



1994 Technical Bulletins

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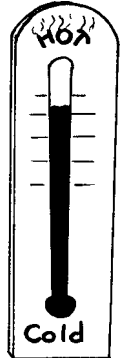
USING HIGH TEMPERATURE HOT WATER EXTRACTION CARPET CLEANING - ITS ADVANTAGES AND BENEFITS

Chemistry is an amazing thing. It's kind of like statistics. It can be used to come up with some sort of laboratory test analysis to prove whatever the chemist wants it to. Fortunately for us, in examining the benefits of high temperatures in extraction cleaning, we have both chemistry tests and real-world performance to document its value.

Let's look at some facts concerning high temperatures and cleaning.

1. HIGH TEMPERATURE CLEANING AND ITS BENEFITS ON CLEANING CHEMICALS

Chemicals are more effective when applied with higher temperature. For every 18° F temperature rise we have in the temperature of our cleaning solution, we double chemical activity. High temperatures cause rapid molecular expansion. The molecules of the cleaning agent become more "excited" and will clean faster. Thus, less chemical is needed in the same amount of our "carrier" (water) to perform the cleaning job. This will result in leaving less residue. So higher temperatures make chemicals work better.



2. HIGH TEMPERATURE CLEANING AND ITS BENEFITS ON DRYING TIME

Hot water cleans faster, so "dwell" time on the carpet by the operator is reduced, thus, overwetting is less possible. The hotter your cleaning temperatures are, the quicker the carpets will dry. Faster drying greatly reduces the possibility of browning, shrinkage, carpet waves, delamination, mold and mildew, popped seams, and color transfer. The primary cause of all of these problems is overwetting. Hotter cleaning solution temperatures clean faster and more effectively while using fewer wand strokes and water. Because hot water dries faster, it leaves virtually no residue (97% recovery with strong truck-mount vacuum). Residues of chemicals contain wetting agents which can contribute to extended drying time.

3. HIGH TEMPERATURE CLEANING AND ITS BENEFITS TO CARPET FIBERS

There is no negative effect of heat upon the carpet fibers themselves. Carpet manufacturers have thoroughly tested the Steam Way Cleaning System and have found it does not harm the carpet. As a matter of fact, Du Pont now requires hot water extraction cleaning for the texture retention part of their Stainmaster X-Tra Life and Luxura® as well as their Stainmaster® Plus and MasterLife® warranty, because it refreshes carpet texture. It helps the carpet! Our temperatures from even the very best equipment will not disturb fibers which soften at 300° (olefin) to 450°F (other synthetics). The high temperature would not affect yarns which are heat-set with dry steam (325°F), or dyes which are set over prolonged periods (45 to 75 minutes) at above boiling temperatures. As a matter of fact, our high temperatures actually assist the carpet fibers in maintaining a better appearance and longer life, because they allow the carpet fibers to "re-twist". Carpet fibers are made to respond to pressure (foot traffic) by retracting and then rebounding. Between soiling and wear, these fibers will lose their "twist". High temperatures clean out the fiber faster and more effectively, allowing it to "re-twist" properly.

"Out of the top 10 manufacturers of truck mounted carpet cleaning equipment, only one promotes using only warm water extraction rather than selecting the right temperature for each job."

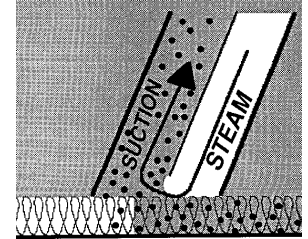
4. HIGH TEMPERATURE CLEANING AND ITS BENEFITS TO CLEANING PERFORMANCE

Higher temperatures can contribute to many benefits of cleaning. High temperatures (above 120 -142°F) kill some bacteria, which is the main source of odor in carpet. They contribute to better cleaning performance because fewer wand strokes (agitation) and time are needed to clean, reducing operator fatigue. Because they allow the carpet to dry faster, the homeowner or business suffers less "downtime"—they can use their carpet faster. High temperatures in combination with proper vacuum efficiency reduce residue, causing less resoiling, i.e., keeping a better appearance longer. Higher temperatures are essential for maximum cleaning results and maximum operator efficiency; and in the cleaning business, time is money.

5. HIGH TEMPERATURE CLEANING AND STAIN RESISTANT CARPETS

A short discussion of the relationship between cleaning solution temperatures and "stain-resistant" carpet fibers is important. It is important to remember that we are concerned with the ambient temperature of the cleaning solution when it begins to take effect on the face of the carpet fiber itself. Between the time the cleaning solution leaves the truck and reaches this point, it loses anywhere between 30 to 70°F, depending upon the situation.

Our problem most often lies in creating enough temperature, rather than too much. Du Pont removed the temperature limitation from their requirements for professional cleaning many years ago. Their own research indicated that carpet cleaning equipment cannot achieve temperatures which will damage carpets when used properly. **THERE ARE NO TEMPERATURE RESTRICTIONS FOR STAIN RESIST CARPETING BY ANY MANUFACTURER!**



"Objections to high temperature cleaning are not supported by the latest research at the carpet manufacturing level."

6. THE RECORD FOR HIGH TEMPERATURE CLEANING

As we celebrate our twenty-fifth year in business as a manufacturer, our equipment and chemicals have cleaned over 10 billion square feet of carpet safely and effectively. This, in combination with customer comments, testing results, and 25 years of cleaning performance, leads us to conclude that our methods lead to superior cleaning results for the consumer, better consumer satisfaction in carpet which helps the carpet manufacturer, and better profit performance for the professional cleaner. Rather than continuing to use methods that were developed years ago, we

believe that cleaning methods should evolve and be upgraded with the improvement in carpet fibers. High temperature technology allows us to do this.

7. HIGH TEMPERATURE CLEANING AND CARPET "SHRINKAGE"

One other thought, high temperatures are often accused of being the culprit when a carpet shrinks. But research indicates that shrinkage is a direct result of overwetting, which can be caused by improper vacuum performance, by not taking advantage of chemical performance requiring repeated spraying, and by using colder water which evaporates slower.

High temperatures help prevent shrinking, not cause it.

"Rather than continuing to use methods that were developed years ago, we believe that cleaning methods should evolve and be upgraded with the improvement in carpet fibers. High temperature technology allows us to do this."

8. HIGH TEMPERATURE CLEANING AND INDOOR AIR QUALITY

Microbiologists tell us that ambient cleaning solution temperatures above 120°F - 142°F will have an adverse effect on biological contamination that is in a carpeting. What level of bio-contaminants that they destroy is being determined by independent scientific testing, but common sense, principles of sanitization, and Research Microbiologists tell us that higher cleaning solution temperatures do kill some bio-contamination. Subsequent studies in indoor air

quality have demonstrated that if we can maintain ambient temperatures above 120° - 142°F on the carpet, we do achieve some reduction in biological contamination. In his book, Protecting The Built Environment - Cleaning For Health, Dr. Michael Berry states; "When we routinely clean the built environment, we rarely seek to sterilize it. We do, however, always seek to sanitize and sometimes to disinfect it. Heat assists in this process by destroying a large number of bacterial cells and spores, even though the entire population of living organisms can rarely be destroyed completely. **REPEATED HIGH TEMPERATURE CLEANING HELPS TO KEEP POPULATIONS OF LIVING ORGANISMS UNDER CONTROL."**

9. A SUMMARY OF BENEFITS

A. Advantages for the carpet cleaner:

There is no one simple basic requirement (of the list that determines effectiveness) that is more important than the use of higher temperatures! We refer to the laws of chemistry and physics to reinforce this view. For instance, starting at 118°F ambient or surface temperature on the carpet, for every 18°F rise in temperature we can add to it, we will increase the effectiveness of our cleaning agents by 100%.

This translates to the cleaner in the following

- Hot water saves chemical
- Hot water cleans faster (better productivity)
- Hot water leaves less residues
- Hot water helps restore color and style to resilient carpet
- Hot water speeds up the job so the professional can be effective and profitable at the same time
- Hot water extraction restoration cleaning results in carpet consumer satisfaction
- Hot water dries faster (one of the ways by which the professional is judged)
- Hot water refreshes carpet texture
- Hot water reduces biological contamination

B. Advantages for the carpet consumer:

- Returns style and color of carpet which is the reason why it was purchased
- Counteracts and sanitizes so it is healthier for her and her family.
- Better cleaning helps to eliminate odors.
- Carpet dries faster and is ready to use.
- Results are longer lasting than “surface” cleaning.
- Cleaner carpets are a good reflection on the homeowner.
- Cleaner carpets last longer
- Hot Water refreshes carpet texture
- Hot Water reduces biological contamination

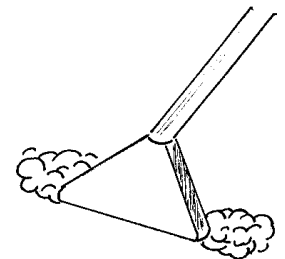
"Most often the objection to high temperature cleaning comes from the manufacturers of equipment that cannot attain high temperatures and thus must defend their position because of a lack of design."

C. How it affects the supplier of professionals?

- Demands more professional consideration in the formulation of cleaning compounds.
- High temperature compatible chemicals make the cleaner and the supplier look better in industry standards.
- Forces a demand to develop safe and yet effective equipment.
- Hot water cleaning allows for more effective results in deodorization and carpet protectors.

D. How it affects the carpet manufacturer?

- Hot water extraction refreshes carpet texture
- Hot water use by the professional cleaner results in consistently high level of consumer satisfaction which supports the decision to choose carpet over hard surface floors. Carpet will thus replace carpet the next time the area is decorated.
- Fiber producers are given credit for more cleanable carpet.
- Mills are given credit for their quality.
- Retailers are in line for repeat business due to consumer satisfaction
- Hot water extraction maintains carpet as a safe and effective floor covering that makes positive contributions to indoor air quality



10. CONCLUSIONS

Now with all the above in mind, what, if anything, could be negative about using high temperatures? As instructors of high tech cleaners, we can assure you that they are taught when not to get hot. There are a few instances where we have to turn down the dial. Older 100% acrylic carpet, true plush carpet, and those few not-so-colorfast carpets are the common exception where we do have to turn down the dial. Also, where staining is suspected in preinspection, before cleaning with high temperatures, professional carpet cleaners are advised to address the stains first. Other than these situations, high temperature solutions are a very good ally to the cleaner.

The biggest misconception in the examination of this subject comes from assumption that you can distort the nap and melt the fibers. That is not true! No cleaner can get over a 175°F ambient (at the carpet interface) temperature even under the worst of conditions. Tests by ourselves and Du Pont have revealed that to be so. On top of this is the consideration of “dwell” temperature. Because water is involved, the unavoidable process of evaporation takes place. Evaporation is a cooling process. So the cleaner would have to stay in one place and constantly hold the valve open in order to promote high temperature damage to carpet fiber. If you were a contract carpet cleaner, would you expect to make money by staying in one place, or would you be more concerned with progressing as quickly as possible? The answer is obvious!

Most often, the objection to high temperature cleaning comes from two sources:

1. The manufacturers of equipment that cannot attain high temperatures and therefore need to defend their position because of a lack of design.
2. The “non-steam cleaning” proponents that feel hot water causes overwetting and destroys carpet. But nothing could be more false! It is the responsibility of proper vacuum that prevents overwetting.

With all this in mind, we are ready for some of my “bottom line” conclusions. The advantages speak for themselves. Professional cleaners and the entire carpet chain (fiber producer to cleaner) benefit by high temperature extraction restoration...especially the carpet consumer. It is highly effective, leaves far less residue, and results in a healthier atmosphere for the consumer.

The reason Steam Way International supports hot water extraction cleaning is because of the proof that it works. If you would like to see this principle demonstrated, give us a call. We are in touch with a national referral list of the best in the cleaning industry that are proud to show their value.