# ARA

technical document

# Contents



# Great Design

is when there's nothing left to take away

## The Story

We wanted to make Ara as simple as we could, both visually and functionally. But simplicity doesn't come easily.

During the early stages of the design of Ara we established a relationship with one of Cradle to Cradle's authors, renowned industrial chemist Micheal Braungart. Throughout the development we have been working with EPEA, Micheal's C2C organisation based in Hamburg.

We've always very carefully considered the materials that we use in our products but our aim in working with EPEA is to ensure that what we're using is truly safe, for humans and the environment alike, and successful in technical cycles of reuse. This means looking in much more detail at every chemical ingredient in the materials we use; to determine which inhibit this aim and need to be substituted or removed as a result.

Ara is the first task chair developed and manufactured in Europe to achieve Cradle to Cradle accreditation.

## Design Engineering

### The Elastomer Back

Ara's character and performance are defined by the design of the chair's adaptive elastomer membrane. The rigid outer frame supports the membrane with a posturally correct 'S' shape and its flexibility allows it to adjust automatically to the profile of your back. The elastomer membrane accommodates different shapes and sizes and **responds subtly to changes** in your back profile as you perform different tasks. So whether you're reaching forward to type, turning sideways to talk to a colleague or reclining while on the phone, you'll always feel comfortable and supported.

### The Upholstered back

For those who simply prefer it that way, we're also able to offer Ara as a fully upholstered chair. Making the back cushion elegantly slim means that it looks great and sacrifices none of the dynamic support from the elastomer membrane which sits behind it.

# Design Engineering

The Seat

One of our toughest challenges is to offer refined seat comfort without compromising good posture, so our seat cushion is carefully shaped. Foam thickness has been maximised in the rear section and balanced with a gently sloping profile at the front, encouraging better posture and maximising blood flow to the legs. Experience also tells us that seat cushions get softer over time as the cellular structure inside the foam relaxes, so **we've done this work for you.** Squeezing the cushions flat straight after they're moulded ensures they're as soft as they can be, yet strong enough to support you throughout the working day.

**The Vertebra**

The vertebra's organic form is deliberately influenced by nature's design for skeletal structures. It's economic with material and at the same time, incredibly strong and effortlessly stylish. Die casting the vertebra in a single piece of aluminium keeps part count and material variation to a minimum, it also means more effective recycling and it is easily reprocessed, with little or no loss of functional performance. More than ever before, sustainability considerations have been key driver in all the design decisions we've made. The materials we've chosen make Ara around 98% recyclable by weight but that's only really part of the story.

The key to a great chair is
really great movement.

# Design Engineering

**The Mechanism**

Ara's synchronous mechanism delivers a smooth, balanced movement from impressively refined engineering. Why synchronous? Quite simply, we've always felt that the action of seat and back moving together in this way provides a natural, intuitive ride. Proven ergonomic research also tells us that regular changes in posture improves our well being when sitting at work. We know that people come in all shapes and sizes. That's why smart engineering inside the mechanism means the ride can be tuned and balanced to your precise needs, using adjustment controls that are easy to operate and labelled clearly.

**Arm support that's there only when you need it.**

Our goal was to design a new arm pad that was more comfortable than ever, using materials that could be segregated easily and recycled more effectively. The traditional PU is replaced by a flexible polymer with a separate insert made from recycled foam. The result is an armrest that's robust, easy to use and probably the most comfortable we've ever made.

**Do something really simple; make the chair base 100% recyclable.**

Not the most complicated part on a task chair, granted, but we asked ourselves the question - some look much better than others but all plastic chair bases are pretty much the same, aren't they? Well in one sense they are, and with very few exceptions they all have a metal collar moulded into the plastic to stop the gas lift creeping through the base. Great for not dragging your chair across the carpet but not so great when you come to recycle it, as the collar can be very difficult to remove.

Smart design and careful material selection has enabled us to create a base without a collar insert. A simple point but unlike almost all other plastic bases ours is 100% recyclable. And rest assured we've tested it like mad.

# Ergonomic Refinement

## Ara's ergonomic engineering is designed to accommodate diverse body weights, shapes & sizes.

Each user can fine-tune the chair's settings to their precise preferences through Ara's seven adjustment settings, with controls that are clearly marked and intuitive to use.


### 1a. Adjustable arms
Both arms are height adjustable.

### 1b. Multi-adjustable arms
Soft touch pads can be rotated 180° rearward & automatically lock forward for additional safety

### 2. Multi-adjustable lumbar
Both height and depth adjustable for fine-tuned seating comfort.

### 3. Seat height control
Lift to raise and lower seat height.

### 4. Seat slide control
Press to adjust seat depth to suit your body size.

### 5. Back lock control
Lift to unlock the recline of the back; press to lock the back in the position most suitable.

### 6. Body weight control
Turn to adjust. Tunes the tension of the back recline to suit your body weight.

## Comfort and postural support combined

# Standard Specification

Standard Task Chairs :

**Upholstery:** The full Orangebox upholstery offer is available. Two tone upholstery is available as an upcharge. Leather upholstery is a panelled solution. Some low stretch fabrics may also require the upholstered panelled solution.

**Castors:** Hard black 65mm castors are fitted as standard with soft tyre RAL 9006 and Stone versions available as an upcharge.

**Base:** Black plastic 5 star base fitted as standard with Black, Stone and RAL 9006, painted aluminium or polished aluminium bases available as an upcharge.

**Column:** Black gas lift fitted as standard with black plastic, black painted and stone base options. Brushed steel gaslift fitted as standard with RAL and polished base.

**Mechanism:** The mechanism and mechanism controls are only available in black.

**Arms:** Height adjustable arm is fitted in black as standard, with a soft TPU arm pad. Width adjustment arms available as an upcharge. The multi-adjustable arm is available as an upcharge, the lockable rotating arm with soft TPU arm pad is available in black and stone.

The aluminium arm supports are Black, Stone, Ral 9006 or Polished.

**Back Yoke:** The Aluminium back yoke is available in Black, Stone, Ral 9006 as standard & polished is available as an upcharge.

**Back Plastics:** The back plastics are available as Black, Stone, Sky, Leaf & Slate as standard.

Upcharge options:

- Two Tone Upholstery (available on UB & UBA)
- Painted Aluminium Base
- Polished Aluminium Base
- Polished Yoke
- Soft Castors (RAL/Stone)
- Multi Adjustable Arms (painted)
- Multi Adjustable Arms (polished)
- Width Adjustable Arms
- Lumbar Support (Black only)
- Glides
- Extended gaslift & footring

# Product Dimensions

### Standard Task Chairs :

Seat and back cushions can be replaced on upholstered option.
Seat cushion is replaceable on elastomer back version.

Independent Lumbar Adjust: Height range 100mm and depth adjustment of 20mm.
Seat Depth: Adjustment range 50mm.
Arms: Standard arm has height adjust only - range 70mm, width adjustable available as an option. Multi adjust version has rotation pad, 30º inwards for additional support, rotate pad 180º rearward to allow user to get closer to desk.
Mechanism: Synchronised sequence of motion seat/backrest ration = 2.9:1, seat angle = 0 to 7.5 degrees, backrest angle = 0 to 23 degrees. Mechanical locking in four positions with return prevention safety function. Individual spring force adjustment to the occupant's weight via rotary knob - side tension adjustment.

- Height: 997mm
- Width:696mm
- Depth: 700mm
- Weight: 19.25kg
- Arm width 50mm

### Weights

Elastomer back chair weight with arms: 19 kg
Elastomer back chair weight without arms: 16 kg
Upholstered back chair weight with arms: 19.25 kg
Upholstered back chair weight without arms: 16.25 kg

## The key to a great chair
## is really great movement

## Statement of line

ARA-EB: Elastomer Back Swivel Task Chair
ARA-EBA: Elastomer Back Swivel Task Armchair
ARA-UB: Upholstered Back Swivel Task Chair
ARA-UBA: Upholstered Back Swivel Task Armchair

ARA-EB

ARA-EBA

ARA-UB

ARA-UBA


## 1a. Adjustable arms

Each arm pad is height adjustable by pressing the button on the outside of the armrest and sliding up and down into the desired position. If possible, your forearms should be supported at 90° to your upper arms with your shoulders relaxed.

## 1b. Multi-adjustable arms

Height: Arm pad is height adjustable by pressing the button on the outside of the armrest and sliding up or down into the desired position. If possible, your forearms should be supported at 90° to your upper arms with your shoulders relaxed.

Rotation: Slide the control on the underside of the front of the arm-pad forward and rotate the pad to the desired position. The soft touch pad can be rotated 180° rearward to allow you to work closer to your desk or 30° inward to provide wrist support whilst typing. The arm-pad will automatically lock in the forward position for additional safety.


## 2. Multi-adjustable lumbar

Ara's adaptive elastomer membrane has been designed to flex, this accommodates different shapes and sizes of user but supports your back in a posturally correct 'S' shape. Because the back adapts to fit the user, Ara doesn't need a height adjustable back, but the adjustable lumbar control can be used to fine tune seating comfort. To fine tune lumbar height, reach round with both hands to grip the lumbar pad and pull up or down to a position that suits. To fine tune lumbar depth, rotate the paddle in the centre of the vertebra, clockwise to increase support from the pad and anti-clockwise to decrease the support from the pad.


## 3. Seat height control

Lift the paddle on the right hand side of the seat to raise and lower seat height. The seat height is locked when the lever is released. It should be set so your feet are comfortably flat on the floor and if possible, your thighs should be at 90° to your back (or slightly more) to help keep your pelvis upright and your spine aligned in a natural 'S' shape.


## 4. Seat slide control

The seat slide control is situated on the right hand side of the seat, toward the front of the chair. It is adjusted back or forward by pressing the button in whilst sliding the seat into the desired position. If possible, there should be at least two fingers gap between the front of the seat and the back of your knees. This will ensure adequate thigh support but without obstructing leg movement and lower leg circulation.


## 5. Back lock control

Lift the paddle on the left hand side of the seat to unlock the recline of the chair back and gently lean back to recline. The mechanism has an anti-kick safety feature which means that adjusting the chair back to be more upright also needs you to put a small amount of rearward pressure on the back first. Press the paddle down again to lock the chair back in the desired position. For healthier sitting, keep the chair unlocked as much as possible as this will encourage you to move more, which is better for you.


## 6. Body weight control

The recline resistance when the chair back is unlocked can be adjusted to suit your body weight by turning the knob on the right hand side of the seat. Turn clockwise to increase resistance and anti-clockwise to decrease resistance. The 'tension' should be set so that you are able to recline gently in a controlled manner but without having to push uncomfortably hard.

# Cradle to Cradle

Cradle to Cradle is an approach to design which asks us to "remake the way we make things" thinking about the materials we use, how our products are designed and assembled, and their cycles of use with our customers.

No matter how good your products are, there comes a time when their first useful life comes to an end. In considering product life cycles Cradle to Cradle asks us to re-think the commonplace approach of "take, make & waste" and this prompted us to act.

During the early stages of the design of Ara we established a relationship with one of Cradle to Cradle's authors, renowned industrial chemist Micheal Braungart. Throughout the development we have been working with EPEA, Micheal's C2C organisation based in Hamburg.

We've always very carefully considered the materials that we use in our products but our aim in working with EPEA is to ensure that what we're using is truly safe, for humans and the environment alike, and successful in technical cycles of reuse. This means looking in much more detail at every chemical ingredient in the materials we use; to determine which inhibit this aim and need to be substituted or remove as a result.

## Returning your ARA at 'End of Life'

Cradle to Cradle is an approach to design which looks to make us truly environmentally effective, by developing products for closed loop systems in which all the materials used are safe and beneficial - either to biodegrade naturally or to be fully recycled into high quality materials for subsequent product generations, again and again. In order for us to maximise the value of the materials used in your chair we'd like to get them back once you've finished with them. It's pretty simple, all you need to do is visit our website at **www.orangebox.com/endoflife.htm**

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PRODUCT CERTIFICATION
SILVER

IS HEREBY GRANTED FROM APRIL 22, 2009 TO APRIL 21, 2010

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**Orangebox Ltd.**
**ARA Task Chair**

William McDonough
PRINCIPAL AND CO-FOUNDER

Michael Braungart
PRINCIPAL AND CO-FOUNDER

Jay Bolus
VP, TECHNICAL OPERATIONS

MBDC EPEA

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ARA

is the first task chair designed and manufactured in Europe to achieve Cradle to Cradle accreditation.

# 98% recyclable

## but that's not the point.


Equally important is the ability to support recyclable products with better systems for recycling.

Sustainability considerations have been a key driver in all our design decisions we've made. The materials we've chosen make Ara around 98% recyclable by weight, but that's only really part of the story.

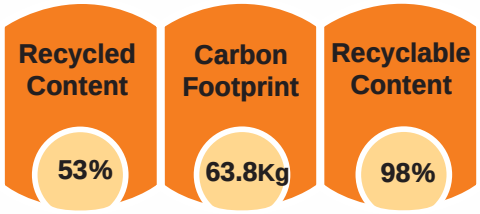
Whenever we recycle, we need to retain the value in the materials themselves and the resources invested in making them. We believe the answer lies in manufacturing with closed loop cycles. These encourage true re-cycling rather than the still damaging process of down-cycling materials, which is one step closer to landfill.

Having set up a recycling facility at our manufacturing site in South Wales and having followed the principles of C2C, we're now able to offer a comprehensive take back service for this chair. Used products will be collected by our delivery fleet and if re-use isn't possible, they'll be disassembled and the materials recycled via the appropriate channel.

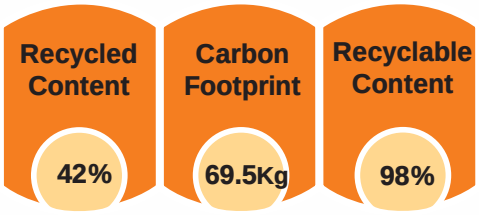

## This is the crucial step in us being able to create a true closed loop cycle.

The materials invested in the product can be recovered and reused rather than being down-cycled and one step closer to landfill.

## Carbon Footprinting




**ARA Aluminium Task Chair**




**ARA Plastic Task Chair**

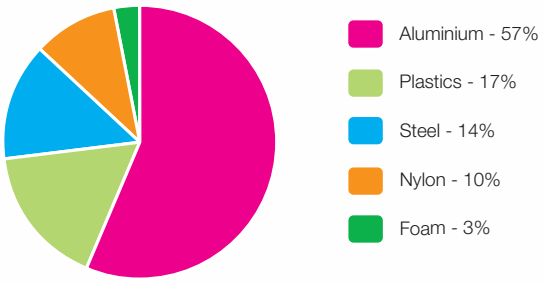
## Life-cycle Breakdown

The footprints look at Environmental impact through the entire life-cycle of the product

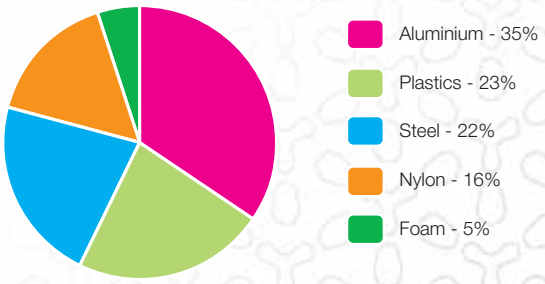

## Materials Breakdown

Our footprint analysis indicates that over 90% of a products environmental impact is down to the raw materials used in manufacture. By understanding the footprint of different materials, we can make better decisions on material selection for forthcoming products.

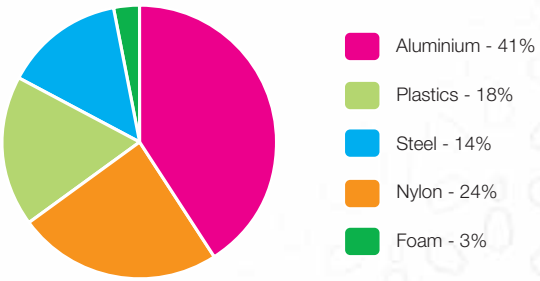
ARA Aluminium Chair - Key Materials by WEIGHT



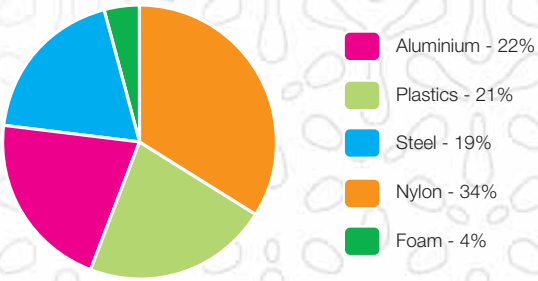

ARA Aluminium Chair - Key Materials by FOOTPRINT




ARA Plastic Chair - Key Materials by WEIGHT




ARA Plastic Chair - Key Materials by FOOTPRINT




Orangebox's Footprints were calculated by FIRA in partnership with Best Foot Forward who are recognised experts in this field and in 2005 won the Queens Award for sustainability. The technique of Ecological footprint analysis co-originated in the 1990's by Professor William Rees and Dr Mathis Wackernagel.

## Operational Overview

Established over 30 years ago in Hengoed South Wales our manufacturing facility has been one of the key factors in our continued success and growth in the UK. Employing over 200 people the factory has produced over 5 million chairs since it opened and produces on average 4000 units per week.

Continued investment and development of the facility, its people and processes has resulted in us receiving many industry accolades over the years.

The investment into our dedicated new Product Development facility, deploying the latest computer aided design and rapid prototyping techniques has further enhanced our abilities.

Despite the fact that we are in principle a manufacturing business our focus remains clearly upon service to our clients our products are clearly targeted to be smart simple and focused on bringing innovation to real market needs.

Therefore it goes without saying that we operate our business within recognised international standards for; Quality management, BS EN ISO 9001; 2000, BS EN ISO 14001; 1996 the Environmental Management system, and we have been accredited with the Investors in People Standard.

# Added Value Services

## Active Ergonomics

This is a specialist consultancy within Orangebox offering services and products to ensure improved health and productivity at work.

The effective application of ergonomics ensures a good fit between people and the tasks they do, the equipment they use and the environment in which they work. Our trained ergonomists and designers are available to offer specific assessment and training to support those staff and departments interested in improving the workplace and work practices affecting posture, activity and comfort.

## Suitable Seating Service

To find the best fit between any individual and their seating we provide an advice, assessment and supply service via telephone and a specifically designed seating-assessment form. We ensure individuals are provided with the seating types, features and adjustments they require.

## End User and 'Champion' Training

To get the greatest benefits from seating and workstations this equipment needs to be used and adjusted properly. Suitable and detailed training can therefore be produced for various targeted audiences.

For more information on any of our services or to speak to an ergonomist please contact Active Ergonomics - 01443 811 982

## Service Centre

All Orangebox Ltd products are covered by a comprehensive warranty. To underpin this warranty in the field we have a team of dedicated, trained and equipped service engineers who operate throughout the UK providing care an maintenance services for our products once installed at a clients location. Our task seating ranges are designed to facilitate their service and repair on site thus negating the need for the chair to be removed from site, unless absolutely necessary.

ARA

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