FLOORING SYSTEMS FOR CLEANROOMS

MAPEI®

ADHESIVES • SEALANTS • CHEMICAL PRODUCTS FOR BUILDING

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Flooring systems for Cleanroom

Cleanroom is defined as a controlled environment in which airborne particulates, contaminants and pollutants are kept within strict limits. In addition, the temperature, humidity, number of dimension of particles, quantity of volatile organic compounds, etc, have to be constantly monitored.

The cleanliness of the environment is a fundamental parameter in the manufacturing process of goods sensitive to contamination such as microchips, electronic devices, pharmaceuticals, photovoltaic films, hospitals, medical devices, food packing industries, etc.

There are many options for cleanroom wall and floor coverings – vinyl sheets, vinyl tiles, rubber flooring, normal painting of floors, raised flooring as well as wall and sealer coatings, etc. Epoxy and polyurethane flooring are one of the options for cleanroom. The advantages of these flooring are that it is seamless, non-particle shedding, easy to clean, has good abrasion resistance and is very durable. Furthermore, it can be customized to meet the requirements of each site.

Mapei Flooring solutions for Cleanroom

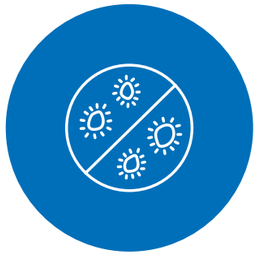
Mapei offer a diverse range of flooring solutions that can be tailored to suit different types of application and requirements.

Cleanrooms and Cleanliness Environments: Pharmaceutical, chemical and foodstuff industries, dairy, wineries, breweries and beverage industries in general, sugar processing and mineral bottling plants, electronics industries, data centers, hospitals, electric or safety industries such as store rooms or areas used for storing and processing inflammable substances.

Our range of solutions encompass the following notable qualities:

- Electrically dissipative
- Dust-repellent
- Resistant to most aggressive chemical products and microorganisms
- Highly resistant to wear and abrasion
- Seamless and joint free (no joints that trap dirt or dust)
- Easy to clean
- Low maintenance
- Very low emission levels of VOC and micro-particles
- Durable and have excellent mechanical performance
- Adhere to international standards

There are various factors that are vital to the build-up of cleanrooms:



Hygiene

Cleanrooms require very high standard of hygiene in order to safeguard process operations and the quality of components. The size and concentration of dust particles and suspended micro-particles need to be monitored.

i) **Very low release of micro-particles:**
Cleanrooms are classified by ISO 14644 (part 1 and 8) according to the maximum permitted number and the dimension of particles per cubic meter of air, and the content of volatile organic molecules (airborne contamination).

According to the suspended particles pollution, cleanrooms can be classified in 9 classes (ISO 1 to ISO 9). The lower the ISO class, the lower the maximum concentration limits for the particles.

ii) **Very low release of VOC:**
VOC must be not released or only a small amount in the air is permitted as it causes airborne molecular contamination (AMC). The ISO 14644-8 guideline defines the classification of cleanrooms in terms of pollution caused by AMC. Classes (0 to -12) are specified by the decadic logarithm of concentration in grams per cubic meter of air for each defined group of contaminants.

Moisture

Cleanroom environments are often maintained at low humidity levels. The air tends to draw moisture up through the concrete slab. If a vapour barrier is not installed properly, water blistering and bubbling will appear on the freshly installed flooring.

Chemical and mechanical protection

Floorings in cleanrooms have to withstand potential chemical, mechanical and bacteriological attack.

Systems for Anti-Static Flooring

Cleanrooms may contain expensive equipment and components which are easily exposed to static charge within a given space and can be irreversibly damaged.

In addition to damaging equipment, built-up charges can put workers and the facility at risk. These potential problems can be mitigated with proper and high performance anti-static flooring.

The standard epoxy, polyurethane, and other liquid-applied resin flooring are electrical insulators. The floor is the surface that keeps everything together in a static controlled environment.

This includes workstations, conveyors, racks, carts, chairs, clothes, ionization equipment, fine powder production or even weapon storage facilities. The anti-static control measures for cleanroom need to be properly evaluated before selecting a suitable flooring system.

Flooring materials must be anti-static and connected to the ground, allowing charges to discharge to the earth. Anti-static flooring must have the following characteristics:

- Very good chemical and mechanical protection
- Suitable for dry areas
- Electro conductive

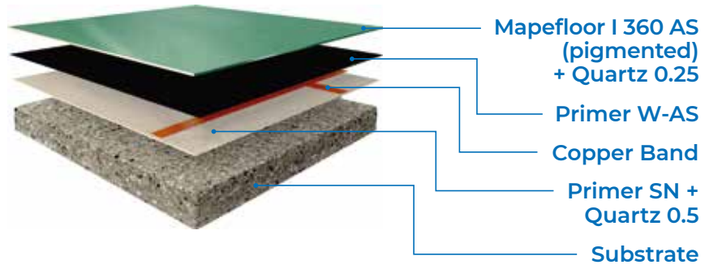
Mapei offers **anti-static** flooring solutions for specific situations:

Mapefloor System AS

Self-levelling epoxy system with a high solids content for anti-static, conductive industrial floors.

Mapefloor I 360 AS

Two-component, self-levelling epoxy formulation for high strength, electrostatically conductive floor coating.



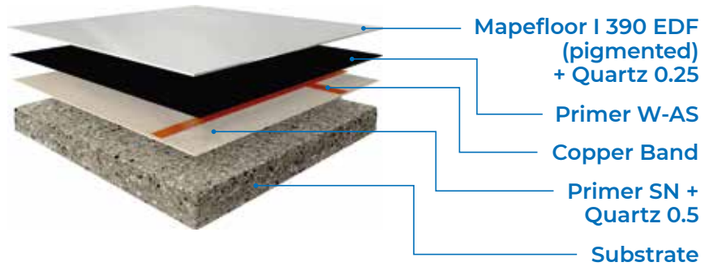
Mapefloor System EDF

Self-levelling epoxy system with a high solids content for anti-static, dissipative industrial floors.

Mapefloor I 390 EDF

Two-component, self-levelling epoxy formulation for high strength, dissipative coatings.

CE EN 13813



Advantages

- Electrically conductive, discharges build-up of static electricity to earthing points
- Dust and water repellent
- High resistance to wear and abrasion from continuous pedestrian traffic and frequent washing
- Easy to clean and sterilize
- Resistant to most aggressive chemical products
- Quick to apply
- Smooth finish
- Low emission of volatile organic compounds (VOC) and particles

Systems for Light-duty Cleanroom Floor and Wall

Environments: Cleanrooms with raised floors, staircases, ceilings, walls and light storage areas.

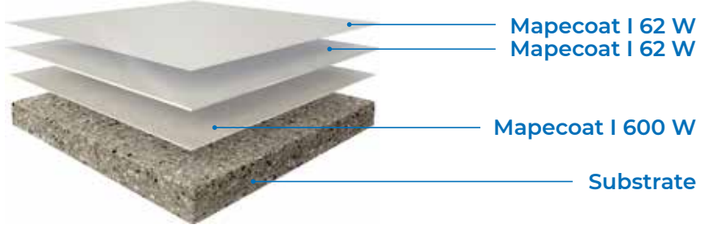
Mapecoat I 62 W

Epoxy coating in water dispersion with a gloss finish, developed specifically for coating the surface of walls and ceilings in cleanrooms.

Cleanroom® Suitable Materials

Classification for particle emissions: ISO 5

Classification for VOC emissions: -7.1



Advantages

- Easy to apply
- Solvent-free
- Low emission of volatile organic compounds and micro-particles
- Good mechanical and chemical resistance
- Dustproof surface; easy to clean and maintain
- Available in various RAL colours upon request
- Impermeable to oil and liquids in general

Systems for Medium to Heavy-duty Cleanroom Floor

Environments: Cleanroom production, storage, laboratories, changing rooms, corridors, etc.

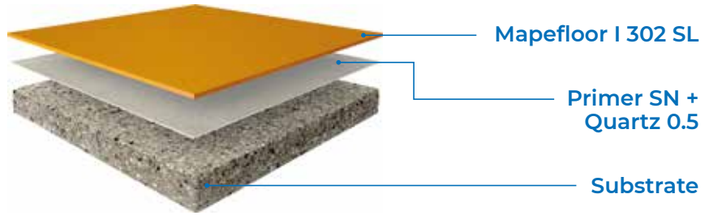
Mapefloor I 302 SL

Multipurpose epoxy formulation for industrial floors in compliance with standards applied to cleanrooms and food and beverage industry.

Cleanroom® Suitable Materials

Classification for particle emissions: ISO 3

Classification for VOC emissions: -5.7



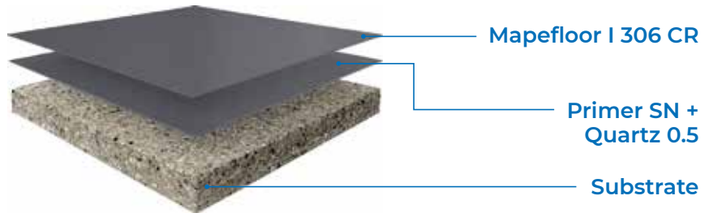
Mapefloor I 306 CR

Low emission epoxy formulation for coating floors in cleanroom.

Cleanroom® Suitable Materials

Classification for particle emissions: ISO 3

Classification for VOC emissions: -6.7



Systems for Medium to Heavy-duty Cleanroom Floor

Environments: Cleanroom production, storage, laboratories, changing rooms, corridors, etc.

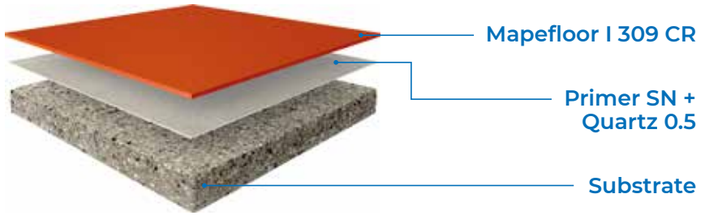
Mapefloor I 309 CR

Epoxy formulation for coating floors in cleanroom and industrial floors.

Cleanroom® Suitable Materials

Classification for particle emissions: ISO 2

Classification for VOC emissions: -9.6



Advantages

- Beautiful smooth finish
- Suitable for floors subjected to heavy traffic
- Excellent resistance to attack from micro-organisms
- Seamless surface with attractive finish
- Highly resistant to chemicals and abrasion
- Low to very low emission of volatile organic compounds (VOC)

Notes

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MK9836424 (GB X FAR EAST) 9/2021