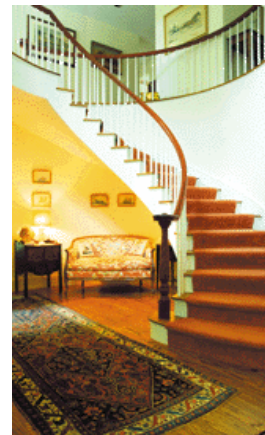
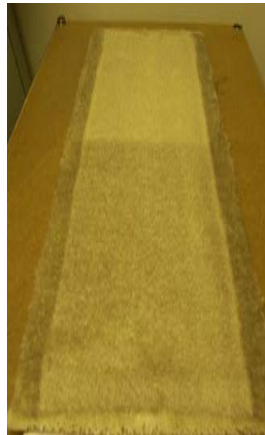


SYNTRAN[®] Water-based Polymers

Carpet Care Technology



BEAUTIFUL CARPETS AT A LOWER TOTAL MAINTENANCE COST

Superior Cleaning Performance

Longer Lasting Resoil Prevention

Significant Total Cost Savings



SYNTRAN Water-based Polymers Carpet Care Technology

Interpolymer, the global leader in the development of high performance water-based polymers for carpet care, has conducted extensive applications testing to quantify the cost-performance benefits of **SYNTRAN**[®] brand water-based polymers in commercial and industrial carpet cleaning and maintenance products.

Currently the majority of carpet cleaning products are primarily surfactant solutions. Surfactants are effective agents in solubilizing and removing dirt. With added fragrances, many of the commercial carpet cleaner formulations deliver a cleaner looking, fresh smelling carpet after they have been applied.

But do these products truly offer long term cleaning efficacy at the lowest possible use cost?

Interpolymer's test work found that many of the leading surfactant based cleaners actually accelerate the resoiling potential because of the sticky surfactant residues they leave on the carpet fibers. These residues attract dirt and dust particles to the carpet's surfaces requiring the need for more frequent cleaning that create unnecessary additional maintenance costs.

The major trends in commercial and industrial building maintenance, including carpet care, are to significantly reduce the total maintenance cost and the use of chemicals identified as harmful to the users or the environment.

To evaluate performance advantages with the use of Syntran polymers, Interpolymer undertook a R&D laboratory study to:

- + Determine the long term cleaning effectiveness of available commercial carpet cleaner products.
- + Compare and contrast the cleaning power of **Syntran** polymers vs. surfactant only products.

The results are significant! Interpolymer **Syntran** water-based polymers offer outstanding cost-performance benefits.

- √ Up to 25% improvement in cleaning
- √ Up to 30% improvement in resoil resistance
- √ Significant reduction in maintenance costs
- √ Minimal increase in formulated chemical costs

INTERPOLYMER offers a broad line of performance polymers for carpet care. The full portfolio and a summary of each product's features and benefits are outlined on page 8.

Depending on the specific carpet care application, selecting the right specialty polymer is the key to maximizing cost/performance.

- If cleaning efficacy is the major requirement, **Syntran 4020** or **Syntran 4015** would be the choices for standard formulations.
- If the cleaning product contains peroxide, **Syntran 4020** will combine superior cleaning properties with excellent stability in peroxide systems.
- For resoil prevention, **Syntran 4180** for standard systems and **Syntran 4022** for peroxide-based products will provide the best results.

To quantify the cost performance of carpet cleaning formulations, Interpolymer has devised the Carpet Cleaning Maintenance Index (CCMI) approach that combines cleaning and resoil prevention to evaluate long-term performance. **Syntran 4180** and **Syntran 4015** for standard formulations and **Syntran 4020** and **Syntran 4022** for peroxide-based carpet products clearly outperformed leading national brands in initial cleaning and preventing resoil.

Formulating with Syntran water-based polymers will add less than \$0.08/gallon on average

Formulating with **Syntran** water-based polymers into commercial strength carpet cleaners will add less than \$0.08/gallon on average to the chemical cost. **Syntran** polymers combine with the dirt and surfactant residues and dry to a non-tacky, brittle powder providing for full and complete removal of these residues during vacuuming. With this nominal increase in formulation cost, the return on investment is high. **Syntran** polymer-based carpet products can extend the days between cleaning cycles by up to 30%. This will allow Building Service Contractors to significantly increase the square footage of carpet they can maintain without any additional labor cost.

Syntran carpet care polymers offer the I&I formulator the opportunity to develop new cleaning products that can provide their customers significant cost savings and productivity improvements. *Plus*, **Syntran** carpet care polymers are non-hazardous to the user and the environment.

<i>Test Methodology</i>		<i>Test Materials</i>	
<i>Foam Test:</i>	Ross Miles, 10ml graduated cylinder	<i>Benchmark Formulation:</i>	
<i>Cleaning efficacy:</i>	Industry-modified method	• Interpolymer formulation F-19-009-05	
<i>Embrittling test:</i>	Interpolymer method	• Each Syntran polymer was tested in this formulation	
<i>Re-soiling efficacy:</i>	Industry-modified method	<i>Competitive benchmarks:</i>	
<i>Optical brightness:</i>	Industry-modified method	• Cold tap water	
<i>Color measurement:</i>	X-Rite SP-62 Spectrophotometer	• 5 leading commercial surfactant-based cleaning products	
<i>Cleaning machine:</i>	Commercial grade self-propelled upright deep cleaner	<i>Carpet (CRI recommended):</i>	
<i>Dirt & resoil testing</i>	Interpolymer designed carpet drum roll	• BCF nylon, non-treated, cut pile, 0.47" height	
		• 718 Commander, 25 oz./sq. yd.	
		• Almond color (703)	

**EXPERIMENTAL DESIGN:
Carpet Cleaning Maintenance Index (CCMI)**

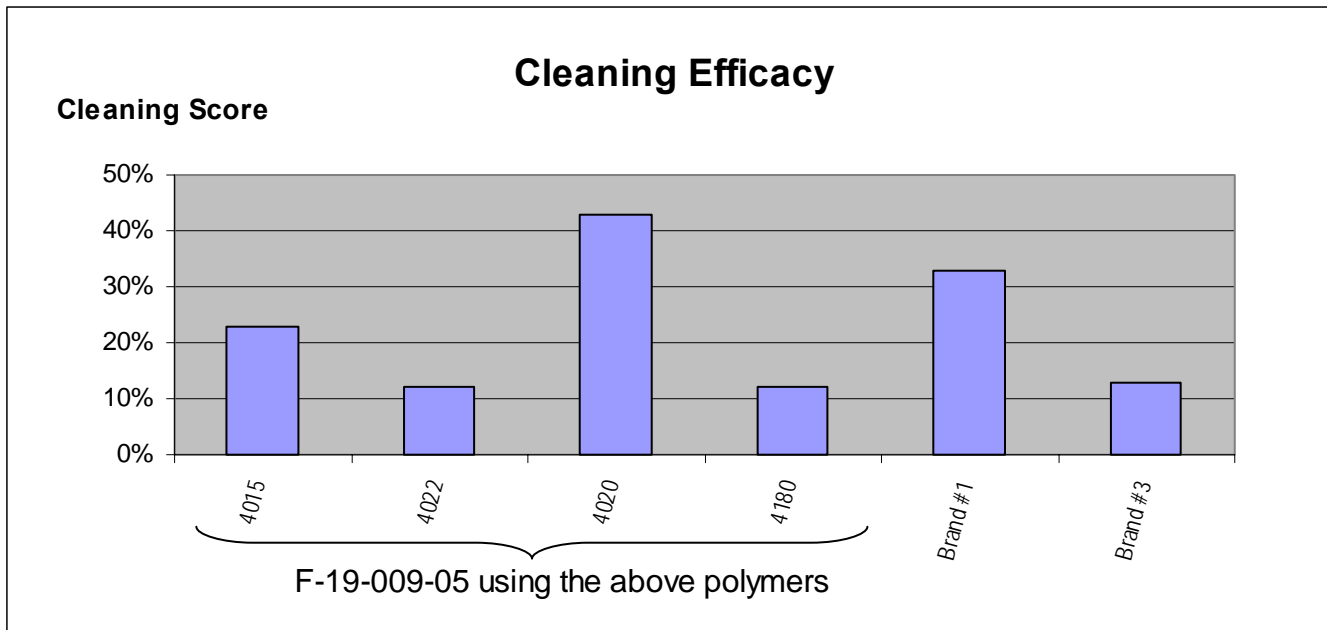
Interpolymer’s experimentation was designed to test and quantify the effectiveness of cleaning and embrittling polymers on commercial carpet when compared to the current standard cleaning solutions which are predominantly surfactant based.

As part of the experimentation, Interpolymer developed a new analytical model to measure the long-term effectiveness of cleaning products. This new model is called the CARPET CLEANING MAINTENANCE INDEX (CCMI), which is a combination of a product’s cleaning efficacy and its ability to reduce resoiling of a cleaned carpet.

Interpolymer’s applications testing and quantification of the CCMI clearly shows that the addition of **Syntran** polymers significantly improves both the cleaning efficacy and resoil resistance of products used in extraction cleaners on commercial carpet.

1. Cleaning Efficacy: % of dirt removed, following cleaning product label use instructions.

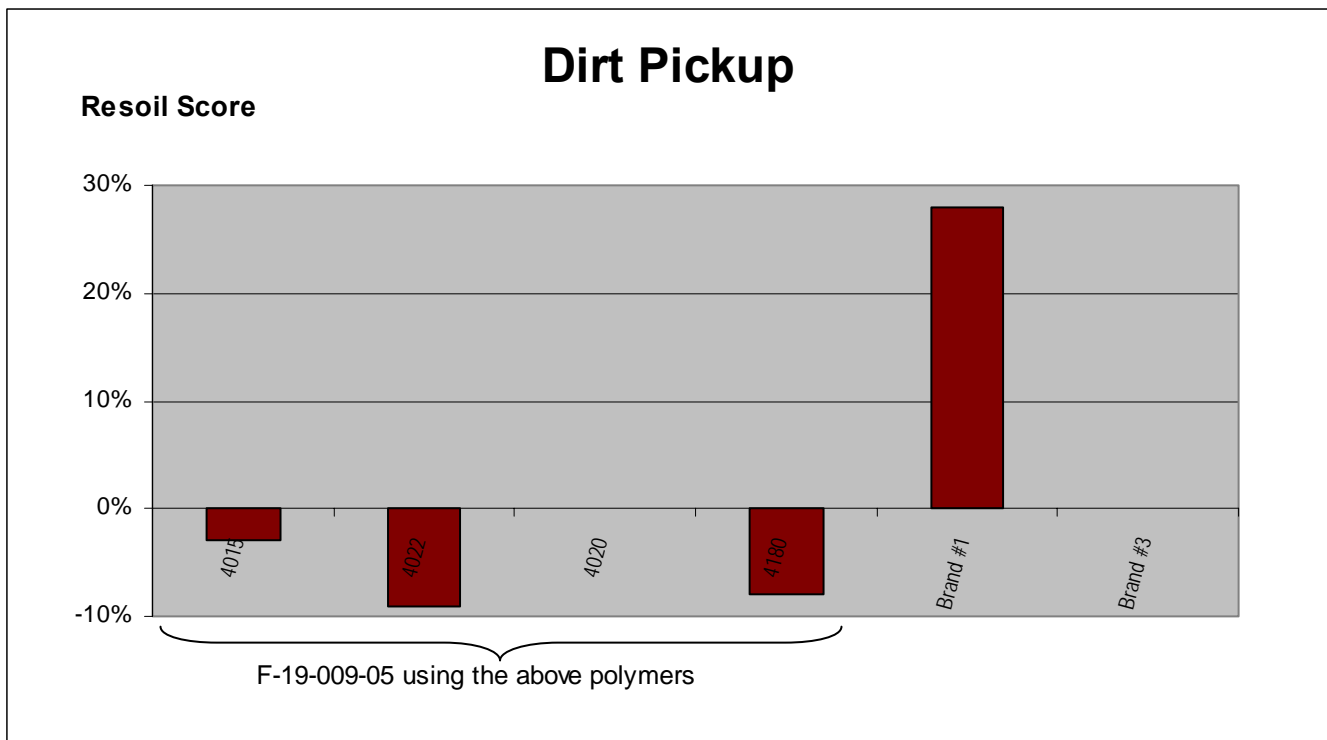
- Start with a clean untreated (virgin) carpet tile (36”x13”) and soil it with 1/2 gram of AATCC dirt in the soiling drum. Measure the dirt pick-up and the change in the carpet’s appearance. Apply recommended amount of cleaning solution and extract. Let the carpet dry and measure the amount of dirt removal.



- A high cleaning score indicates a cleaner carpet upon cleaning,
- **Thus, the higher the better.**
- Cleaning scores compare how effectively a carpet is cleaned when you use a cleaning formulation versus *without* using one.

EXPERIMENTAL DESIGN:
Carpet Cleaning Maintenance Index (CCMI) *continued*

2. Resoil prevention: effectiveness of a cleaning product in preventing dirt pick-up after cleaning.
 - Start with the carpet squares used in the Cleaning Efficacy Test. Put in soiling drum with 1/2 gram of AATTC soil and measure the dirt pick-up.

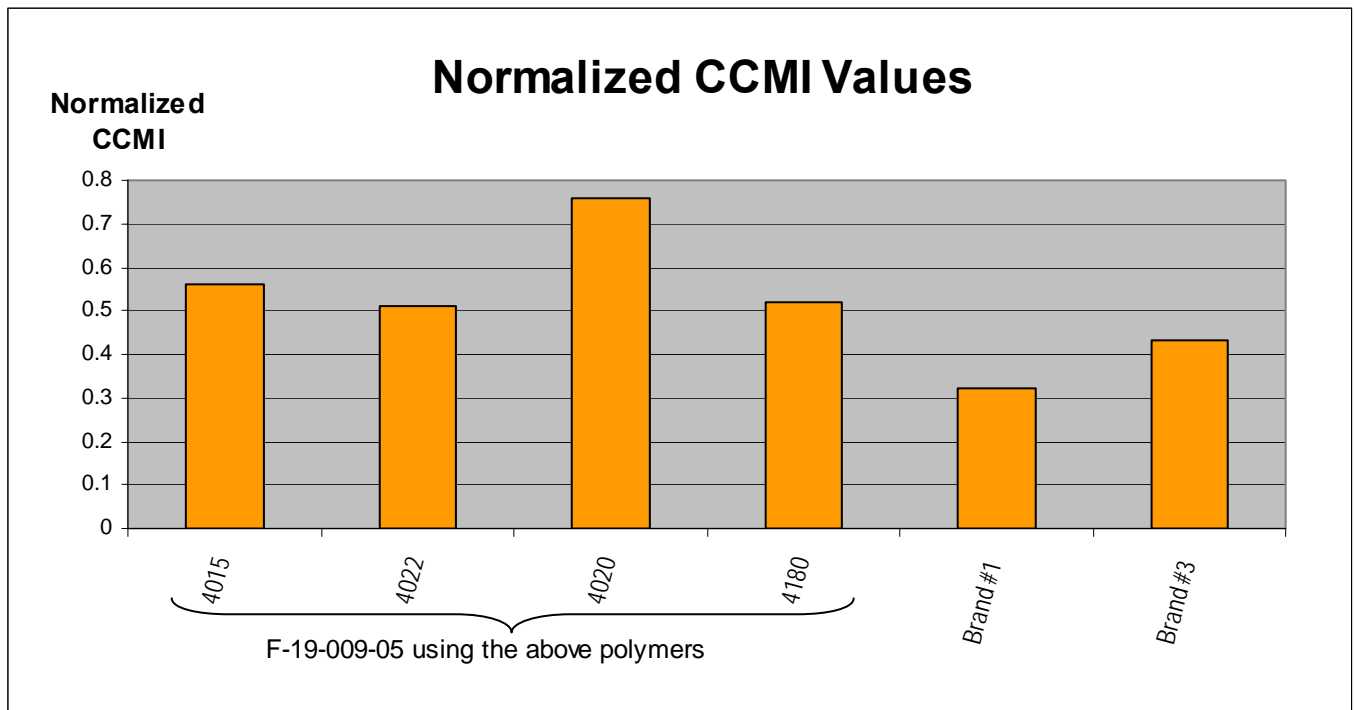


- A higher resoil-score indicates the carpet gets dirtier, quicker
- ***And, the lower the better***
- Resoil scores compare how much dirt a carpet picks up when it was cleaned *with* a cleaning formulation versus *without* using one.

EXPERIMENTAL DESIGN:

Carpet Cleaning Maintenance Index (CCMI) *continued*

- CCMI: Combined effectiveness of cleaning products in cleaning and preventing further soiling. CCMI is an analytical model comparing the combined cleaning and resoiling efficiency of a formulation to competitive benchmarks. The base standard for all products is a carpet tile that has been repeatedly soiled with AATCC soil without any cleaning product applied.



- A higher normalized CCMI indicates a better overall carpet cleaning efficiency
- ***And, the higher the better***
- The CCMI compares how a carpet dirties over time when using a cleaning formulation versus using water, which is defined as zero.

Note 1: All testing was done using cold undistilled tap water as the cleaning benchmark. The competitive products are national commercial brands.

Note 2: All test guidelines, data and measurement models are available on request.

Interpolymer Carpet Care Polymers Application and Starting Point Formulation Index

Product	Application	Appearance	% Solids	pH	Starting Point Formulation	Comments
Syntran 4010	Stain resistance applications	Clear solution	20%	8.80	F-10-036-26	Flourine modified acrylic for carpet and textile protectant applications
Syntran 4015	Soil suspension aid	Clear solution	30%	7.50	F-19-010-09	Sodium Acrylate copolymer for high pH soil suspension and chelation applications
Syntran 4022	Soil suspension aid / embrittling polymer	Clear solution	30%	6.00	F-19-011-07	Sodium Acrylate copolymer for lower pH soil suspension and chelating applications (peroxide stable)
Syntran 4020	Embrittling polymer	Opaque emulsion	35%	6.00	F-19-011-07	High Molecular Weight acrylic copolymer
Syntran 4080	Soil suspension aid / embrittling polymer	Opaque emulsion	40%	8.00	F-19-010-03	Efficient, high solids acrylic embrittling copolymer for high pH applications
Syntran 4178	Embrittling polymer	Clear solution	20%	8.00	F-19-010-09	Zn-crosslinked / low foam solution embrittling copolymer
Syntran 4125	Embrittling polymer	Clear solution	20%	8.00	F-19-009-05	Zn-free acrylic solution embrittling copolymer (zn-free version of Syntran 4180)
Syntran 4180	Embrittling polymer	Clear solution	20%	8.00	F-19-009-01	Efficient, solution zn-crosslinked embrittling copolymer for high pH / high foam applications

SUMMARY:

Historically, the majority of commercial I&I carpet care cleaning products are water/surfactant solutions. The use of water-based polymers as cleaning boosters and embrittling agents for resoil prevention is growing rapidly, as the cost performance benefits are becoming better quantified.

The **Syntran** series of specialty polymers has been developed specifically to offer significant benefits in the cleaning efficiency of formulated products. This increased cleaning efficiency and long-term carpet care maintenance offers cost savings by extending the time between cleaning cycles. **Syntran** polymers efficiently entrap dirt and dust particles and accelerate the drying process to form a brittle residue. The cleaned, dried carpet can be vacuumed more effectively for the removal of dirt and other unwanted materials.

Carpets are cleaner and stay clean longer when treated with **Syntran** polymer products. This allows the maintenance contractor to significantly extend the time between cleaning cycles, saving time and money.

In our applications and development test work, **Syntran** cleaning boosters and embrittling polymers can enhance the CCMI performance of carpet care products by up to 30%. **Syntran 4020 and Syntran 4022** are the two latest polymer innovations from Interpolymer. In addition to their outstanding cleaning and resoil resistance properties, these polymers are stable in hydrogen peroxide-based formulations. With the increasing number of oxygenated cleaning products on the market, **Syntran 4020 and Syntran 4022** are two of Interpolymer's fastest growing products.

As the requirements for change in the I&I cleaning industry increase, those formulators who design products to deliver superior long-term cost performance to their customers will build their next line of carpet care products around **Syntran** water-based polymers.



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