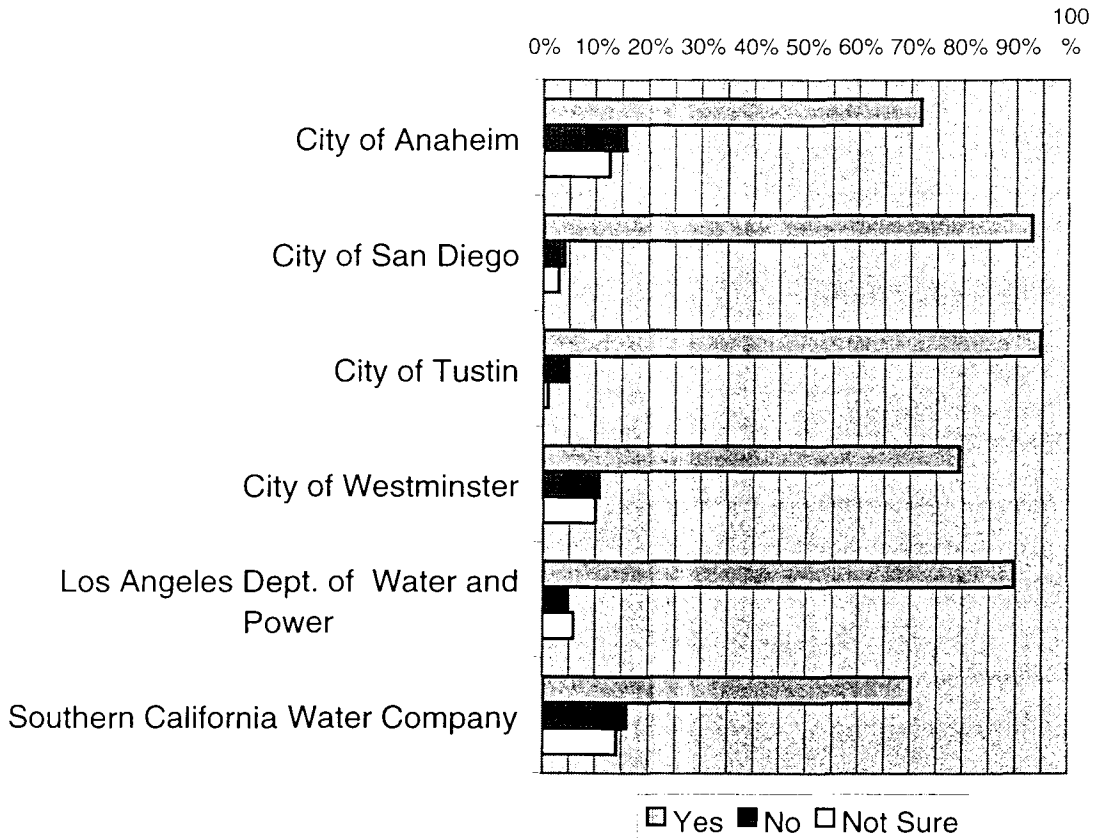
Fig. 8 - Percentage of Respondents Who Would Have Purchased a New Toilet Anyway



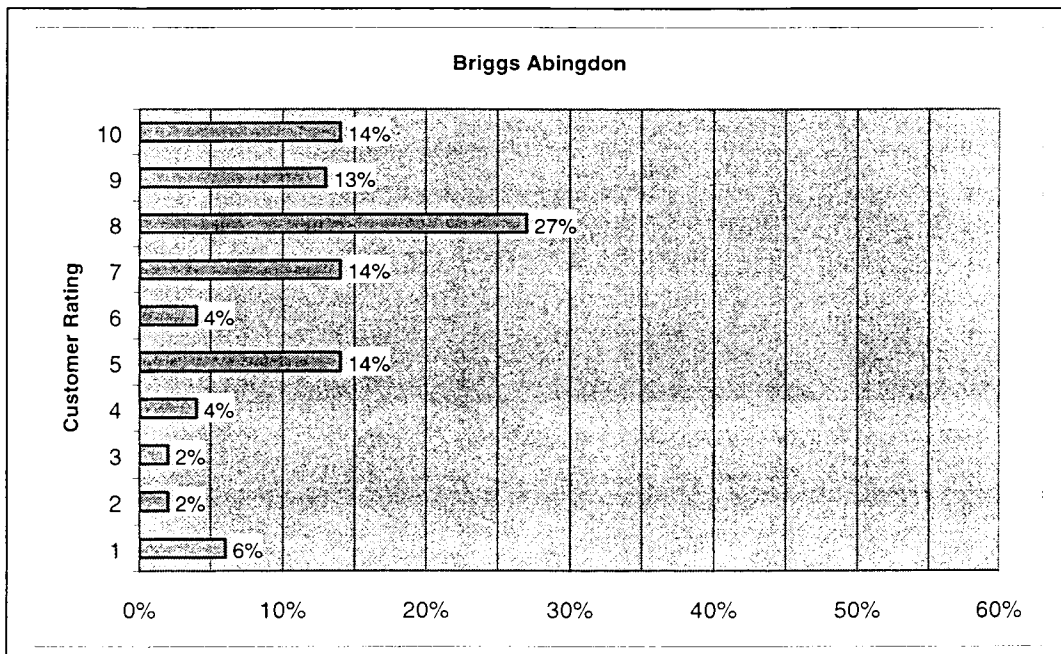
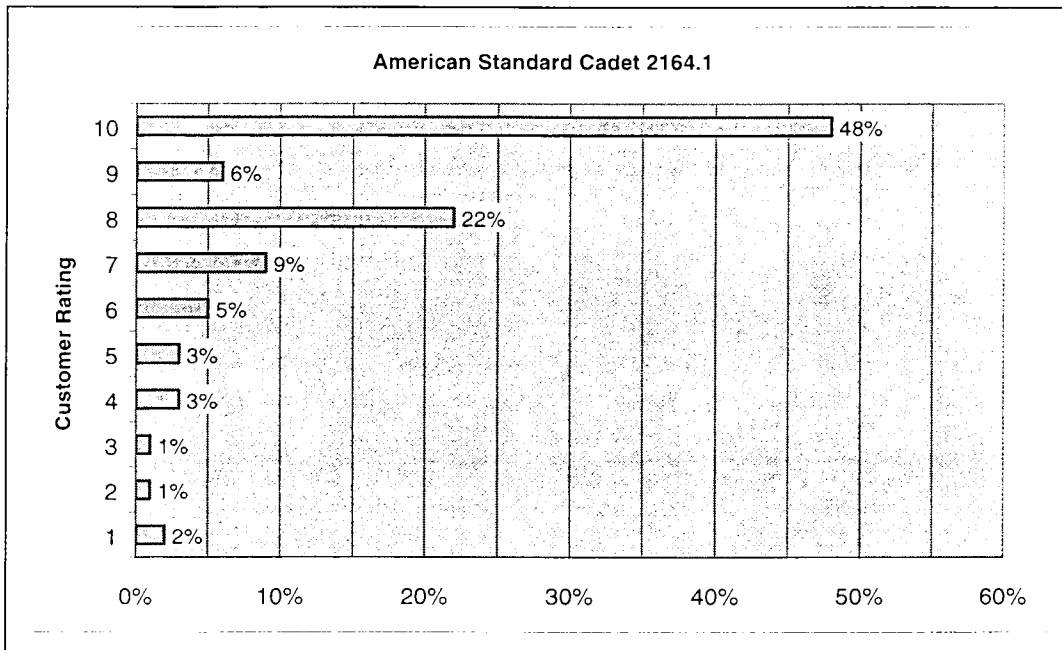
Question 10: Would you recommend the <<Agency>> toilet replacement programs to others?

The six agencies below were selected for this graph because their customers contributed a significant percentage of the surveys used in this study.

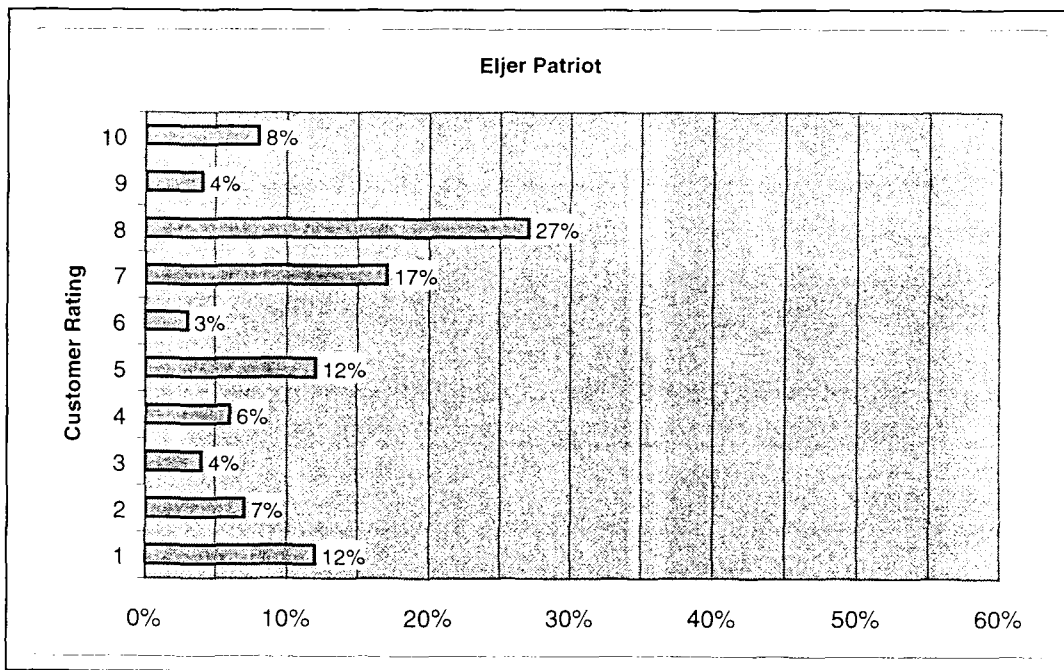
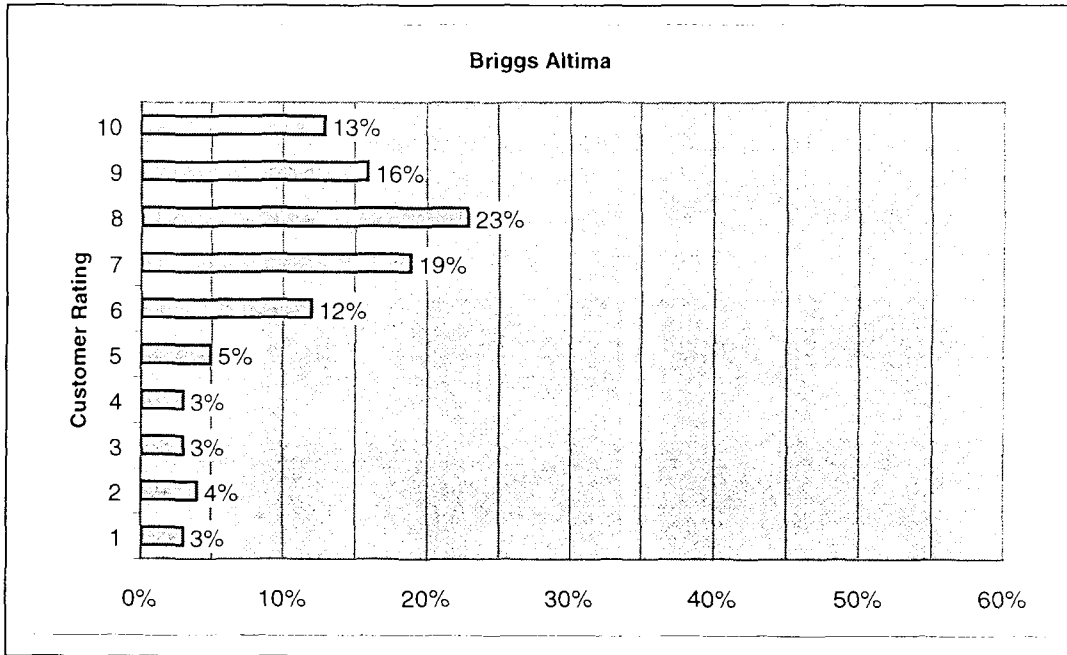
Fig. 9 - Agency Performance Based on Customer Recommendation of the Program

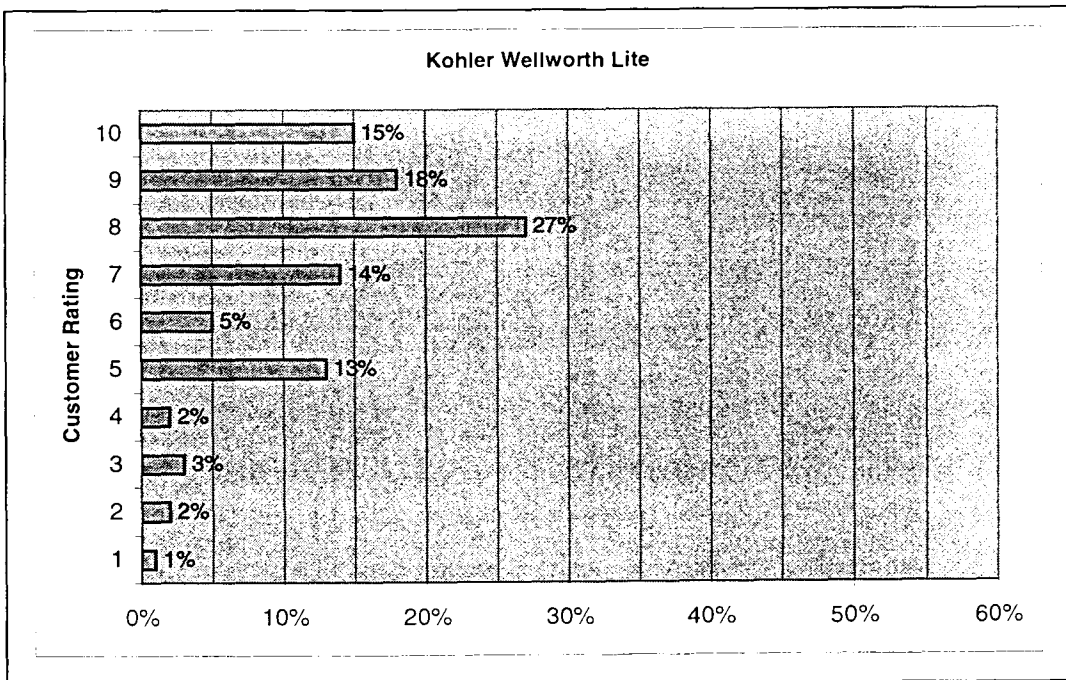
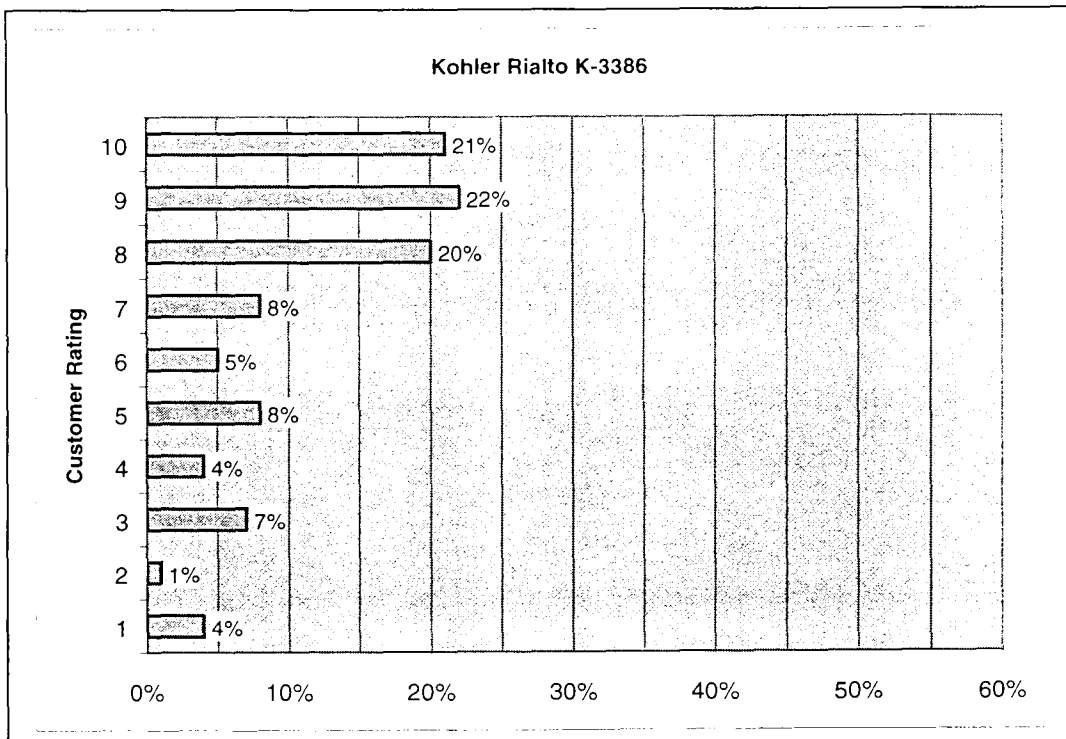


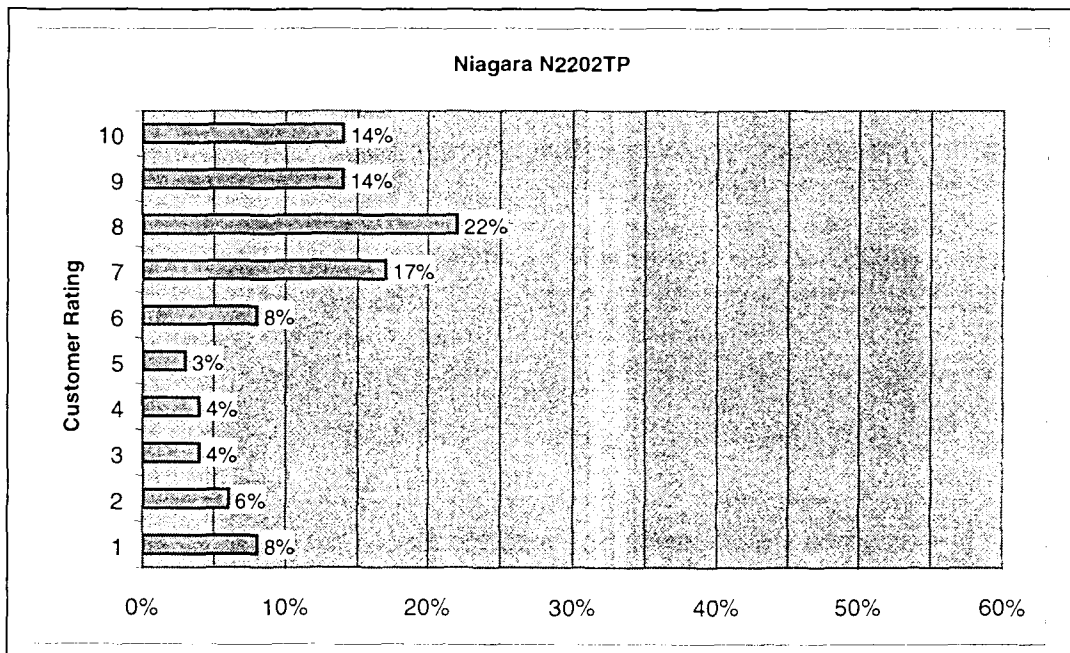
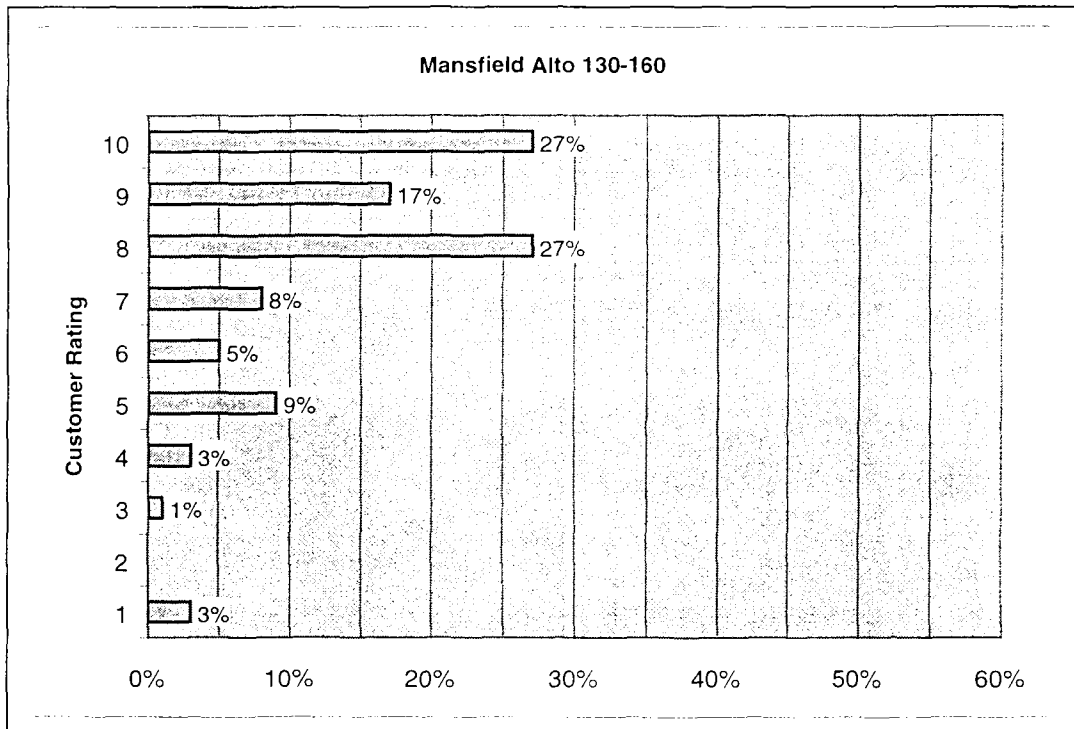
Question 11: Using a scale of 1 to 10, with "10" being excellent and "1" being totally unsatisfactory, how would you rate your new toilet?

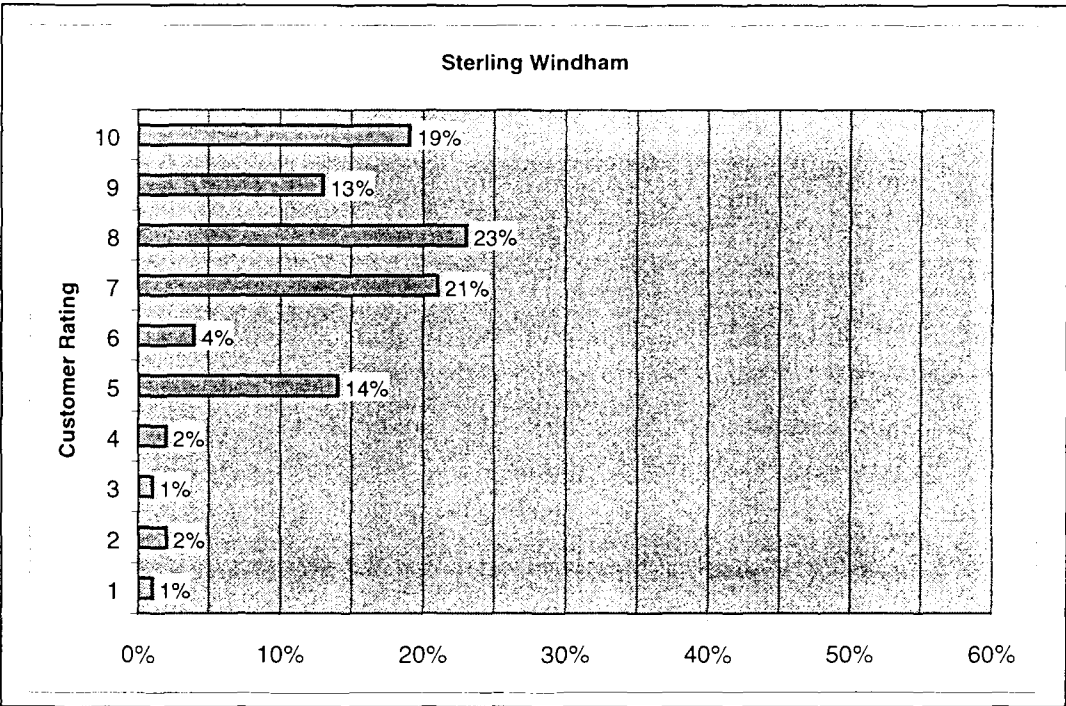
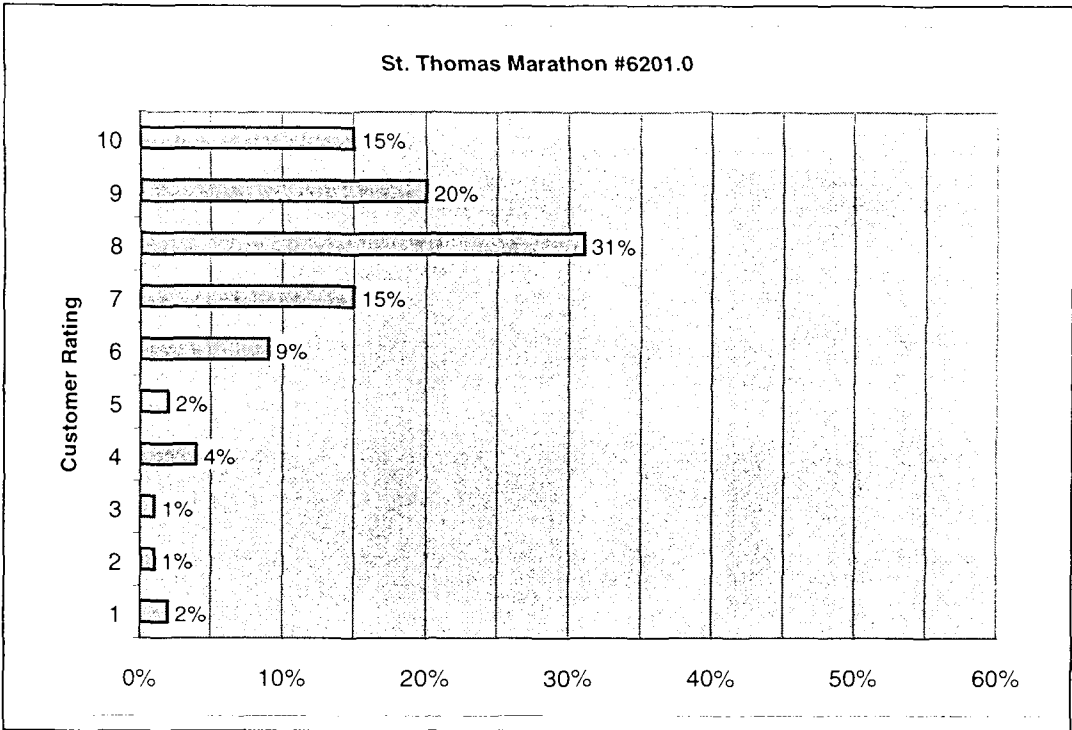


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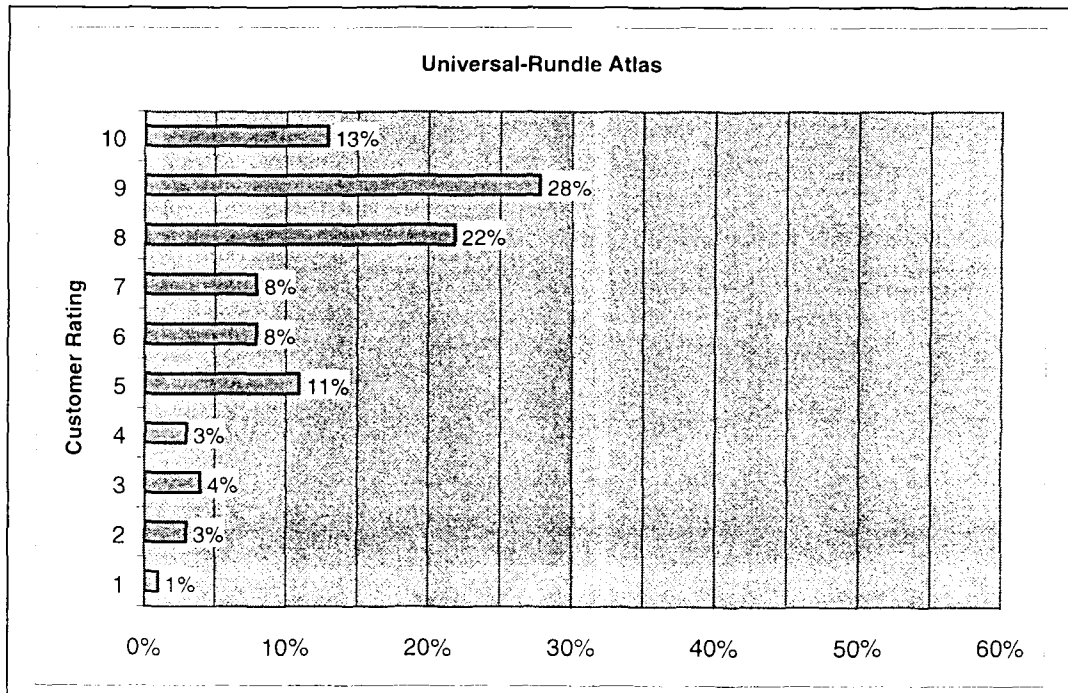
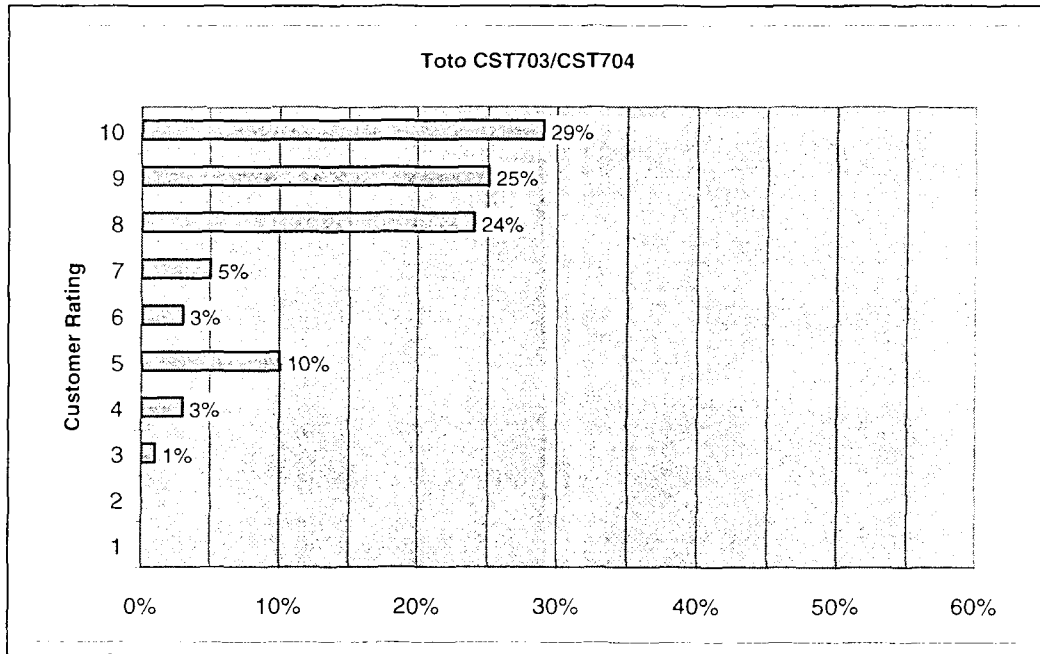


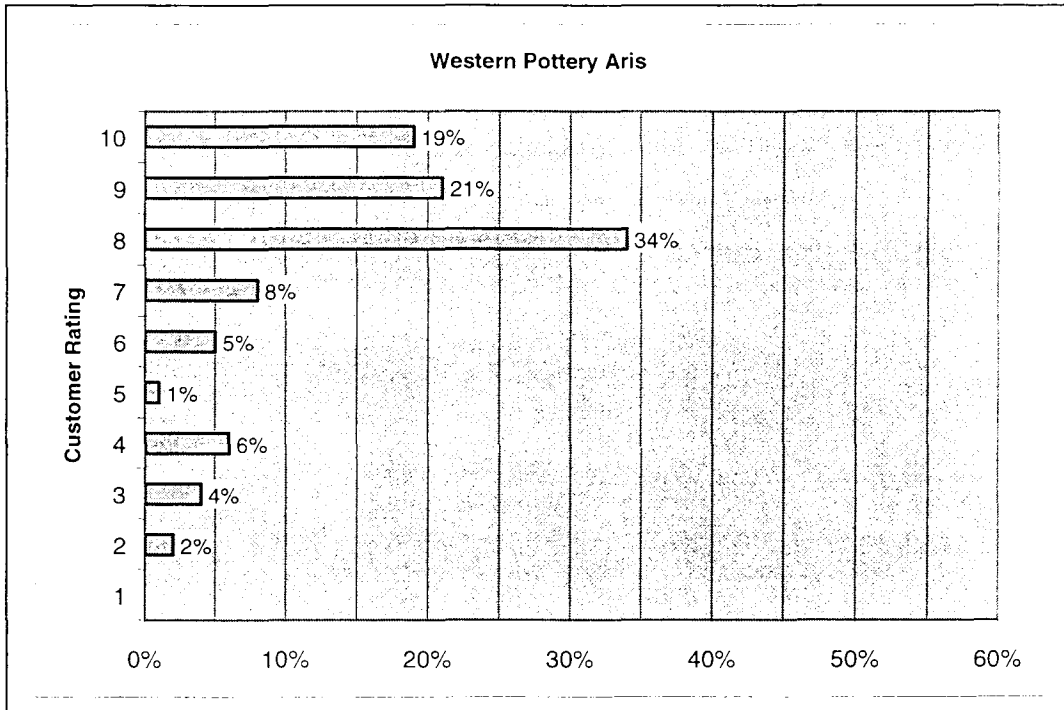






DMC





Question 12: If there were one thing you would want the manufacturer of your toilet to change, what would it be?

Responses in the table below are taken from both phone and mail-back surveys. It lists the three most common responses per brand (if available). It should be noted that many customer who completed the mail-back survey left this question unanswered.

Table 11 - Model Improvement Recommendations

Brand/Model	Manufacturers Improvements Recommended
American Standard Cadet 2164.1	-More flushing power -More water in the toilet bowl -A larger trapway for the waste to exit
Briggs Abingdon	-Water level too low -Sturdier parts -Design makes it difficult to clean
Briggs Altima	-The size of the toilet is too small -The toilet needs more water in it to flush -The tank lid needs to have more support
Eljer Patriot	-Stronger flush to eliminate clogging -Toilet needs to be raised higher -Needs more water
Kohler Rialto K-3386	-More flushing power -Non-stick sides -Seat and bowl are too small*
Kohler Wellworth Lite	-Improvements on the trim of toilet (chains, valves, handles) -Make toilet higher off ground -More water and power for flushing
Mansfield Alto 130-160	-Redesign to reduce clogs -More bolts to secure/anchor toilet -More flushing power
Niagara N2202TP	-More color selection** -A stronger flush -Larger toilet bowl
St. Thomas Marathon #6201.0	-Need better quality internal parts -Should have a better variety of colors** -Increase the water left in the bowl
Sterling Windham	-Larger toilet -Make them a little higher (for disabled people)*** -Better design to clean sides better
Toto CST703/CST704	-The tank lid is weak. It moves easily
Universal-Rundle Atlas	-More color options -More water pressure for flushing -Better handle (broken)
Western Pottery Aris	-Better quality toilet seat* -Stronger flush -More durable, non-plastic parts

* Toilet seats were not provided by the toilet manufacturer

** In water districts' free toilet distribution programs, the only color offered was white

*** ADA toilets were generally not available through water districts' free toilet distribution programs.



CONCLUSIONS

- The highest rated and lowest rated toilets are listed below. The results of this survey indicate that the American Standard Cadet 2164.1 is the highest rated ULF toilet among the brands and models surveyed. Results indicate that the Eljer Patriot is the least favorite of the toilets surveyed.

Highest Rated	Lowest Rated
American Standard Cadet 2164.1	Eljer Patriot
Toto CST703/CST704	Niagara N2202TP
Mansfield Alto 130-160	Briggs Abingdon

- The table below shows overall results from the 1999 Residential Customer Satisfaction Survey compared to results from the 1996 customer survey. Please note that the 1999 survey uses a 10 point scale as opposed to the 1996 survey which uses a 5 point scale.

**Table 13 - Comparison of Average Ratings Between
95-96 Survey and 98-99 Survey
(Highest to Lowest)**

1995-1996 AVERAGE RATINGS

Toilet Brand	Average Rating
1 Western Pottery	4.46
2 Toto	4.33
3 Sterling	4.32
4 American Standard	4.30
5 St. Thomas	4.22
6 Kohler (1996)	4.02
7 Universal	4.02
8 Briggs	3.83
9 Eljer	3.60

1998-1999 AVERAGE RATINGS

Toilet Brand	Average Rating
1 American Standard	8.37
2 Toto	8.25
3 Western Pottery	7.82
4 St. Thomas	7.70
5 Sterling	7.48
6 Kohler*	7.43
7 Universal	7.42
8 Briggs*	7.18
9 Eljer	5.91

*Since two Kohler and two Briggs models were surveyed, this rating uses the highest rated toilet per brand for the purpose of this comparison: the *Kohler Wellworth Lite* and the *Briggs Altima*. Refer to Table 1 on page 2 for individual model ratings.

APPENDICES

Sources of Survey Data

Surveys were conducted using ULF toilet installation records provided by the Metropolitan Water District of Southern California. Those records, in turn, were derived from databases resulting from ULF toilet distribution and rebate programs within the service areas of the following water agencies:

City of Los Angeles Department of Water and Power

San Diego County Water Authority

City of San Diego

Municipal Water District of Orange County

Capistrano Valley Water District

City of Brea

City of Buena Park

City of Fountain Valley

City of Garden Grove

City of Huntington Beach

City of La Habra

City of La Palma

City of Orange

City of Seal Beach

City of Tustin

City of Westminster

El Toro Water District

Irvine Ranch Water District

Los Alisos Water District

Mesa Consolidated Water District

Moulton Niguel Water District

Santa Margarita Water District

Santiago County Water District

Serrano Irrigation District

Southern California Water Company

Trabuco Canyon Water District

Yorba Linda Water District

City of Anaheim

City of Fullerton

City of Santa Ana

Coastal Municipal Water District

City of Newport Beach

City of San Clemente

Laguna Beach County Water District

Mesa Consolidated Water District

METHODOLOGY

1. **Toilet Selection** - The models chosen for this study were those ULF toilets distributed or rebated upon by various water agencies in Southern California during 1998 and 1999. MWD recommended and selected 13 toilet models for this study. HDMC and MWD agreed that accurate, unbiased data could be obtained by sampling 100 customers per selected toilet model for a total of 1300 surveys.

2. **ULF Toilet Models Surveyed** -The thirteen toilet models selected for the study were:

American Standard Cadet 2164.1	Niagara N2202TP
Briggs Abingdon	St. Thomas Marathon #6201.0
Briggs Altima	Sterling Windham
Eljer Patriot	Toto CST703/CST704
Kohler Rialto K-3386	Universal-Rundle Atlas
Kohler Wellworth Lite	Western Pottery Aris
Mansfield Alto 130-160	

3. **Customer Contact Methods** - Customers were contacted by two means in the following proportions:

Direct Mail	50%
Telephone	50%

4. **Sample Selection** - In order to assure that all customers had the same probability of being selected, random sampling was accepted as the method for selecting the target population.

- The data sources obtained from participating water agencies contained customer contact information for the sites at which new ULF toilets were installed. These data sources were provided in electronic format. Sites for the sample were randomly selected from these lists.
- A total of 650 customers were used as the target population for each toilet model. The following information was obtained for each customer:

Customer Name/Address/Telephone number
 Program type
 Toilet Brand
 Model
 Quantity installed
 Date of installation

- HDMC assigned a unique tracking number to each customer record. This identifier was used to follow the customer record through the various stages of the project.

5. **Survey Protocols** -Two survey methods were used to gather data; mail-back and telephone phone surveys. Questionnaires for both were developed by HDMC and approved by MWD.

- Mail-back surveys - Mail-back surveys were randomly distributed to the targeted customers on each of the 13 lists. HDMC coordinated all mailing services.
 - Phone-surveys - HDMC personnel conducted and managed the phone surveys. Targeted customers were randomly selected from the lists until 50 surveys were completed. When contacts were attempted but the caller was unable to complete a survey due to refused calls, wrong numbers, and other barriers, the caller randomly selected another customer to call until 50 surveys were completed. Some customers received a courtesy "follow-up" call if they were sent a mail-back survey but failed to respond.
6. **Questionnaire Design** -The two surveys used in this program contained the same 12 questions. The phone survey also contained a telemarketing script. Both questionnaires were reviewed and approved by MWD. Survey questions were grouped according to the following four categories:

Reason for installation
 Performance and Installation
 Old toilet vs. New toilet
 Overall Satisfaction

The rating scales used in the surveys (1-10, yes-no, poor-excellent) were purposefully varied to make sure that attitudes towards toilet models were consistent even when the questions were posed differently. See Appendix C for samples of the mail-back and phone surveys.

OPERATIONS

1. **Database Management** - Customer lists were provided in diverse data designations. Data was separated by toilet brand/model to create 13 lists. These lists were then standardized. After evaluating the data for completeness, the information was then exported into databases. These databases were eventually used as source data for mail merges.
2. **Mail Package** - Each mailing package contained a customized, color cover letter and survey (Appendix C), and a postage-paid business reply envelope.
 - HDMC developed a merge document including one cover letter and questionnaire per record. These form letters were then printed in-house on a color printer. Printing of outer window envelopes and business reply envelopes was outsourced to a direct mail facility. Folding, inserting, and sealing was done in-house.
 - Surveys were mailed first class to ensure a timely turnaround.
 - HDMC initially chose one database from which 650 surveys were mailed in order to determine the response rate. This rate was used as the basis for determining the number of customers to target for each of the remaining databases.

3. **Phone Surveys** - Telemarketing staff used a script to conduct surveys over the phone. Most of the calls were made during the daytime. However, staffing hours remained flexible so that surveys could be conducted in the evening when more customers were likely to be at home. Contacts were made up until 7:00 p.m.
4. **Data Entry** - Two databases were designed for data entry using two different applications. HDMC chose to use the database that best suited program needs such as ease of use for data entry, effective tracking and ad-hoc reporting capabilities. The other was available as a back up database for archiving customer records and for sampling test data for accuracy. Data entry was assigned to one data entry specialist to ensure accuracy and consistency.
5. **Quality Assurance and Control** - Quality assurance and quality control systems were implemented for the three major components of this project:

- Original Databases - Customer lists received from MWD were scrubbed before use. Duplicate entries were deleted, punctuation was added where required (i.e. periods for middle initials), and obvious spelling errors were corrected. Records containing incomplete addresses were removed from the mailing portion of the lists; these may have been used later for the phone survey if the complete telephone number was available.

Some brand/model lists did not include phone numbers for all records, which decreased the number of customers available for phone surveys. In these cases, an additional search for customer phone numbers was required. Search methods included the use of phone directories, directory assistance, and the Internet.

- Returned Mail-Back Surveys - HDMC randomly selected 50 surveys per toilet from among the completed mail-back surveys used for this program. These surveys were opened and reviewed to determine if the respondents completed the questionnaires in their entirety. Incomplete surveys were replaced with randomly-picked, complete surveys if available. Otherwise, some customers who returned surveys with insufficient information received a follow-up phone call for clarification.
- General Tracking - Project managers developed and implemented a daily tracking system which was used for daily reporting, data entry integrity, monitoring, and operations.

WATER AGENCY

in cooperation with



November 1, 1999

John Sample
5555 Anystreet
Anytown, CA 91423

Dear John Sample:

Thank you for participating in the Water Agency toilet replacement programs. By installing your ultra-low-flow toilet, you've joined thousands of families in the southern California area who, together, help conserve over *18 billion gallons* of water annually.

We need your help to ensure that we're providing our customers with the best quality toilets available. Please take a moment to complete and return the attached *Customer Satisfaction Survey*. No postage is required. Your valued input will be used to identify those products that best meet customer needs.

Thank you in advance for your participation, and we hope to hear from you soon.

Sincerely,
Metropolitan Water District of Southern California
Water Conservation Branch

<<WATER AGENCY>>
LOW-FLOW TOILET DISTRIBUTION PROGRAM
Customer Satisfaction Survey

Please review and make corrections: John Sample 5555 Anystreet Anytown, CA 91423 Phone: (213) 555-5555	Tracking Number: 000-000 Toilet issued: Anybrand Model: Anymodel Qty. installed: 1 Install date: 4/6/98
---	--

ABOUT YOUR NEW TOILET

- 1) Why did you decide to install the new low-flow toilet?
 (Check all that apply)
- To reduce my water bill
 - To save water and improve the environment
 - Someone told me it was a good idea
 - My old toilet was broken
 - My old toilet needed to be replaced
 - I'm selling the home and had to replace my toilets
 - Other _____

PERFORMANCE AND INSTALLATION

- 2) How well does the new low-flow toilet clear out the bowl on each flush?

	Very		
Excellent	Good	Satisfactory	Poor
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Using the same scale, how would you rate how well the toilet cleans the sides of the bowl?

	Very		
Excellent	Good	Satisfactory	Poor
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 3) How often do you experience blocking or clogging?

Half of the time	A quarter of the time	Once a month	Never
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 4) How often do you have to "double flush" to clear the bowl?

Half of the time	A quarter of the time	Once a month	Never
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do you have to "double flush" to clean the sides of the bowl?

Half of the time	A quarter of the time	Once a month	Never
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 5) Who installed your new low-flow toilet?

Self Plumber/Contractor Other

If you installed the toilet yourself, how did you find the ease of installation?

	Very			Very
<input type="checkbox"/> easy	<input type="checkbox"/> Easy	<input type="checkbox"/> Difficult	<input type="checkbox"/> Difficult	

COMPARING OLD TOILET TO NEW TOILET

- 6) Compared to the old toilet, do you like the new toilet:

	More	Same	Less
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 7) Compared to your old toilet, your new toilet:

	More	Same	Less
clogs...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
requires double flushing...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
requires bowl cleansing...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OVERALL SATISFACTON

- 8) Would you recommend your *Anybrand* toilet to others?

Yes No Not Sure

- 9) Would you have purchased a new toilet if a free toilet (or rebate) were not available?

Yes No Not Sure

- 10) Would you recommend the <<Agency>> toilet replacement program to others?

Yes No Not Sure

- 11) Using a scale of 1 to 10, with "10" being excellent and very satisfactory and "1" being totally unsatisfactory, how would you rate your new toilet? (circle one)

1 2 3 4 5 6 7 8 9 10

- 12) If there were one thing you would want the manufacturer of your toilet to change, what would it be? _____

Comments:

MWD Low-Flow Toilet Distribution Program Customer Satisfaction Telephone Survey

Name _____

Customer ID _____

Zip Code _____

Good morning (afternoon). My name is _____. I'm calling from Honeywell DMC on behalf of <<Agency>>. We recently mailed you a brief survey asking for your opinion of the new low-flow toilet you recently installed. Have you had an opportunity to complete and return the survey? **If yes:** Thank you. We appreciate your participation. **If No:** If you'd like, we can conduct the survey over the phone. It will only take about 3 minutes of your time.

1) Why did you decide to install the new low-flow toilet?
(Probe for specifics - check all that apply)

- To reduce my water bill
- To save water and improve the environment
- Someone told me it was a good idea
- My old toilet was broken
- My old toilet needed to be replaced
- I'm selling the home and had to replace my toilets
- Other _____

2) How well does the new low-flow toilet clear out the bowl on each flush - excellent, very good, satisfactory, or poor?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Excellent | Very
Good | Satisfactory | Poor |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

And using the same scale, how would you rate how well the toilet cleans the sides of the bowl?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Excellent | Very
Good | Satisfactory | Poor |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3) How often do you experience blocking or clogging - half of the time, a quarter of the time, once a month, or never?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Half of
the time | A quarter
of the time | Once a
month | Never |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4) How often do you have to "double flush" to clear the bowl?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Half of
the time | A quarter
of the time | Once a
month | Never |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Using the same scale, how often do you have to "double flush" to clean the sides of the bowl?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Half of
the time | A quarter
of the time | Once a
month | Never |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5) Who installed your new low-flow toilet?

- Self Plumber/Contractor Other

(If customer installed) Would you say it was very easy, easy, difficult, or very difficult to install?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Very
easy | Easy | Difficult | Very
Difficult |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6) Do you like your new toilet more, the same, or less than the old one?

- | | | |
|--------------------------|--------------------------|--------------------------|
| More | Same | Less |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7) Would you say your new toilet clogs more, the same, or less than your old toilet?

- | | | |
|--------------------------|--------------------------|--------------------------|
| More | Same | Less |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Would you say your new toilet requires double-flushing more, the same, or less than your old toilet?

- | | | |
|--------------------------|--------------------------|--------------------------|
| More | Same | Less |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Would you say your new toilet requires double-flushing more, the same, or less than your old toilet?

- | | | |
|--------------------------|--------------------------|--------------------------|
| More | Same | Less |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

8) Would you recommend your Anybrand toilet to others?

- Yes No Not Sure

9) Would you have purchased a new toilet if a free toilet (or rebate) was not available?

- Yes No Not Sure

10) Would you recommend the <<Agency>> toilet replacement program to others?

- Yes No Not Sure

11) Using a scale of 1 to 10, with "10" being excellent and very satisfactory and "1" being totally unsatisfactory, how would you rate your new toilet? (circle one)

1 2 3 4 5 6 7 8 9 10

12) If there were one thing you would want the manufacturer of your toilet to change, what would it be? _____

That completes the survey. Thank you very much for your time. Do you have any questions or other comments?

Customer Response Rates

The mail-back survey response rate is derived by dividing the total number of completed and returned surveys by the total quantity mailed. The first mailing dropped on October 26, 1999. Mail-back surveys received by HDMC on or before December 20, 1999 are included in the mail response rate.

Phone surveys were conducted over a three week period. The phone-survey response rate is derived by dividing the total number of completed surveys by the total number of attempted contacts. Attempted calls are those in which a telemarketing representative actually spoke with a live person at the targeted household. Wrong numbers, disconnects, answering machines, busy signals, and no answers were not counted as attempts.

Table 12 - Response Rates from Mail and Phone Surveys

Brand	Number Mailed	Completed Surveys Returned by 12/20/99	Mail Resp. Rate	Phone. Attempted	Phone. Resp. Rate
American Standard Cadet 2164.1	325	56	17.23%	54	92.59%
Briggs Abingdon	325	51	15.69%	60	83.33%
Briggs Altima	400	174	43.50%	61	81.97%
Eljer Patriot	270	100	37.04%	54	92.59%
Kohler Rialto K-3386	400	177	44.25%	57	87.72%
Kohler Wellworth Lite	400	152	38.00%	60	83.33%
Mansfield Alto 130-160	324	88	27.16%	56	89.29%
Niagara N2202TP	399	147	36.84%	59	84.75%
St. Thomas Marathon #6201.0	650	183	28.15%	59	84.75%
Sterling Windham	323	142	43.96%	59	84.75%
Toto CST703/CST704	399	166	41.60%	59	84.75%
Universal-Rundle Atlas	324	56	17.28%	56	89.29%
Western Pottery Aris	324	105	32.41%	58	86.21%

Mail Surveys

Phone Surveys