

# Forbo Flooring Systems for Mass Transit

*What about flooring?*

Stephan Plomp  
October 2012

# Content

- Introduction of the Forbo Group
- Types of floor coverings in Mass Transit
- Properties of products and applications
- Rail:
  - 4 case studies with different products
  - Sustainability as a company policy

# Forbo Group



## **Forbo Flooring is a member of the Forbo Group:**

- Headquarters in Baar (CH)
- Forbo's shares are listed at the Swiss stock exchange

## **Worldwide presence with:**

- 4,900 employees in 33 countries
- 24 production sites
- 36 sales organizations

## **Leading manufacturer and supplier of:**

- Floor coverings
- Bonding systems (Building, construction, transport flooring)
- Movement systems (Siegling Belting Solutions)

creating better environments

**Forbo**  
FLOORING SYSTEMS

# Forbo company history

**1928:** Continentale Linoleum Union is born – a merger of 3 linoleum factories in Germany, Sweden and Switzerland.

**1950-1971:** New flooring products are introduced.

**1973-1974:** Separation of bonding and linoleum into individual business units.

**1975-1994:** Forbo spreads to 5 continents

**1995-1998:** Acquisition of Seigling, a specialist in process and conveyor belt systems.

**2000-2001:** Focus on 4 divisions; linoleum, vinyl, belting and adhesives.

**2002-2003:** Linoleum and vinyl divisions merged to create Forbo Flooring.

**2004-2006:** Strategic focus on 3 core divisions – Bonding/Flooring/Movement.

**2007:** All divisions under one Forbo brand.

**2008:** Acquisition of Bonar Floors, a major European manufacturer of flooring systems.

# Forbo Flooring Systems

Founded in 1847, Forbo Flooring Systems is a global producer of world-class flooring solutions

**A global producer of commercial flooring solutions with:**

- More than 2,800 employees
- 12 manufacturing plants, all ISO14001 certified
- A worldwide network of sales offices in over 20 countries
- Training and installation centers, providing global customer support
- Worldwide distribution network
- Established partnerships with many global clients



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# Global presence, local knowledge

All manufacturing, logistical and service structures are modelled on the ability to respond locally, on a global scale:

- Local sales teams are present in each market
- Orders are dispatched from local and regional distribution centres
- Local Key Account teams work closely with Divisional Key Account Managers
- Clients benefit from a local response with global infrastructure and support
- Consistency and reliability across the regions

# Flooring Systems Solutions

## Linoleum

General purpose, functional, special purpose

## Safety Vinyl

General purpose, functional, special purpose, design/loose lay

## Entrance Flooring Systems

Textile, rigid

## Flocked flooring

General purpose

## Textile flooring

Tufted, Fusion Bonded, Needlefelt

## (Cushion vinyl)

Residential and semi professional use



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# Forbo - Committed to the environment

The **25% improvement** in LCA is an **ambitious target**

## Forbo Flooring Systems Environmental Report 2010

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### Environmental Footprint

#### ISO 14001 certified

This report details the Flooring Division's environmental performance during 2010. We place great importance on all our facilities meeting internationally recognized management standards in terms of how we manage our quality and environmental responsibilities. We are delighted to announce that our site based at Kaluga, Russia, has been ISO14001 certified Environmental Management System. We are the first flooring manufacturer to be awarded this in Russia. All of our 12 manufacturing sites, spread across 6 countries, are now complying with both ISO14001 and ISO9001 management standards.

#### Our main goal

To continuously minimize the environmental impact of Forbo Flooring Systems as measured by the weighted categories in our independently verified Life Cycle Assessment measurement system by 25% before the end of 2015 (of 2009).

#### Creating better environments

The LCA is calculated for 1m<sup>2</sup> installed floor covering from order to installation. Measuring the environmental impact of our division we based our LCA calculation on the mass weighted mix of all our products produced including also the energy consumption of all our offices and warehouses worldwide. We are taking into account the following environmental impact categories:

- Acidification Potential
- Eutrophication Potential
- Ozone Layer Depletion Potential
- Photo Oxidant Creation Potential
- Abiotic Depletion Potential
- Global Warming Potential

We strongly believe that creating better environments means reducing all environmental impacts and not only Global Warming. Therefore, we equally weight all 6 impact categories and express them in one index figure.

The LCA Index - Environmental Footprint - shows that we have continued to improve our performance for the fourth straight year. This reduction is due to the work that has been undertaken in all our production facilities. We are yet to capture improvements made by the raw material supply chain and during the installation process. These are also expected to make a positive contribution to our goal. The carbon footprint - Global Warming Potential - has been reduced by over 30% since 2007. This is due to our policy of purchasing renewable forms of electricity and our internal waste reuse and recycling programs.

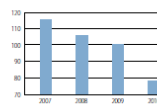
### PRODUCT WASTE BREAKDOWN



#### LCA INDEX ENVIRONMENTAL FOOTPRINT



#### GLOBAL WARMING POTENTIAL INDEX CARBON FOOTPRINT



### % REUSED & RECYCLED PRODUCT WASTE



### % RECYCLED & REUSED MATERIAL CONTENT



# Types of floor coverings in Mass Transit Vehicles

## 1. Resilient flooring:

- Safety vinyl - Hygienic, wear and slip resistant.
- Rubber sheet - Durable, sound absorbing, slip resistant.
- Linoleum sheet - Hygienic, wear resistant, sustainable.

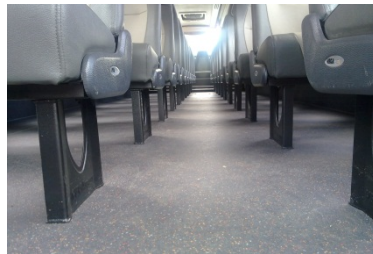
## 2. Soft flooring:

- Carpets/Textile - Warm, luxurious, acoustic properties.
- Needle punch - Robust, hard wearing and textile look.
- Flocked flooring - Slip and wear resistant, acoustic properties

# Applications of products

## Safety vinyl :

1. Used in open area vehicles with a high slip risk, though not bound to stringent fire and toxicity regulations (i.e. City Buses / Trams)
2. Roll size: 25m x 2m - 2,9kg/m<sup>2</sup> (approx.)
3. Installation: i.e. Acrylic or 2C adhesive / welding



# Applications of products

## Rubber flooring:

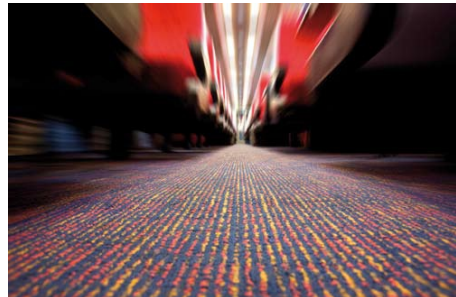
1. Considered a slip-free, sound absorbing material, making it a prime flooring option for places where there are high levels of activity and strict adherence to safety and fire- and toxicity standards;
2. Roll size: 15 x 1,22m –3.2kg/m<sup>2</sup> (approx.)
3. Installation: i.e. Acrylic or 2c adhesive / welding (advised)



# Applications of products

## Carpet Flooring:

1. Aesthetically pleasing, welcoming, comfortable, luxurious;
2. Insulation and non-slip surface plus soften impact.
3. Absorb airborne pollutants, dust and moisture
4. Roll size: 27 x 1,25 to 2m – 3kg/m<sup>2</sup> (approx.)
5. Installation: i.e. Acrylic adhesives



# Applications of products

## Linoleum sheet:

1. A sustainable, dimensionally stable and extremely durable homogeneous floor covering, made out of renewable resources that meets highest fire and toxicity standards.
2. Roll size: 30 x 2m – 2.8 kg/m<sup>2</sup> (approx.)
3. Installation: i.e. Acrylic adhesive / optional welding





# Rail – four case studies

- 
1. East Midlands Trains – Great Britain
  2. Northern Ireland Railways – Northern Ireland
  3. KiwiRail – New Zealand
  4. Nederlandse Spoorwegen (Dutch Railway) – the Netherlands

# Case study

EAST MIDLANDS TRAINS



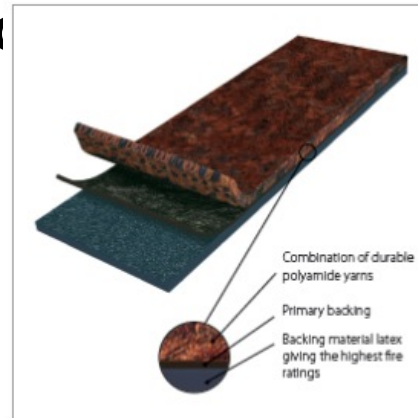


# Case Study 1

EAST MIDLANDS TRAINS

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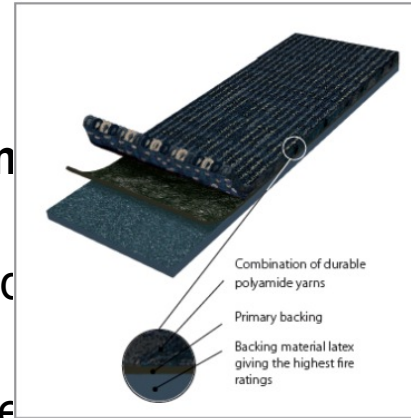


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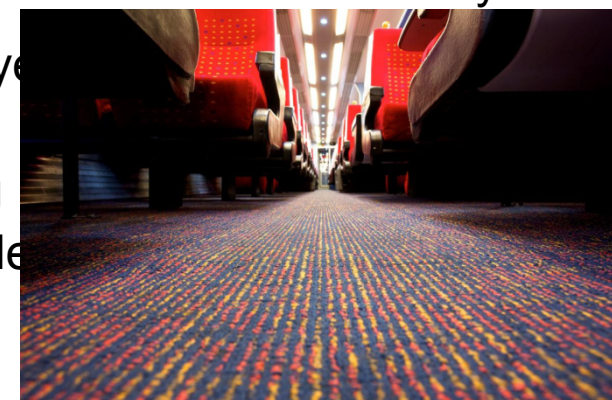
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FLOORING SYSTEMS

# Statements

EAST MIDLANDS TRAINS



*"The Coral vestibule matting has been used on all of our train refurbishments because it does a superb job of stopping soil entering the carriage and causing unnecessary soiling and premature wear and tear. Once again on this project it has proved to be an excellent. It is by far the best product in the marketplace that we have found."*



*"Now, 18 months after the first carriages were refurbished and returned to service, we continue to be very satisfied with the performance and appearance of the products we've fitted. We've been transporting passengers from Sheffield and Nottingham into London several times a day and we've no complaints. The Tessera carpets are living up to expectations and still look great. The tufted construction is very hardwearing and standing up well to daily vacuuming. We see no reason why they shouldn't last throughout the current franchise."*

*"Tessera Alignment FR was a very good looking contemporary carpet that incorporated our corporate colours and we were able to chose Coral Brush Activ FR vestibule matting to comply with DDA requirements"*

**HST Refurbishment Project Manager, Chris Elliott**

## Case study 2



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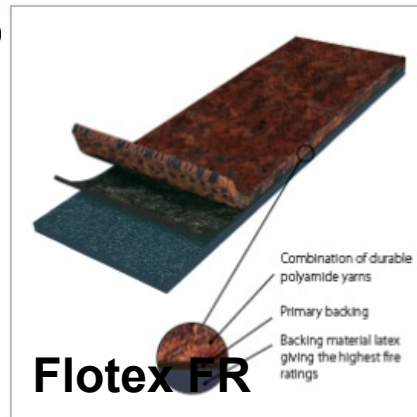
extremely well.



# Case study 2

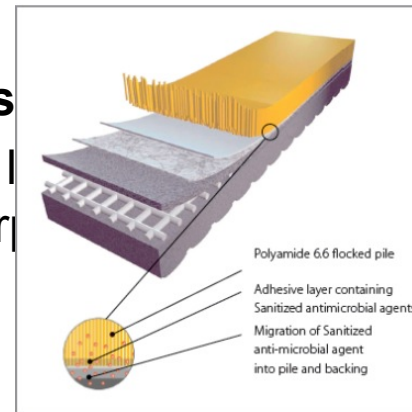


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2. Flotex FR

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Unique product, color, durability of a resilient flooring with the comfort, slip, acous



# Statements



*“Most carpets would be short lived if subjected to this sort of punishment, but Flotex seems to thrive on it “*



*“We installed this particular combination of products back in 2004/2005 on trains that are still in service.*

*The floor coverings are well maintained...we stick to a minimum daily cleaning regime with periodic more intensive leaning and the good results are there for all to see”*

*“We wanted to use textile floor coverings on these trains for their warmth and acoustic properties, however, we weren’t so keen on the cleaning and maintenance requirements associated with conventional carpeting”*



*“The use of these products has helped us achieve another important project objective : compliance with the latest European PRM (Persons with Reduced Mobility) standards – Flotex is so very different texturally from Coral which provides an additional navigational aid for passengers with restricted vision.”*

**Senior Designer , DCA Design International - Paul Rutter**

**New Trains Two Programme Manager Northern Ireland Railways - James Erwin**

## Case study 3



tracked through carpeted areas).

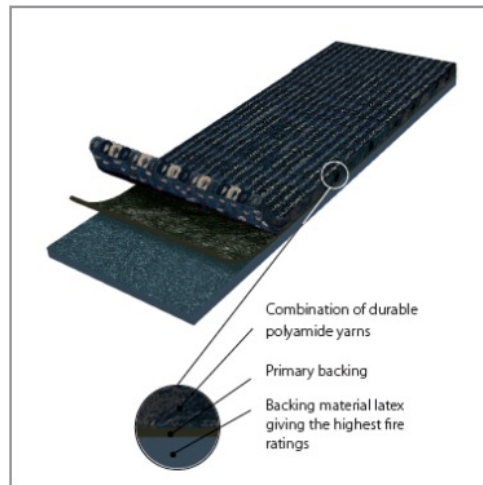


# Case study 2



## Solutions:

### Tessera Alignment FR



**tessera<sup>®</sup> FR**

- Product has to comply with EN 13813 guidelines, which require the walking surface to have a coefficient of friction conditions of at least  $0.4 + 0.0125 S$  ( $S$ : slope/surface%).



was chosen for rolling stock or refit.

All interior surfaces are due to the high traffic along the routes.

The train features a

wide aisles) and

easy accessibility

in all conditions.



FLOORING SYSTEMS

# Statements



*"For tourism focused rail travel, the look and feel of the carriage interior is a very important factor in creating an environment for passengers to experience the scenery outside and a convivial atmosphere within"*

*"The past performance of Forbo's unique Flotex - used successfully by KiwiRail for many years – was cited as a key reason for choosing to work with Forbo on this project. Flotex Montana, has been installed in approximately 150 commuter rail carriages over the last decade and it has worn really well and still looks good, ten years on"*



*"A critical part of the transition between manufacture, commissioning and entry into service was the setting up of an on-going maintenance regime"*

*"Where budgets are concerned we have compared Forbo's product to standard Heavy Duty Contract Grade 100% wool carpet and whilst it is undoubtedly more expensive, it will last between 2 and 3 times as long in rail service, so it offers great value for money when assessed on an all-of-life cost basis"*

***Barnacle Design, Keith Strode-Penny***



# Case study 4



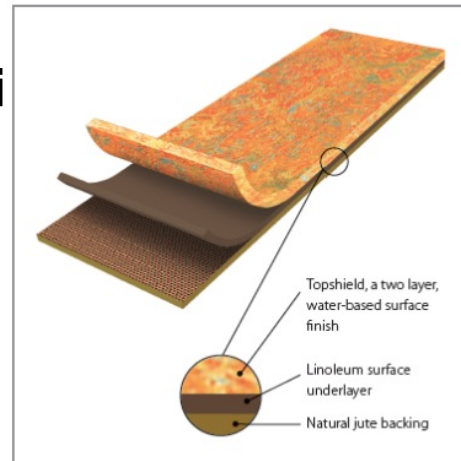
# Case Study 4



## Solutions:

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- **marmoleum®FR** stability (e
- **artoleum®FR** durable and renewable water
- 11 collections – 150 colors o



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# Statements



*“The Artoleum Striato-collection is completely different from traditional linoleum and it fits precisely into the new concept which we devised for this modernisation”*

*“In relation to the flooring, this means that it must be easy to clean, safe and, moreover, meet high legal safety requirements. Finally, we require a lifespan of at least 10 to 15 years”*

*“Throughout the years we have become familiar with its quality and the ease of cleaning, we know that it is very durable regarding its use as well as the production process”*



*“The floor is an important part of a train - just like in any interior, the flooring is the basis”*

*“What’s more important than the appearance and the colours, is the quality! Maintenance is extremely important – the floor should be easy to clean and last for a very long time”*

**Train Formula Manager Dutch Railways, Brigitte Matheussen**  
**Puur| Ruimte Design Studio, Marion Rovers**



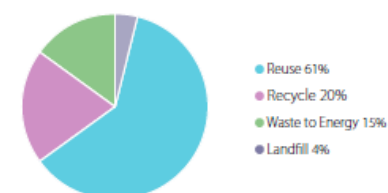
# Sustainability

## Our main goal

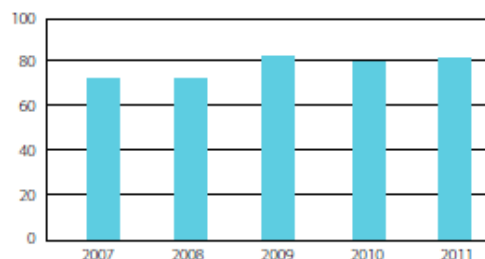
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PRODUCT WASTE BREAKDOWN



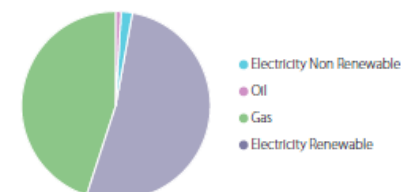
% REUSED & RECYCLED PRODUCT WASTE



% RECYCLED & REUSED MATERIAL CONTENT



PRIMARY ENERGY MIX 2011



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