

TRANSMITTED VIA E-MAIL



April 4, 2019

Mattress Recycling Council

Mr. Mike O'Donnell
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Ms. Justine Fallon
Director of Operations
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Subject: Mattress Age Study in California, Connecticut and Rhode Island

Dear Mike and Justine:

MSW Consultants, LLC, is pleased to provide the Mattress Recycling Council (MRC) with the following tabulation and observances from the recent age study conducted at facilities in Connecticut, Rhode Island, and California.

Project Overview

Mattresses and foundations are tagged when manufactured. Mattress and foundation tags contain a range of identification information such as manufacturer name, location, breakdowns of material content, and in most cases, the date manufactured.

MSW Consultants was hired to collect date of manufacture, model size, and manufacturing location for a representative sample of mattresses. It was determined during study planning that data from a minimum of 400 tags would be collected as a combined representative sample from Connecticut and Rhode Island to provide, with 90 percent confidence, proportion estimates within 5 percent of their true population values. A minimum of 787 data points (tags) would be the representative sample from California facilities to provide, with 99 percent confidence, proportion estimates within 5 percent of their true population values.

Data Collection Summary

MSW Consultants visited the Park City Green mattress recycling facility in Bridgeport, CT and the Rhode Island Resource Recovery Corp. (RIRRC) environmental complex in Johnston, RI to gather tags for the Connecticut-Rhode Island combined sample. Four facilities were visited in California to collect tags, including two in the Los Angeles area, and two in different regions. Table 1 summarizes the number of tags gathered at each facility, showing the targeted sample numbers were exceeded.

Table 1 Data Gathering Summary

Date	Location	No. of Tags Collected
7/25/2018	Park City Green - Bridgeport, CT	305
7/27-7/31/18	RIRRC - Johnston, RI	237
<i>Subtotal Connecticut and Rhode Island</i>		542
10/11/2018	Cristal Materials - McKinley St., Los Angeles, CA	250
10/12/2018	Cristal Materials - Stanford St., Los Angeles, CA	235
10/13/2018	Cleaner Earth - Santa Maria, CA	235
10/15/2018	DR3 - Stockton, CA	215
<i>Subtotal California</i>		935
Total		1,477

At all facilities except Cleaner Earth, data was collected from previously stockpiled units as well as from incoming loads to gather a sufficient number of tags with qualifying data. Cleaner Earth did not have scheduled loads arriving on Saturday, but MSW staff worked through stockpiled units and was able to obtain sufficient tags to exceed the sampling target.

The following notes are provided regarding the gathering of the tag data:

- The units contain a variety of tags. Some manufacturers sew their brand name into the fabric of the unit or add a separate material tag for branding sewn in the seam. Some units had two or three different tags with various data points on them, others had all information on a single tag. The tags primarily containing the manufacturing information (model, dimensions, material content, manufacturer name and address, date manufactured, various regulation references, etc.) are sewn into a seam of the unit, in most cases on the short side (head or foot) of the unit. Some are in the side seam and others in the casing seam.
- Early in the collection process, it was determined that material contents are not identified specifically enough to categorize and track. Some tags contained no material/content information; some provided percentages; and some would say “foam and fiber” or “polyester fill, cushion, wood” or other broad categories. Due to the inconsistent and limited availability of content-related data on the universe of tags analyzed, no findings could be tabulated regarding mattress and foundation content.
- Only a subset of mattresses and foundations observed at the facilities retained their date of manufacture tags; many tags had already been removed before being dropped off for recycling, and/or did not have the date of manufacture on existing tags. Various reasons the mattresses and foundation ages were unavailable to be included in this study are provided below:

Tags removed by owner prior to drop-off <i>(consistent across all visually-gaged unit ages)</i>	Tags were faded and unreadable <i>(more common in older-appearing units, but also in newer appearing models as well)</i>
Tags were cut or torn and the date of manufacturer was not on remaining partial tags	Tags did not contain date of manufacture <i>(many had the designated area for date left blank, observed in newer appearing units (particularly internationally-produced) as well as older appearing units)</i>

During two days at RIRRC, MSW staff collected tags from the incoming loads to get an estimated percentage of units that contain the data tags at the point of drop-off. Of the 87 units dropped off during survey hours on July 30-31, 33 of the units (38 percent) had tags containing the date of manufacture. Similarly, approximately 33 percent of the units arriving in a tractor trailer at Cristal Materials in Los Angeles during the data gathering October 12th contained tags with the date of manufacture. It should be noted that the study was conducted on the units that contained a readable date of manufacture on the tag. Based on the observed occurrences, the age-identifiable units represented 35-36% of the universe of units during the study. It should not be deduced that older units with removed tags were more numerous in comparison to newer units with removed or incomplete tags.

- The date of manufacture was identified from 1,477 units. Of these, 935 were for the California analysis, which is more than the targeted minimum, resulting in proportion estimates expected to be within 4.6 percent of their true population values (given a 99 percent confidence level). The Connecticut and Rhode Island sample size was 542 tags, also more than the targeted minimum, resulting in proportion estimates expected to be within 4.3 percent of their true population values (given a 90 percent confidence level).
- The oldest units (based on appearance, material, and basic construction), were less frequent in the population of units, and also were less likely to contain a date of manufacture on their tag. However, as noted previously, many new units also did not contain tags and in our opinion the lack of a tag does not predict the unit's age.
- In many cases, the unit size and type (mattress or foundation) were not identified on the tag. MSW Consultants noted this information on tags during collection when needed.
- In cases where the stockpiles were obviously homogeneous and from a single source, such as hotel or dorm with the same date of manufacture, only one or two of the units was included in the sample.
- The location of manufacture was available on most of the tags and recorded. Reasons for excluding the location of manufacture included: no data found on the tags; information sewn into the seam; partial cut-off of the tag; and older tags being smeared, faded or otherwise illegible.

Findings

Figure 1 provides an overview of the percentage of units falling into year of manufacture by decade. The vast majority of tags indicated being manufactured within the past two decades. The oldest observed unit was from 1968, and was collected from a unit at the RIRRC. No manufacturer name or location was noted on this tag.

Figure 1 Distribution of Manufacture Date by Decade and Percentage

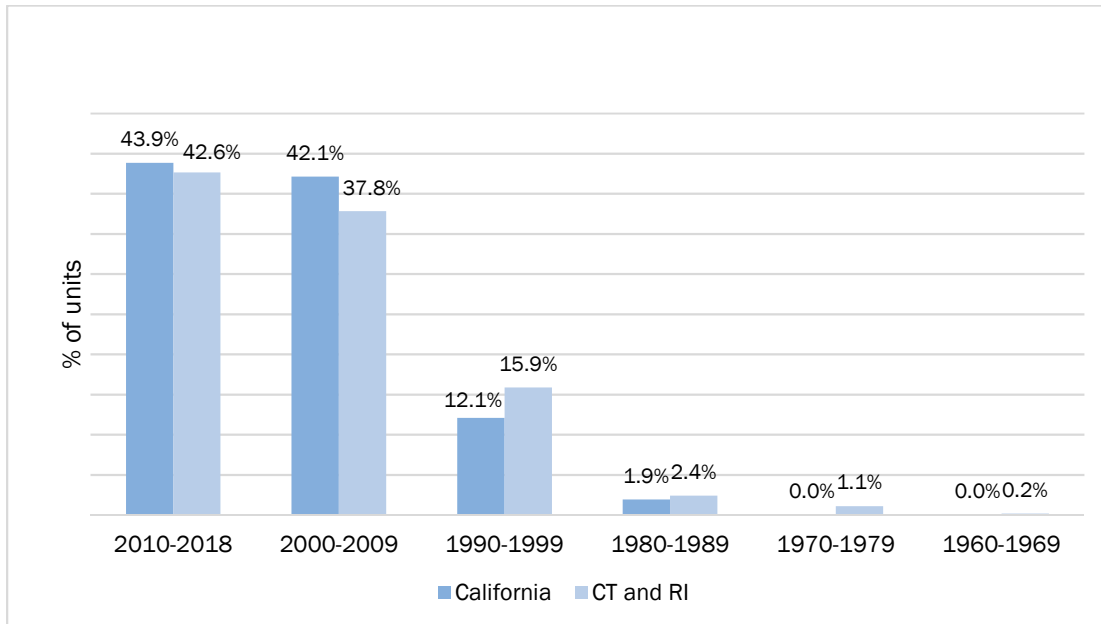


Table 2 presents the average age and date of manufacture for California, Connecticut-Rhode Island, and all three states combined. As shown, the averages for each study group fell within 10 months of each other. The average age of mattresses and box springs observed during the study was between 11.1 years (CA) and 11.7 years (CT-RI) with an average 11.2 years when considering all three states.

Table 2 Average Age and Date of Manufacture

State/Region	Average Date of Manufacture	Average Age (Yrs.)
California	8/13/2007	11.1
Connecticut-Rhode Island	10/31/2006	11.7
All 3 States	4/30/2007	11.2

Table 3 provides the breakdown of mattresses and foundations represented in the study. Mattresses represent 68 percent of the data points, with foundations the other 32 percent.

Table 3 Summary of Units by Type and Size

Unit Type	State of Origin	Unit Size					Subtotal	Percent
		Twin	Full	Queen	King	CA King		
Mattresses	CA	188	129	220	115	12	664	45.0%
	CT and RI	106	82	115	38	0	341	23.1%
	<i>Subtotal</i>	294	211	335	153	12	1,005	68.0%
Foundations	CA	91	43	94	30	13	271	18.3%
	CT and RI	95	39	59	8	0	201	13.6%
	<i>Subtotal</i>	186	82	153	38	13	472	32.0%
Total		480	293	488	191	25	1,477	100.0%
Percent		32.5%	19.8%	33.0%	12.9%	1.7%	100.0%	

Table 4 provides the same breakdown for the sampled units manufactured over the last decade. Not significantly different than the overall sample population, mattresses represent just over 71 percent of the data points for this time period, and foundations almost 29 percent.

Table 4 Units Manufactured Most Recent Decade

Unit Type	State of Origin	Unit Size					Subtotal	Percent
		Twin	Full	Queen	King	CA King		
Mattresses	CA	116	67	96	42	2	323	21.9%
	CT and RI	50	43	66	14	0	173	11.7%
	<i>Subtotal</i>	166	110	162	56	2	496	71.3%
Foundations	CA	39	16	42	15	3	115	7.8%
	CT and RI	40	21	22	2	0	85	5.8%
	<i>Subtotal</i>	79	37	64	17	3	200	28.7%
Total		245	147	226	73	5	696	100.0%
Percent		35.2%	21.1%	32.5%	10.5%	0.7%	100.0%	

Figures 2 and 3 provide a breakdown of state or country of manufacture. As shown, there is a much broader geographic representation for the Connecticut-Rhode Island data set which is not surprising given the size differential of these states compared to California.

Figure 2 Origin of CT and RI Units

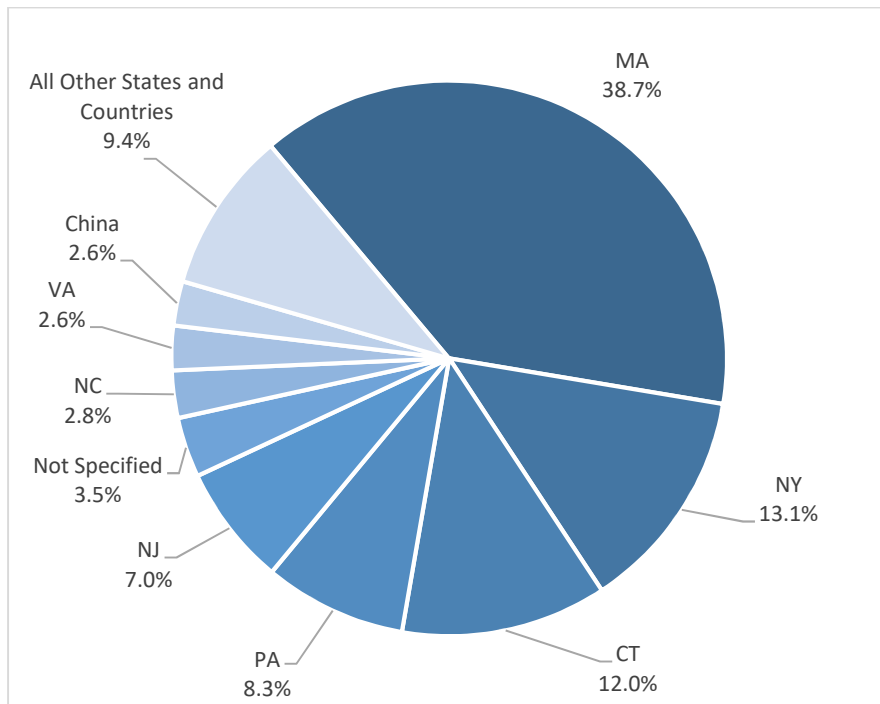
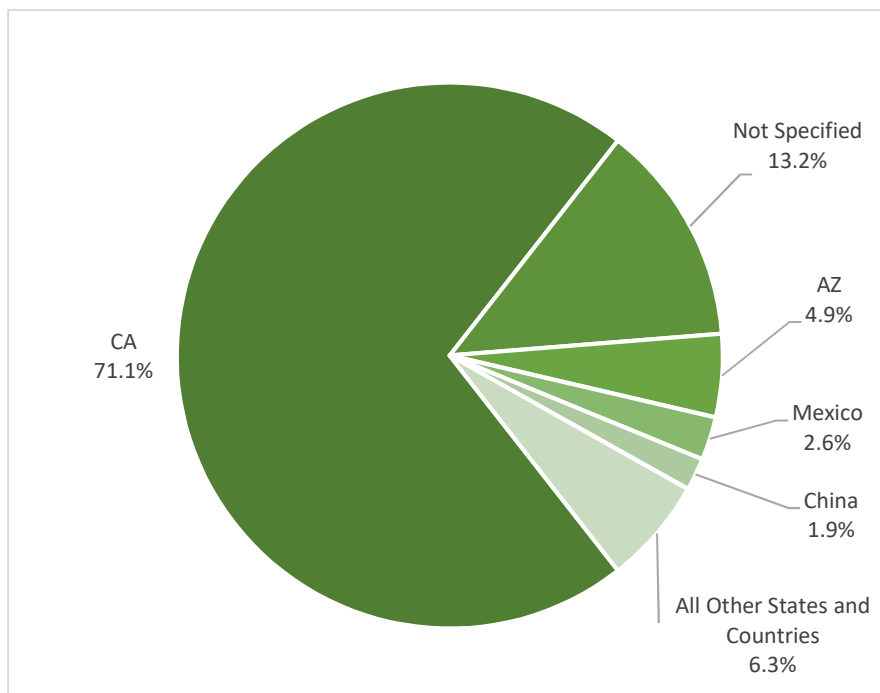


Figure 3 Origin of CA Units



Summary

This research provided a comprehensive first assessment of the age of mattresses and foundations being recovered in the California, Rhode Island and Connecticut programs, as well as the origin of the units containing the qualifying tag information.

Attachment A includes pictures representative of findings throughout the study.

If you have any questions about these results, please contact me or project manager Cynthia Mormile (cmormile@mswconsultants.com) at your convenience. We appreciate the opportunity to assist MRC with this project. Do not hesitate to let us know if you have any questions upon review.

Sincerely,

MSW CONSULTANTS, LLC

A handwritten signature in black ink that reads "Walt Davenport". The signature is written in a cursive style with a large, prominent "W" and "D".

Walt Davenport, President

WD/cmm

Attachment

ATTACHMENT A – MATTRESS AGE STUDY PHOTOS

Stockpiled Units for Data Collection



MRC Container Arriving at Park City Green



Example of Typical Stack With and Without Tags



Example of Tag with Illegible Data



Example of Readable, but Undated Tag



Example of Undated Tag on Old Unit

