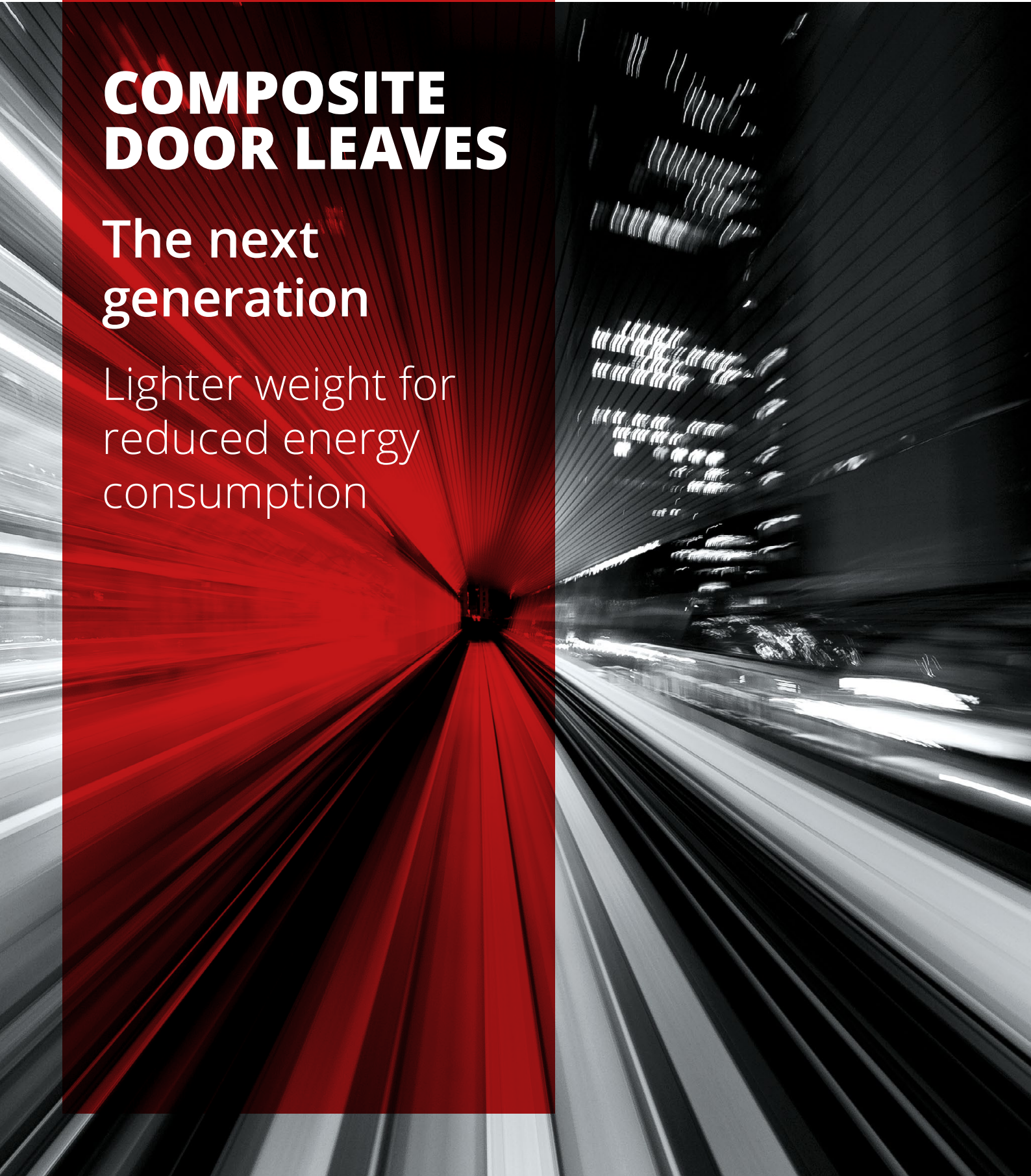


COMPOSITE DOOR LEAVES

The next
generation

Lighter weight for
reduced energy
consumption





ABOUT US

TRB is passionate about reducing weight in the transport industry with the ultimate goal of delivering a positive impact on the environment.

This value is at the heart of our business, we believe in accountability and care how we affect the environment around us, both locally and globally.

IRIS approved, TRB have been manufacturing high quality rail doors and rail interior products for over 60 years.

Since formation in 1952, TRB has grown into a leading international manufacturing and engineering company, specialising in lightweight composite products.

With facilities in the UK, Europe and USA, we are able to maintain quality and deliver finished products to an exceptionally high standard.

We offer a concept to delivery service, which includes design, build, test and validation of products. Our knowledge of the rail industry standards and requirements ensures a smooth development and approval process.

TRB has extensive experience with both new train builds and refurbishment of existing trains.



Door weight reduced from

40KG

(aluminium composite)

TO

26KG

(fibre composite)

RAIL INNOVATION

TRB are proud to introduce the first "Bio" composite door leaf for rail while still maintaining **comparable cost**.

For many years the rail industry has used aluminium bonded assemblies, which were considered to be durable and robust...SO WHY CHANGE?

Due to the technological advancements in engineering and manufacturing methods, coupled with TRB's knowledge and expertise in materials and train doors, it has been possible to design and build a door leaf using a new "Bio" composite pre-impregnated system and foam constructed from recycled materials - **that meets all industry standard requirements, while providing a 35% weight reduction.**





FEATURES AND BENEFITS

The leaf itself is more robust than its aluminium equivalent and due to the weight reduction it delivers the following benefits:

Reduction in energy consumption.

Reduced track wear and tear.

Reduction in journey times through faster dwell times.

Low maintenance costs through its 40 year life cycle.

Long life expectancy as the leaf does not oxidise or rust.



DURABILITY

One of the key points of the door construction is the use of carbon fibre. Carbon fibre has both phenomenal strength and superior fatigue resistance when compared to other commonly used materials.

A component made from carbon fibre based on the same thickness as an aluminium door will offer 31% more rigidity and 60% more strength.

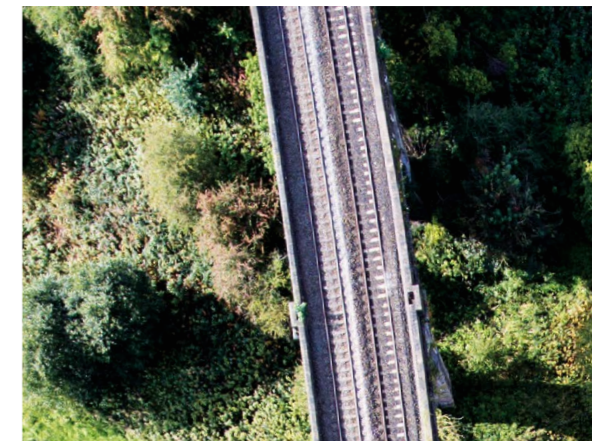
A composite leaf would not rust or oxidise, and has no bond line for water ingress, due to the construction methods and materials used, providing a “life of train” life cycle.

Doors are compliant to GM /RT 2100 rev 5 Section 5.4.2

A carbon fibre door will offer

31% MORE RIGIDITY
AND
60% MORE STRENGTH

than an aluminium door of the same thickness



GREENER MATERIALS

TRB have also developed a revolutionary new “Bio” composite pre-impregnated system that combines high strength fabrics with a Bio based resin system.

This resin system used is extracted from the natural waste bi-product, obtained from the manufacture of sugar, which is non-toxic and does not use volatile organic solvents. It can produce an extremely light and hard wearing composite assembly capable of meeting GM/RT 2100 rev 5 combined with exceptional fire resistance to EN45545-HL3 (BS 6853 Category 1A).

Within the construction of the Composite door TRB have used a foam made from 100% post-consumer PET, this enables TRB to offer a real green alternative to standard PET foams and other foam core materials currently used in railway applications. The foam delivers superior FST properties, mechanical properties, is lightweight, cost-effective and environmentally sensitive, making this an ideal product to use as part of the composite door.





35% WEIGHT
REDUCTION



CONSTRUCTED FROM
RECYCLED MATERIALS



40+ YEAR
LIFE CYCLE



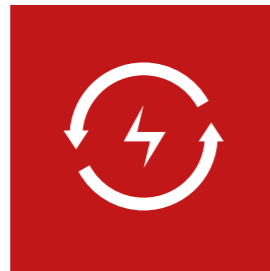
31% MORE RIGID
AND 60% STRONGER



REDUCED TRACK
WEAR AND TEAR



DOOR WEIGHT
REDUCED TO 26 KG



REDUCTION IN ENERGY
CONSUMPTION



REDUCTION IN
JOURNEY TIMES

DATA

Weight

Aluminium bonded door circa 40 kg

Composite door circa 26 kg

This is indicative and is exclusive of furniture

Fire

Skin material - Interior Vertical Surfaces

BS 476: Part 6: 1989+A1:2009 - Fire Propagation

i1 (max) = 2.1 = Category 1a (max allowed = 6)

I (max) = 10.3 = Category 1a (max allowed = 12)

BS 476 Part 7: 1997 - Spread of Flame

Class 1 = Category 1a (50mm @ 1.5 mins -
Max = 165mm @ 1.5 mins)

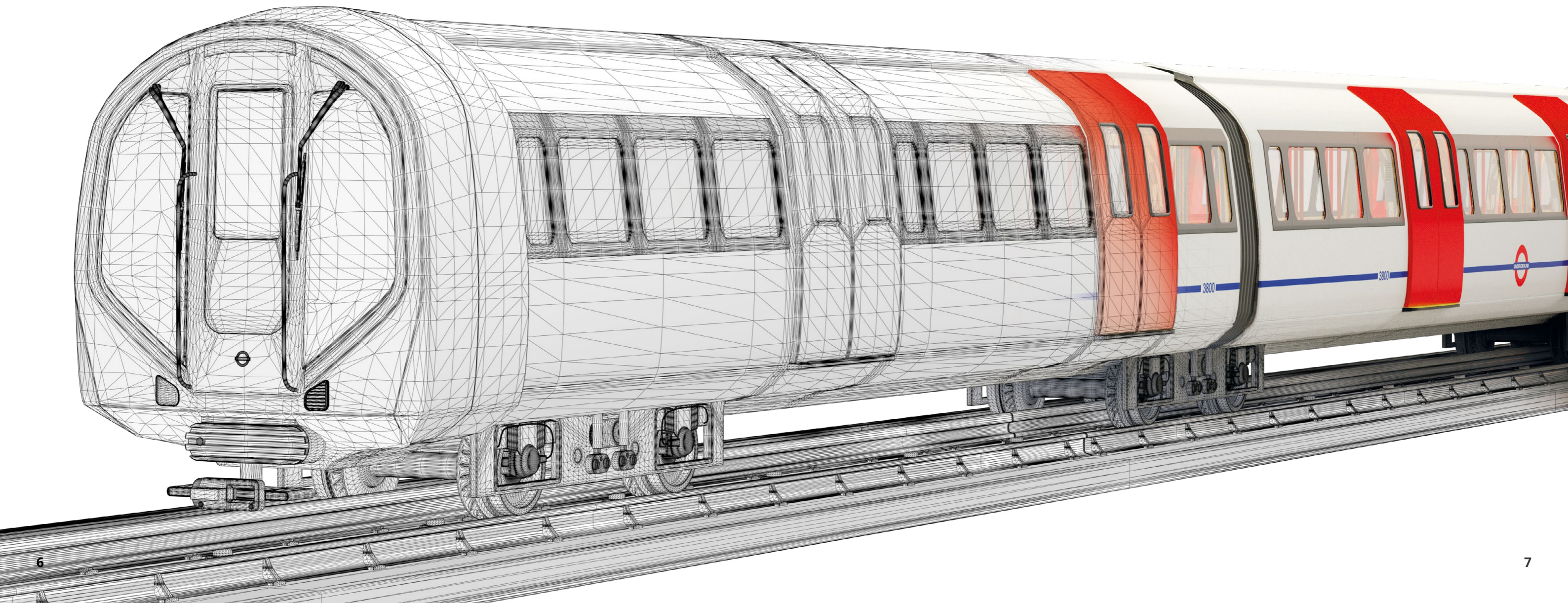
BS 6853:1999: Annex D.8.4 - Smoke Density

A0 (On) = 1.33 = Category 1a (Max = 2.6)

A0 (Off) = 1.65 = Category 1a (Max = 3.9)

BS 6853:1999: Annex B.2 - Toxic Fume

R (max) = 0.13 = Category 1a (Max = 1.0)



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