



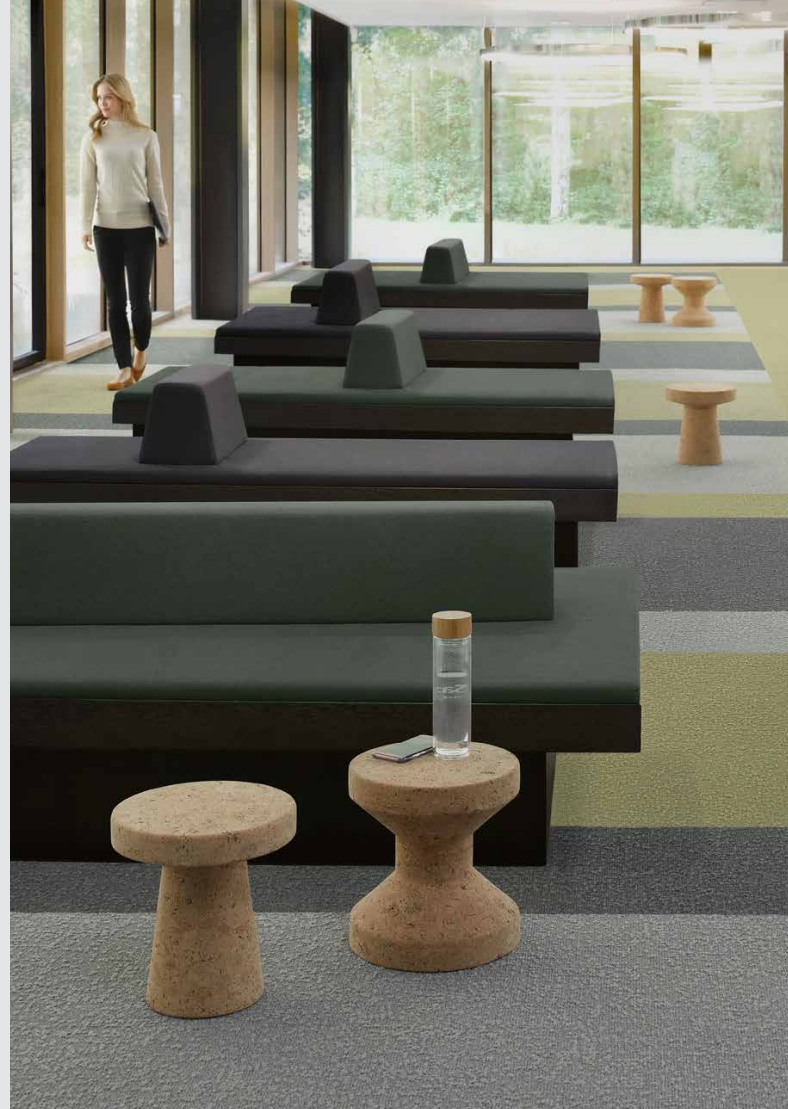
WORKING SMARTER, NOT HARDER:
IMPROVING WORKPLACE
HEALTH & WELLBEING
THROUGH EFFECTIVE DESIGN

INTRODUCTION

Millennials are driving the contemporary workforce. In offices around the world, their numbers are growing; according to a 2016 report by global workforce experts ManPowerGroup, millennials – people born between the early 1980s and 2000s – will comprise the majority of the global workforce by 2020.ⁱ This massive demographic shift is shaping workplace culture and office design, particularly with regard to health and wellbeing. It is no surprise that a strong focus on healthy lifestyle choices is creeping into the workplace: the Huffington Post has reported that as a group, millennials are more concerned with health and wellbeing than any preceding generations.ⁱⁱ

In light of this, employers are increasingly aware that they must strive to meet enhanced health outcomes in order to attract and retain the best and brightest talent, and are looking toward designers to deliver appropriate solutions. In turn, the architecture and design industry is carefully evaluating all aspects of workplace design – including furniture, fitout, and material choices – to maximise their positive impact on worker health and wellbeing. The impetus behind this is at least in part economic, with studies having demonstrated a strong link between elevated employee wellbeing, reduced absenteeism and enhanced productivity, and the attraction and retention of top talent.

In this whitepaper, we focus specifically on how flooring can shape healthful experiences within the workplace, and take a closer look at how carpet can improve wellbeing and indoor environmental quality.



FACTORS DRIVING WELLBEING

INDOOR AIR QUALITY

According to the Australian Bureau of Statistics, the average employee spends a total of 41.3 hours per week at work.ⁱⁱⁱ Given how much time employees are spending in the office, it is important that workspaces are designed to support good physical health. One way of achieving this is by ensuring high indoor air quality through the creation of indoor spaces that are free of dust and particulate matter, which can irritate asthma and allergies.

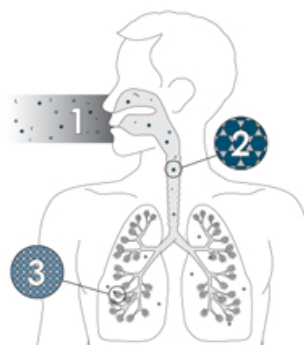
Research conducted by the National Asthma Council Australia demonstrates that approximately 45% of all Australians suffer from allergies: of this, about 80% are allergic to dust mites.^{iv} Combined with the fact that 1 in 9 (around 2.5 million) Australians have asthma,^v careful management of dust and other allergens within indoor environments is absolutely critical.

The presence and size of particulate matter (PM) or fine dust is a determining factor in air quality and is directly linked to potential health problems. Once inhaled, these particles can contribute to the spread of microbial contaminants, such as mould, pollen and allergens. In addition, they can affect the heart and lungs and cause serious physiological problems (e.g. changes in lung function or inflammation markers).

In this regard, carpet excels amongst all floor coverings. Carpet pile traps dust and other harmful particulates, effectively removing them from the air and storing them until they can be vacuumed or cleaned away. According to a major study by the German Allergy

and Asthma Society (DAAB), this unique characteristic allows rooms with wall-to-wall carpet to contain half as much dust as rooms with hard flooring. The study's findings also demonstrate that high denier, low pile carpet is particularly adept at allergen retention and markedly reduces allergy and asthma risks.^{vi}

HOW PARTICULATE MATTER ENTERS YOUR BODY



1. Particulate matter enters our respiratory (lung) system through the nose and throat.

2. The larger particulate matter is eliminated through coughing, sneezing and swallowing.

3. Smaller particulate matter can penetrate deep into the lungs. It can travel all the way to the alveoli, causing lung and heart problems and delivering harmful chemicals to the blood system.

BRIGHTER SPACES

The connection between proper lighting and wellbeing and productivity is well known. Research conducted by the Canadian Centre for Occupational Health and Safety (CCOHS) has demonstrated that insufficient lighting can adversely affect the quality of work, particularly where precision is required. Poor lighting can also negatively impact productivity levels,^{vii} and has been linked to eyestrain and headaches.

Recognising the health and safety risks posed by inadequate or improper lighting levels, the European Committee for Standardisation (CEN) sets out the following minimum light levels for common office tasks:

- 300 lux for administrative tasks
- 500 lux for writing and computer tasks
- 500 lux for conference and meeting rooms

Ideally, workspaces should have bright, even lighting that maximises natural light sources. The ‘blue light’ emitted by many artificial lights – including energy efficient light bulbs – has been linked to disrupted circadian rhythms and elevated rates of cancer, diabetes, heart disease, and obesity.^{viii}

These negative effects may be minimised through careful specification of carpet. Carpet with high Light Reflectance Values (LRV) can boost overall interior light levels, providing even, glare-free lighting that can have positive effects on worker productivity and wellbeing. By reflecting diffuse, gentle light upwards, high LRV carpet can combat the eyestrain and visibility issues caused by harsh overhead lighting.

Adequate light levels can also enhance the safety of a workplace by enhancing visibility and reducing the risk of slips, trips, and falls, which are a major source of injury in Australian workplaces; according to SafeWork, 56% of workplace slips, trips, and falls were caused by environmental factors.^{ix} High LRV carpet can also reduce energy consumption by allowing the specification of lower intensity lighting.

ACOUSTIC MANAGEMENT

The importance of controlling office noise levels cannot be overstated. Unlike in other environments, noise levels in offices cannot be controlled through simple elimination of sources of noise, which in many cases are critical to operations. For example, staff conversations, phone calls, and the use of devices are essential to the majority of workplaces.

In spite of this, studies have repeatedly identified excessive noise as the “most disturbing factor” causing disruption and irritation amongst workers,^x and elevated noise levels can have direct, negative effects on worker productivity and job satisfaction. Carpet can reduce noise levels in three critical ways. Firstly, it can absorb excess sound and prevent it from spreading far beyond its original source.

Secondly, it is an effective means of adjusting reverberation times and reducing impact sound between floors. Thirdly, carpet can significantly reduce impact sound. Beyond this, carpet is more cost effective than acoustic wall or ceiling panels, and is more durable and long lasting than dividers or freestanding acoustic screens. Always use cushion backed carpet tiles with appropriate pile structure for improving acoustic performance of the area.

THERMAL COMFORT

As awareness of the importance of sustainable design and environmentally friendly building solutions continues to grow, designers and specifiers are investigating ways to reduce reliance on air conditioning. A number of design-based solutions can facilitate this, including the specification of carpet flooring. Thanks to its dense, soft composition, carpet provides low heat conduction and exceptional thermal insulation.

Fibres in the surface of the carpet pile trap air and heat, allowing carpet to offer thermal insulation values up to 10 times of hard floor coverings.^{xi} Insulation properties increase proportionate to carpet thickness and density.

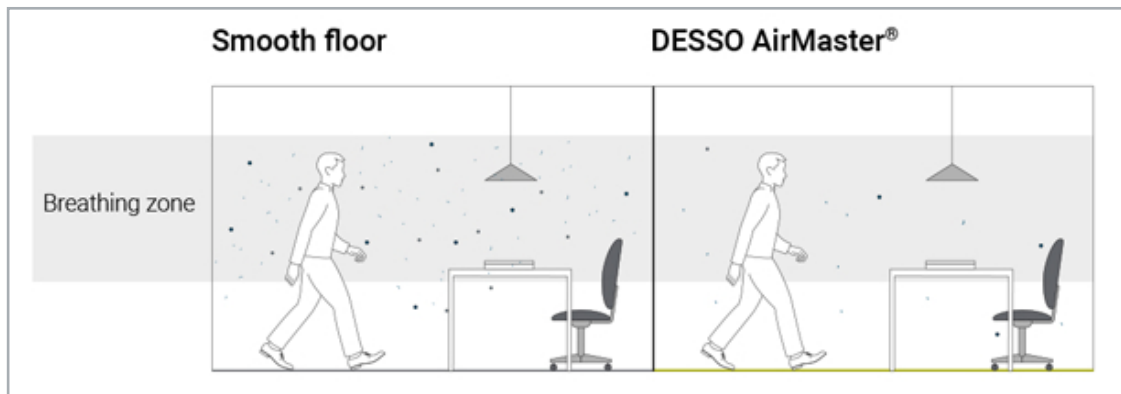


DESSO™ AIRMASTER®

Designed and engineered to enhance occupant health and wellbeing, AirMaster® carpet captures and retains fine dust and other particulate matter. The dense carpet acts as a filter, trapping dust and other contaminants within its pile until it is vacuumed, thereby preventing the exacerbation of dust-related allergies and asthma. To achieve this, AirMaster® utilises a unique two-part profile. Fine yarned DESSO AirFilters trap very fine dust and are combined with the thicker yarns of DESSO DustCollectors, which capture coarser particles.

As a consequence, AirMaster® is 8 times more effective than smooth flooring solutions and 4 times more effective than standard carpet when it comes to capturing and retaining fine dust. Independent testing has verified the effectiveness of AirMaster® in cleaning the air, and the carpet has subsequently become the first product in the world to achieve GVI Gold Label Certification.

Research conducted
by the National
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DESSO LIGHT REFLECTION MASTER®

Ideal for crafting bright, open workspaces and reducing reliance on artificial light, DESSO Light Reflection Master® is a valuable addition to any office environment. Independent testing has demonstrated the carpet's ability to enhance brightness on interior walls and ceilings by up to 14%, leading to reductions of as much as 10% in artificial lighting. In turn, this reduces lighting costs, energy consumption, and overall CO₂ emissions.

The DESSO Light Reflection Master® collection can boost LEED credits in the Energy and Atmospheric category and can help in meeting WELL standards. The LRVs of all DESSO products are readily available, and many DESSO products have LRVs of greater than 25 to ensure the perfect appearance.



DESSO SOUNDMASTER®

Designed to manage noise levels in spaces where acoustic control is vital, DESSO SoundMaster® is a truly remarkable multilayered carpet tile system. Suitable for use in offices, schools, hospitals, and other commercial spaces, SoundMaster® combines a unique 80% recycled, 100% polyester backing with a plush yarn and high pile to deliver exceptional sound control.

The high performance carpet can improve impact sound insulation by up to 10 dB. When compared with ceramic tiles and linoleum, SoundMaster® flooring has been demonstrated to adjust reverberation times and deplete background noise levels, and may absorb sound and improve acoustic conditions by as much as $+0.15\alpha_w$.

In addition, SoundMaster® is designed with cost efficiency in mind, with the carpet tiles allowing easy repairs or replacement by simply isolating and replacing the damaged section with minimal fuss.

The DESSO SoundMaster offers an impact sound insulation value (ΔL_{wv}) up to +10 dB above the standard value and an improvement in sound absorption performance up to $+0.15 (\alpha_w)$, in comparison to standard carpet designs.

TARKETT

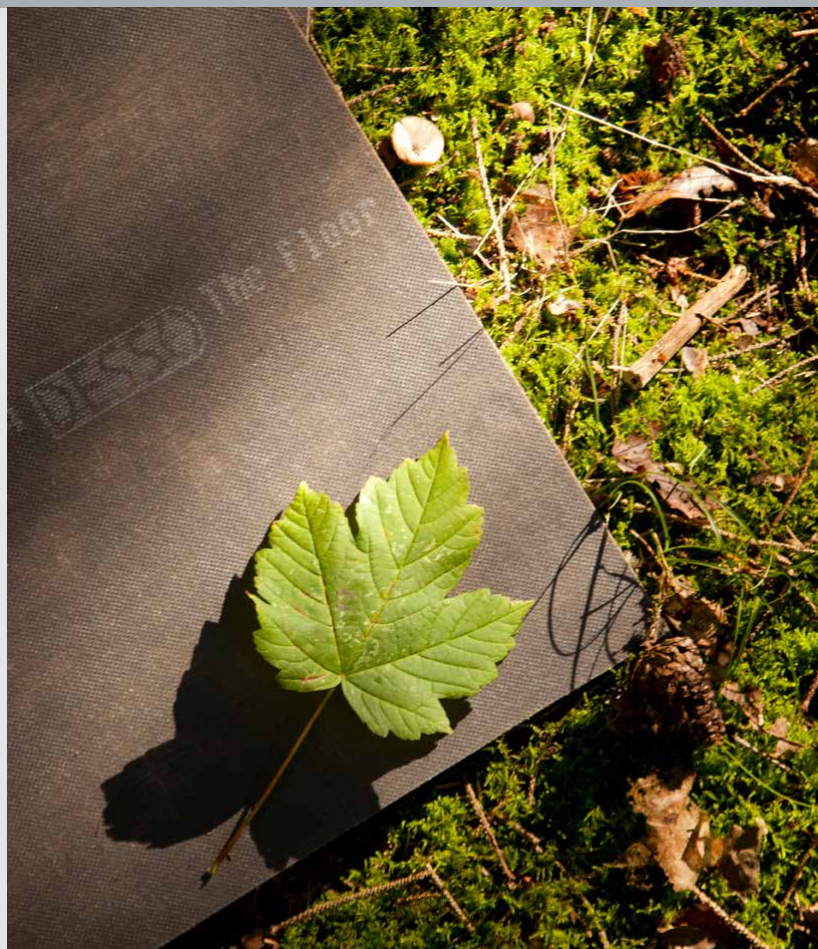
For over 130 years, Tarkett has led the global flooring industry. Around the world, the Tarkett brand is synonymous with quality and is favoured by architects and building professionals for its unique combination of performance, style, and environmental credentials.

All Tarkett operations are driven by a commitment to functionality and sustainability, which is matched by a genuine desire to enhance quality of life through the provision of high quality, healthy flooring.

Tarkett's, catalogue of innovative carpet and soft flooring solutions is expansive and diverse, and includes the DESSO range of high quality carpet tiles.



All DESSO carpet tiles in Australia have GreenTag GreenRate Level A certification



REFERENCES

- i ManPowerGroup. Millennial Careers: 2020 Vision. Milwaukee, Wisconsin: ManPowerGroup, 2016. https://www.manpowergroup.com/wps/wcm/connect/660ebf65-144c-489e-975c-9f838294c237/MillennialsPaper1_2020Vision_lo.pdf?MOD=AJPERES
- ii Gustafson, Timi, and R.D. "Younger Consumers Are More Health Conscious Than Previous Generations." HuffPost Canada. January 23, 2017. Accessed April 30, 2018. https://www.huffingtonpost.ca/timi-gustafson/younger-consumers-are-mor_b_14290774.html.
- iii "Feature Article - Trends In Hours Worked (Feature Article)." Australian Bureau of Statistics, Australian Government. Accessed April 30, 2018. <http://www.abs.gov.au/ausstats/abs@.nsf/featurearticlesbytitle/67AB5016DD143FA6CA2578680014A9D9?OpenDocument>.
- iv Fleming, Katherine. "Skin Feeders: Living with Dust Mites." Australian Geographic. June 8, 2010. Accessed April 30, 2018. <http://www.australiangeographic.com.au/topics/science-environment/2010/06/skin-feeders-living-with-dust-mites>.
- v Asthma Australia. "Statistics." Statistics - An Asthma Australia Site. Accessed April 30, 2018. <https://www.asthmaaustralia.org.au/national/about-asthma/what-is-asthma/statistics>.
- vi Lewis, R. D., P. N. Breyse, P. S. Lees, M. Diener-West, R. G. Hamilton, and P. Eggleston. "Factors affecting the retention of dust mite allergen on carpet." American Industrial Hygiene Association journal. September 1998. Accessed March 14, 2018. <https://www.ncbi.nlm.nih.gov/pubmed/9778820>.
- vii Canadian Centre for Occupational Health. "Lighting Ergonomics - Survey and Solutions : OSH Answers." Canadian Centre for Occupational Health and Safety. April 12, 2018. Accessed April 30, 2018. https://www.ccohs.ca/oshanswers/ergonomics/lighting_survey.html.
- viii Harvard Health Publishing. "Blue Light Has a Dark Side." Harvard Health. May 2016. Accessed April 30, 2018. <https://www.health.harvard.edu/staying-healthy/blue-light-has-a-dark-side>.
- ix Safe Work Australia. "Slips, Trips and Falls." Safe Work Australia. Accessed April 30, 2018. <https://www.safeworkaustralia.gov.au/slips-trips-falls>.
- x Hongisto, Valterri. 2008. "Effects Of Sound Masking On Workers - A Case Study In A Landscaped Office". In 9th International Congress On Noise As A Public Health Problem. Turku: Finnish Institute of Occupational Health. <http://www.icben.org/2008/pdfs/hongisto.pdf>.
- xi Carpet Institute of Australia Limited. Fact Sheet: Thermal Insulation Performance of Carpet. Melbourne, Vic: Carpet Institute of Australia. https://www.carpetinstitute.com.au/wp-content/uploads/2014/02/factsh_thermal.pdf