

The Science of Cleaning

R.E. Whittaker Co., Inc.

- Carpets have wear warranties
- Carpets do not have appearance warranties
- Appearance generally determines carpet replacement
- Appearance is not the determining factor in early carpet replacement when the LOMAC[®] (Low-Moisture Agitation & Crystallization) System is used.

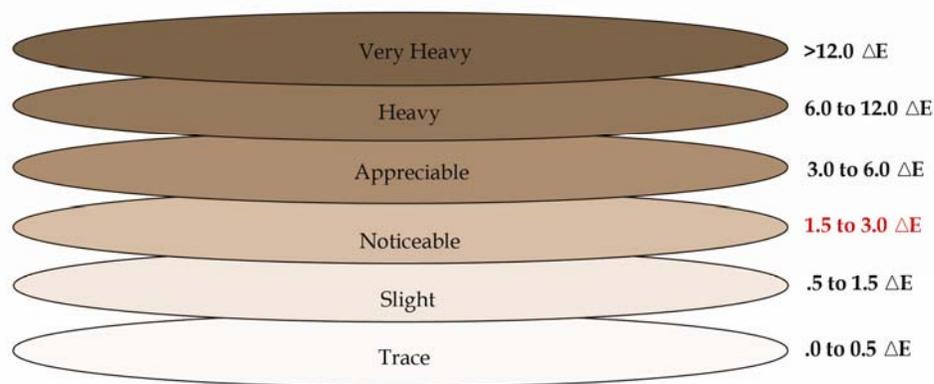
Soil Measurement

Our patented Δ soil measuring system provides answers to carpet cleaning questions related to: *Frequency, Procedures, and Accountability.*

ΔE is a numerical measure of the total color difference between a new carpet and a soiled carpet.

Frequency – Layering of Soil in Grey Carpet Tiles

As soil builds up, carpets change color and continue changing color until saturated. The color change of the carpet, as expressed by ΔE , correlates with the buildup of soil.



Objective soil measurements reveal that carpets need cleaning before ΔE equals 3.

Generally accepted vacuuming and cleaning frequencies:

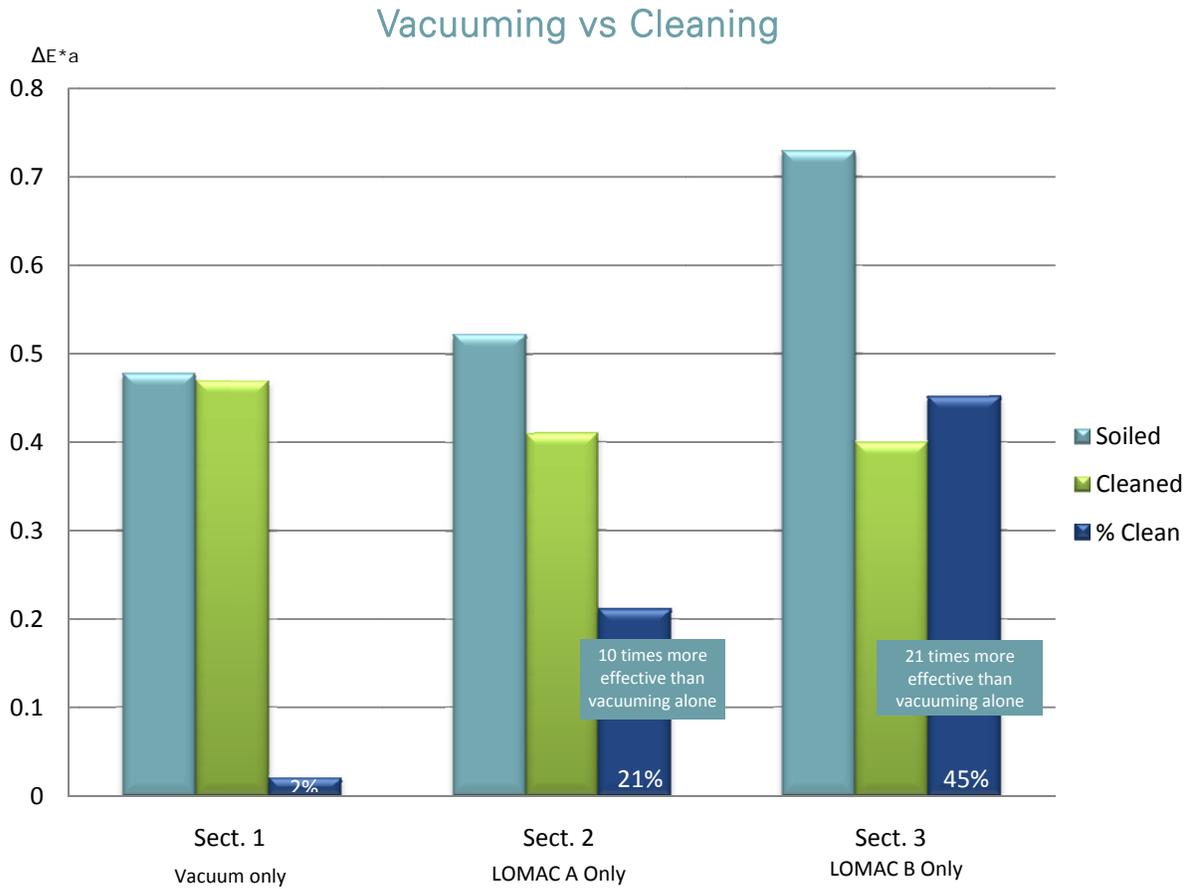
- Vacuum – daily
- Interim clean – as needed
- Deep clean – once or twice a year



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In-House Visual Appearance Results Comparing Two Procedures:
 Vacuum Cleaning vs. LOMAC® Cleaning using numerical soil measurements (ΔE)



LOMAC® carpets are up to 21 times visually cleaner than when vacuuming alone is performed.



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Third Party Certification Cleaning Research International

Test Results

The higher the ΔL number, the more soil present in the carpet.

SOILING CYCLE	VACUUMED ONLY (ΔL)	WITH INTERIM CLEANING (ΔL)
1	17.7	17.7
2	23.6	23.6
3	26.9	26.9
4	30.8	30.8
5	31.5	18.6
6	31.2	24.3
7	31.6	26.9
8	32.2	28.3
9	33.6	30.4
10	34.9	19.9
11	34.5	24.8
12	34.6	28
13	35.1	29.8
14	35.4	31.4
15	36.2	19.5
16	35.8	23.1
17	35.4	25.9
18	36.5	27.9
19	35.2	30.6
20	35.5	20.1
Extracted	27.3	11.2

Every fifth soiling cycle is highlighted to show when the Whittaker interim method was performed. There is a notable difference in the amount of soil present after interim cleaning is performed.

— D.W.

We commissioned Cleaning Research International to confirm our in-house visual appearance procedures.

- Hot water extraction is part of the Whittaker Comprehensive Planned Approach to Maintenance and was included in the third party certification report.
- Each soiling cycle represents approximately 10,000 footsteps.
- ΔL is a measure of the difference in whiteness between a new and a soiled carpet.

Comments

When the carpet is soiled for the first time, there is a sudden change in its appearance. In the case of the sample which was vacuumed only, this change continues to worsen until a plateau is reached which is an equilibrium between the color of the soil and the color of the carpet. In the case of the carpet subjected to interim cleaning, however, each subsequent clean restores the carpet to a value around that obtained after a single soiling. This means that by regular use of the LOMAC System, the soiled appearance of the carpet can be maintained at a satisfactory level over a prolonged period of time.

Furthermore, after so-called 'restoration cleaning' using hot water extraction equipment, the recovery of the carpet regularly maintained with the LOMAC[®] system is significantly better than that which does not have the benefit of LOMAC[®]'s interim maintenance.



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LOMAC® Interim Cleaning Related to Carpet Depreciation

- For savings listed below, eliminate one vacuum per month and replace with one LOMAC® cleaning per month.
- Vacuum and LOMAC® cleaning machines both clean at 6,000 sq. feet per hour.
- Carpet life is generally determined by how quickly a carpet visually deteriorates.
- For this illustration, the value of the carpet is estimated at \$160,000 (\$3.20 per sq. foot x 50,000 sq. feet).

LOMAC® Cleaning Schedule	Carpet Life	Yearly Depreciation	LOMAC® Cleaning Cost
NONE	5 YEARS	\$32,000 (\$160,000/5)	NONE
12x Year (monthly)	12 YEARS	\$13,333 (\$160,000/12)	\$2,496

Cost Savings Study

Vacuuming 5 days per week	260 Days per year
Replacing one vacuum per month with one cleaning	-12 Days
LOMAC® cleaning once per month	+12 Days

- Since both machines clean at the same rate, there is no change in labor costs
- Since LOMAC® uses chemicals, the additional cost is \$2,496 per year
- Savings based on a 12 year depreciation vs. a 5 year depreciation: **\$194,052**

Conclusions

- Carpets are not cleaned often enough
- Skip one vacuuming per month and substitute a LOMAC® cleaning
- Visual appearance is a factor in carpet replacement
- The LOMAC® System, when used monthly, significantly reduces costs



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