



A MORE  
COST-EFFICIENT  
WAY OF USING  
SUSTAINABLE  
MATERIALS  
OVER PCR

OFFERING  
A REDUCTION  
IN PLASTIC  
CONTENT

# SUPRA-SUSTAINABLE 'CLIMATE-SMART PLASTICS'

BROADWAY'S MARINE - BASED  
ENVIRONMENTAL SOLUTION FOR PLASTICS





# SUPRA-SUSTAINABLE

## BROADWAY'S MARINE - BASED ENVIRONMENTAL SOLUTION FOR PLASTICS

Broadway Colours range of Process+ performance masterbatches offer many benefits that extend way beyond simply adding colour.

**Supra-Sustainable** is one such example. This environmental material takes advantage of refined bio-renewable marine waste and is recyclable and compatible with all plastics processes and resins, including recycled materials.

Available as a stand-alone base material or as an additive, Supra-Sustainable can be combined with masterbatch to include colour or any other additives from our **Process+ Supra Range**.

The **Supra-Sustainable** bio-enhanced range meets new taxation laws regarding sustainable or recycled materials and do not affect the end products recyclability.

This environmental solution can be processed at lower temperatures and have shown to decrease cycle times, thereby saving energy during production substantially.

### WHAT ARE THE BENEFITS OF SUPRA-SUSTAINABLE?

- Provides a more cost-efficient way of using sustainable materials over PCR
- Less expensive, more readily available than PCR
- Significantly reduces processing cycle times, increasing output
- Processes at lower temperatures
- Saves energy during production
- Does not affect recyclability.
- Can be combined with colour masterbatch and other additives
- Falls within the new UK taxation laws regarding recycled content if required\*.
- Lowers CO2 footprint. Climate-Smart
- Free from allergens
- FDA Food Contact Approved

*\* Subject to future government advice*

### HOW IS SUPRA-SUSTAINABLE SUPPLIED?

Available in either masterbatch or rotational powder formulations, Supra-Sustainable can be supplied as a stand-alone additive or incorporated into a specific colour for a cost-effective environmental solution.





## WHY USE SUPRA-SUSTAINABLE?

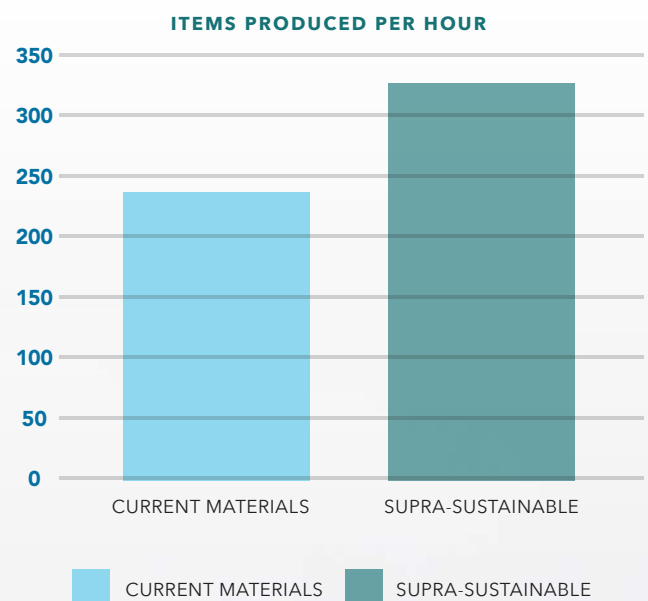
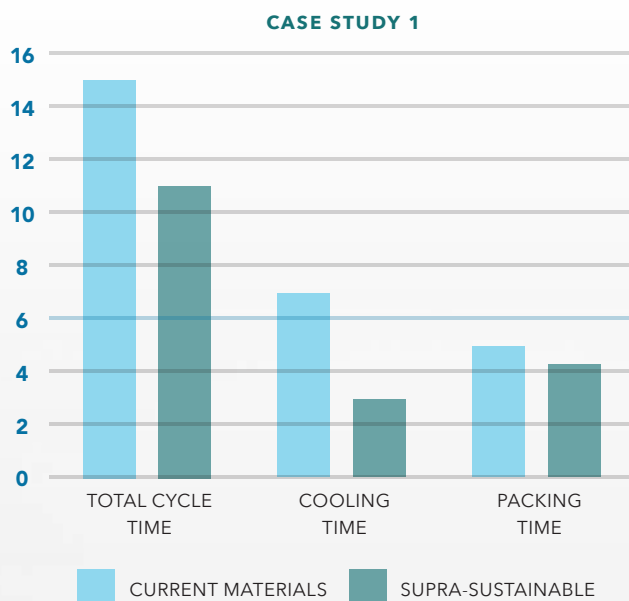
- When used it becomes a bio-based and bio-renewable substitute for oil-derived plastic.
- Supra-sustainable is a substitute for polyethylene (PE), Polyethylene Terephthalate (PET), polypropylene (PP) and polystyrene (PS) in packaging materials. We can add between 5% and up to 50% into conventional material, depending upon cross-section thickness.
- Supra-sustainable contains a bio-based material derived from a bio-renewable marine waste product.
- Supra-sustainable (SUS) provides approximately five times less Green House Gas (GHG) impact than PE, PET, PP and PS when used as a bio-based compound\*. This is because more than 75% of the product is based on the bio-marine waste and carbon capture in the bio-marine waste - based on an LCA (ISO 14040) provided by SGS for Supra-Sustainable in 2011. (\* 75 SUS/25 Resin compound)
- Additionally, the material is tested to contain 98 % so called modern carbon – C14 according to ASTM D6866 performed by BETA LAB in the United States.
- Supra-sustainable has no detriment on manufacturing parameters or performance.
- Supra-sustainable is significantly cheaper than fossil-fuel derived plastic raw materials.



## CASE STUDY 1 INJECTION MOULDING

- Injection moulding of a 4 impression threaded closure
- A standard 4 impression threaded cap mould using PPHP running on its normal cycle had 30% SCM 42887 supra sustainable additive added to it, to see what, if any changes in cycle time could be achieved.
- Single gate entry.
- Machine used was an Arburg all rounder 320c
- Standard cycle time and condition as below
- Total cycle time: 15.06 seconds, with 5 sec holding and 7 secs cooling.
- Cooling time was reduced in 0.25 second steps and the influence of the end moulding and obvious issues like stringing and dimensional stability were observed.
- A gate freeze off trial was also carried out, where the weight of the standard material was taken and the packing time taken down until any difference in weight was observed indicative of gate freezing.
- The cooling time was reduced from 7 to 3.5 seconds (50% reduction) and the packing time reduced from 5 seconds to 4.5 seconds.
- Giving an overall cycle time of 11.05 seconds. Saving a total of 4 seconds, which is a saving of approx. 36% in cycle time.

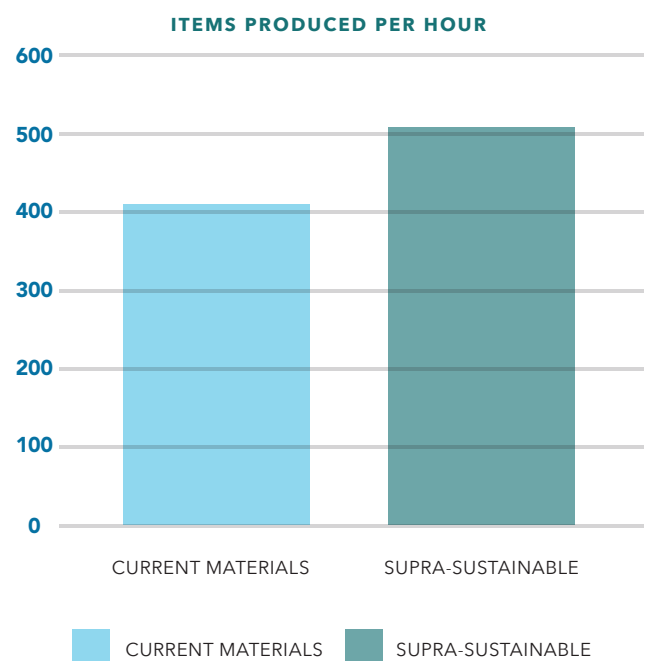
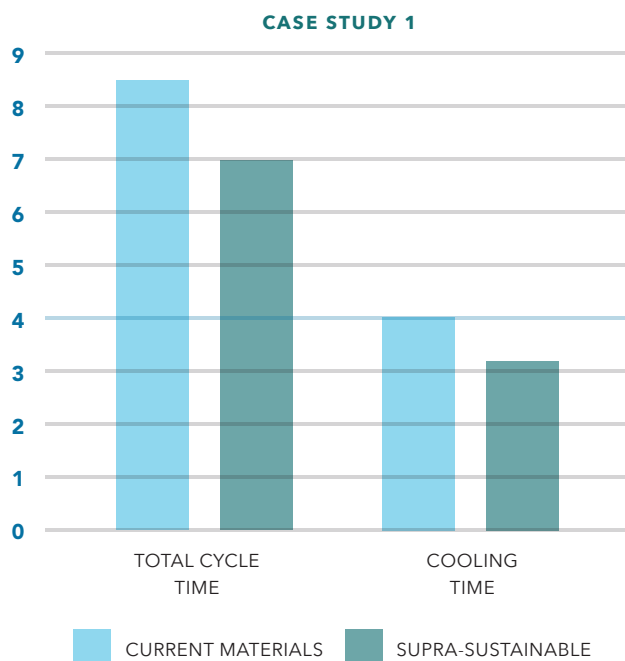
## CYCLE TIME REDUCTION INJECTION MOULDING



## CASE STUDY 2 **BLOW MOULDING**

- Broadway Colours Bio HDPE compounds SCM 41902 & SCM 41903
- Both compounds moulded identically, so they have been referred to as one for this report
- The melt temperature ran at approximately 1-15° C cooler than standard HDPE
- Upon moulding, the samples presented light grey in colour. with a slight powdery feel to touch with a rubbery flex when squeezed whilst warm
- Form and structure were consistent, with samples running cooler than standard HDPE allowing for a 1.5 sec reduction in cycle time with no adverse affect on the bottle
- A further reduction to a 3 sec cycle was made, this increased the punt depth by approximately 0.2 - 0.3mm, but did not appear to have had any detrimental affect on the neck or shoulder
- The material runs with a lower viscosity than standard HDPE, requiring a slight reduction in screw RPM and presented a reduced 'die swell'
- Samples also trialled in white, these have a dull grey/white appearance
- Overall cycle time reduction was 8.5 to 7.0 seconds
- Material quantity used approximately 20kg of each

## CYCLE TIME REDUCTION **BLOW MOULDING**



## CONCLUSION **POTENTIAL IMPROVEMENTS**







- Climate-Smart Plastics
- Improved CO2 Impact on Climate (in kg eqv.)
- Improved sustainability
- Fewer fossil fuels materials utilised
- Improved price stability
- Stable bio-renewable source
- Improved production performance
- Lowers the energy usage
- Less heat source - lower specific heat
- Improved productivity
- Higher yield
- Less cooling time
- Better thermal conductivity
- Less time on pigment exchange
- Self-cleaning for the tools, the moulds and dies
- Improved material flow and machine through-put
- Improved bubble stability - improved printability
- Fewer additives; Whitener (TiO2), Anti-lock, Anti-slip
- Non-food sourced materials
- Improved sealing properties
- FDA Food Contact Approved
- Fully recyclable



Our **Process+ Technology® Supra Range** can ensure your products are consistent and stand the test of time. We can tailor your masterbatch additive for exact manufacturing conditions, and for specific end use requirements. Generally colourless, these additives can sometimes affect the final colour due to their chemical composition.

incorporating our  
**PROCESS+ TECHNOLOGY** 

### OUR **SUPRA RANGE** INCLUDES:

-  **Supra-Guard** offers an antimicrobial solution to counter product surface bacteria
-  **Supra-Free** our range of mould release agents, which can also ease dispersion
-  **Supra-Static** disperse the static build up that can occur during manufacture, as well as preventing dust build up
-  **Supra-Solar** is our solution for UV protection in plastics
-  **Supra-Mark** is our range of laser marking additives
-  **Supra-Sure** is a detectable agent which provides security for your products, to prevent fraud and piracy.

To find out more about our **Supra-Sustainable** or any of our other **Process+ Supra Technology®** additives, email: [sales@broadwaycolours.com](mailto:sales@broadwaycolours.com) or call us on

**+44 (0)1986 875100**





**Broadway Colours** was established in 1997, specialising in the production of cost-effective, custom colour, polymer specific masterbatch to the cosmetics and personal care industry. In that time, we have grown to become a market leader to a broad and diverse range of brands across several market sectors.

Situated in the Suffolk countryside, our state-of-the-art facility occupies 90,000 sq.ft of space, fully equipped to confidently provide a fully customised and tailored service to meet the exact requirements of our customers.

With a combined experience of over 60 years, our in-house laboratory experts can provide the highest possible accuracy and consistency utilising the very latest pigments, along with market-leading innovative special effects and additives designed to add value to your products.

With the agility and flexibility to respond quickly and efficiently, we have established a strong and lasting reputation for providing a service focussed solely around customer needs.

Our rapid lead times offer fast responses to brands who require orders turned around in timescales to suit their requirements.

Production and colour matching orders can be satisfied in an average of three days, with some emergency orders satisfied within twenty-four hours.



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