Diversey

TASKI®

TASKI Mobile Work Station

Time, Motion and Consumption Study

Executive Summary

Overall the TASKI Mobile Work Station (with pre-wetted microfiber mops and cloths) outperformed the leading stainless steel cart system (with string mop and cotton cloths) and the leading plastic cart system (with flat mop and cotton cloths) – especially in the areas of ergonomics (muscle exertion), sustainability (chemical and water usage) and cleaning efficiency.

- **Ergonomics:** The TASKI system required 79% less muscle effort compared to the leading plastic cart system and 83% less muscle effort than the leading stainless steel cart system – both of which required wringing – during the cleaner-cart interactions of a hypothetical cleaning shift.

- **Sustainability:** The TASKI Mobile Work Station, combined with a pre-wetted microfiber cleaning system, required 58% less chemicals and 54% less water than the leading plastic cart utilizing a flat mop and cotton cloths. Compared to the leading stainless steel cart using a wet mopping system, the TASKI Mobile Work Station used 75% less chemicals overall and required 90% less water during the cleaning process.

- **Efficiency:** Cleaning staff that used the TASKI system spent 12.3% less time at the cart and cleaned their areas 20.7% faster per shift than when using the leading plastic cart. TASKI users spent 28.3% less time at the cart and cleaned their areas 21.0% faster per shift than when using the leading stainless steel cart.

- In self-reported questionnaires, the cleaning staff rated the TASKI Mobile Work Station as more convenient based on location of and access to cleaning supplies and tools compared to either competitive cart.

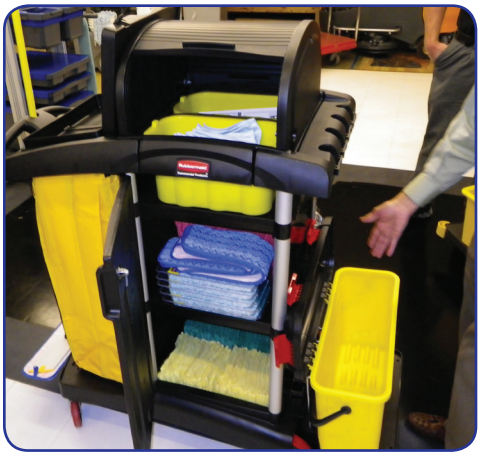
TASKI Mobile Work Station

Time, Motion and Consumption Study

Cleaning carts are designed to make it easier and more efficient for users to do their jobs. However, many of the leading systems are rigid in design and provide limited flexibility to accommodate different cleaning needs, tools or work processes.

In response, Diversey developed the TASKI® Mobile Work Station & Cleaning System. This new cart system features modular components and improved cleaning processes that can be easily adapted to meet different customer needs.

Diversey commissioned the Human Factors Engineers at Design Concepts, Inc., an innovation and product design consulting firm, to conduct an independent study to compare the performance and user satisfaction of the TASKI system to the leading stainless steel cart and plastic cart systems.



Leading Plastic Cart

TASKI

Leading Stainless Steel Cart

Through the assistance and cooperation of Crothall Healthcare, two evaluation sites were selected: Mercy Hospital in Chicago and Mercy Fitzgerald Hospital in Darby, Pennsylvania. Crothall provides contracted cleaning services for each hospital.

Methodology

At each hospital, a group of cleaners were videotaped using their current cleaning carts. The leading plastic cart with a microfiber flat mop and cotton cloths was used at Mercy and the leading stainless steel cart with a string mop and cotton cloths was used at Mercy Fitzgerald. These same individuals were then trained to use a TASKI Mobile Work Station with a pre-wetted system of microfiber mops and cloths. After allowing three weeks for acclimation, the cleaning staff was videotaped using the TASKI system.

The methodology developed by Design Concepts for the Time, Motion and Consumption Study included the following elements:

- Compiling Time & Motion data on cleaners using each cart and cleaning process
- Measuring electromyographic (EMG) muscle exertion data of users to evaluate the ergonomics of each cart
- Measuring chemical and water usage for each cart and cleaning system
- Assessing user satisfaction and convenience for each cart

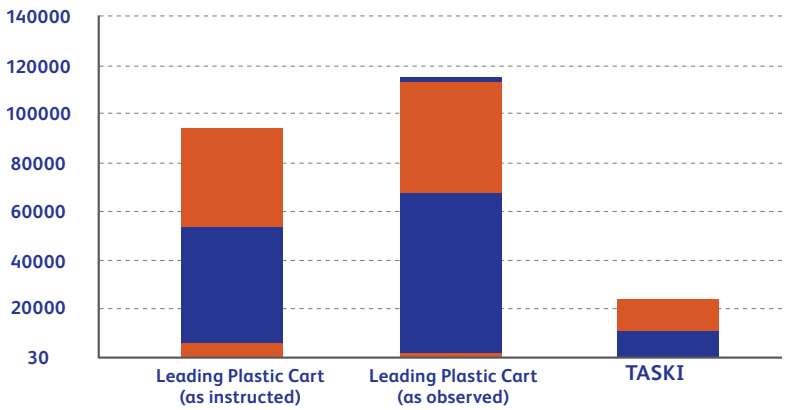
Highlights from the 2011 TASKI Study

Electromyographic (EMG) Results

Prior to the in-hospital research, Design Concepts conducted EMG analysis on six participants to measure exertion while performing cleaning tasks while using the three different cleaning carts.

Each participant had surface electrodes attached to the muscle groups being studied (forearm flexors, forearm extensors, biceps, triceps and lower back) to measure muscle contraction. The higher the voltage recorded, the stronger the muscular exertion or the greater the effort required to perform the task. The participants were monitored as they performed surface cleaning and floor cleaning tasks with each cart.

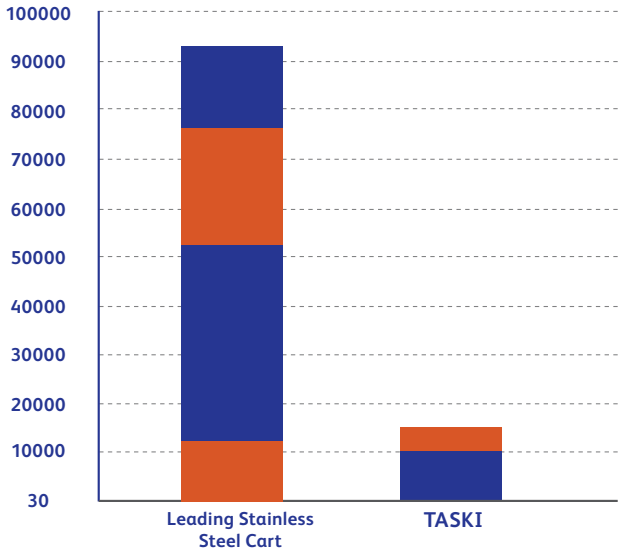
EMG Results – Combined Average Muscle Effort



Note that units for muscle effort are expressed in µV-sec

The study concluded that, as observed during actual use, the participants used 79% less combined muscle effort when using the TASKI Mobile Work Station and pre-wetted microfiber cleaning system compared to the leading plastic cart utilizing a flat mop and cotton cloths.

EMG Results – Combined Average Muscle Effort



Note that units for muscle effort are expressed in µV-sec

When compared to the leading stainless steel cart and wet mopping system, the TASKI system performed even better, with participants using 83% less combined muscle effort to perform the same tasks.

Sustainability Results

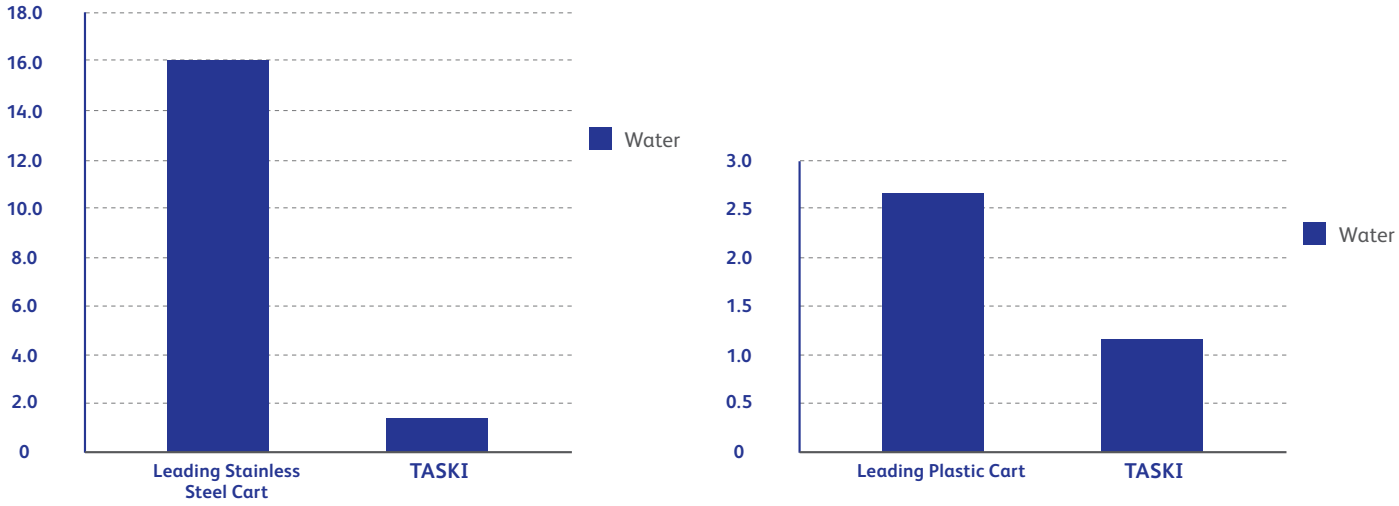
The research team collected chemical and water consumption data – weighing water and chemical used by the cleaning staff at both hospitals to conduct the cleaning process.

To ensure accuracy, all weights were re-measured independently of the cleaning staff for calibration purposes, with final consumption determined based on this data.

Both hospital cleaning teams used a hospital-grade disinfectant cleaner for surface cleaning and an all- purpose neutral cleaner for everyday floor cleaning.

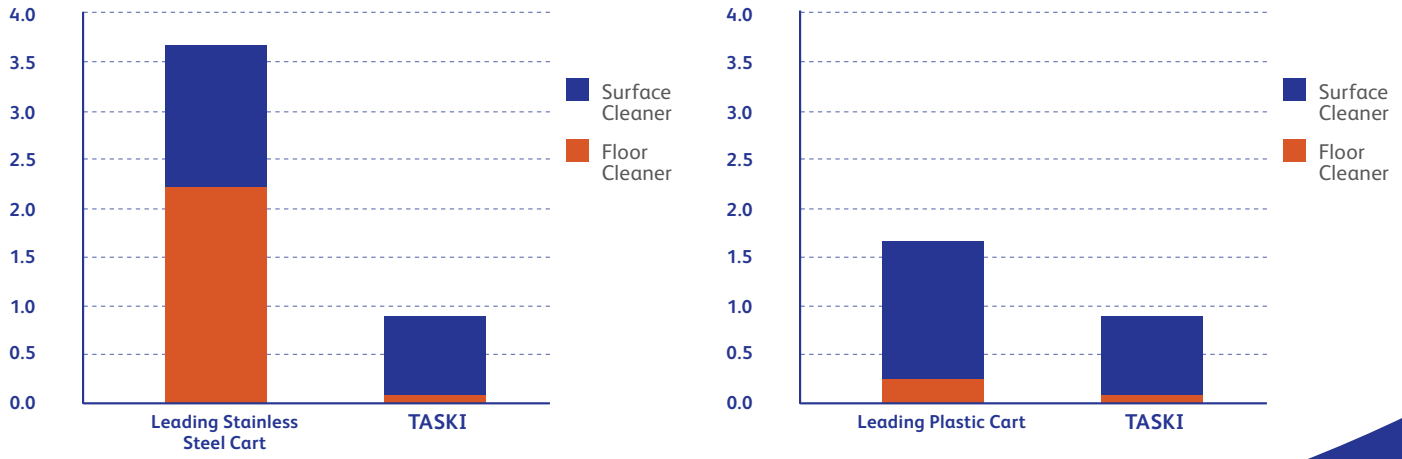
The study revealed that cleaners using the TASKI Mobile Work Station combined with a prewetted microfiber cleaning system used 58% less chemical and 54% less water than those using the leading plastic cart with flat mop and cotton cloths.

Average Water Consumption per Worker by Gallons Used



The differences were even greater when comparing the TASKI system to the leading stainless steel cart with wet-mopping system. Chemical usage was reduced by 75% and water consumption was reduced by 90% when the cleaning staff used the TASKI System.

Average Chemical Consumption per Worker by Ounces Used



Time and Motion Results

In addition to the EMG results, which monitored muscle exertion during cart use, Multimedia Video Task Analysis (MVTA) was used to break down the video of cleaning activities into individual tasks and events. These were then interfaced into a software application to summarize and record the frequency of each cleaning task that was conducted. Based on observations of individual workers, average room cleaning times were calculated for both patient occupied rooms and discharge rooms. These averages were then used to determine the total time required for a hypothetical shift consisting of 20 rooms, with 15 occupied rooms and 5 discharge rooms.

At Mercy Hospital in Chicago, the TASKI Mobile Work Station with pre-wetted microfiber mops and cloths was compared to the leading plastic cart with flat mop and cotton cloths. For a typical 20-room shift, cleaners would spend an average of 284.5 minutes cleaning with the plastic cart, but only 225.5 minutes with the TASKI Mobile Work Station. This overall time savings of 20.7% can be attributed to the efficiency of TASKI's pre-wet cleaning method. The time cleaners spent actually interacting with the plastic cart was 28.5 minutes, but only 25.0 minutes with the TASKI cart. This 12.3% increase in productivity can be attributed to the more efficient design of the TASKI cart.

At Mercy Fitzgerald Hospital, the TASKI Mobile Work Station was compared to the leading stainless steel cart with string mop and cotton cloths. The TASKI system proved to be 21.0% more efficient than the more conventional methods used with the stainless steel cart. The cleaning staff spent 352.6 minutes when working with the stainless steel cart but only 278.5 minutes working with the TASKI Mobile Work Station. The time spent interacting with the carts was 26.5 minutes for the stainless steel and 19.0 minutes for TASKI – a 28.3% time savings with the TASKI system.

Self-Reported Questionnaire Results

At the beginning of the study, participants at both hospitals completed a survey rating Feature Importance of cleaning carts in general. The survey gauged 17 separate cart attributes including size, weight, design, ease of use, comfort of the handle grips and several other characteristics. This and all surveys used a 5-point Likert scale.

The cleaners completed a second survey after they were videotaped using their current cleaning carts. This questionnaire gauged Feature Satisfaction of the same attributes measured above as they pertain to their current carts.

The third and final questionnaire was a Feature Satisfaction assessment of the TASKI Mobile Work Station after the cleaners had used it for three weeks.

Their responses were plotted into a grid to determine their like or dislike of each attribute represented in the surveys – with the more successful attributes showing up in the blue quadrant (below).

Rated attributes included:

1. Lockability
2. Ease of moving
3. Comfortable handles
4. Ease of cleaning the cart
5. Nice looks
6. Good size
7. Good weight
8. Sturdy and made of good materials
9. Tough and durable
10. Holds enough supplies
11. Ability to be personalized
12. Works well with pre-wet mops
13. Works well with mop and bucket
14. Ability to quickly and efficiently get items from the cart
15. Overall ease of use
16. Ease of restocking
17. Makes the job easier

Conclusions and Next Steps:

Participants were also given a list of cleaning supplies (trash bags, spray bottles, wet and dry mops, etc.) and asked to rank how conveniently located they were on each cart.

On the list of attributes, the TASKI Mobile Work Station was rated significantly higher (9.75 out of 10 versus 6.38 out of 10) in overall cart satisfaction compared to the leading stainless steel cart – and also rated higher in the convenience factor for all 15 cart supplies. Although it was not asked as part of the survey, the difference in the cart configuration and the difference in the cleaning method used (TASKI's pre-wet microfiber) could have accounted for the higher favorability of the TASKI system.

While the TASKI Mobile Work Station rated higher for convenience in the placement of 12 out of 15 cart supplies compared to the plastic cart used at Mercy Hospital, the plastic cart rated slightly higher for overall satisfaction. Researchers noted that Mercy Hospital had recently converted to the plastic cart, and some study participants expressed displeasure with testing a new system.

Also, it should be noted this was the only part of the overall study where the TASKI system did not rank higher than either the leading stainless steel or the leading plastic cart systems.

Using an independent research firm and participants from two separate hospitals, human factors research demonstrated that the TASKI Mobile Work Station with a pre-wetted microfiber system provides significant advantages to the leading stainless steel cart with wet-mopping system and the leading plastic cart with flat mop and cotton cloths in terms of ergonomics, sustainability and productivity in healthcare settings.

The TASKI Mobile Work Station & Cleaning System makes cleaning less taxing, offers a significant reduction in chemical and water use, and improves employee productivity by enabling them to conduct cleaning activities more efficiently.

Diversey has been, and always will be, pioneers and facilitators for life. We constantly deliver revolutionary cleaning and hygiene technologies that provide total confidence to our customers across all of our global sectors. Led by Dr. Ilham Kadri, President & CEO, and headquartered in Charlotte, North Carolina, USA, Diversey employs approximately 9,000 people globally, generating net sales of approximately $2.6 billion in 2016.

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