



Metal
Packaging
Manufacturers
Association

All about metal packaging in the UK

I.M3



STARPACK

**Metal Packaging Manufacturing
& Design**

Properties of Metal

From the designers perspective metal has some really useful properties. It has both high strength and impressive ductility.

Which makes it bendable, stretchable & drawable

It can also be welded and/or mechanically joined

This means that metal packaging can either be made from a single piece or several pieces of metal



Metal Packaging: Tinplate & Aluminium



Tinplate welded
body containers

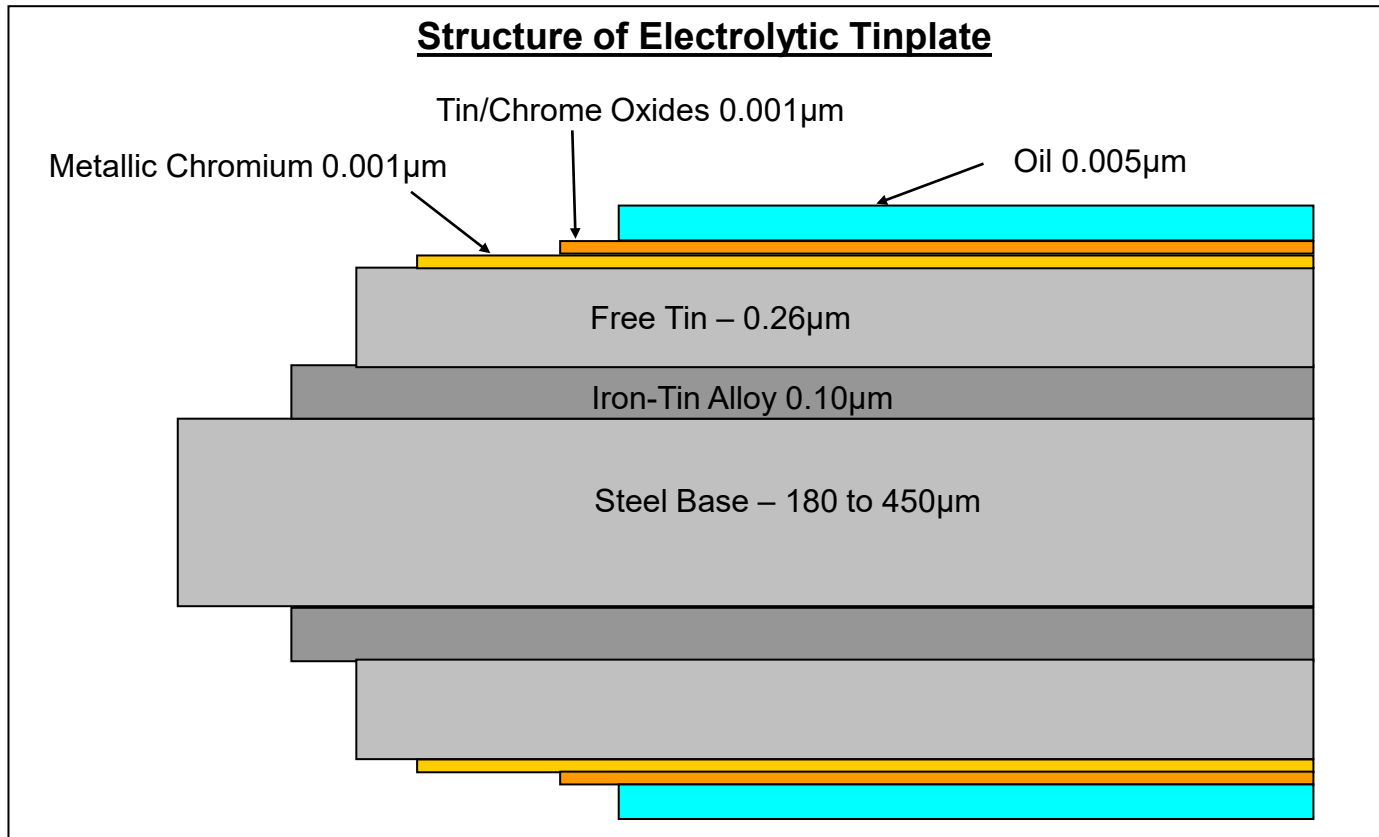


Aluminium drawn
body containers



Metal Packaging: Tinplate

Tinplate is a mild steel based multi-layer material



Key parameters are:

- Gauge
- Temper
- Surface finish
- Tin weight

All European tinplate is made in accordance with EN10202

Tinplate – Incoming Raw Materials - Coil

Coil width, gauge and other characteristics matched to specific body or component specification

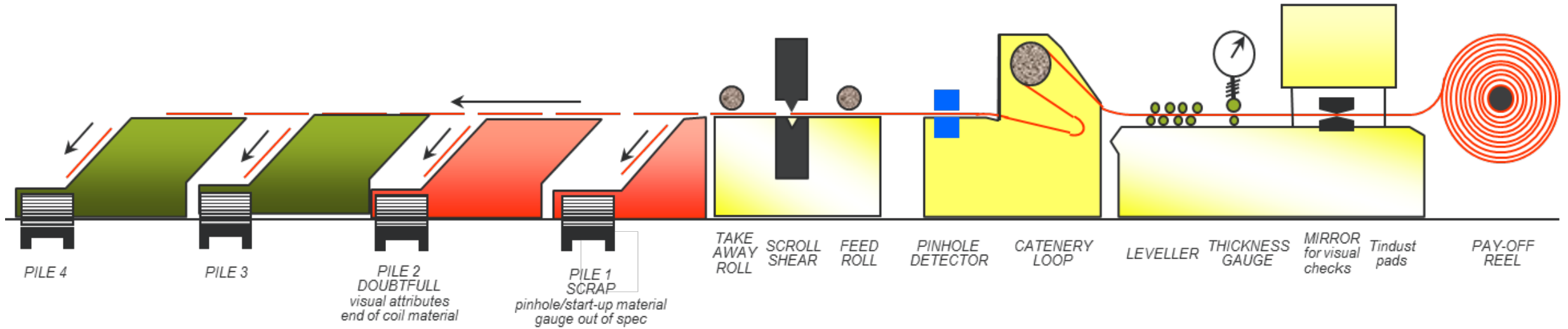


tinplate coil

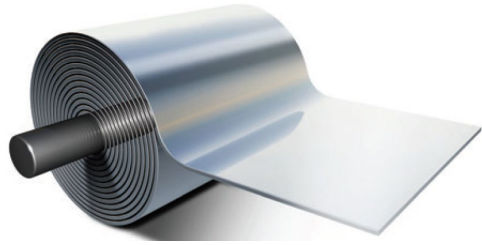


- Typically 8 - 10 tonnes
- 4,000 – 10,000 metres

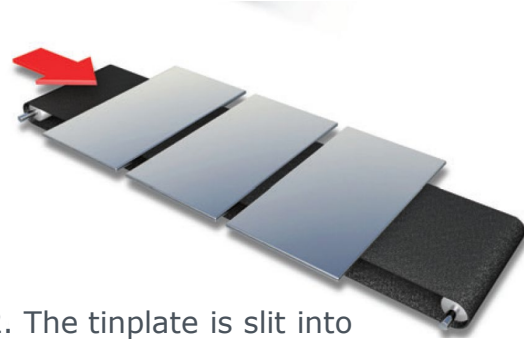
Typical Coil Cutting Line



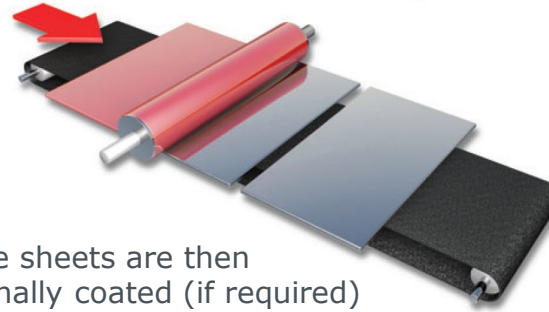
3-Piece Cans – Sheet preparation



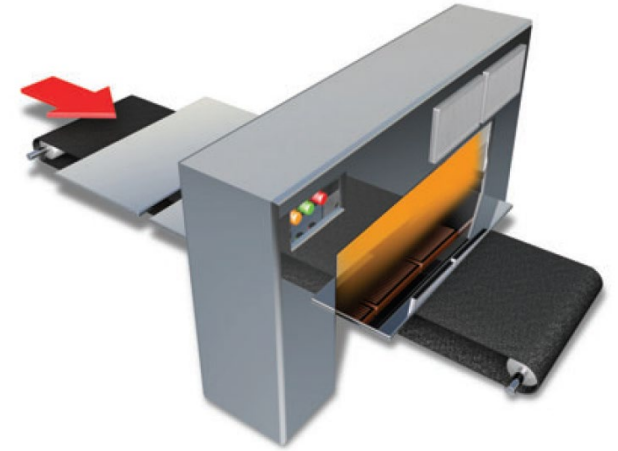
1. Tinplate coils arrive at the can plant



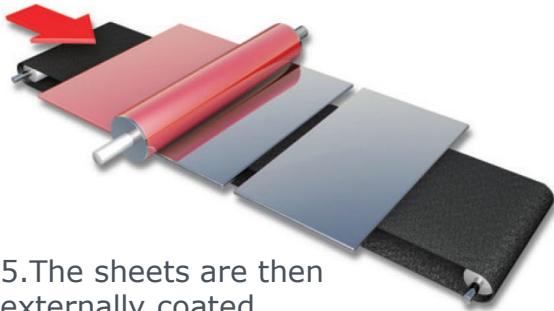
2. The tinplate is slit into large sheets



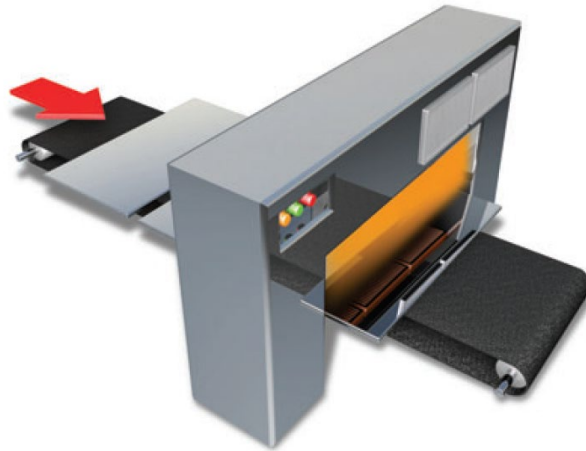
3. The sheets are then internally coated (if required)



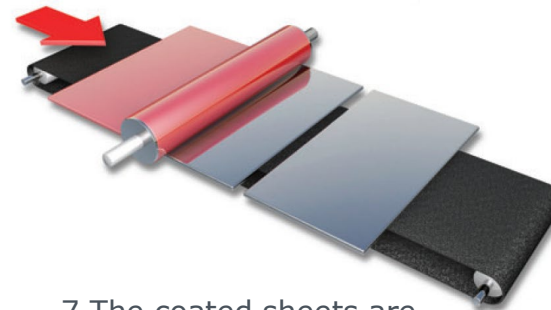
4. The coated sheet is then cured in a large oven



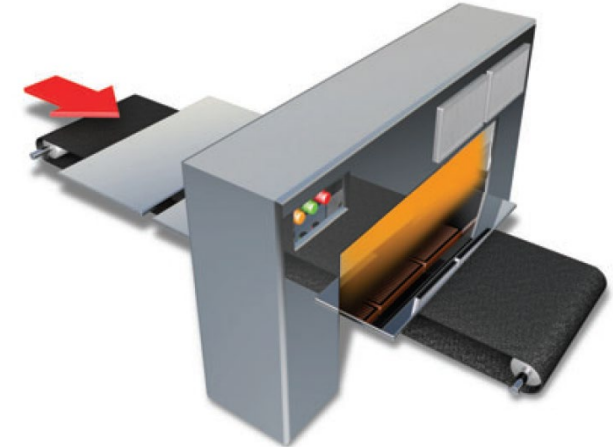
5. The sheets are then externally coated



6. The coated sheet is then cured in a large oven

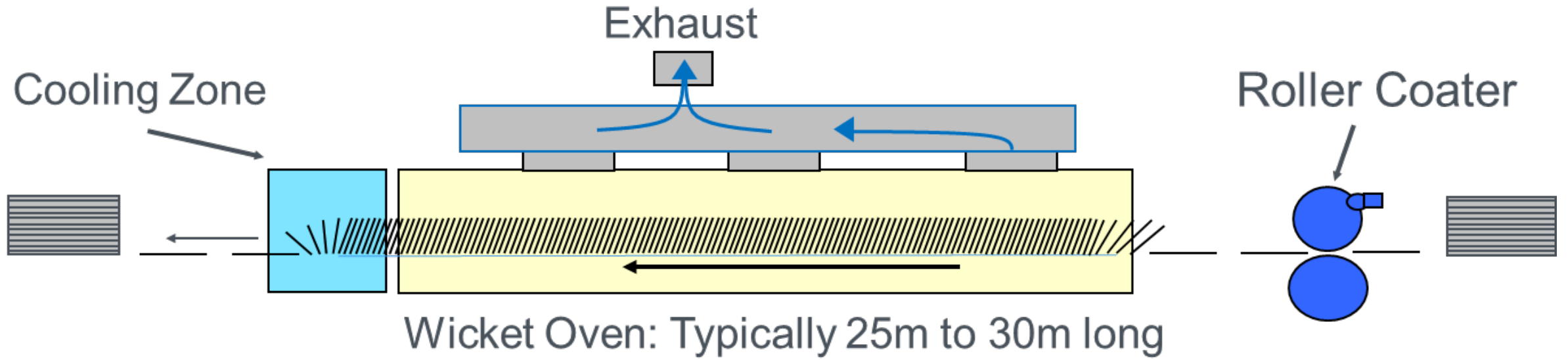


7. The coated sheets are then externally decorated

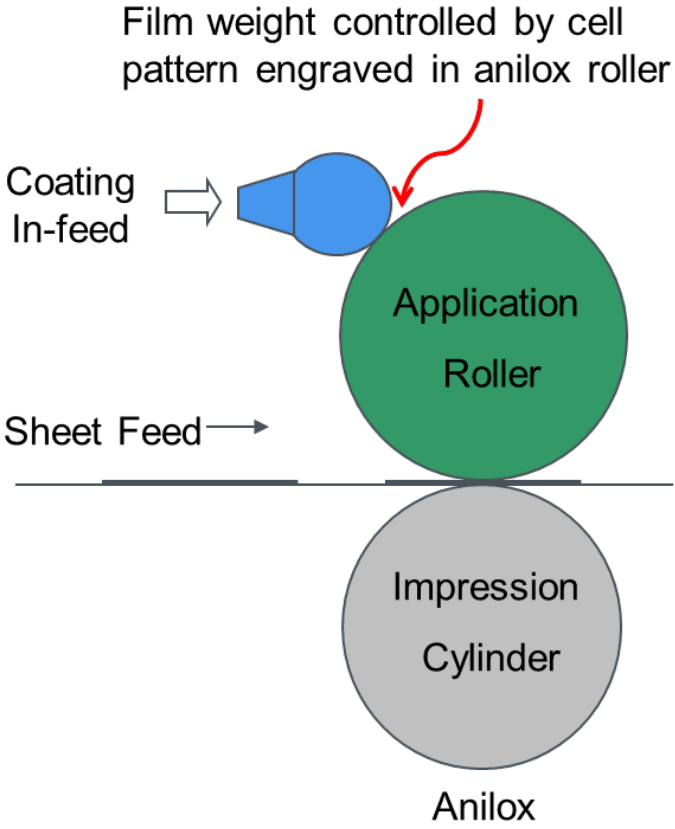


8. The decorated sheets are then cured either in a large oven or a UV Drier

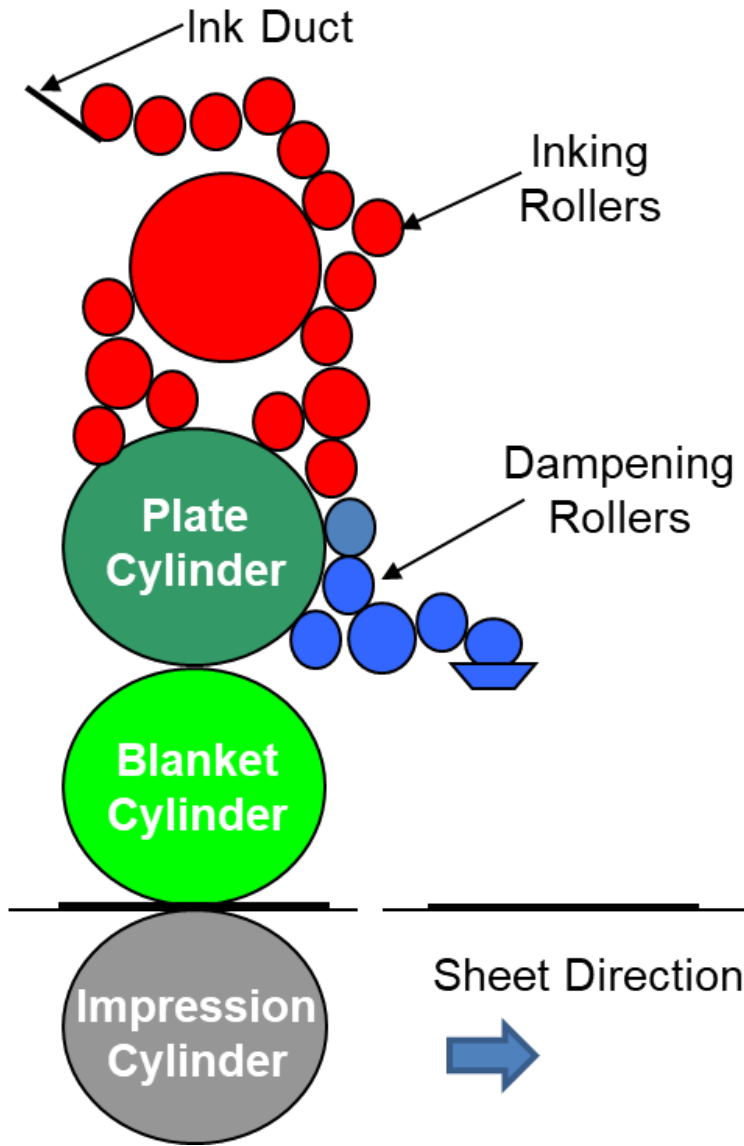
Typical Coating Line



Metal Packaging: 3-Piece Tinplate External Decoration



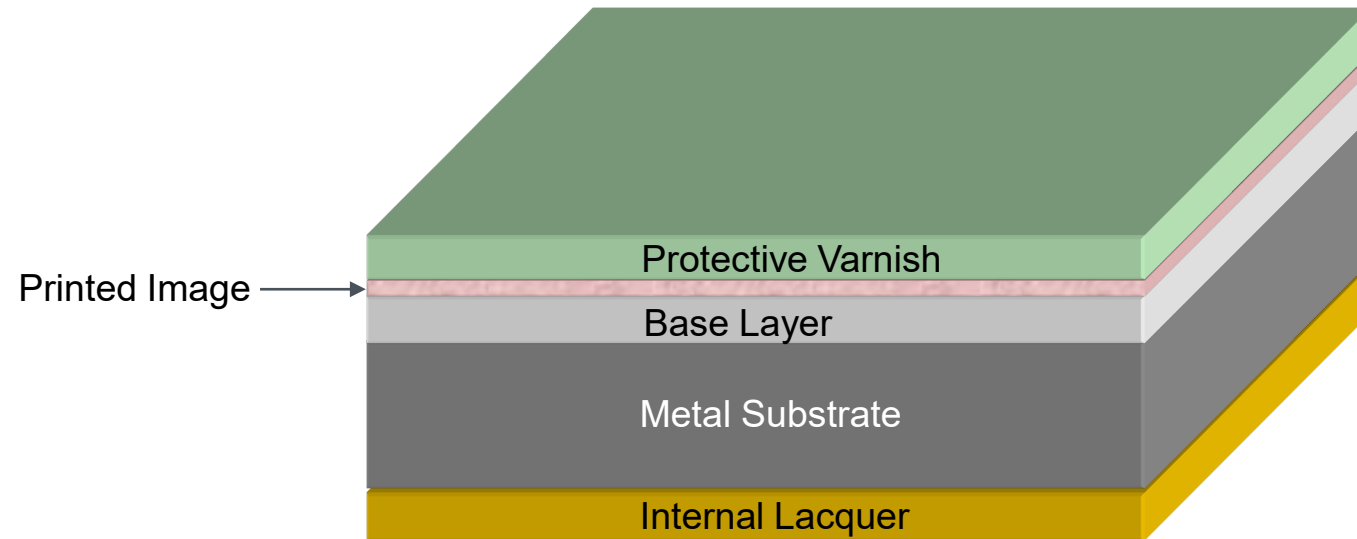
Internal and external basecoat and over-varnish typically applied using an anilox system



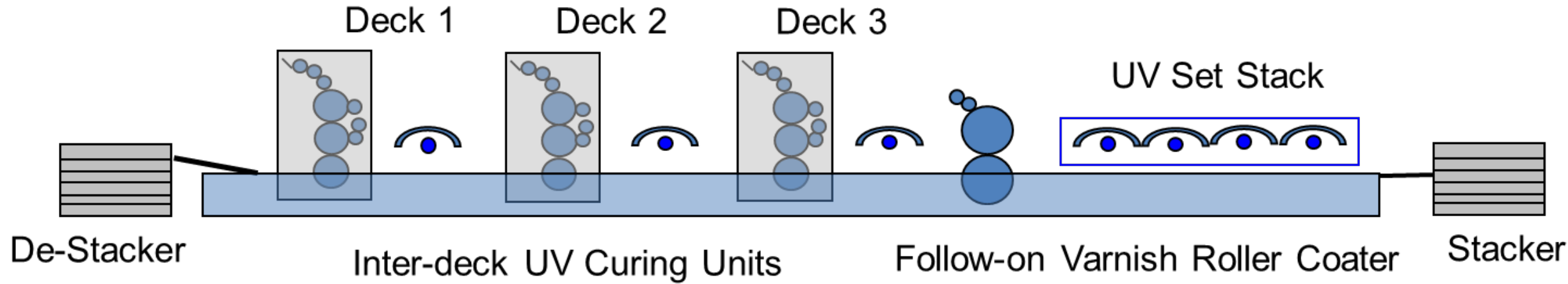
For 3-piece cans printing is almost exclusively via offset lithography

Structure of Decorated Tinplate

- Printed image applied onto a receptive “basecoat”
- Basecoats can be clear, white or customised
- Printed image is applied one colour at a time onto the pre-coated metal
- After printing is complete, the image is varnished which both protects it and enhances its appearance



Metal Packaging: 3-Piece Tinplate Printing



Metal Packaging: Half tone printing

These are the basic colours used by most printers to create picture images (CMYK)



Full Colour with Black Key



Cyan



Magenta



Yellow



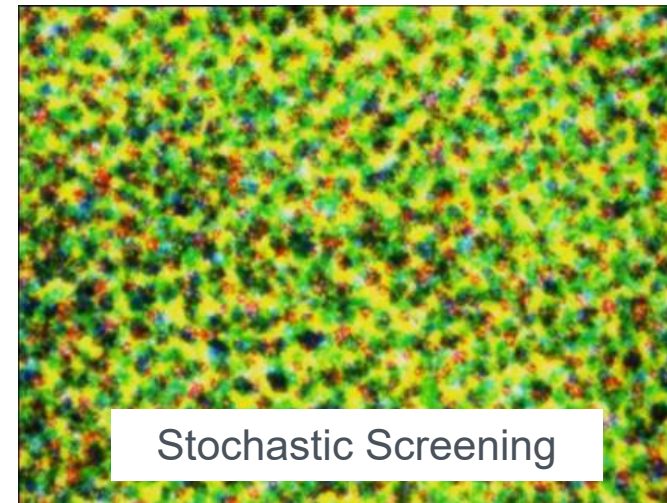
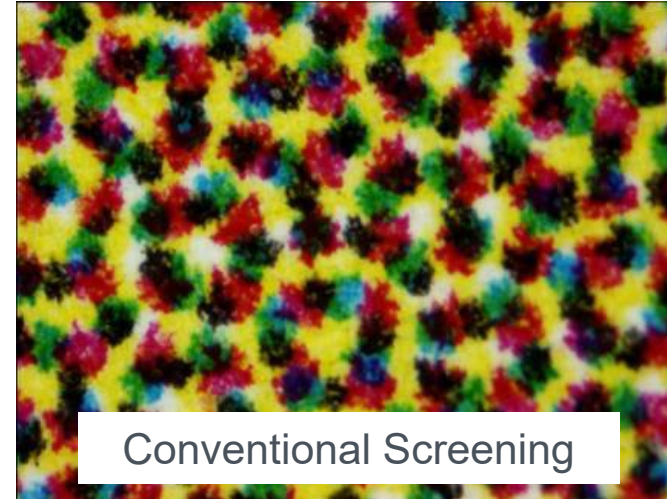
Black

Metal Packaging: Conventional & Stochastic Screening

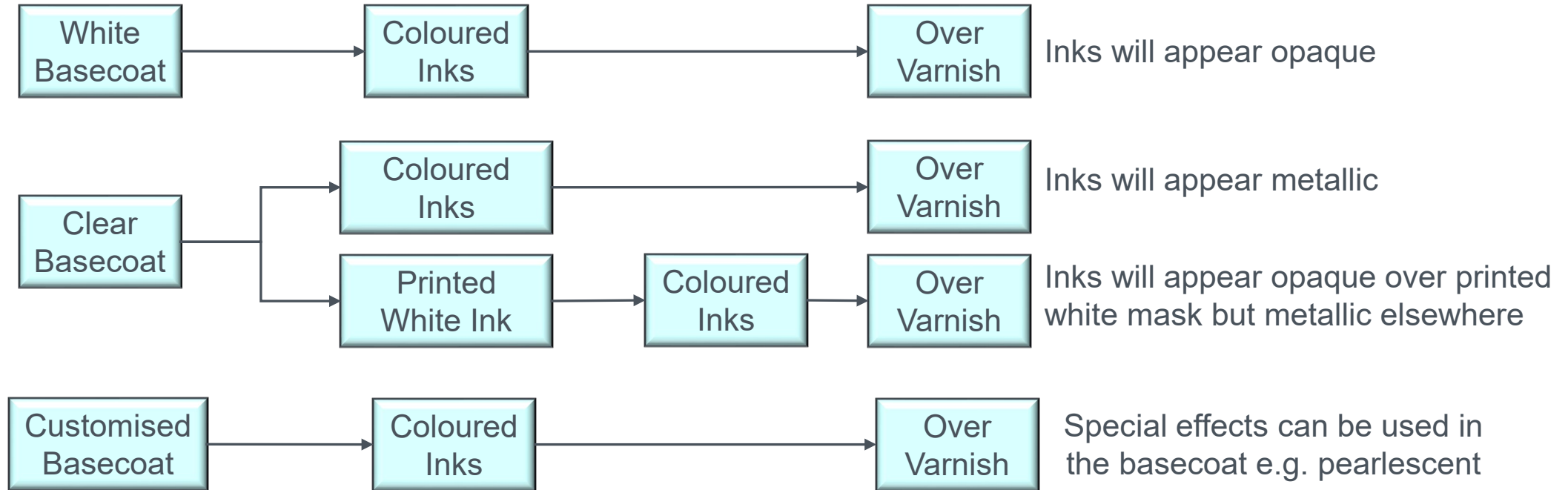
- Superb high-resolution print
- Photographic quality
- Excellent vignette capability



Fine Tone Work & Photographic Quality



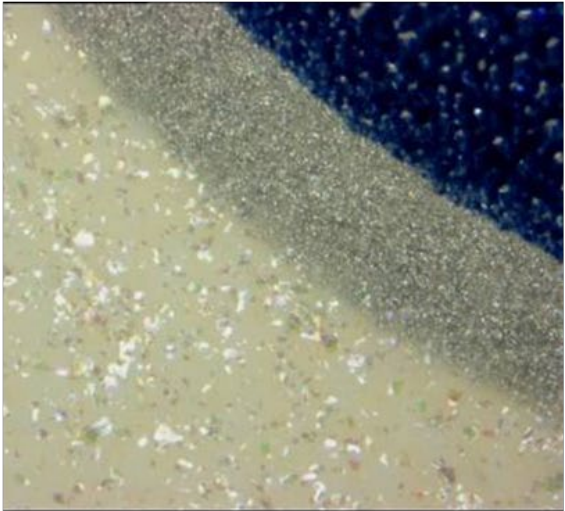
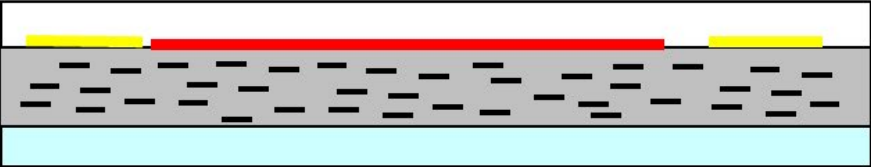
Metal Packaging: 3-Piece Tinplate External Decoration



- Basecoats - applied and cured using the same equipment as internal coatings
- Printing inks - thermally or UV cured depending upon the equipment type
- Over varnishes – applied similarly to internal coating and either thermally or UV cured

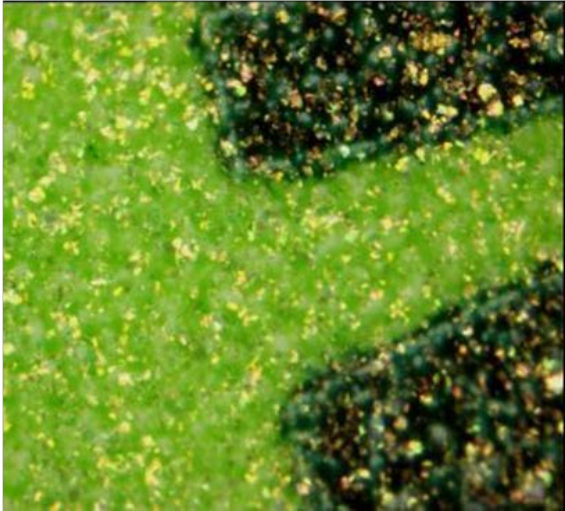
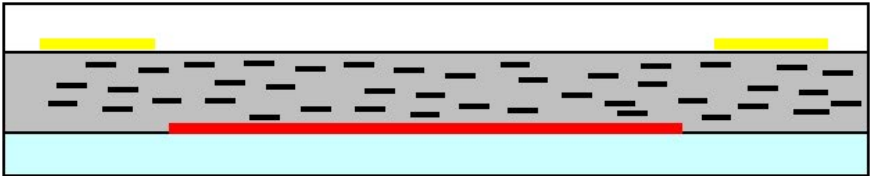
Metal Packaging: Pearlescent and Interference Pigments

Effect in Base Coat – only background colour modified



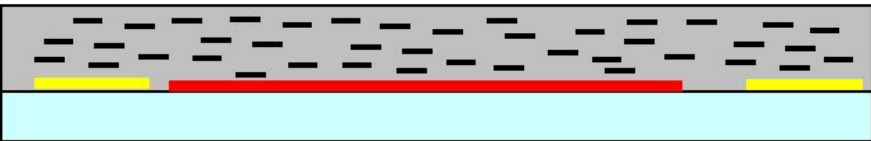
Example of effect in base layer

Effect in Intermediate-Varnish – only some ink colours modified



Example of effect in over varnish

Effect in Over-Varnish – all ink colours modified

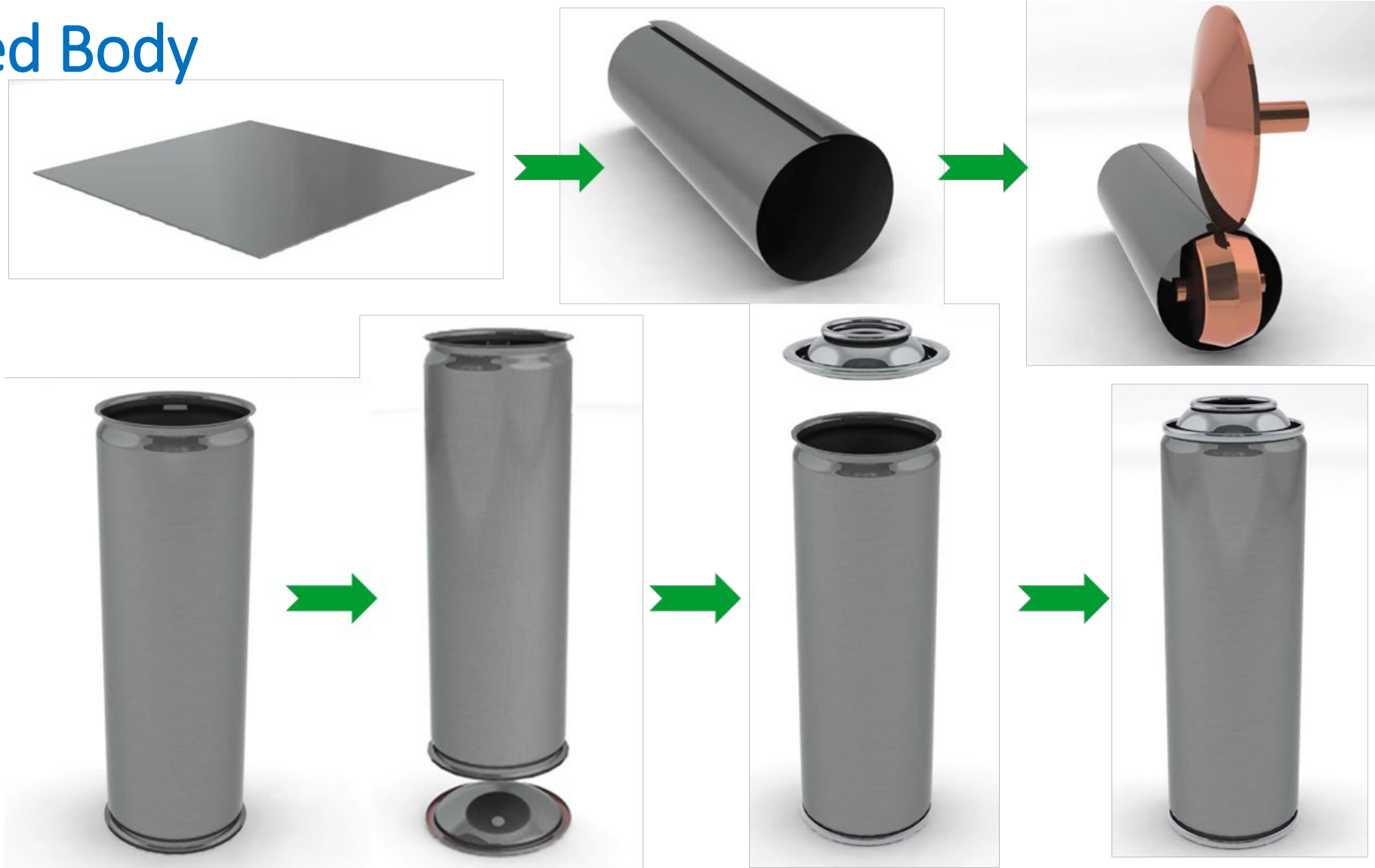


Metal Packaging: Internal Printing

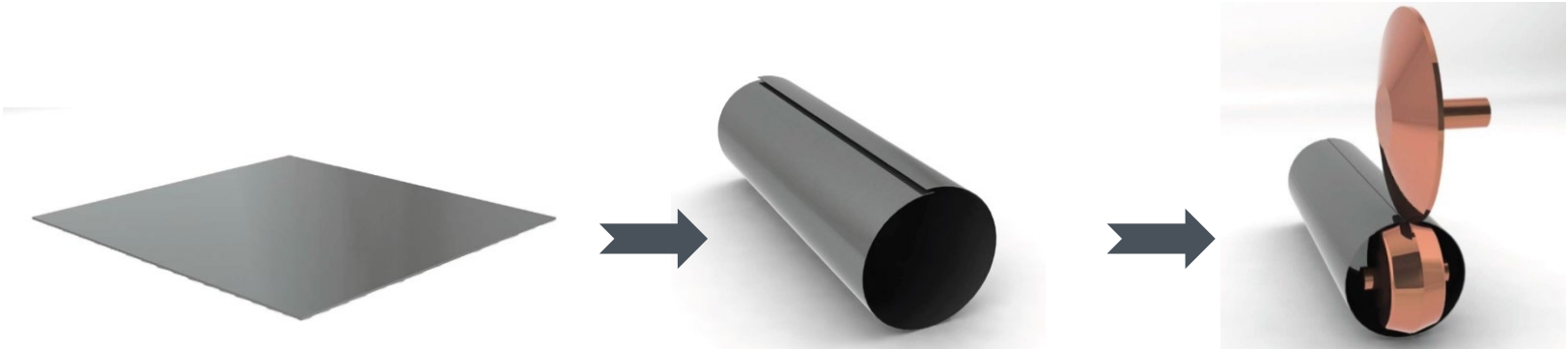
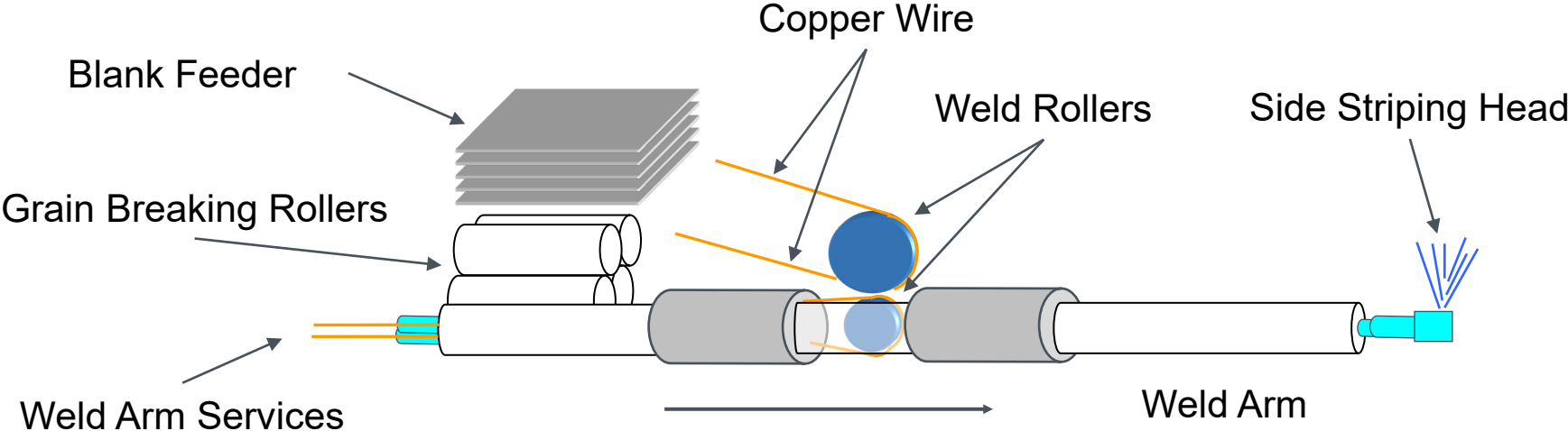


Metal Packaging: Standard Tinplate 3-Piece Containers

Welded Body

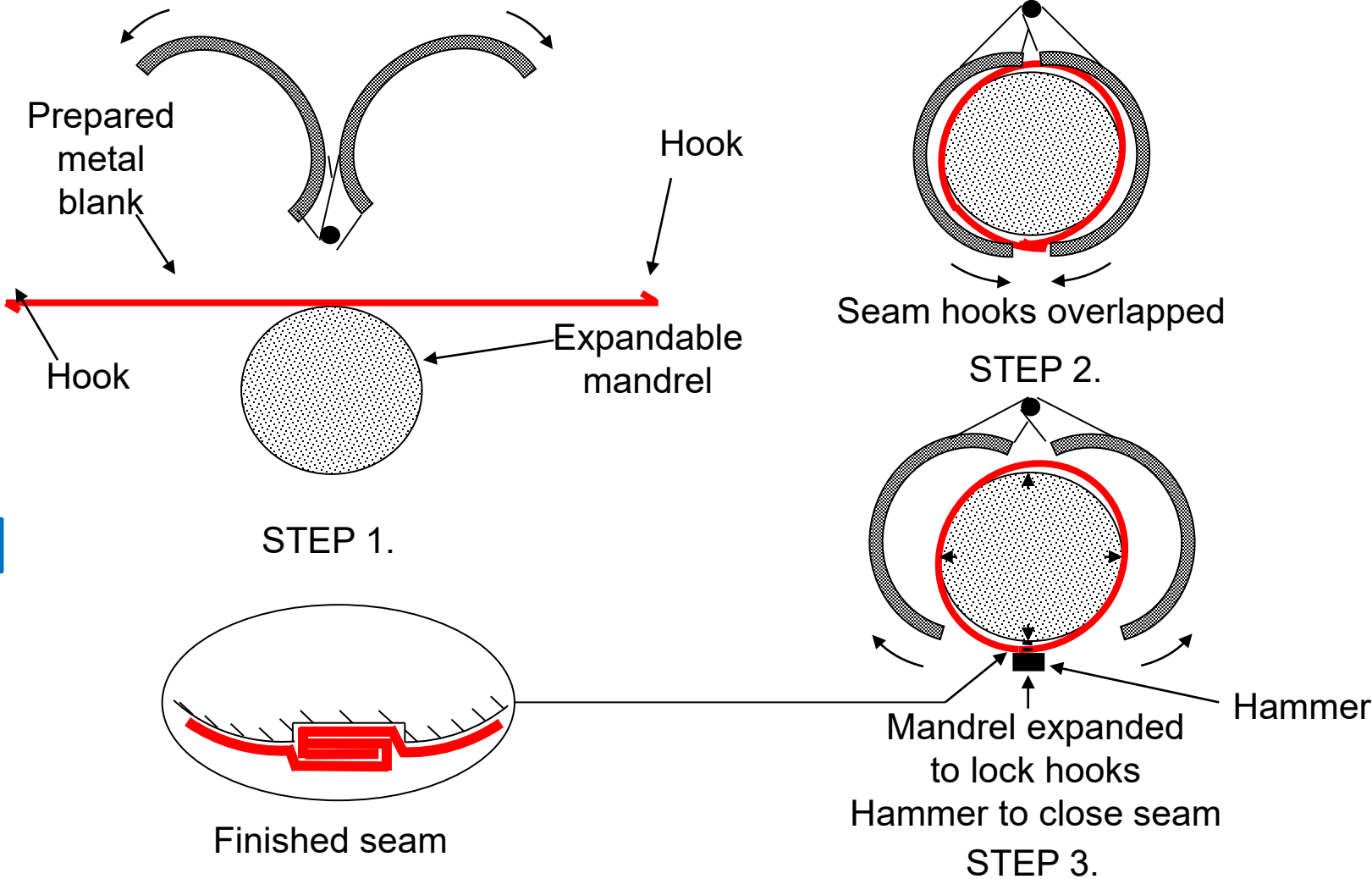


Schematic of the Weld Arm



Metal Packaging: Standard Tinplate 3-Piece Containers

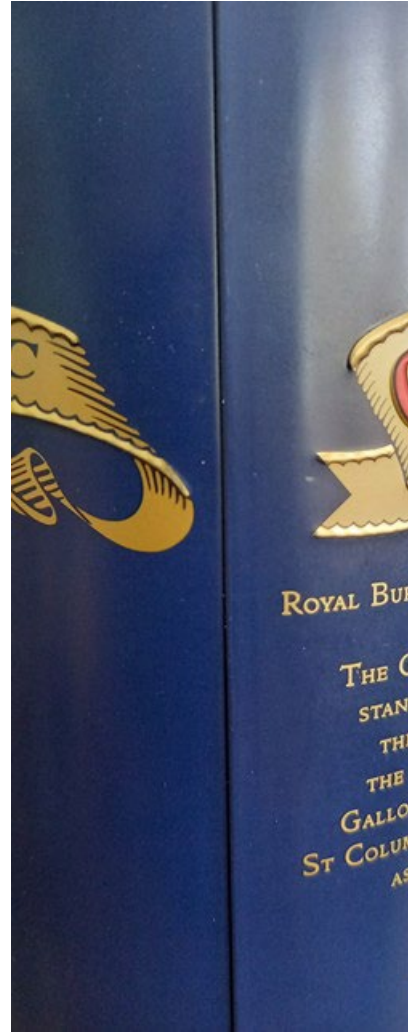
Mechanical Lock Seam



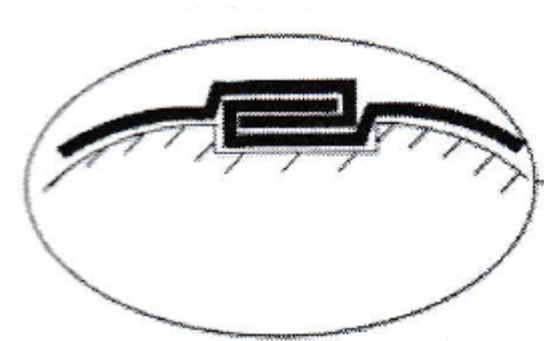
Metal Packaging: 3-Piece Joining – Body Blank



Welded Seam



Mechanical Lock Seam

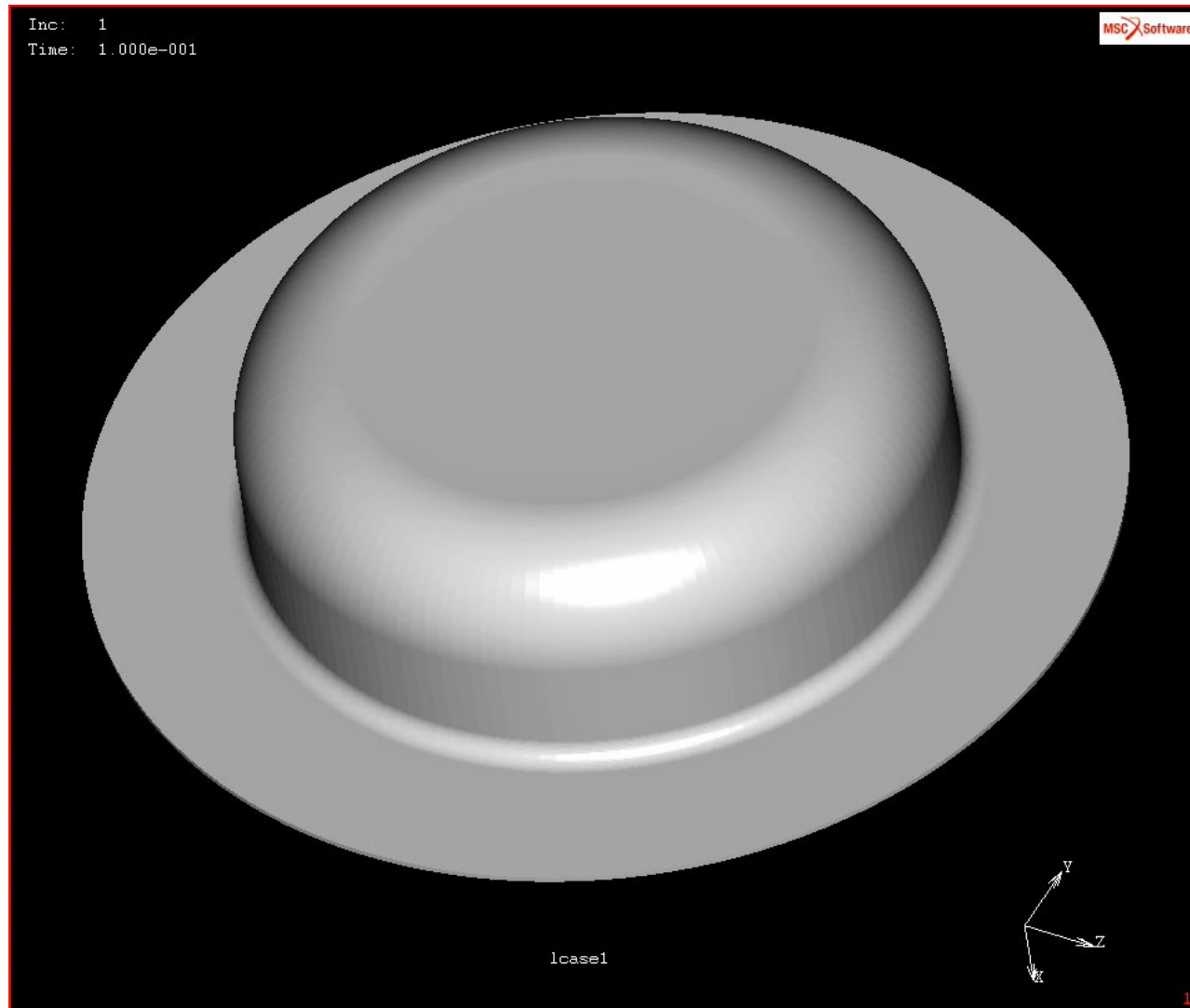


Cross section of
mechanical lock
seam

Metal Packaging: 3-Piece Joining – Fitting End Components

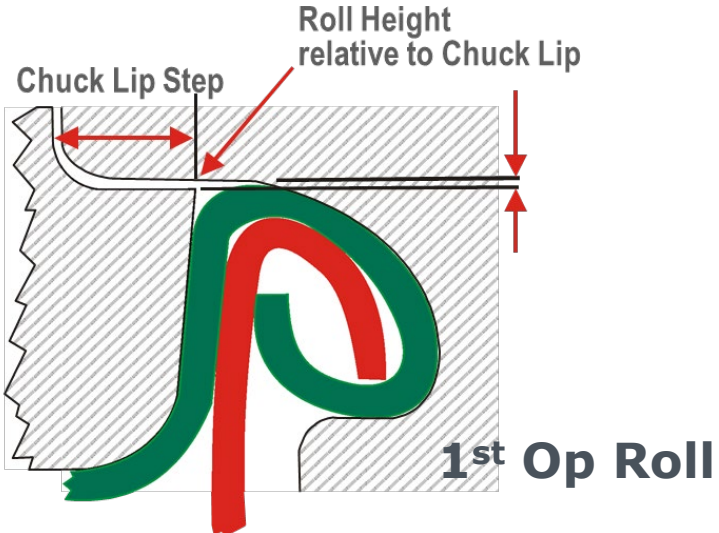
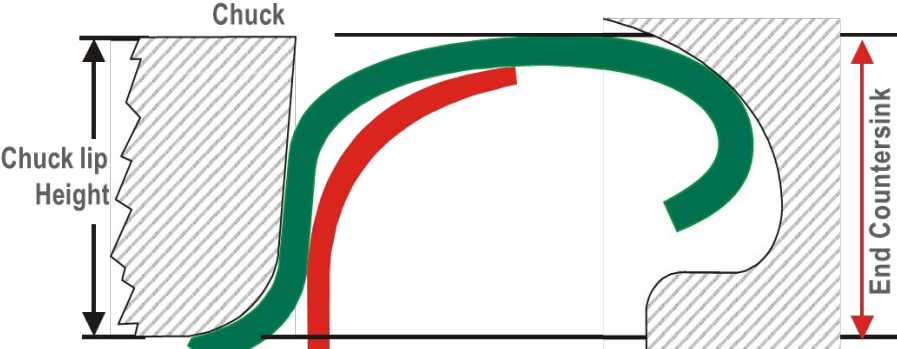


8 Stage Progression Tooling

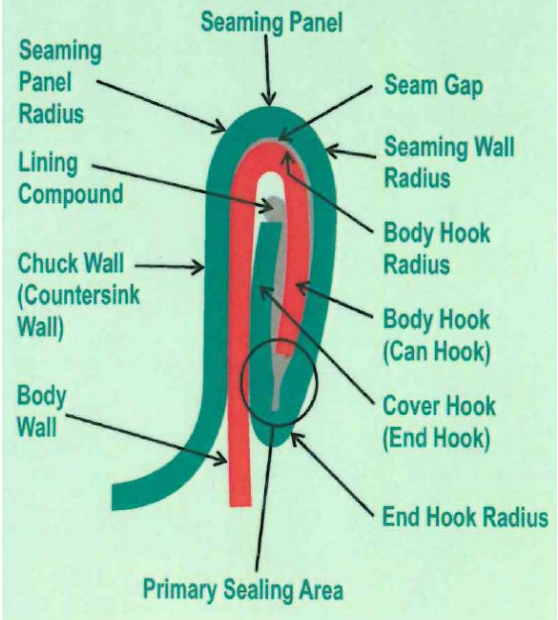
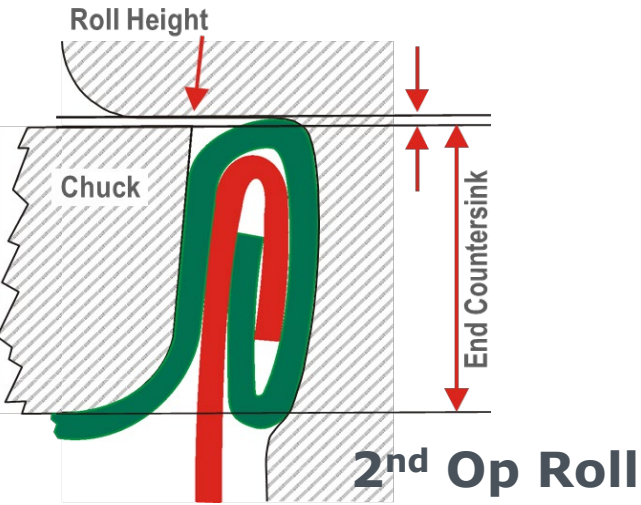
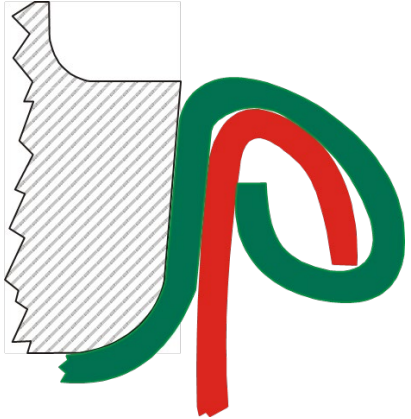


Metal Packaging: 3-Piece Joining – Components to Body

First Operation



Second Operation



Metal Packaging: 3-Piece Joining – Components to Body



Standard Double Seam



Necked-In Double Seam

Metal Packaging: 3-Piece Non-round Geometries



Metal Packaging: 3-Piece Non-round Geometries



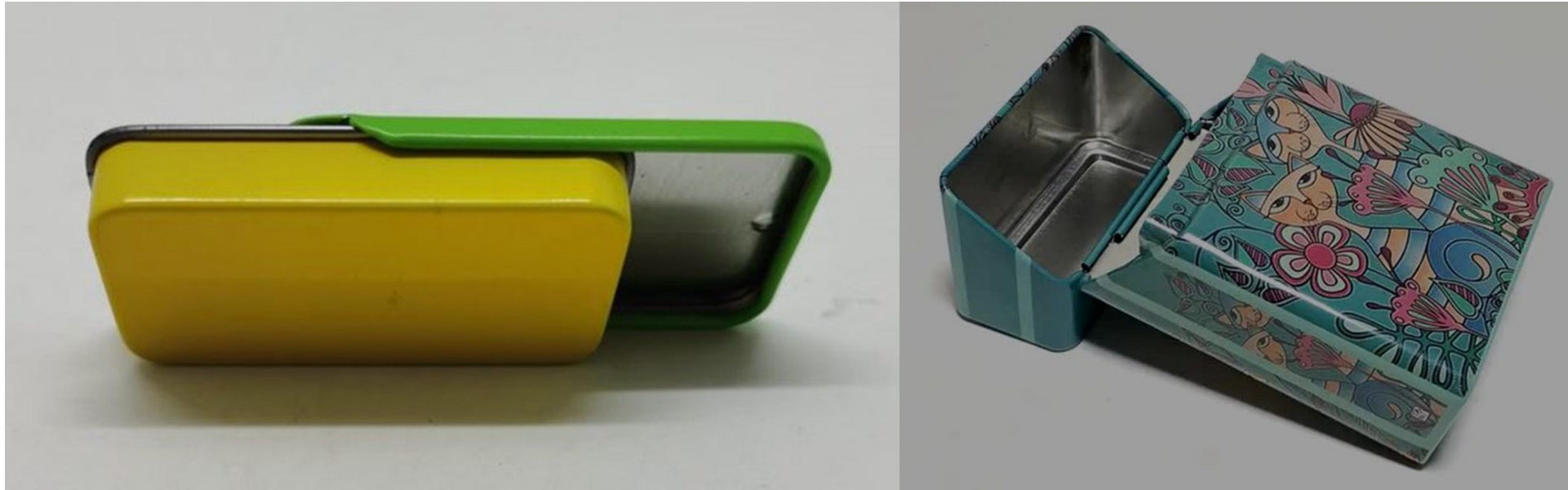
Metal Packaging: 3-Piece Lids & Opening



Metal Packaging: 3-Piece Lids & Opening



Metal Packaging: Other Lids & Opening



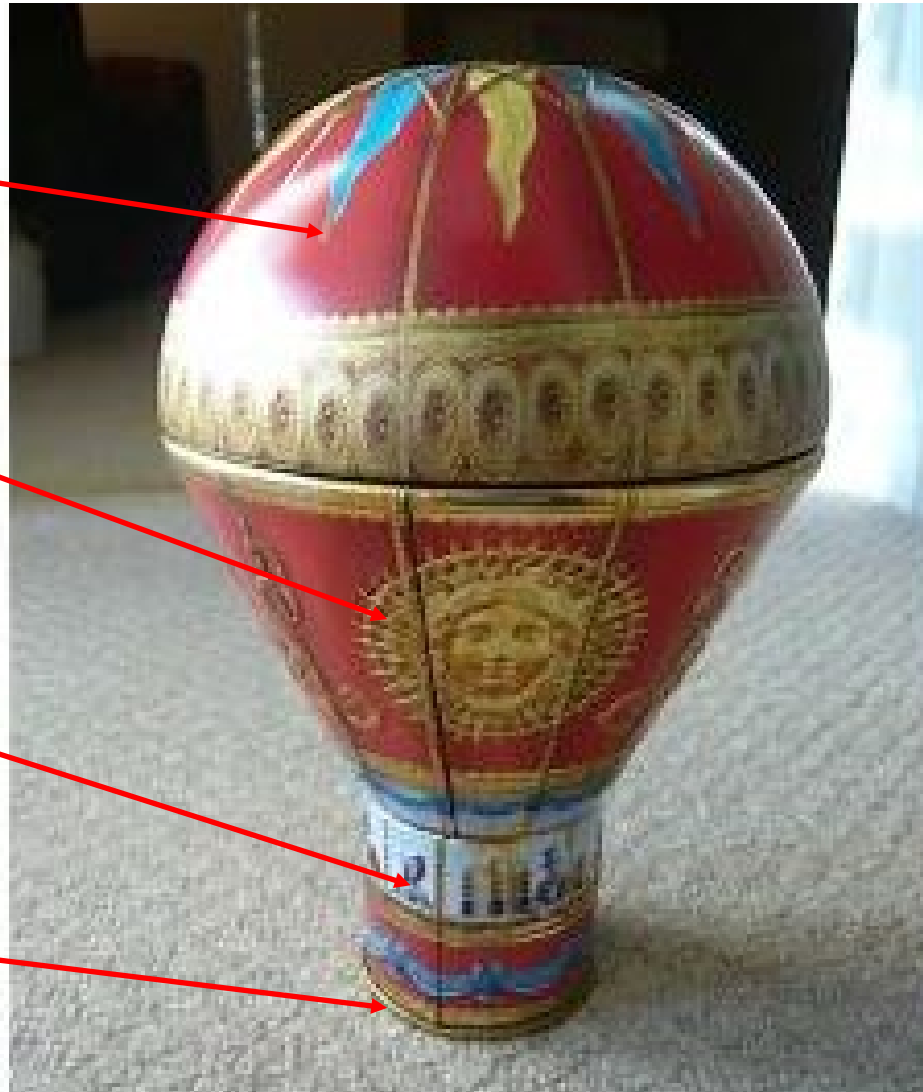
Metal Packaging: “3-Piece” Combination of Fabrication Techniques

Drawn single piece dome

*Stretched & embossed,
mechanical lock seam cone*

*Embossed mechanical lock
seam cylinder*

*Double seamed base
component*

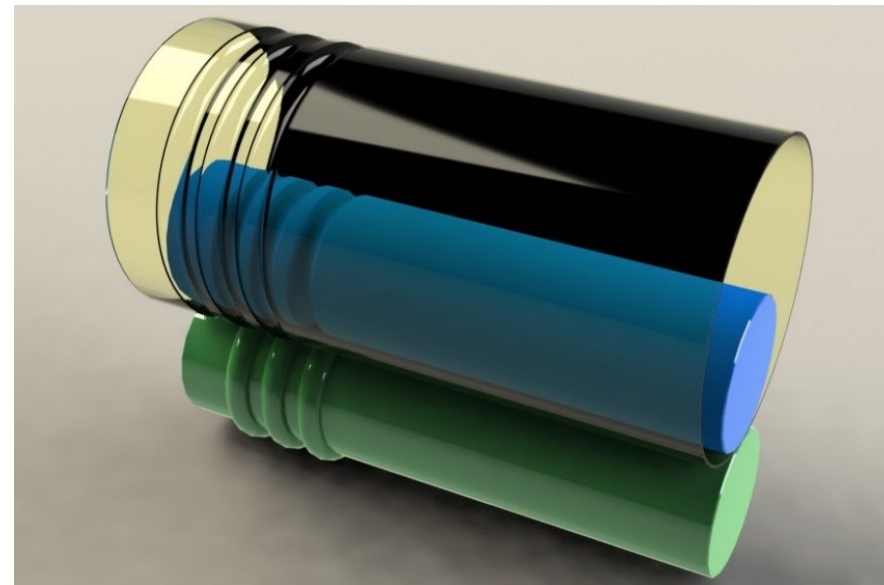
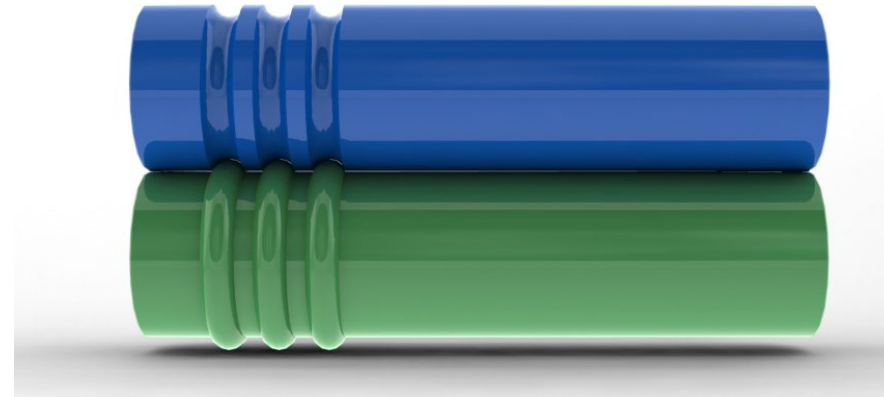


Metal Packaging: 3-Piece Other Features - Beading



Metal Packaging: 3-Piece Other Features - Beading

- Mechanical “in-line” process conducted at welded cylinder stage
- Rotary action
- Creates symmetric circumferential shapes
- Both ergonomic & aesthetic shapes possible
- Large range of “beads” possible
- Doesn’t interfere with the containers transit capability through can manufacture

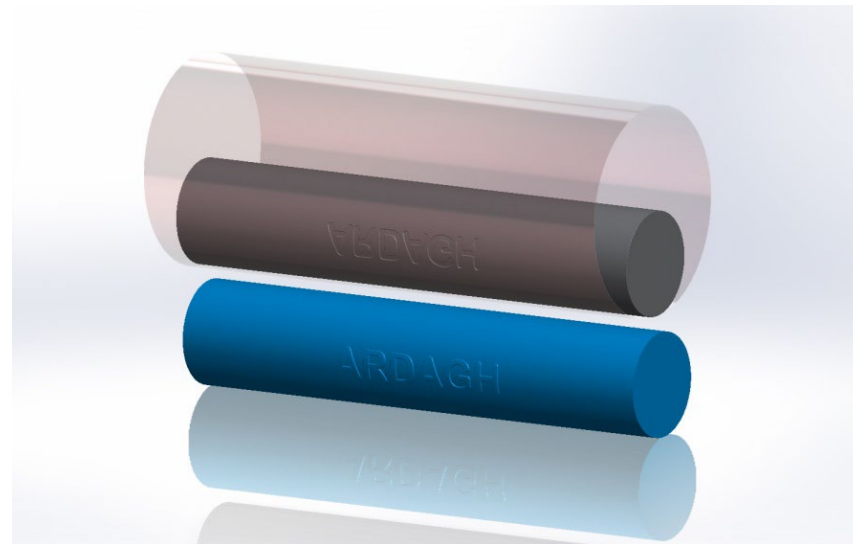
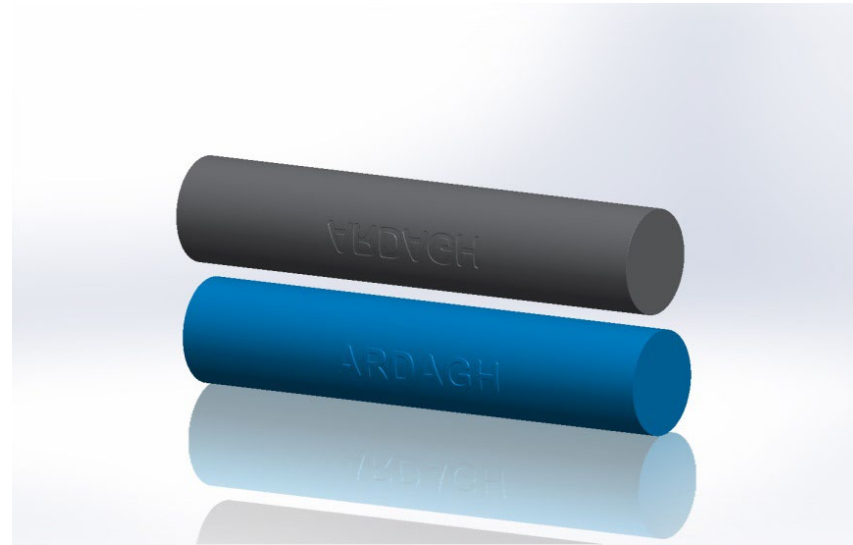
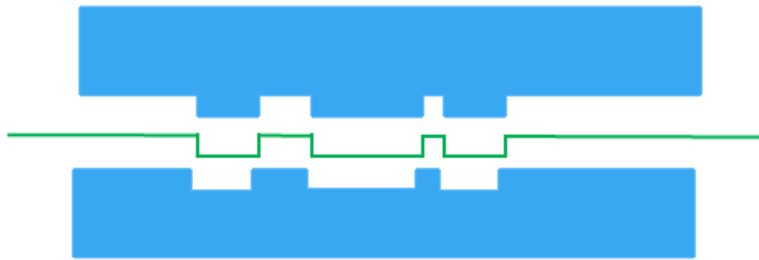


Metal Packaging: 3-Piece Other Features – Embossing/Debossing



Metal Packaging: 3-Piece Other Features – Embossing/Debossing

- Two types of embossing /debossing – rotary and standard/ linear
- Metal forming registered to graphics for maximum visual impact
- Logo embossing & tactile warning
- Brand identification features



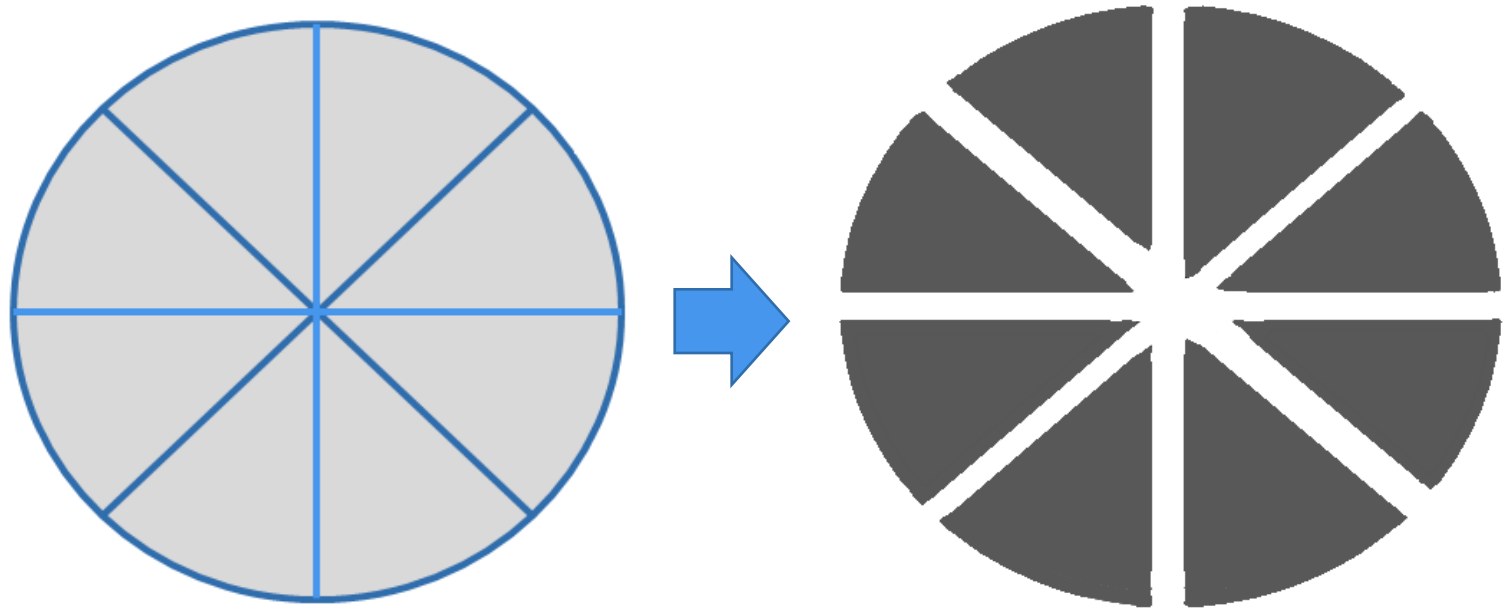
Metal Packaging: 3-Piece Other Features – Texturing



Metal Packaging: 3-Piece Other Features – Mechanical Expansion



Metal Packaging: 3-Piece Other Features – Mechanical Expansion



“Tram Lines” showing tooling segment separation

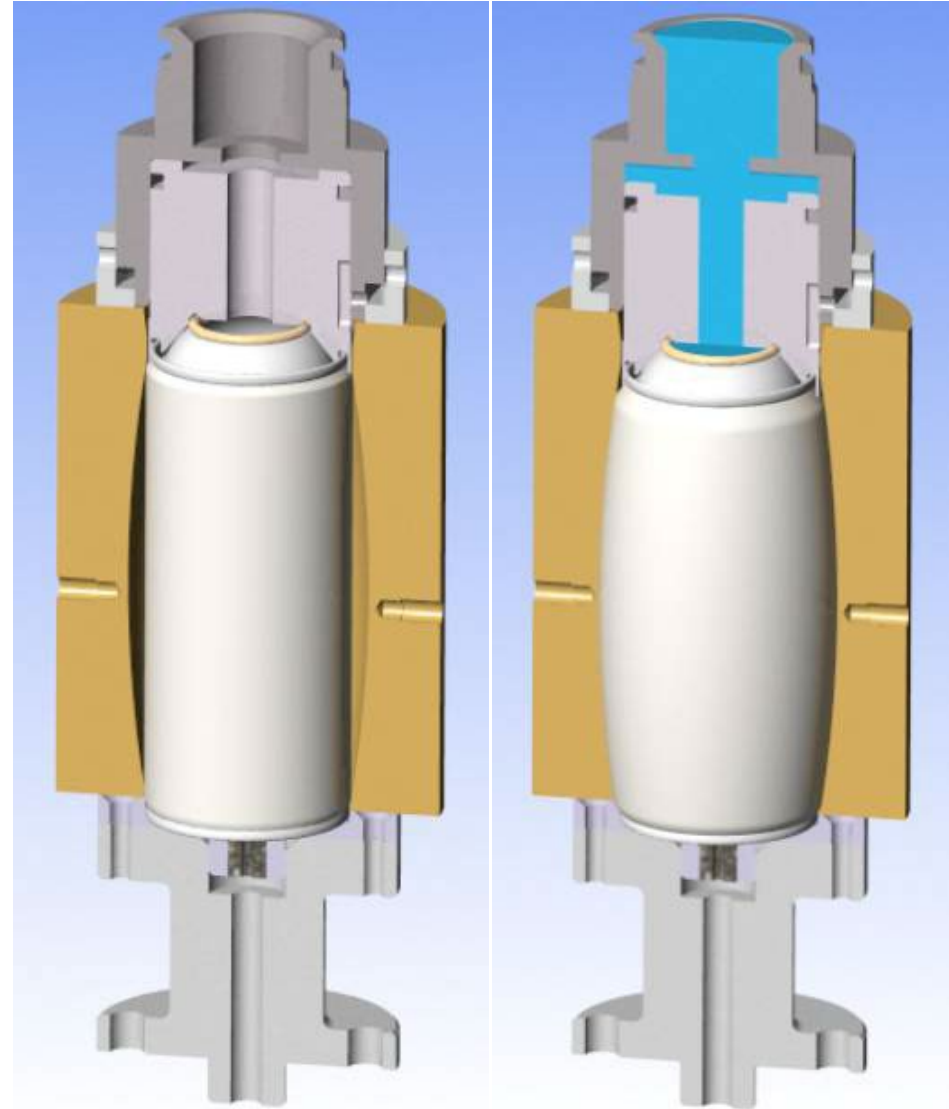


Metal Packaging: 3-Piece Other Features – Blow Forming



Metal Packaging: 3-Piece Other Features – Blow Forming

- High Pressure Blow Forming
- Full length of side wall can be shaped
- Up to 30% expansion possible
- Asymmetrical & eye-catching shapes possible
- Body shaping together with “de-bossing” possible
- Creates a high level of shelf appeal and visual impact
- Increases Volume - Assists with light weighting



Metal Packaging: 3-Piece Other Features - Windows



Metal Packaging: 3-Piece Other Features – Perforations



Metal Packaging: 3-Piece – Cut Edges



How to significantly increase your chances of winning the 2024 MPMA metals brief

Brief C: Metal Pack for a Luxury Fragrance

Sponsored by MPMA

Introduction

Fragrances date back to the Egyptian times when the earliest perfumes were made. Today, the total sales value of fragrances in Great Britain (at December 2021) was almost £1.7 billion, and the global fragrance market is expected to reach a value of around £53 billion in 2023.

Visual appeal in terms of both the primary and secondary packaging are very important to purchasers, and many packs are kept long after consumption of the contents for alternative uses, or just because they are stunning pieces in their own right.

The Brief

To design and develop a luxury promotional metal pack to hold a 100ml bottle of perfume, aftershave or cologne.

Students should create a fictitious brand reflecting the quality retail gift sector. The pack should be developed for sale at 'luxury' retail outlets spanning duty free areas at airports; high-end, high-street stores; and specialist fragrance stores.

Students will need to develop the name and branding, but the key focus must be on the secondary metal pack. The pack should showcase what can be achieved with metal, have real shelf appeal and also look just as good on the dressing table or shelf at home.

Points to consider:

The great possibilities in metal:

Shaping

High quality graphics

Textures

Embossing, debossing, micro embossing

Perforations

Print finishes

Variety of opening and closing options

Creative branding to enhance shelf impact and consumer appeal and add value to the brand.

Materials to be used:

These types of packs are usually made of tinfoil.

Entrants do not need to specify the thickness of the metal.

Materials other than metal should not be used in the main pack design.

Help:

Visit www.mpma.org.uk for guidance and helpful videos.

For inspiration (including bottle samples) see:

<https://uk.pinterest.com/metalpackuk/>

Email: debbie@mpma.org.uk

Prize:

£600 to the winning designer. Runner up awards will be awarded at the judge's discretion.

Metal Packaging: 3-Piece Manufacturing

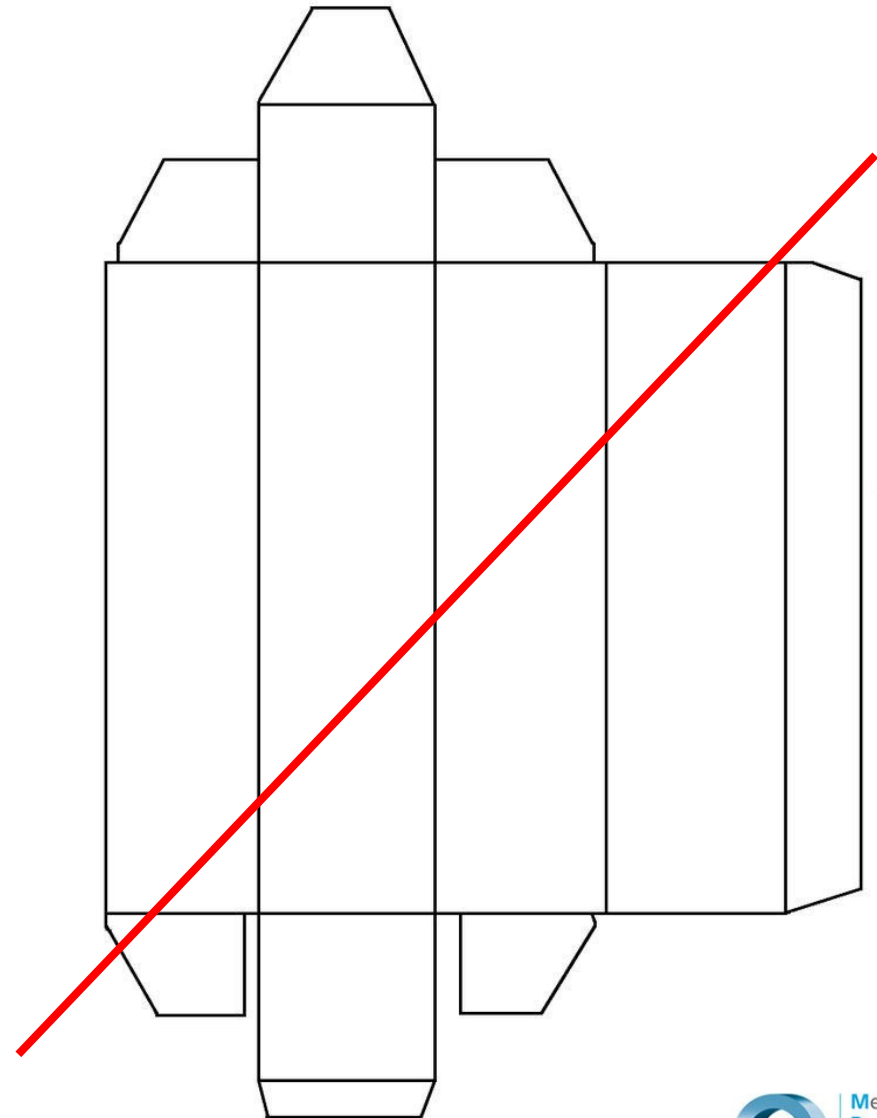
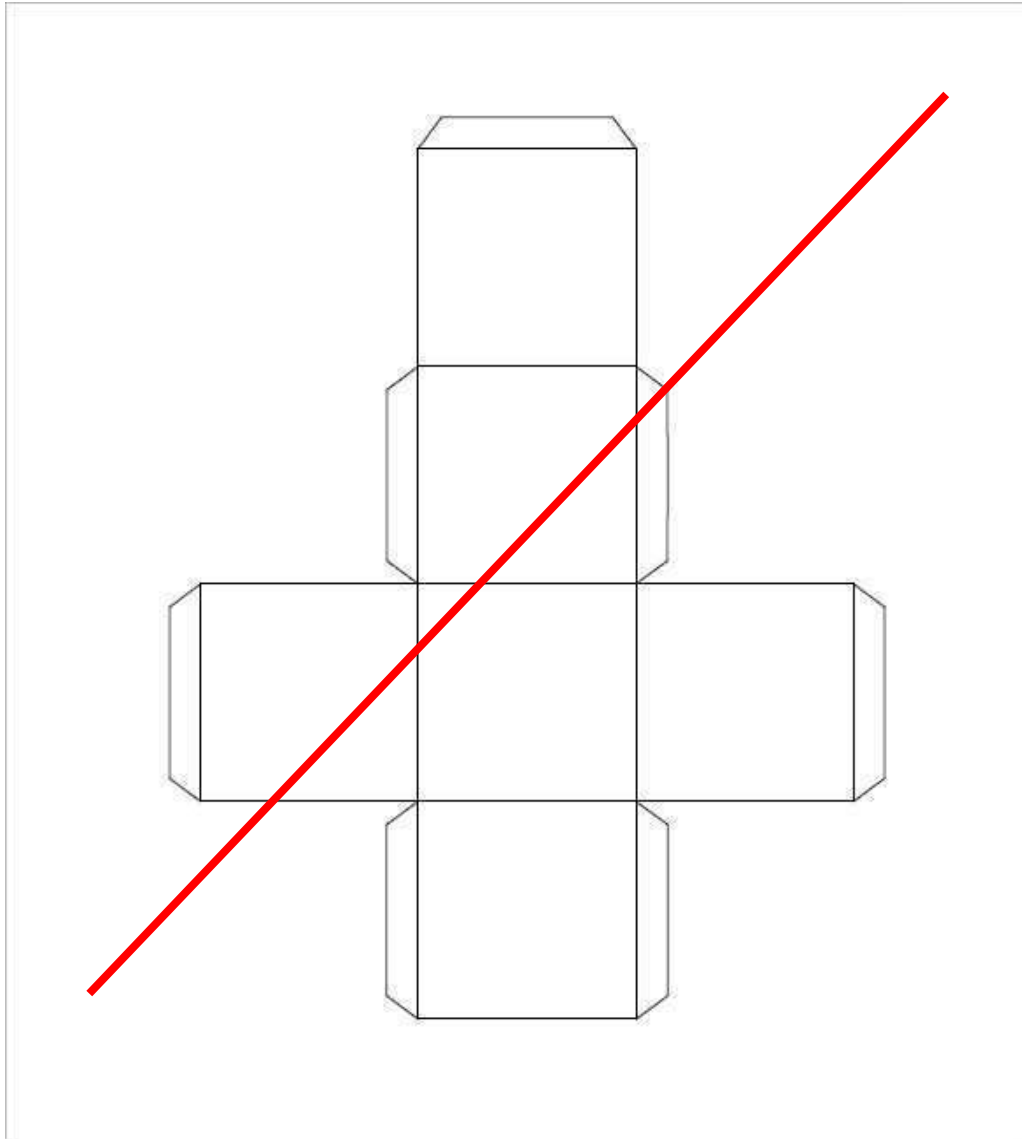
Remember, this is a brief from the Metal Packaging Sector, so the judges are all from the sector and therefore will be looking for:

1. That the brief is met in full
2. That the entry is a celebration of what's possible with metal packaging
3. Creativity, novelty, clever design, but within the bounds of what's physically possible with metal packaging – which is considerable!
4. Clear evidence that the student has done their research

What the judges don't like to see

1. The metal clad/hidden with other materials
2. Large lumps of other materials being used – even for internals, its not necessary
3. Manufacturing techniques that are clearly based on how non-metal packaging is fabricated
4. Clear evidence that the student hasn't bothered to do any research

Metal Packaging: 3-Piece Manufacturing





For inspiration (including bottle samples) see:

<https://uk.pinterest.com/metalpackuk/>

Also worth looking at:

<https://www.eviosys.com/mytin-2>