

# colorex® – LIFE SCIENCES

**Leader in Cleanroom flooring**



creating better environments

**forbo**  
FLOORING SYSTEMS



***Colorex is independently certified to be a Cleanroom Suitable Material and meets the requirement for tight control of all types of contamination.***

Whether you design or manufacture prescription drugs or medical devices, Colorex will protect your product.

Colorex is an advanced technical flooring system specifically designed to meet high class cleanroom standards and control static discharge in sensitive areas such as pharmaceutical sterile manufacturing environments and beyond.

Not only does Colorex provide an ideal solution for Pharma and Medtech manufacturers demanding premium quality floor coverings with electro-conductive or static dissipative characteristics, it is also aesthetically pleasing and will enhance any commercial interior, from specialised scientific research establishments to highly regulated sterile manufacturing environments. Colorex is a high density floor covering that offers a suitable finish for aseptic cleaning with superior resistance to chemical contamination and staining. When compared to conventional PVC flooring, Colorex has excellent heavy load resistance. Longevity is further enhanced by ease with which the surface can be repaired and refinished in situ.

## A UNIQUE MANUFACTURING METHOD

It is the unique way in which Colorex is made that gives this advanced technical floor covering its exceptionally high density and outstanding particle release behaviour. In cleanroom environments in the life sciences industries, airborne particles can be a major source of contamination.

Other benefits of Colorex's dense construction are heavy load resistance and durability; critical performance properties for non-classified transit, storage and warehousing areas, where resistance to high point loading and heavy rolling traffic is demanded yet clean environment must be maintained.

The dense construction and pore-free surface, resulting from the application of intense heat and pressure, combine to give Colorex its inherent resistance to chemicals and staining making it compatible with the industry's aggressive cleaning chemicals. The surface permits extensive and effective surface repairs to be made near invisibly, avoiding the need to replace tiles.

Whilst offering the performance features normally associated with ESD 'sheet' products Colorex tiles do not require the high plasticiser content that gives sheet vinyl its flexibility, but which can also result in out-gassing and poor mechanical performance such as indentation. Colorex has only minimal plasticiser content and exceptionally low VOC emissions, providing the perfect solution for any environment where micro-contamination has to be controlled.



### WE OFFER COLOREX IN TWO MAIN FORMS:

#### **Colorex SD/EC:**

A premium conductive glue down tile that is highly dimensionally stable, offers low emissions and is available with two ranges of conductivity SD and EC.

#### **Colorex Plus:**

A loose lay conductive floor system with a surface composed of Colorex tile material. This ensures all the benefits of standard Colorex like high density, easy repair and stain resistance but also combines the benefits of a heavy duty loose lay tile. Colorex Plus can be installed quickly and easily without the need for conductive adhesive.

## HOW COLOREX IS MADE

### **STEP 1: CHIPS AND CONDUCTIVE COATING**

Small vinyl chips are coated with a conductive substance.

#### **ADVANTAGES**

- The conductive coating on the chips ensures that the unique electrostatic dissipative properties are consistent throughout the product.
- The construction guarantees a lifelong conductivity that remains unaffected by changes in humidity and temperature.

### **STEP 2: HIGH PRESSURE PRODUCTION**

By applying very high pressure and temperature, these coated chips are then compressed into solid blocks of homogeneous material.

#### **ADVANTAGES**

- The conductive coating on the chips forms a dense network of tiny black veins. These 'conductor paths' enable safe electrostatic discharge through the whole thickness of the tile.
- The compressed construction creates an extremely dense product with high traffic durability, ensuring suitability for a range of manufacturing environments including those where pallet trucks and forklift trucks operate.

### **STEP 3: SPLITTING AND SURFACE TREATMENT**

Colorex tiles are cut from the solid blocks of homogeneous material and machine-finished to create a pore-free surface.

#### **ADVANTAGES**

- The compressed construction and pore-free surface give Colorex its easy to clean and repairable properties.
- The tiles are more convenient to work with than large rolls of sheet, and installation is easier and more straightforward.
- As with all modular products, less waste is generated during the installation.

## MAJOR PROBLEMS FACED BY CUSTOMERS

### CLEANROOM CONFORMITY

Colorex is independently certified as a 'Cleanroom Suitable Material' by Fraunhofer IPA. Colorex is suitable for ISO Class 2 and GMP A environments. We achieve this through Colorex's dense construction specifically designed to reduce particle emission both from abrasion and outgassing whilst providing a bacteriostatic surface.

### HARSH CLEANING PROCESSES

A common cause of functional and aesthetic degradation of floors in Pharmaceutical Manufacturing. Colorex has excellent chemical resistance thanks to its pore-free surface construction and low plasticiser formulation.

### CRACKED FLOORING

Unacceptable in any cleanroom or hygiene critical area. Colorex is highly resistant to high point loading, rolling traffic and falling loads and is easily repaired in the event of damage.

### COST AND TIME REQUIRED TO UPLIFT EXISTING FLOORS

Colorex Plus can be overlaid onto existing cracked flooring once the damage has been patched. Our range of accessories still allow for full hygienic coving.

### COSTLY DOWNTIME FOR FLOORING RENOVATION

Colorex Plus can be fitted dust-free in a fraction of the time required to lay a traditional poured floor or install glue-down sheet options.

### SUBFLOOR HUMIDITY

Commonly known to be one of the biggest causes of flooring failure, subfloor humidity will emulsify adhesives and cause poured resin floors to lift. Colorex Plus is unaffected by subfloor humidity thanks to its unique raised and ventilated honeycomb backing.

### UNSIGHTLY PATCHING AND REPAIRS

It is difficult to effectively repair many types of flooring commonly used in manufacturing environments, and over time, an unsightly patchwork effect can be created. Colorex can be invisibly repaired with ease, ensuring that the appearance of the floor can be maintained for many years.



## WHY CHOOSE COLOREX?

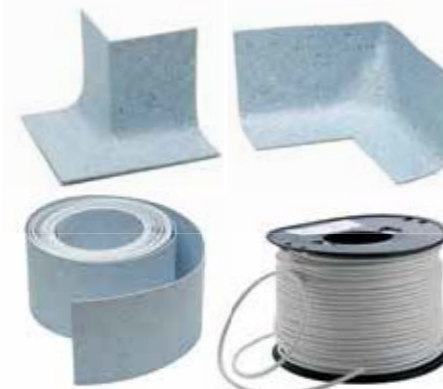
1. Colorex offers complete peace of mind as it fully complies with all ESD and cleanroom standards which have been verified by independent bodies including Fraunhofer IPA.
2. Colorex offers a lifetime conductive warranty assuring optimal ESD performance throughout the life of the product.
3. The low plasticiser content in Colorex tile creates a unique dimensional stability and prevents shrinkage.
4. The low plasticiser content also ensures extremely low VOC emissions and out-gassing making Colorex the right choice for any area where control over micro-contamination is required.
5. The surface of Colorex can be fully repaired extending the useful life of the product.
6. The dense construction of Colorex provides excellent resistance to heavy loads making it an ideal solution for all types of commercial and industrial environments.



## DESIGNED WITH YOUR ENVIRONMENT IN MIND

### GETTING IT RIGHT FIRST TIME

Colorex products offer a highly engineered solution to meet your cleanroom manufacturing needs. We at Forbo understand that the installation and final finish of the flooring will have significant impact on the floors performance and lifespan. Forbo has developed a suite of pre-formed accessories to ensure the precision of Colorex install can reflect the environment in which it is placed.



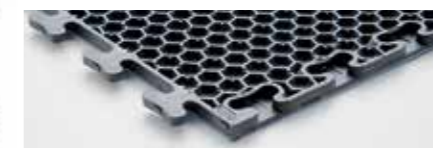
### CLEANROOM SUITABLE

Following a comprehensive programme of testing, its suitability in cleanroom applications has been certified by the renowned Fraunhofer IPA Institute in Germany.

The cleanroom suitability certification of Colorex actually consists of two independent qualifications:

The CSM qualification, which defines the suitability of Colorex EC for a specific cleanroom class, based on particle release and outgassing behaviour.

This is the main qualification, typically dedicated to front-end semiconductor manufacturing but also to pharmaceutical cleanrooms.



The TESTED DEVICE certification, where the action of chemical and biological stresses on Colorex EC, as well as its decontamination capabilities, have been assessed. This test series will be typically dedicated to the pharmaceutical industry, to life science applications and to healthcare in general.



# IDEAL FOR STERILE MANUFACTURING ENVIRONMENTS

## SUITABLE FOR THE MOST DEMANDING SETTINGS

Life Sciences manufacturing environments present their own flooring issues, particularly through the combination of demand for aseptic environment and large scale manufacturing logistics and traffic. Forbo's Colorex high performance floor covering systems are designed for use in both cleanroom classified and semi-industrial areas found within Pharma manufacturing. Cut from a homogeneous, solid block of highly compressed material they have a high vinyl content and a well-balanced amount of mineral filler for optimum performance.

### COLOREX OFFERS:

- Excellent chemical resistance thanks to the pore-free surface and an exceptionally low plasticiser content.
- High mechanical and wear resistance with no need for factory coatings or additional surface hardening treatments.
- Lifetime stable conductivity.
- A 100% repairable and restorable solution that leaves no trace of abrasive treatment methods.
- Resilience and durability to withstand forklift traffic.
- Resistance to high point loading (1,500 PSI ).
- Minimal likelihood of cracking, (unlike resin poured floors).

### FULL SITE SOLUTION

Our ESD flooring doesn't stop at the threshold of the cleanroom; we can supply advanced high performance flooring for all ESD sensitive areas in industrial settings, extending across the factory floor and into every area of the site as required.

To complement our ESD flooring we can offer 'R10' and 'R11'; rugged, quick-lay general purpose warehousing flooring that addresses the need of customers for whom epoxy resin flooring is starting to fail or has already become unusable. The way that R11 integrates seamlessly with EC Plus means that ESD flooring need only be used in localised areas where it is needed.



## MANUFACTURING CUSTOMER REFERENCES

Sanofi  
Merck  
Pfizer  
Patheon  
Polpharma Group  
KRKA  
TEVA

### Technical specifications

Colorex meets the requirements of EN 649

		Colorex SD	Colorex EC	Colorex EC Plus	Colorex Basic Plus	R11 Plus
CE	CE marking	EN 14041	Compliant	Compliant	Compliant	Compliant
	ASTM**		Compliant	Compliant		
	Total thickness	ISO 24346 / EN 428	2.0 mm / 3.0 mm*	2.0 mm / 3.0 mm*	10.5 mm	10.5 mm
	Tile size	EN 427	615 x 615 mm 615 x 1230 mm*	615 x 615 mm 615 x 1230 mm*	608 x 608 mm	608 x 608 mm
	Commercial very heavy	ISO 10874 / EN 685	34	34	34	34
	Industrial heavy	ISO 10874 / EN 685	43	43	43	43
	Electrical resistance	IEC 61340-4-1 EN 1081 (100V) ANSI/ESD 7.1	$10^6 \leq R \leq 10^9 \Omega$	$5 \times 10^4 \leq R \leq 10^6 \Omega$	$2.5 \times 10^4 \leq R \leq 10^6$	n.a.
	Electrical resistance in combination with ESD Shoes	IEC 61340-4-5 ESD STM 97.1	n.a.	$R < 3.5 \times 10^7 \Omega$	$R < 3.5 \times 10^7 \Omega$	n.a.
	Outgassing	IDEMA M11-99	total < 1 µg/cm²	total < 1 µg/cm²	total < 2 µg/cm²	total < 2 µg/cm²
	Total TVOC 28 days	AgBB guidelines	< 1 mg/m³	< 1 mg/m³	< 1 mg/m³	< 1 mg/m³
	Total TSVOS 28 days		< 0.1 mg/m³	< 0.1 mg/m³	< 0.1 mg/m³	< 0.1 mg/m³
	Bacteriostatic	SNV 195 920	Pass	Pass	Pass	n.a.
	Chemical resistance	ISO 26787 / EN 423	Excellent	Excellent	Excellent	Excellent
	Slip resistance	DIN 51130	R9	R9	R9	R9
	Total weight	ISO 23997 / EN 430	3.2 kg/m²	3.2 kg/m²	12.4 kg/m²	12.4 kg/m²
	Dimensional stability	ISO 23999 / EN 434	0.05%	0.05%	n.a.	n.a.
	Thermal dilation coefficient		n.a.	n.a.	0.11 mm/m°C	0.11 mm/m°C
	Residual indentation	ISO 24343-1 / EN 433	0.035 mm	0.035 mm	n.a.	n.a.
	Resistance to loads (performance may vary, subject to local conditions)		n.a.	n.a.	Powered pallet truck and forklifts: total weight up to 2.5 t with hard wheels and up to 5 t with air tyres. Static loads: 50 kg/cm² - dynamic loads: 90 kg/cm²	
	Abrasion resistance	EN 660-2	Group M	Group M	Group M	n.a.
	Castor chair continuous use	ISO 4918 / EN 425	no effect	no effect	no effect	n.a.
	Light fastness	ISO ISO 105 B02	≥ 6	≥ 6	≥ 6	n.a.
	Impact sound reduction	ISO ISO 140-8	2 dB	2 dB	12 dB	12 dB

All Colorex products meet the requirements of EN 14041							CE EN 14041
	Body voltage generation, with appropriate ESD shoes	IEC 61340-4-5 ESD STM97.2 EN 1815	40 V	20 V	20 V	< 2 kV	< 2 kV
	Reaction to fire	EN 13501-1	B <sub>fl</sub> -s1	B <sub>fl</sub> -s1	B <sub>fl</sub> -s1	B <sub>fl</sub> -s1	B <sub>fl</sub> -s1
	Slip resistance	EN 13893	μ = 0.60	μ = 0.60	μ = 0.60	μ = 0.60	n.a.
	Thermal conductivity	EN 12524	0.28 W/(m·K)	0.28 W/(m·K)	0.28 W/(m·K)	0.28 W/(m·K)	0.28 W/(m·K)

\* Available on request

\*\* Product also tested to ASTM. Results available on request.



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