

# Summary Report on the Benefits of Commercial Bonded Polyurethane Carpet Cushion in the Workplace



When you install commercial bonded polyurethane carpet cushion under workplace carpet you can improve appearance retention, durability, sound absorption, vacuumability and energy efficiency.



From a “people perspective,” carpet over cushion can offer ergonomic benefits and help maintain a quieter, more productive workspace. And of course, cushion makes carpet feel better.

These benefits continue to accrue over the entire life of the installation, providing superior value through improved lifecycle costs.



This report summarizes research, technical information and case studies that support the decision to install workplace carpet using the double-glue method of installation, whereby cushion is adhered to the floor, followed by adhering carpet to the installed cushion, rather than directly to the floor. The recommended cushion for the workplace environment is commercial-grade bonded polyurethane carpet cushion -- a proven performance booster.

## Appearance Retention: Cushion Helps Carpet Look Better and Last Longer

Maintaining the look of new carpet is vital to longer carpet life – and to lower lifecycle cost. One of the major factors that can affect carpet appearance over time is traffic – how much it’s walked on and rolled over.

### Challenge:

Acting like a shock absorber as it supports the carpet, much of the force from common traffic is redirected to the cushion. Like a life-preserver for carpet, bonded cushion protects the face fibers and allows the carpet to maintain its appearance over a longer lifecycle.



This has been demonstrated in the field as well as through accelerated fatigue testing in the laboratory. Using the Hexapod Drum, carpet is exposed to high levels of simulated foot traffic.

Assessing appearance before and after testing provides reliable insight into carpet and cushion performance.

### Research Findings:

In a study at Independent Textile Testing in Dalton, Georgia, commercial bonded polyurethane carpet cushion was shown to improve the appearance retention of carpet after heavy traffic by as much as 50% compared to the same carpet installed without cushion.

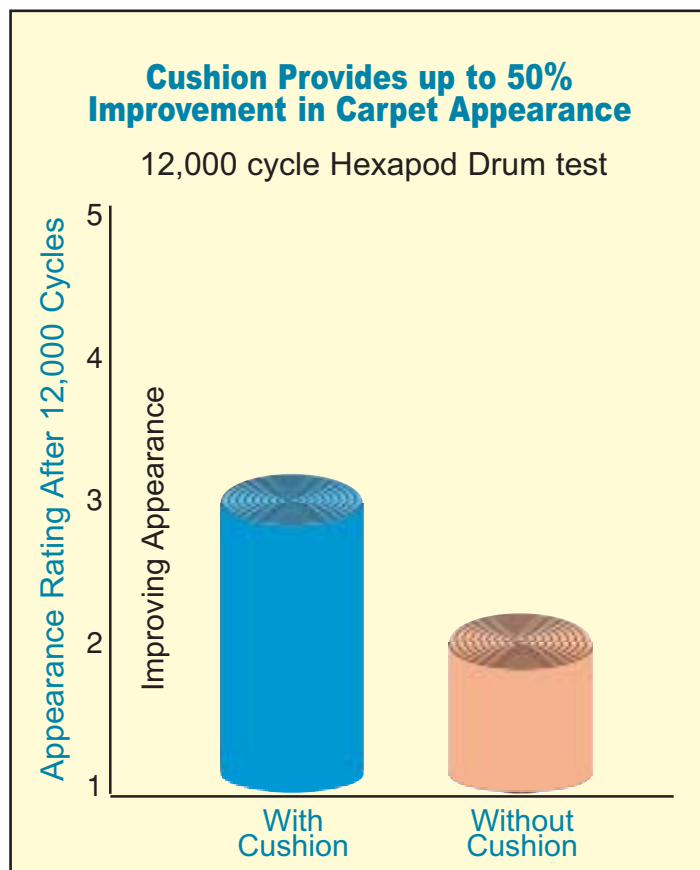


The Hexapod Drum is used for accelerated fatigue testing of carpet

The study included a 26 oz./sq. yd. nylon loop product. Tested side-by-side in cushioned and non-cushioned (direct-glue) installations, the cushioned carpet maintained up to a 50% better appearance rating (see graph).

In fact, the cushioned carpet maintained better appearance even after it had received one and a half times more traffic than the direct-glue carpet.

For more information, download *The Impact of Bonded Polyurethane Cushion on Appearance Retention and Durability of Commercial Carpet* at [afpf.com](http://afpf.com).



The Alliance for Flexible Polyurethane Foam (AFPF) provides technically sound information on the benefits of commercial carpet installed with commercial bonded polyurethane carpet cushion. For detailed information on the research, case studies and information outlined in this summary report, please visit our web site at [afpf.com](http://afpf.com).

## The Phillips Chair Test: Proof of Performance

Before a product is specified, there must be confidence in its performance. In high traffic applications, the carpet specifier needs to know that the carpet and cushion of interest will stand up to severe conditions – and continue to perform without delamination, without damage, without problems.

### Challenge:

Areas of particularly demanding conditions are intermixed within nearly every commercial installation. Perhaps one of the harshest tests faced by carpet and cushion is beneath caster chairs, found behind nearly every desk in every office and workstation in the country. Under the weight of the chair's occupant, the casters subject the carpet to an ongoing barrage of potentially abusive forces. Carpet and cushion that can stand up to this abuse establish a high degree of purchasing confidence.

“...even after exposure to 50,000 cycles [in the Phillips Chair Test], no problems were found with the carpet, the cushion, or the installation...”

The Phillips Chair test allows us to simulate the weight and movement of an occupied caster chair. Carpet and cushion installed under the chair are exposed to many thousands of cycles of chair movement, providing an accelerated indication of the floor covering's performance over its lifecycle.

### Research Findings:

A durability study was conducted by Independent Textile Testing in Dalton, Georgia, using the Phillips Chair test. In this test, a 32 oz./sq. yd. nylon loop commercial carpet was installed over a 10 lb./cu. ft. density commercial bonded polyurethane carpet cushion using the double-glue method.



In multiple tests, even after exposure to 50,000 cycles, no problems were found with the carpet, the cushion, or the installation. In fact, it was noted that the carpet and cushion samples looked so good that they could likely go another 50,000 cycles.

Success under these harsh conditions underscores the high performance of commercial bonded polyurethane carpet cushion.

This research is described in detail in: *The Impact of Bonded Polyurethane Cushion on Appearance Retention and Durability of Commercial Carpet* at [afpf.com](http://afpf.com).

## Easier Carpet Maintenance: Cushion Helps Get the Dirt Out

A good maintenance program is important for carpet appearance. Well-maintained carpet will look better and last longer. Commercial bonded polyurethane carpet cushion improves the vacuumability of carpet.



### Challenge:

Not only does soil that is left in carpet cause it to look dirty, but it also acts as an abrasive. Over time, the grinding action of the soil particles reduces the luster of the fibers, degrading the carpet appearance.

Vacuuming is made more efficient with the use of cushion, allowing more dirt to be pulled out of the carpet. By making dirt removal easier, cushion provides an additional boost to improved carpet appearance retention.

Vacuuming efficiency is measured through a standardized procedure developed by the Carpet and Rug Institute.

### Research Findings:

In a study conducted by Professional Testing Laboratory Inc. in Dalton, Georgia, a 26 oz./sq. yd. nylon loop commercial carpet was evaluated in the vacuuming efficiency test. The carpet was tested without cushion installed by the direct-glue method. Then, using commercial bonded

polyurethane carpet cushion, the same style carpet was installed by stretch-in and double-glue methods.

In every case, the use of cushion showed as much as 40% to 60% or greater improvement in the amount of soil removed compared to the same carpet installed without cushion. By providing a livelier foundation for the carpet, the cushion works with the beater brush on the vacuum cleaner to help dislodge embedded soil particles. Then, increased air flow provided by the cushion makes it easier for the vacuum to pull out the loosened dirt. The result? More effective dirt removal every time you vacuum.

Read the details of this study at [afpf.com](http://afpf.com) in the report, *Maintenance Breakthrough -- Polyurethane Cushion Improves Vacuumability of Commercial Carpet*.

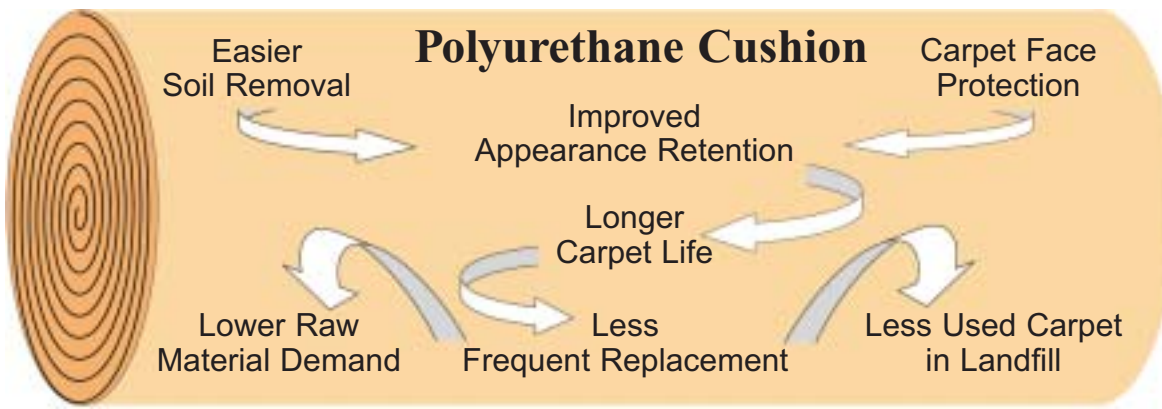
## Sound Absorption : A Quieter Workplace with Carpet Cushion

Shrinking workstation size and higher employee density have made noise management a primary design criterion. Each component in the interior space has a role and carpet cushion can help. The pay-off is productivity. Fewer distractions can mean a more productive workforce.

### Challenge:

As the single largest design element in the commercial setting, the choice of flooring can play a major role in noise management. Hard surfaces tend to reflect sound, while carpet does a much better job of sound absorption and reducing overall transmission of unwanted noise from sources such as machinery, conversations and foot traffic.

“...the use of cushion showed as much as 40% to 60% or greater improvement in the soil removed compared to the same carpet installed without cushion.”



For more information, read *Sound Absorption in the Workplace – Acoustic Benefits of Polyurethane Carpet Cushion in Commercial Installations* at [afpf.com](http://afpf.com).

As good as carpet is alone, the addition of commercial bonded polyurethane carpet cushion can more than double the amount of sound that is absorbed.

### Research Findings:

In a study conducted by Intertek Testing Services (ITS), an independent laboratory with specific expertise and capability in acoustic evaluations, the sound absorption and sound transmission of carpet, cushion and the concrete subfloor were determined.

While the hard-surface subfloor had essentially no ability to absorb sound, direct-glue carpet (no cushion) absorbed approximately 25% of the sound that struck its surface. When the same carpet was installed via the double-glue method over commercial bonded polyurethane carpet cushion, approximately 55% of the sound was absorbed, more than a 2x increase over the carpet alone.

Sound transmission, such as you might hear from one floor to the next, was also significantly improved with the use of carpet and cushion vs. carpet alone.

Cushion plays a valuable part in noise management and a quieter, more productive workplace.

“As good as carpet is alone, the addition of commercial bonded polyurethane carpet cushion can more than double the amount of sound that is absorbed.”

## Green Buildings and Bonded Polyurethane Cushion: A Sustainability Success

A product’s environmental footprint – the overall environmental impact from raw materials, manufacture, usage, and ultimate disposal – has a growing importance in product specification.

The goal is for every product that we use to have a relatively low impact on Planet Earth. This has never been as true as it is today and commercial interiors are no exception.

### Green Solution:

Guidelines, audits and environmental assessment tools, such as Green Globe, LEED, Energy Star and BEES, are some of the tools increasingly associated with product specifications.

Regardless of which approach is used, recycle content and recyclability are two factors consistently identified with green products. Commercial bonded polyurethane carpet cushion proudly touts both recycle content and recyclability.<sup>1</sup>

With a typical recycle content of around 90%, commercial bonded polyurethane carpet cushion primarily uses scrap foam generated from various manufacturing processes. This recovered material is incorporated into a valuable, high-performance cushion and serves to divert hundreds of millions of pounds of material from land-fill or other disposal routes.

And, it's not just a matter of recycle content and recyclability. Commercial bonded polyurethane contributes to the green equation by extending the lifecycle of carpet.

With the use of bonded polyurethane cushion, better appearance retention and longer carpet life mean less frequent replacement. This has the combined effect of reducing raw material demand for replacement carpet and reducing the amount of used carpet requiring disposal by landfill or other routes. The sustainability contribution of longer lasting carpet becomes clearer when you consider that an estimated 4.5 billion pounds of used carpet was destined for landfill in 2002 alone.

## Proper Installation of Carpet and Cushion is Key

The starting point in commercial applications is choosing an appropriate commercial carpet cushion for a particular application. The double-glue method requires carpet cushion that has been specifically designed for this installation approach. AFPF has published industry-accepted guidelines based on the use of a typical commercial-grade bonded polyurethane carpet cushion with a thickness of 0.25" maximum and a density of 10 lbs./cu.ft. minimum with woven or non-woven scrim on both sides.



Carpet installation should be performed by professional installers with specific training in commercial carpet installation. Many installers are certified by the International Certified Floorcovering Installers Association (Master or C-II), are members of the Floor Covering Installation Contractors Association (FCICA), or are employed by floor covering contractors certified by the Floor Covering Installation Board (FCIB).

### The Energy Efficiency of Cushion: Cost Savings with Environmental Benefits

Commercial bonded polyurethane cushion has the added benefit of outstanding thermal insulation. In fact, the product's high R-value, typically around 1.0, is higher than many other cushion options.<sup>2</sup> Because R-value is additive, cushion adds to the insulating value of carpet, producing an insulating system that can lower HVAC demand and reduce energy requirements.

## Double-glue Method

The recommended method of installing carpet over commercial bonded polyurethane carpet cushion is the double-glue method. It involves adhering carpet cushion to the floor, followed by adhering the carpet to the installed cushion.

To help ensure consistency and provide availability of a common resource available to everyone, guidelines for installing carpet and cushion via the double-glue method have been published by AFPF. These guidelines reflect a consensus of carpet and installation leaders on best practices for proper installation.

An excellent resource for carpet specifier and carpet installer alike, a copy of *Installation Guidelines for Commercial Carpet and Commercial Bonded Polyurethane Carpet Cushion* may be downloaded at [afpf.com](http://afpf.com).

## Case Studies:

Case studies provide a window into the applications where commercial bonded polyurethane carpet cushion is being used. The perspective is beneficial as new or refurbishment installations are planned, giving insight as to how others are utilizing cushion.

### Carpet-Smart Renovations

The Commonwealth Tower in the Washington, D.C. area had a common refurbishment dilemma: one client vacating a space to be occupied by another client waiting to move in. Balancing tight short-term schedules with the long-term needs of the office space, the facility manager chose commercial bonded polyurethane carpet cushion for use with both office and corridor carpets. The result is an installation that went in on-time, was noticeably more comfortable to tenants and will continue to perform over an extended lifecycle. Details at [afpf.com](http://afpf.com).



### Double-Glue Meets Doubletree®

With an eye on increasing the hotel's rating, the Director of Operations at the Doubletree Hotel in Crystal City, Virginia chose commercial bonded polyurethane carpet cushion for the hotel's major renovation. The cushion was paired with high-end, wool-blend woven patterned carpets in the 68,000 square foot installation, including the 9,000 square foot Crystal Ballroom. The complexity of patterns was demanding, but the hotel facility manager noted, "...the installation went very well and the cushion makes a significant difference." Details at [afpf.com](http://afpf.com).

### Specify Commercial Bonded Polyurethane Carpet Cushion with Confidence

Research proves the value across the board. Carpet cushion improves lifecycle cost, appearance retention, durability, comfort, sound absorption, vacuumability and energy efficiency. All these benefits in a product that is

made from recycled material and is recyclable in communities with appropriate facilities make bonded polyurethane carpet cushion a product that is truly designed for today's workplace.

For more information and a list of carpet cushion suppliers, visit [afpf.com](http://afpf.com).

<sup>1</sup> An online database of recycling companies is available from the Alliance for the Polyurethanes Industry at [www.polyurethane.org](http://www.polyurethane.org)

<sup>2</sup> "Carpet cushion and radiant panel floors," Radiant Panel Report, Lawrence Drake, 9/1997, page 2.

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