RotoTrends

Exploring the potentials of rotational moulding in design

Issue 3

ARMO

ASSOCIATION OF ROTATIONAL MOULDING ORGANISATIONS

Introduction

The evolution that has distinguished rotational moulding in recent decades is intimately related to the development of awareness of rotomoulding in the design world.
In other words, as the potential of rotomoulding becomes "common knowledge" amongst designers and producers the sophistication of their projects using our technology for industrial applications grows.
RotoTrends explores the different potentials of rotational moulding showing case-histories where the roto technology is able to open new markets, developing innovative products and working successfully in new niches.
The projects developed in partnership with international design institutes, and the selected industrial products produced a faithful portrait of an industry constantly hungry for new ideas, eager to experiment with new shapes and new materials, sensitive to the international richness of globalization.
Rotomoulding is strategically placed as one of the key technologies for rethinking the industry according to today's needs for technology and performance.

Prospects for Tank Tractors

Truck manufacturers present in the Australian market have a specific challenge to solve - find an efficient way to move goods across a widely spread country.

The geography of the continent and varied climate mean that Australia continues to produce a broad range of agricultural products, each to be delivered daily all over the country.

Australia is home to some world-leading mineral supply chains. These supply chains allow for enormous quantities of minerals to be mined, transported and exported.

The infrastructure in Australia is not consistent, therefore there is a specific need for the trucks to cover very long distances with limited opportunities to refuel.

Key factors Details

Advantages:

- improved volume capacity and range;

- optimized lay-out of the chassis;

- any shape is possible, the only limit is the imagination and the chassis;

- better mechanical and impact resistance (for instance, in the case of stones ricocheting from the wheels);

- no residual stress;

- maximum refill level and adequate expansion volume (11%)

DEF tank for Volvo Truck Australia

production Rototech - Italy

Rototech has developed a high volume DEF tank for this particular application.

Features:
- uses the space available inside the chassis of the vehicle, but leaving the exact space need for the draft shaft, also considering the alteration due to thermal swelling of the plastic material;
- normal position of a DEF tank is next to a fuel tank, but in this case it doesn't steal space from the fuel tanks assembled on both side of the chassis, which is extremely valuable for transportation over huge distance. This DEF tank occupies unused space;
- although the tank is positioned in the middle of the chassis, the filler neck (which could be monolithic o assembled) grants a user-friendly access;
- versions from 150l to 200l DEF capacity;
- co-moulded inserts allow fixing electric cables and other functions of the truck;
- optimum drain plug position to ensure almost full emptying of the tank.
The project was developed for Volvo Truck Australia

www.rototech.it

Designing Innovative Tourism Products

Tourism product attributes can be described as compilation of several qualities that make a tourism functional, useful and aesthetically pleasing to tourists.

When designing a rotomoulded product for the beach, the values that most tourists hold as very important when purchasing a particular type of tourism product should be the fundamental block.

Based on this, tourism product designers are advised to determine whether attributes such as aesthetics, case of use, technical quality or features are most important in product choice for the target group at the early stage pf product design.

Key factors Details

1. Differentiation can be defined as the creation or invention of tourism products that different, bigger, or better than competitors. From this point of view, rottational moulding offers a lot of possibilities in terms of design, functionality and visual appeal to develop innovative solutions for the beach landscape.

2. The combination of differentiation and focus strategies paves the way to actualize rotomoulded product attribute leadership in a niche market. The niche market provides a narrow group of target customers with clearly defined needs. All efforts on product research, design, development and marketing can be channeled towards delivering the most desirable products to that specific group.

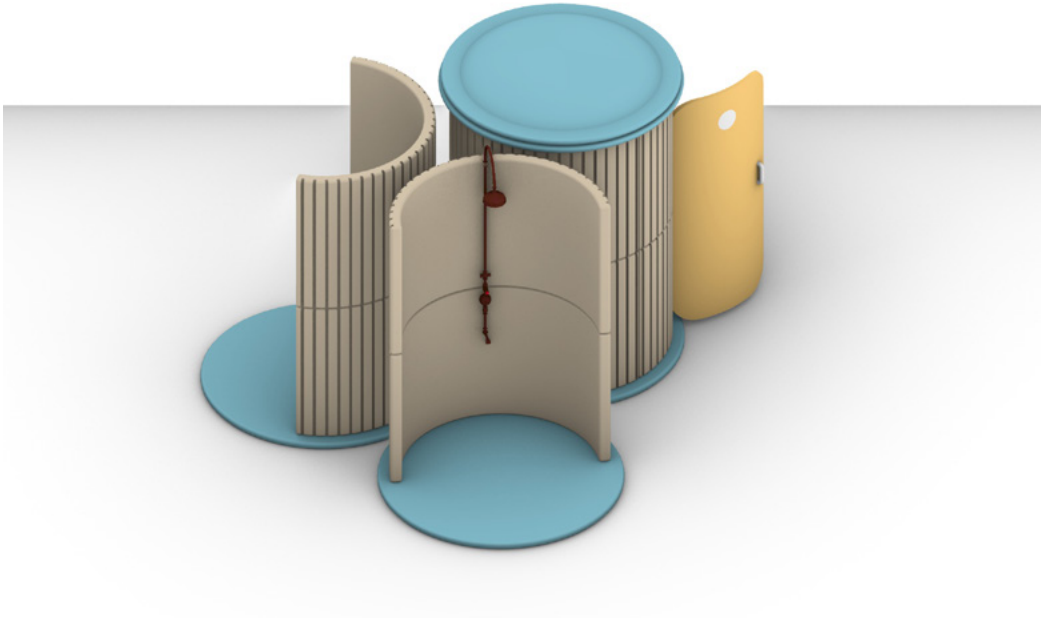
Beach Units

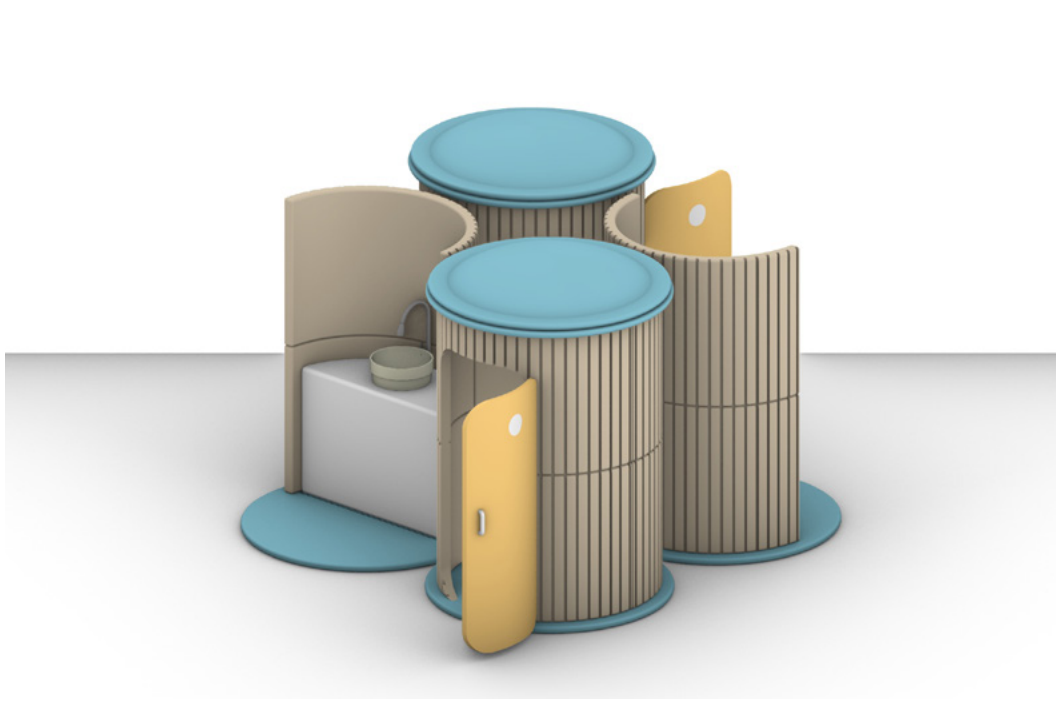
project Maheshika Gyathri
Domus Academy Milan

The sophistication impregnates the project of this beach furniture collection inspired by nature and sea, in which the new rotomoulded elements are clear protagonists, establishing a game between warmth and avant-garde with an innovative result.
With Beach Units, the borders between exterior and interior are blurred, because any beach becomes an oasis of fun and relaxation.
The collection explores the potentials of rotational moulding for the beach mixing harmony and functionality, timelessness and universality. An outdoor ambience, encircling as a result of the blissful combination of the material and shape, so that the sole sensation would be its fusion.
The modularity of Beach Units permits the tourists to adapt the furniture, showers, cabins and pots to their beach style and needs without losing the harmony of this furniture set.

www.domusacademy.com

> *Rotomoulded elements based on the circle, the symbol of pureness, a recall to the ancestral shapes, devoid of useless frills.*





Designing New Microenvironments

Whether it's for the workplace, the learning environment, or the hospitality, retail and leisure sectors, rotationally moulded furniture solutions can help transform the office space from ordinary to extraordinary.

From revolutionary task seating, breakout furniture and office pods, to handcrafted upholstered furniture, rotomoulded products are meticulously crafted and enjoyed by companies around the world.

When people come together to communicate and collaborate, the best ideas are generated. Rotational moulding can provide the ideal space for team meetings and collaborative tasks that require support from technology.

Key Factors Trends

A dynamic workplace should be a multifunctional space, designed and equipped to meet its workers' psychological needs.
The adequate provision of private individual work settings is key to creating a culture that's smarter and more efficient.
Designated microenvironments where privacy leads to improved performance.
A modern product balances an eyecatching visual with intelligent functional design. A magnet for mobile workers, its assured profile provides exceptional comfort and privacy on demand.
An innovative rotomoulded product transforms third-spaces into innovative destinations that will improve users' experience at work.

Mango

design Boss Design - Great Britain
production Boss Design - Great Britain

Mango, a new personal workspace solution, is created with headspace in mind. Striking the perfect balance between privacy and ergonomics, Mango allows its user to comfortably escape distractions for extended periods of time without the need to leave the room.
Mango is available with or without a high upholstered screen surround, with the option of an extended privacy screen for acoustic insulation to minimise surrounding noise levels. A left-hand or right-hand writing tablet on an articulated arm lets the user position work and devices ergonomically, ensuring the user's physical wellbeing. Integrated power and data options provide connectivity, essential for modern day work and life.
Developed in-house by the expert design team, Mango acts as a magnet for mobile workers, whilst also providing sedentary workers with more choice and privacy on demand. Transform third spaces into practical destinations for individual focussed work.
Mango also fits seamlessly into public areas, including airport lounges, waiting areas, and hotel lobbies, offering users a private space to work, touchdown or relax.

www.bossdesign.com

> Backrest structure in HDPE linear polyethylene moulded with rotational system

Modular Work
Lounge Seating

Rotational moulding can be a key asset to develop modular systems with distinct profiles, workplaces where comfort meets every day ergonomics.

A dynamic area where individual meets integrated through a new generation of rotomoulded products able to furnish a complex landscape.

A holistic work lounge solution that transcends everyday distractions to offer people choice and better ways of working.

Designed to encourage serendipity and nurture the flow of ideas and information, the new concept is based on a flexible concept from solo working to several person booths, with the slimline aesthetic and zip detail enables agile reconfiguration.

Key Factors
Trends

1. New lounge areas can be used as a standalone piece or in conjunction with other units.

2. The unit can be used for team meetings, collaborative tasks or as a base for the day.

3. Smart workplace design is key to elevating productivity.

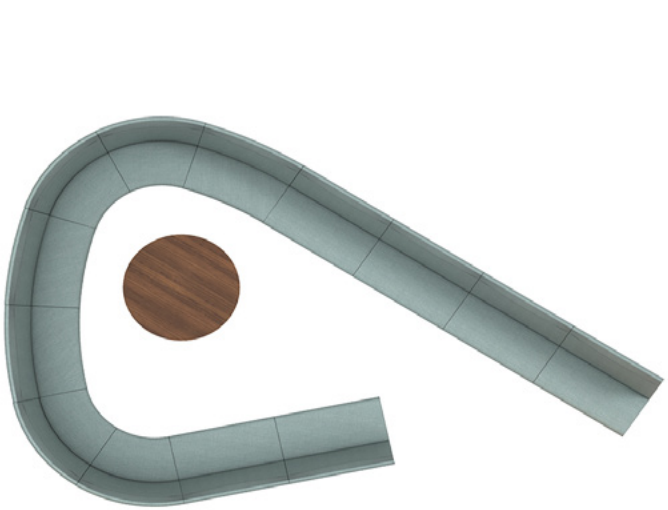
4. Intuitively engineered for maximum ergonomic comfort and privacy to help improve posture, health and wellbeing.

Atom

design Simon Pengelly - Great Britain
production Boss Design - Great Britain

Atom is a single unifying family of products comprised of seating, tables and desks. Developed to bring harmony to the workplace.
When people come together to communicate and collaborate, the best ideas are generated. Atom Media Units provide the ideal space for team meetings and collaborative tasks that require support from technology.
Unique in its adaptability, Atom has been designed to respond to the way people interact with their working environments.
Extensive, adaptable and elegant – Atom makes every space matter. The Atom breakout collection is organic, sculptural and intuitive, creating collaborative space for interaction and bringing harmony to the workspace.

www.bossdesign.com



> Rotationally moulded polyethylene (MDPE) seats

The Evolution of the Aquatic Experience

VAS (Vertical Aquatic Styles) are the new frontiers of aquatic fitness that new customers love.

The idea of Vertical Aquatic Styles is heading towards new horizons, a revitalised management of water spaces and targeted, organised training programmes tailored to specific goals, through the most up-to-date and advanced methodologies: from interval training to functional training, integrated with holistic activities.

Vertical Aquatic Styles also means relaxation and quality free time, personalizing the pool wellness Relaxation and wellness are essential values for the guests of hotels and hospitality structures, as well as for the free time you spend in your own pool.

Key factors Advantages

1. In our frenetic world, where time dictates every day-to-day experience, optimizing the working life of the instructors becomes fundamentally important to enable them to accomplish their mission properly, by creating objective-oriented programmes and adding variety and engagement to every lesson.

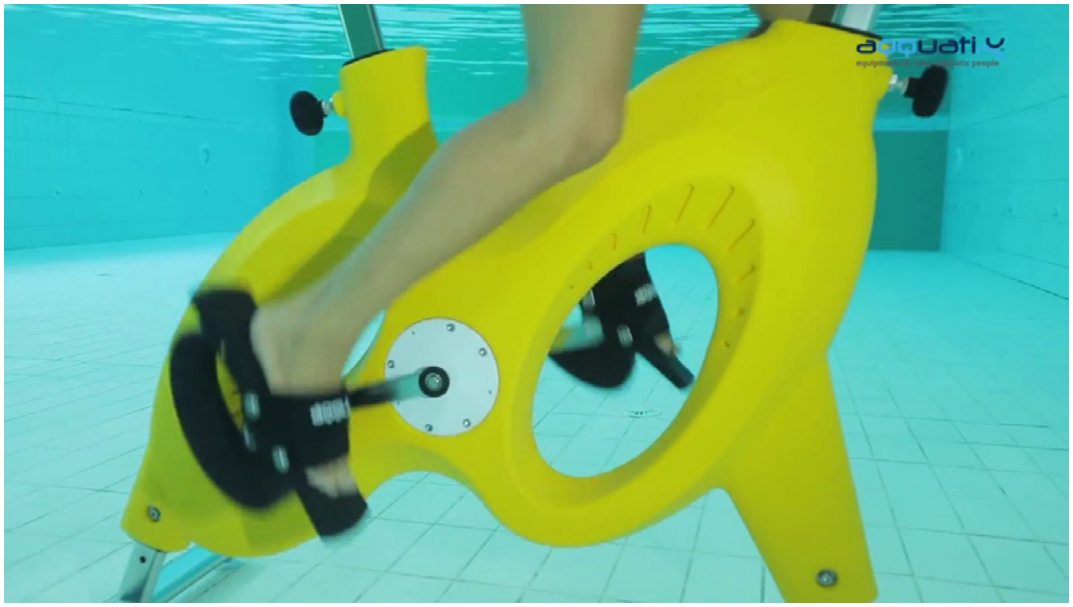
2. Water gives unique benefits and rotomoulded solutions can make the time guests spend in the pool personalized, pleasurable and exclusive.

Aquatic Bike Two

production Aqquatix, Italy

The Aquatic Bike Two is recommended for high-performance activities, with the possibility of mechanically adjusting the pedalling intensity during use
The bike represents one of the most innovative example in the world of aquatic fitness. It's equipped with a rotomoulded polyethylene shell and stainless steel frame with oval outlines.
The brake system studied by the R&D department to guarantee increased fluidity and durability.
Wide handlebar allowing more positions and a better grip, while resistive pedal in polyethylene, designed to increase the pedalling fluidity and strength.
The stability of the bike is ensured by the perfect balance between the front and rear axle, the new reinforced bases and the four suction cups in transparent PVC.
The 74 ° saddle-handlebar angle ensures the best position during use, excluding horizontal saddle adjustments. Wheels on the front base allow easy movement of equipment during surfacing and movement along pool side.

www.aqquatix.com

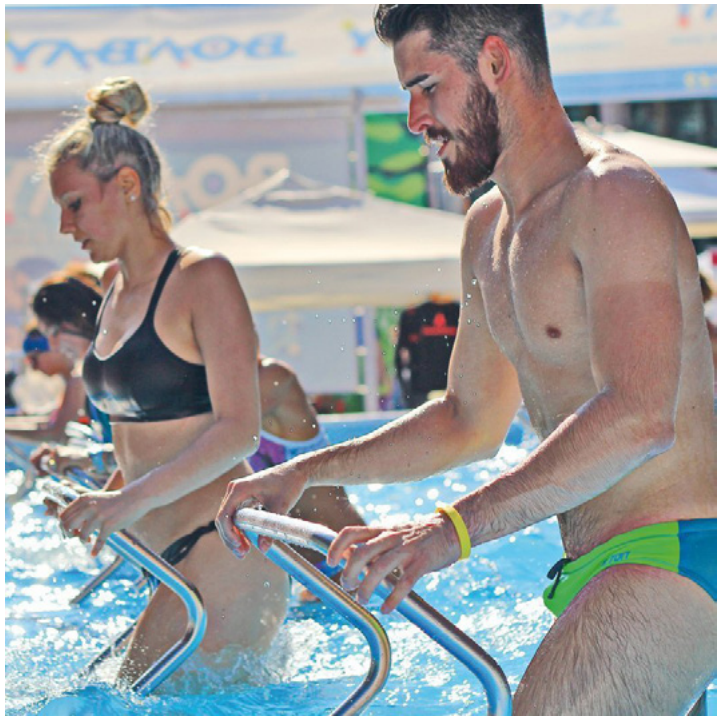


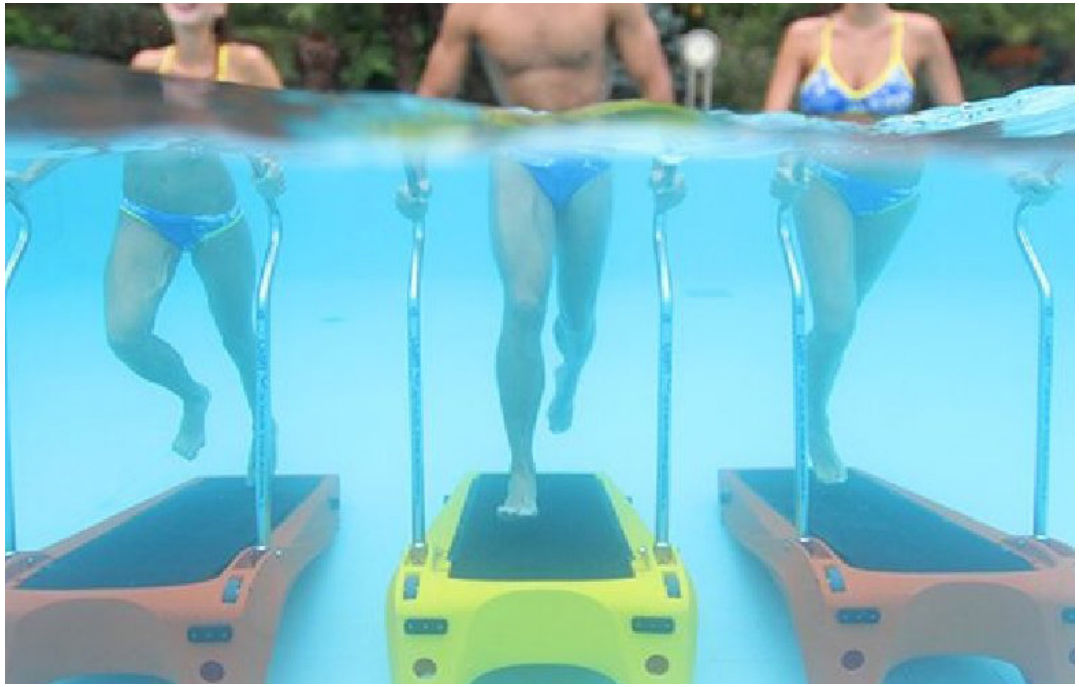
Star Aquatread Mill

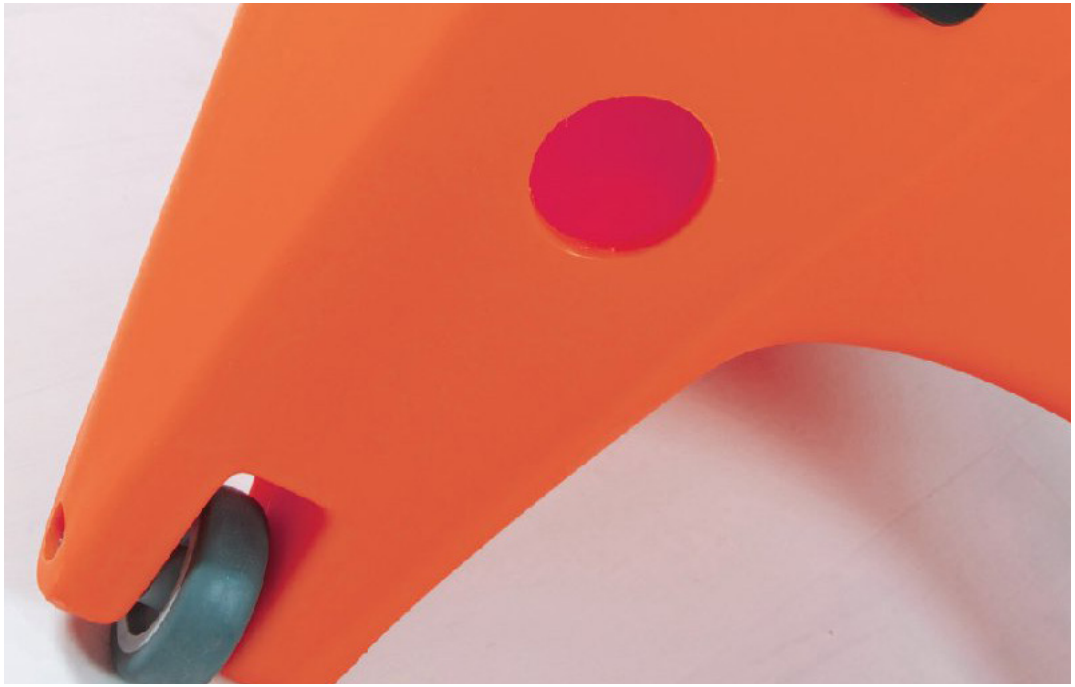
production Aqquatix, Italy

The Star Aquatread Mill three-roll sliding system guarantees maximum fluidity and smoothness: it is the only kind that allows running in the water.
The product is a mechanical treadmill, made of rotomoulded polyethylene, designed for aqua walking and aqua running.
The whole object combines innovation, design, functionality and practicality: designed to aquawalking and aquarunning, is ideal for work with classes of students coordinated by an instructor, for rehabilitation and training.
Thanks to its design, the Star Aquatread Mill nique for stability, reliability and smoothness of the belt.

www.aqquatix.com





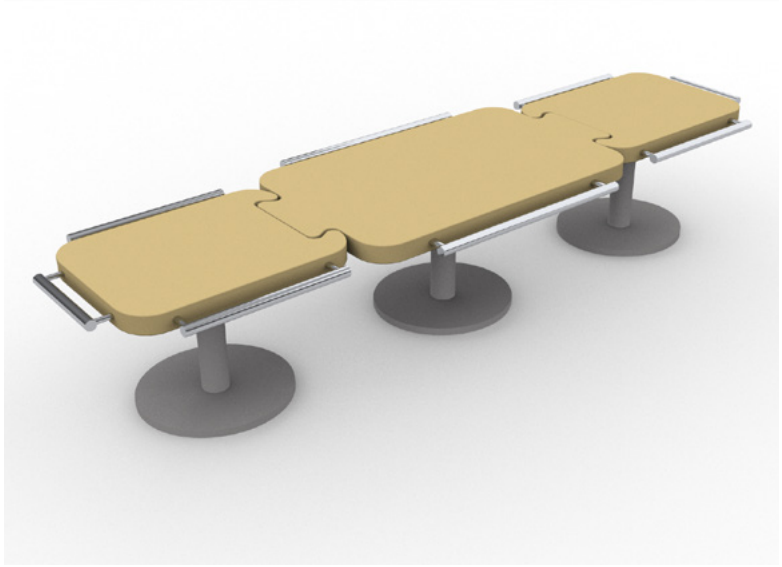


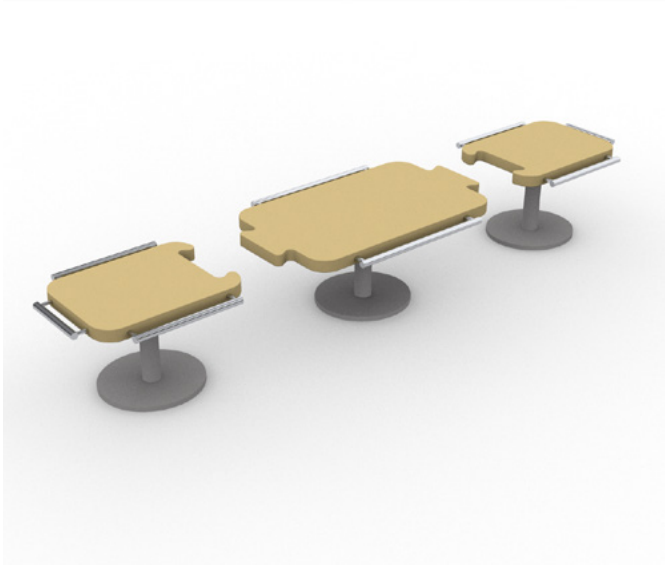
Roto AquaGym

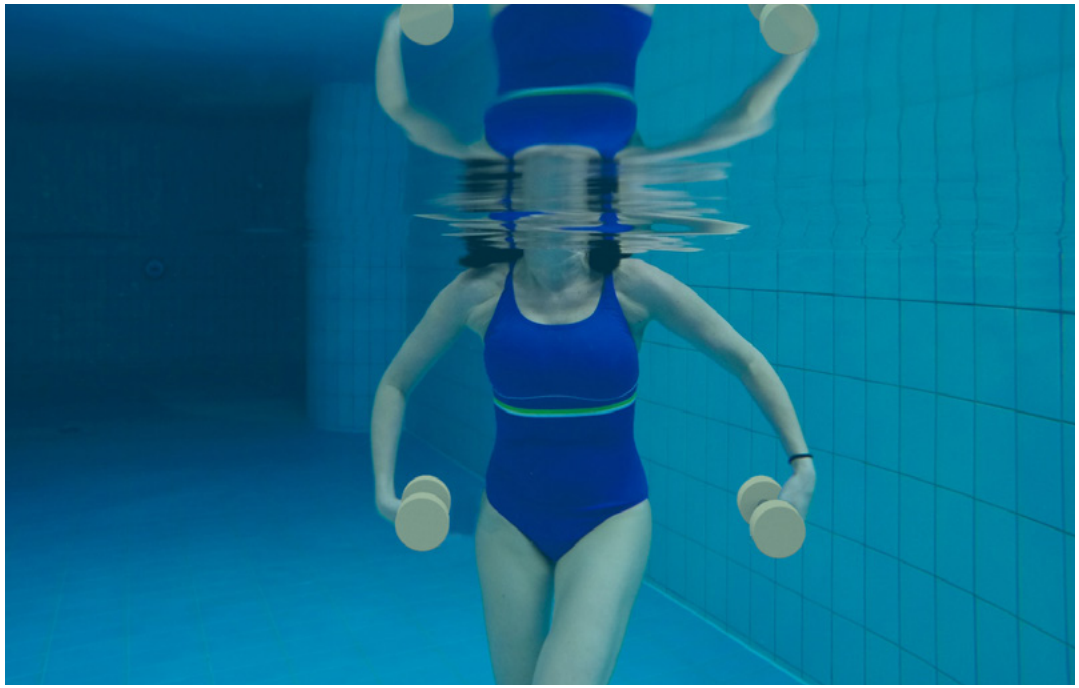
design Sean McKenna,
RCA Design Institute, London, Uk

This is a series of newly designed aqua gym equipment, produced using rotational moulding methods and therefore creating a new way to approach the market. With rotationally moulded objects there is the possibility to create an empty space inside which allows for good buoyancy when in water. This process also allows for unique one piece designs that can be coloured in a variety of ways.
The designs here include a series of platforms with handles attached that are placed in the water to allow people to hold on to them while they work their arms or legs, a series of weights to be used under water for arm excercises, and a series of weighted shoes allowing the user to stay stationary in the water for any desired activity.

www.rca.ac.uk







Advantages for New Excavator

Main advantages are the following:

- more precise maneuvers, simultaneous, sequential and much easier to manage;

- time-reduction for excavation operations;

- improved ergonomics: the operation can now get up and down from both sides of the vehicle;

- cost and weight reduction;

Main Features

Most important features are:

- the fuel tank shape was designed based on the chassis and using at most every inch of it;

- the fixing method was developed considering the characteristics of thermoplastic polymer and linear thermal expansion;

- versions from 250l to 400 lt fuel capacity

- impact resistance to stones or wreckage which is hard to underestimate at a construction or mining site;

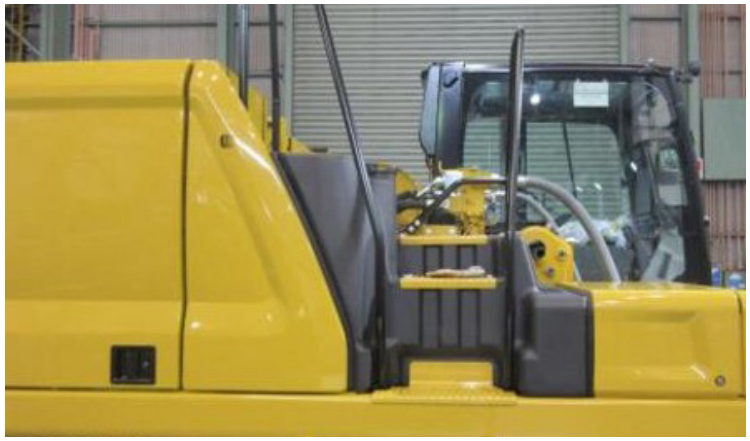
Katana tanks for CAT excavator

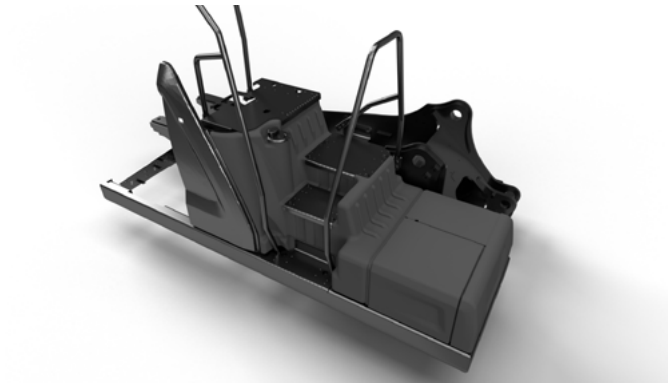
production Rototech, Italy

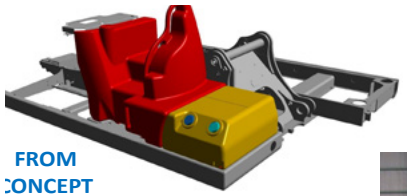
This is a brilliant example of metal to plastic conversion and co-design. The project that was developed step-by-step and side-by-side with the client, that turned into a success and a real game-changer in the field of construction machinery. CAT was able to raise the bar to its competitors strengthening its leadership in the segment.
Rototech was initially engaged by the client to transform the existing metal tank into plastic. The geometry was pretty standard, a cube like, due to the metal transformation constraints. The fist step in the co-design process was to implement a new shape that would firstly improve the visibility of the operator from the driving position. Before the metal tank occupied most of right side blocking the view, thus forcing the driver to break down a work flow into more moves, hence the process was more time-consuming.
And of course, the benefits of the conversion are not limited to only this improvement.

Project was developed for Caterpillar Japan

www.rototech.it







How can we use Technology to Measure Feet?

All main shoes brands have been measuring people's feet for many years, and the starting point for re-imagining this process is always a key question; "how can we use digital technology to measure feet?".

From this emerged a brief to revitalise the Clarks' in-store foot measuring consumer journey offering an immersive experience whilst providing accuracy and un-rivalled ease of use and ensuring that brand loyalty and the Clarks' USP is secured for the next generation.

Key factors Trends

1. Using non-contact capacitive measurement, wireless data transmission and apps capable of complex algorithmic calculations in seconds, the iPad foot gauge allows trained fitters to quickly and accurately ascertain the exact foot size.

2. An iPad - running an App capable of gathering and displaying the information in a consumer engaging way.

3. The Digitape - a device capable of measuring the foot digitally, within fractions of millimeter accuracy.

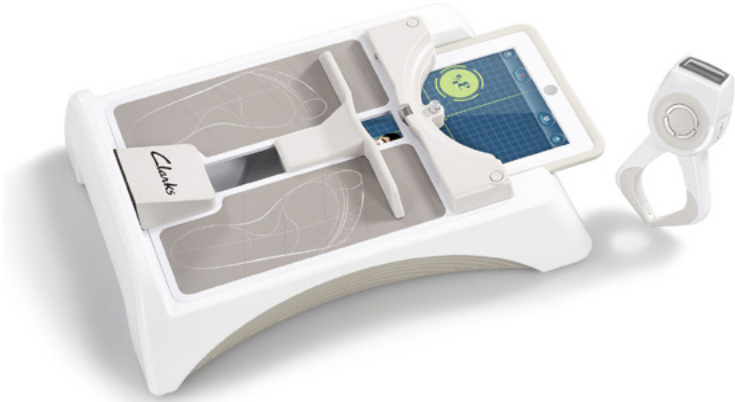
4. The Footplate - intuitive, mobile, robust and accurate.

IPad Foot Gauge Clarks

design Designworks, Brighton, UK
production Clarks, Street, UK

As the world's no. 1 everyday footwear brand, Clarks sell over 50 million pairs of shoes every year across more than 35 countries.
Working with Clarks' internal Innovations team, Designworks quickly identified the opportunity to create a compelling solution using proprietary measuring technology developed by Designworks; the 'Digi-Tape' device used in conjunction with a custom designed iPad application thus delivering the most accurate of results ever achieved by a Clarks foot measuring system. Clarks can now proclaim to provide a unique, digital-physical in-store and mobile customer experience that is simultaneously fun for boys and girls while remaining re-assuring for parents, all achieved whilst retaining that all important hands-on interaction with trained store staff. The Clarks iPad Foot Gauge has been awarded the prestigious iF Design Award.

www.designworks.studio



> *The rotomoulded modules are supported by heavy concrete blocks*

Water is Precious:
Don't Waste it!

A re-interpretation of the traditional combination of flower pot and umbrella pot in one product can be a good example of an innovative approach to classic typologies.

Simplifying the external watering through a simple formal intervention leading to an extension - while formally referring to a flower pot with a saucer.

A bigger amount of water can be poured into the extension opening of the pot, which can be absorbed by the plant whenever needed.

Key factors
Trends

1. The rotomoulded umbrella pot has a small plant container to use the rain water.

2. This umbrella pot allows rainwater from your umbrella to drain into the plant pot. Low-maintenance way to keep a small plant. Rainwater drains into the plant pot via internal holes

3. A large amount of water can be held by this new pot cuff, water that can then be absorbed at any rate the plant chooses through its roots.

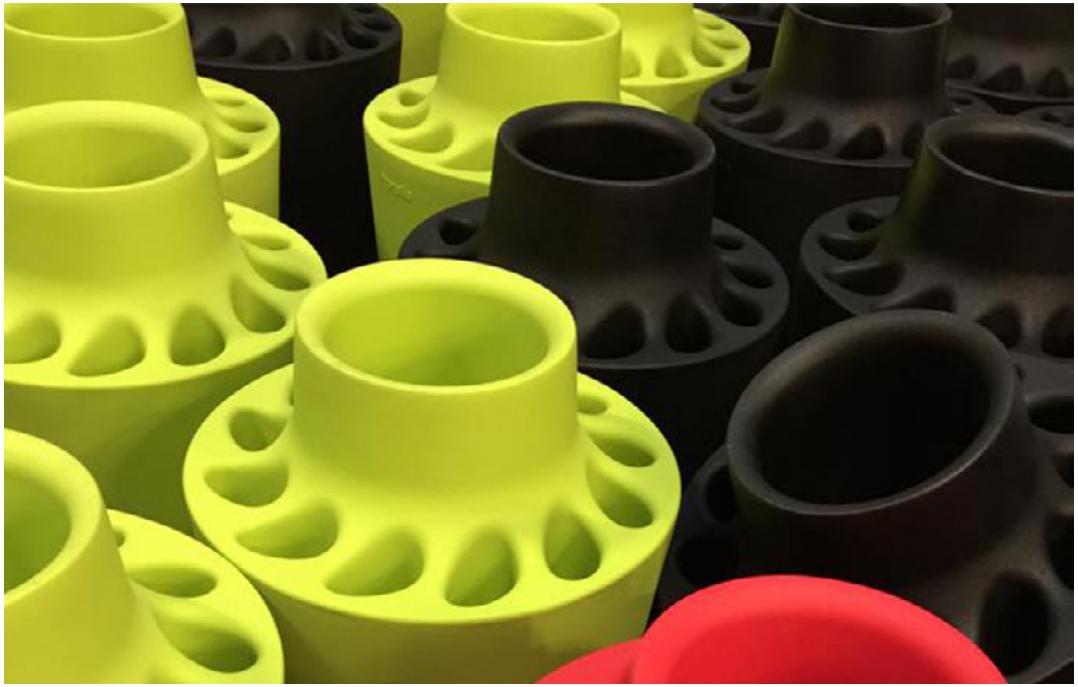
Uggioso

design Stefano Soave - Italy
production Abrella - Denmark

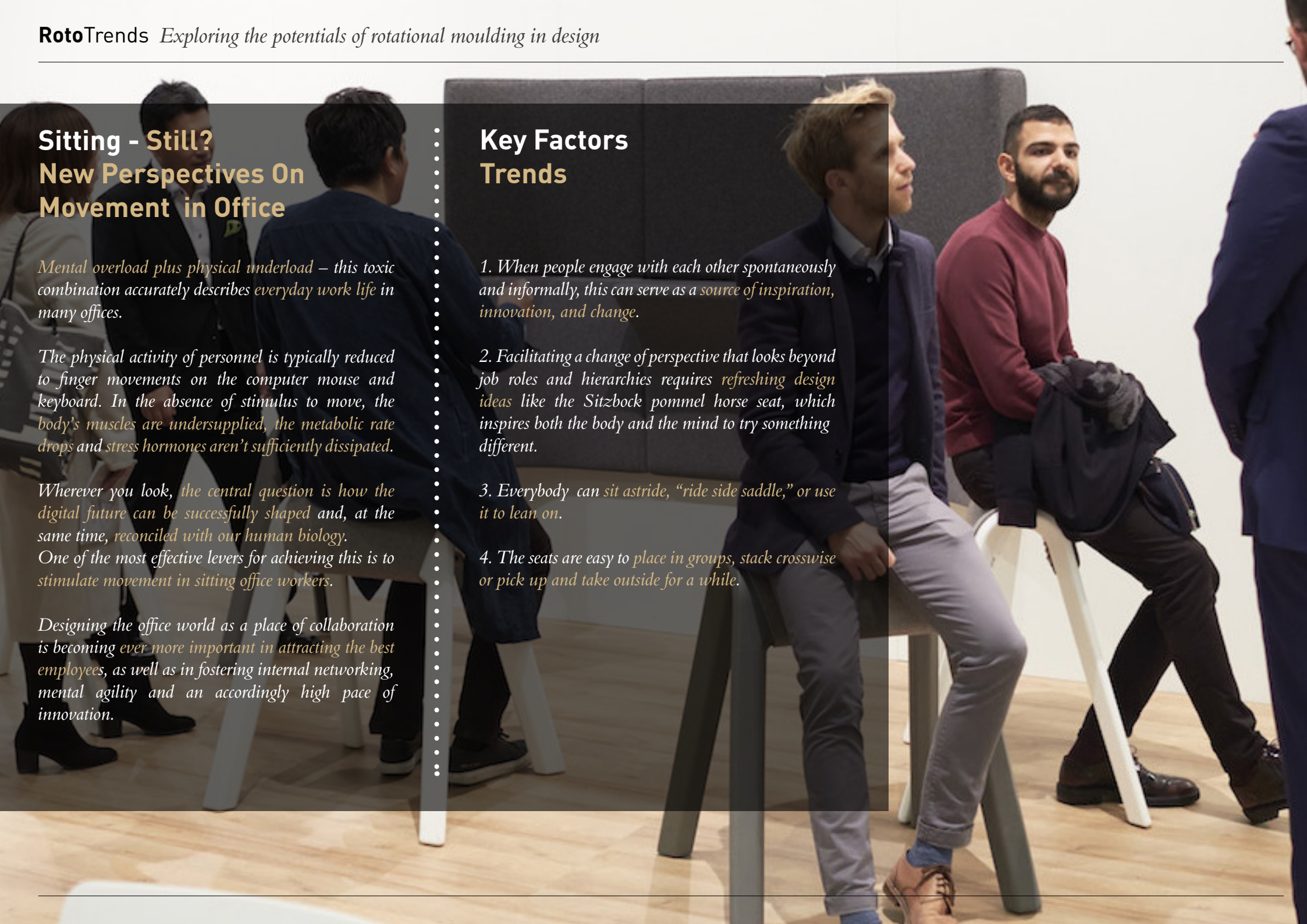
Uggioso is a vase and an umbrella stand, designed to perform the functions of these two traditionally distinct objects. The initial idea is a large circular double-bottomed pot, with outer compartments: the water coming from the umbrellas drip is collected into the central vase, to be then recovered as nourishment for the plant placed in the centre of the structure. In this way, a totally self-sufficient miniature ecosystem is created. The project intends to draw attention to this small daily gesture, making the costumer ponder, even for a moment, on the importance of every single drop of water.
Currently Uggioso is distribuited in Denmark, Finland, Norway, Sweden and Switzerland.

www.abrella.dk

> *A complete new ranges of rotomoulded equipment open new markets*



> *The rotomoulded modules are supported by heavy concrete blocks*



Sitting - Still? New Perspectives On Movement in Office

Mental overload plus physical underload – this toxic combination accurately describes everyday work life in many offices.

The physical activity of personnel is typically reduced to finger movements on the computer mouse and keyboard. In the absence of stimulus to move, the body's muscles are undersupplied, the metabolic rate drops and stress hormones aren't sufficiently dissipated.

Wherever you look, the central question is how the digital future can be successfully shaped and, at the same time, reconciled with our human biology.
One of the most effective levers for achieving this is to stimulate movement in sitting office workers.

Designing the office world as a place of collaboration is becoming ever more important in attracting the best employees, as well as in fostering internal networking, mental agility and an accordingly high pace of innovation.

Key Factors Trends

1. When people engage with each other spontaneously and informally, this can serve as a source of inspiration, innovation, and change.

2. Facilitating a change of perspective that looks beyond job roles and hierarchies requires refreshing design ideas like the Sitzbock pommel horse seat, which inspires both the body and the mind to try something different.

3. Everybody can sit astride, "ride side saddle," or use it to lean on.

4. The seats are easy to place in groups, stack crosswise or pick up and take outside for a while.

Sitzbock

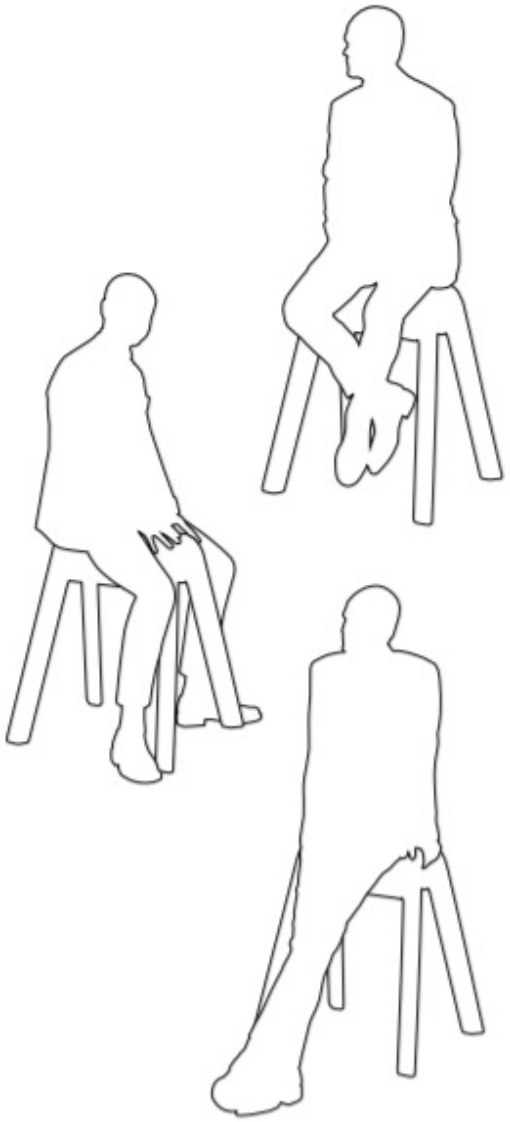
design Rudolph Schelling Webermann - Germany
production Wilkhahan - Germany

The innovative pommel horse seat "Sitzbock" for kitchenettes, lobbies and similar semi-public spaces invites passersby to take a break and use it in all sorts of ways. It's 707 mm high, 627 mm wide and its legs splay out to 520 mm. Just like a real horse, you can sit astride or ride "side saddle" or use it to lean on. Rotomoulded from black, white, grey or orange through-dyed polyethylene and just 4.8 kg in weight, they're easy to place in groups for spontaneous meet-ups, stack cross-wise or pick up and put on patios for a while. Anyone preferring a little more comfort can add a non-slip felt saddle blanket that comes in anthracite, graphite, mango or a light mottled hue and adds extra splashes of colour. Positioned in casual groups, the pommel horse seats create an atmosphere that's just as playful as it is ergonomic and invites interaction.

www.wilkhahn.com

> *The pommel horse seats are mass coloured with different finishes.*

> A pommel horse seat weighing just 4.8 kg that's ideal for informal interaction in kitchenettes, bistros and workshops and enables a range of different and flexible postures.



> Users can lean on it, sit side saddle or position themselves astride it.s

> *Four-leg seat made of throughdyed polyethylene with non-slip multipurpose glides-*

> *Optional felt blanket in anthracite, a light mottled hue with a rubber underside.*

Mobile Marking for Parking Spaces

The mobile marking for parking spaces offers significant advantages for real estate developers and operators of commercial premises.

Usually, real estate operators also rent out parking spaces for their commercial premises. Changing tenants require the frequent reassignment of parking areas.

The result is a confusing sign accumulation and an incoherent overall impression. In order to reserve parking spaces for tenants, these areas are marked separately and additional parking barriers are used. Among these barriers are fixed brackets, which can be folded down with a key, or complicated lowerable bollards as well as shut-off chains.

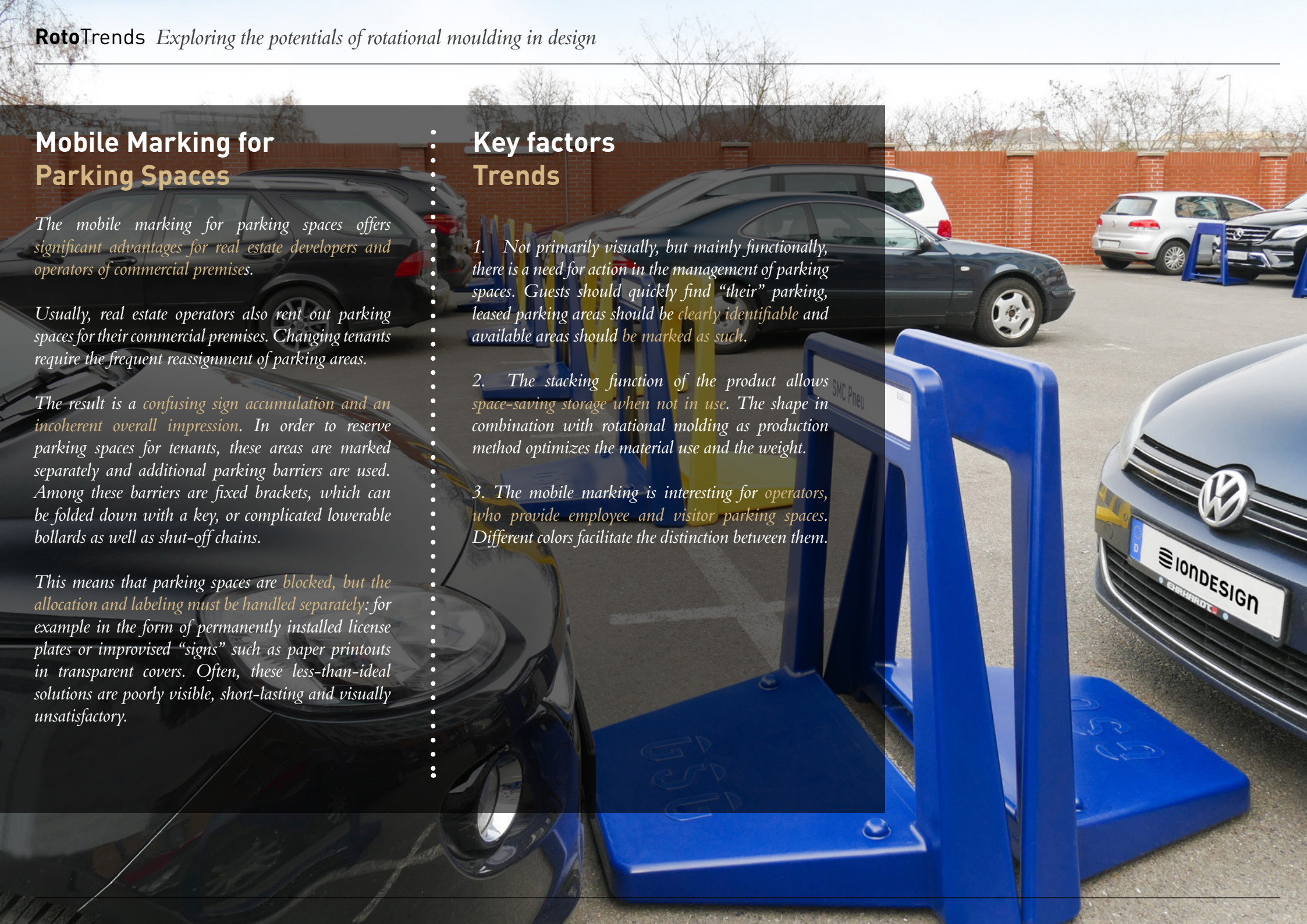
This means that parking spaces are blocked, but the allocation and labeling must be handled separately: for example in the form of permanently installed license plates or improvised "signs" such as paper printouts in transparent covers. Often, these less-than-ideal solutions are poorly visible, short-lasting and visually unsatisfactory.

Key factors Trends

1. Not primarily visually, but mainly functionally, there is a need for action in the management of parking spaces. Guests should quickly find "their" parking, leased parking areas should be clearly identifiable and available areas should be marked as such.

2. The stacking function of the product allows space-saving storage when not in use. The shape in combination with rotational molding as production method optimizes the material use and the weight.

3. The mobile marking is interesting for operators, who provide employee and visitor parking spaces. Different colors facilitate the distinction between them.

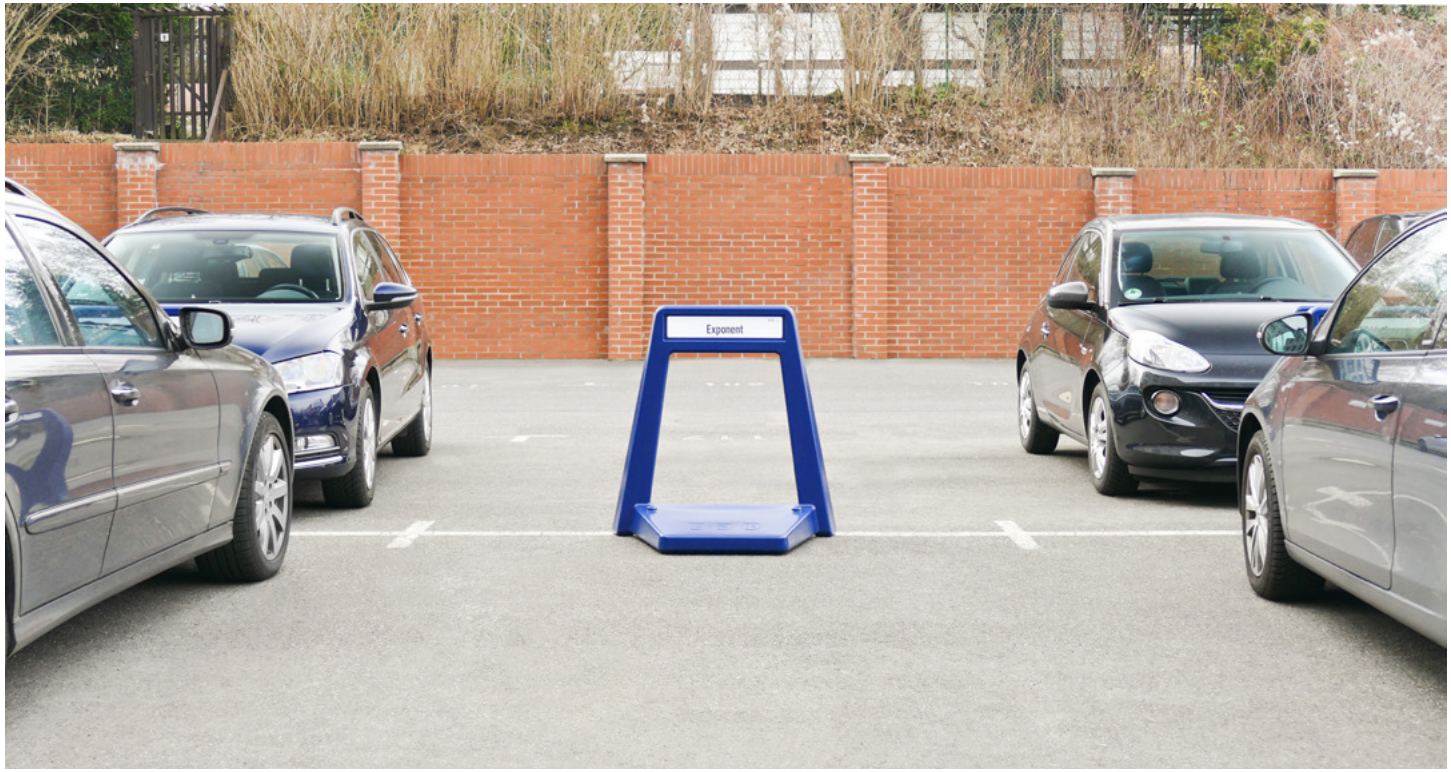


ParkPlatze

design IonDesign - Germany
production GSG - Germany

The mobile marking is used for the flexible labeling of car spaces. It marks reserved spaces and serves as a barrier for individual parking spaces, which are not rented. The innovation lies in the easy mobility and stackability of this parking lot. The wedge shape of the parking mark slopes down towards the vehicle, which makes it possible to approach the marking. When a car is parked in front of the bollard, the field in the top part, which has the size of a license plate, remains visible. In the base a recess provides space for a removable concrete slab, which increases the stability. If the plate is inserted as far as it will go, it sinks behind a safety edge that prevents accidental slipping out. The stacking function of the product allows space-saving storage when not in use. The shape in combination with rotational molding as production method optimizes the material use and the weight. Different colors facilitate the distinction between them. The color adaptation to the corporate design of a company expands the external representation into the outer space.

www.mobilerparkplatzpoller.de



> *When a car is parked in front of the bollard, the field in the top part remains visible.*

> *The stacking function of the product allows space-saving storage when not in use.*

> *The innovation lies in the easy mobility and stackability of this parking lot.*

> *In the base a recess provides space for a removable concrete slab, which increases the stability.*

> *The mobile marking is used for the labeling of car spaces.*

Capping the Chimney
New Potentials with Plastics

Trends come and go in home design and it's not uncommon for trends from the past to show up as new trends after a decade or so. Fireplaces, which have always been popular in some geographic areas, are coming back as a huge trend for home design.

Fireplaces are popular again with designers because they offer a stylish function that homeowners want and the luxurious touch that homebuyers today look for in new homes. Fireplaces can boost energy efficiency and help heat older homes that don't have a lot of air flow or new homes that are just so large that the system just can't heat the entire house.
The primary function of a chimney is to produce the draft necessary to carry smoke or gases to the outside of the structure without endangering the structure or its occupants.
The top or cap of the chimney can be finished in different ways. Plastic cap are becoming a valid alternative to other more traditional materials as bricks and concrete cast.

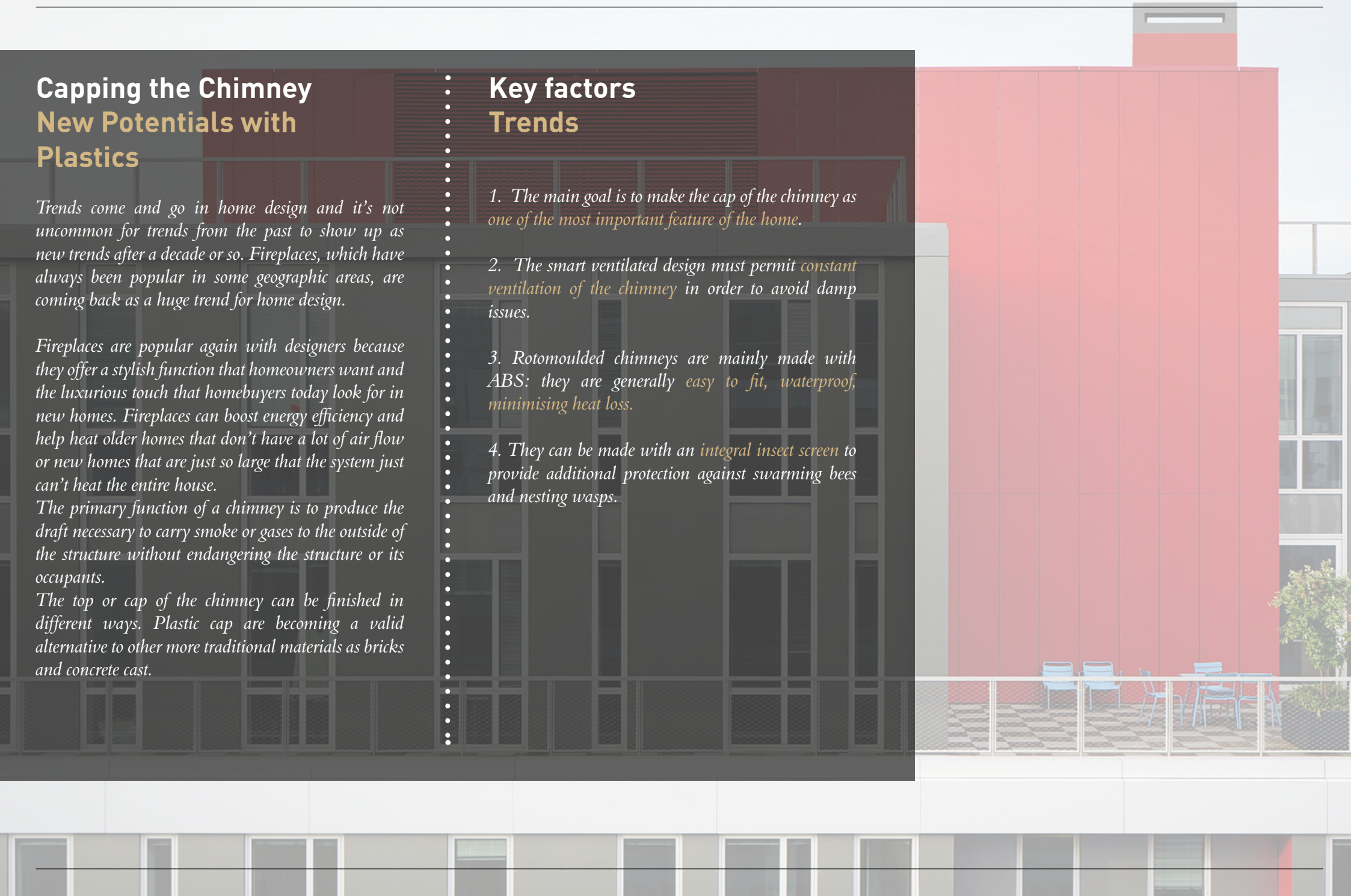
Key factors
Trends

1. *The main goal is to make the cap of the chimney as one of the most important feature of the home.*

2. *The smart ventilated design must permit constant ventilation of the chimney in order to avoid damp issues.*

3. *Rotomoulded chimneys are mainly made with ABS: they are generally easy to fit, waterproof, minimising heat loss.*

4. *They can be made with an integral insect screen to provide additional protection against swarming bees and nesting wasps.*



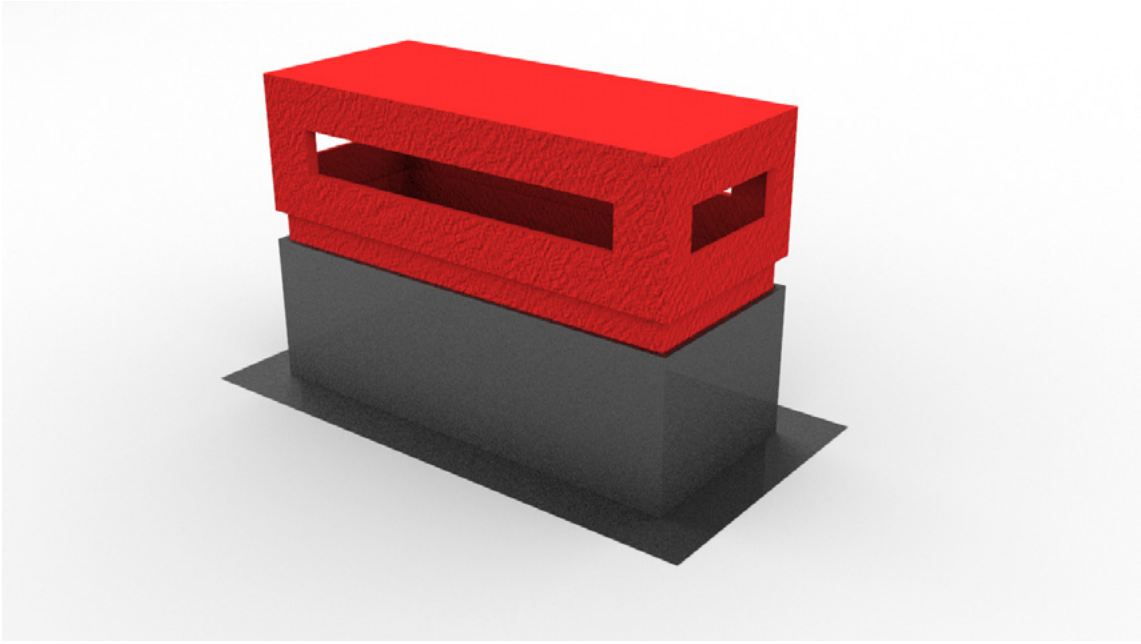
Chimneys

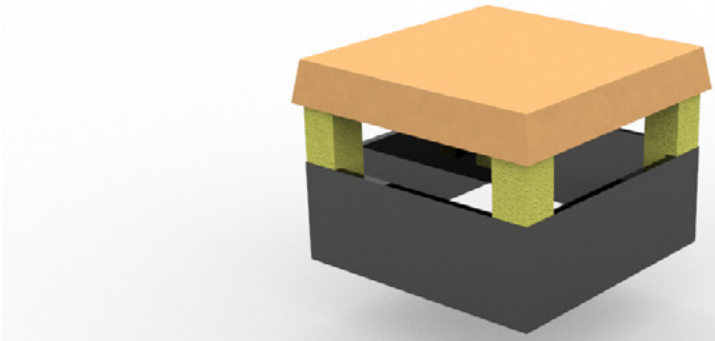
design Marc Muller - Ecal France

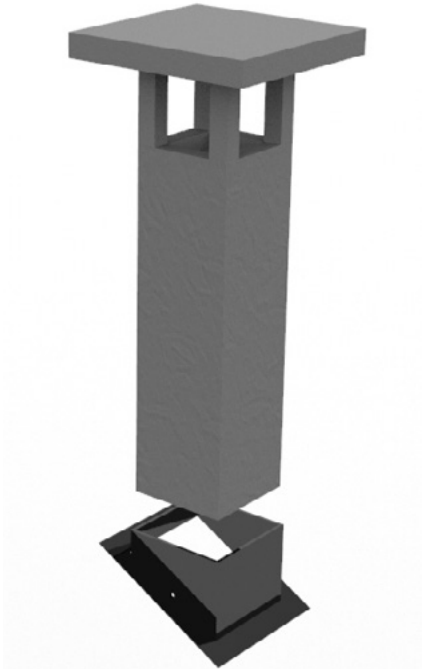
These are a series of chimneys designed to suit the rotational moulding process, while retaining the classic look of various chimneys from different styles and eras.

Each chimney is designed in two pieces, the first being the top half made from a polymer, and the base made from a metal which is attached to roof during installation.

The lighter coloured chimneys follow a more classic design period, including venetian style chimneys. The more modern looking chimneys take on the current trends in style for chimneys in the present day. The use of polymers for this application as opposed to concrete, metal or cotto, allows for unique designs that can survive any type of weather.







Redesigning the Social Distancing in Transport

As the effects of the Covid19 pandemic impact aspects of our daily lives, the transport industry continues investigating how it can ensure safe and fearless traveling.

New products are encouraging the use of partition systems and reversed seating to guarantee social distancing inside bus, train and metro.

Social distancing, together with hygiene, have been the strongest recommendations against the novel Coronavirus and public transport is not the best example of this.

New rotomoulded products can give trains and buses the flexibility to adjust cabin configuration based on real time demand, allowing them to make the most efficient use of precious cabin space while maximizing passenger appeal.

Key factors Trends

1. All parts must be designed to remove any dirt and be easily cleaned.

2. Vertical screens can alternatively be produced in a lightweight thermo-formed foam, with or without a cleanable plastic trim.

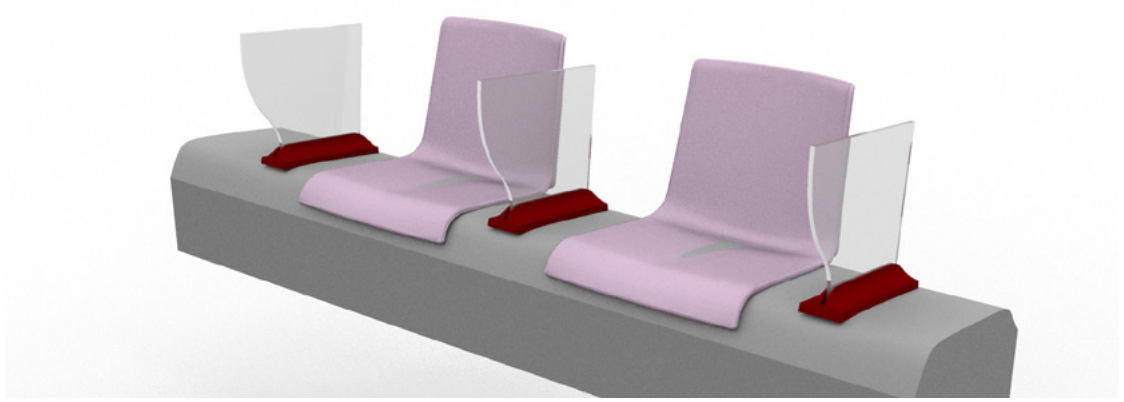
3. The kit disassembles easily and can be fitted to any seat in order to facilitate travelling persons who wish to be screened from the aisle.

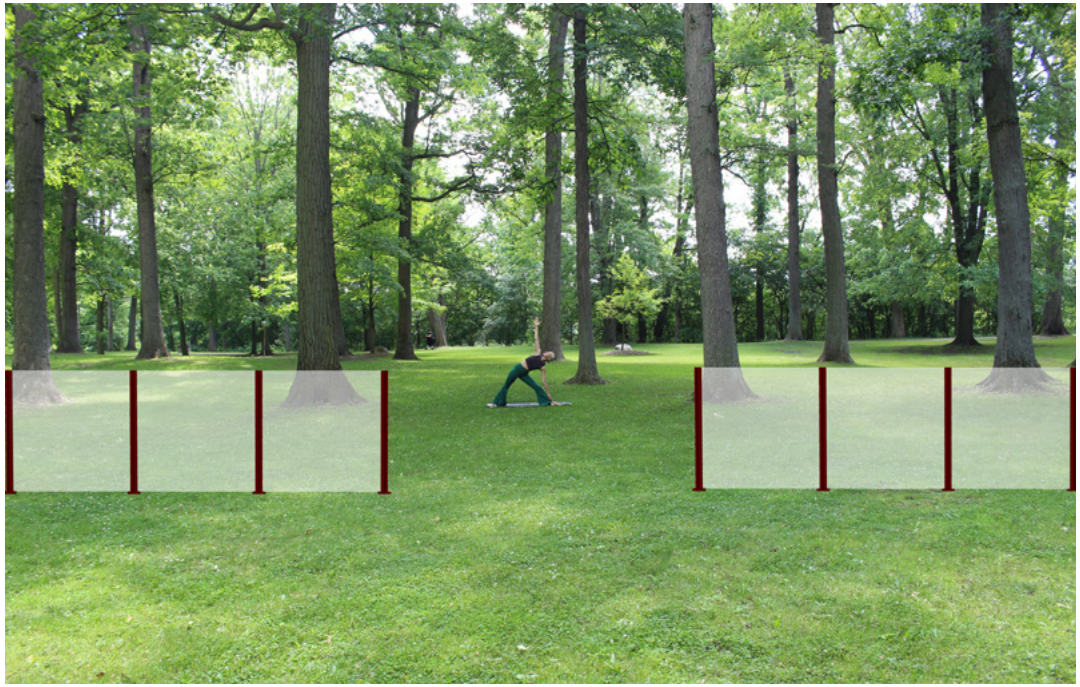
Di-Viders

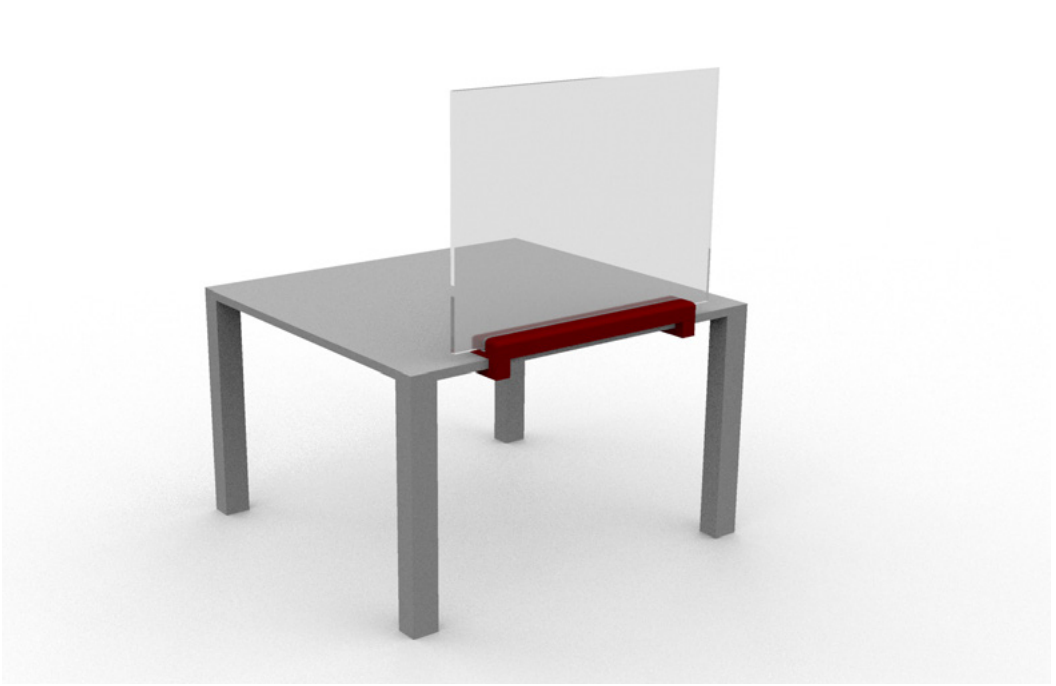
design Patel Ashwal, IED Madrid

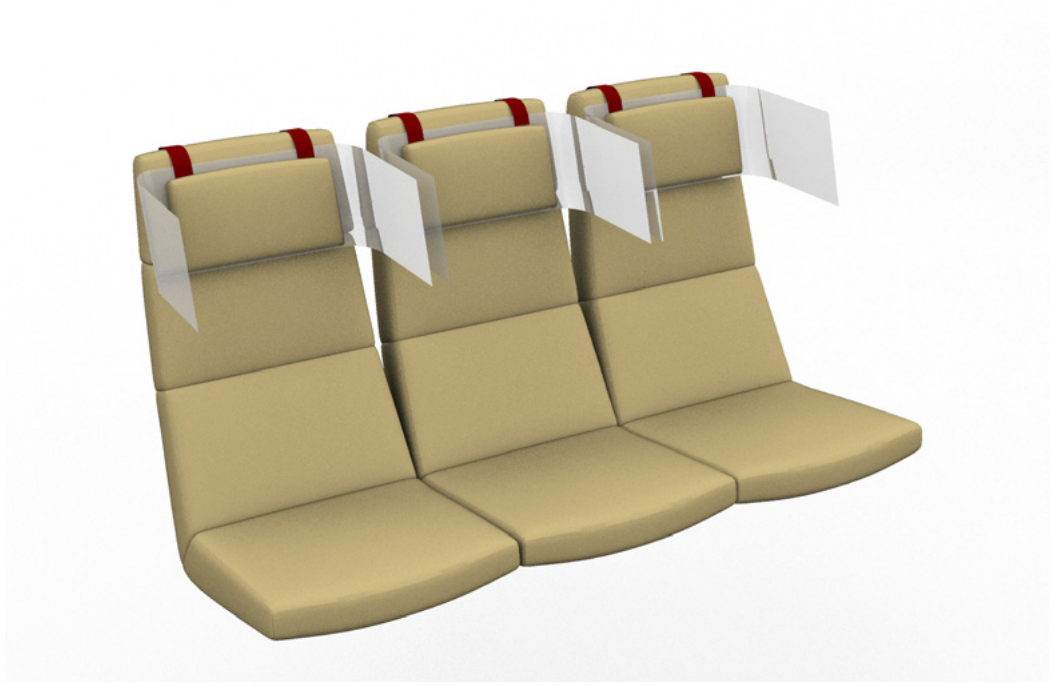
This project was realised in order to try and combat the current global situation affecting many countries known as covid-19.
We have created a series of concepts to help with the issue of social distancing currently and when day to day activities return to normality.
We have a series of dividers and screens constructed using rotationally moulded parts and plexiglass screens to help create distance between two or more people. These products can be used in a variety of locations and will help with keeping two or more people at a safe distance. These products include; large screens for public spaces, screens for public transport and sporting events.

www.ied.edu









23

credits

Abrella, *Denmark*
Aqquatix, *Italy*
BossDesign, *Great Britain*
Caterpillar, *Japan*
Clarks, *Great Britain*
ParkPlatz Poller, *Germany*
Rototech, *Italy*
Volvo Truck, *Australia*
Wilkhahan, *Germany*

Cover Pictures
courtesy Euro3Plast, *Italy*

Projects
Domus Academy, *Italy*
Ecal, *France*
Istituto Europeo Design, *Spain*
UDK, *Germany*
Politecnico di Milano, *Italy*
SJB-Institute of Technology, *India*
St. Martins School, *Great Britain*

Concept
Studio Giovanetti, *Italy*

affiliates ARMO

- AFR - Association Francophone du Rotomoulage
- ARM - Association of Rotational Molders
- ARMA - Association of Rotational Moulders Australasia
- ANIPAC - The Mexican Plastic Association
- ARMSA - Association of Rotational Moulders Southern Africa
- ARM-CE - Association of Rotational Moulders Central Europe
- StAR - Society of Asian Rotomoulders
- Nordic ARM - Nordic Association of Rotational Moulders
- BPF - Rotational Moulders Group
- IT-RO - Italia Rotazionale
- RPC-CPPIA
- Rotopol Association