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# UNITED CAPS and Nestlé Creating Golden Moments

# Value of Partnerships

UNITED CAPS is recognised as a leader in providing innovative caps and closures for the food, beverages and agrochemicals segments, primarily in Europe and Asia. The goal is to develop caps and closures that meet the needs of the end user while also ensuring optimum productivity at the filling line.

About 50% of UNITED CAPS' products have been created through customer collaboration with the UNITED CAPS R&D Centre to develop bespoke closures tuned to their specific requirements. In some of these cases, the customer request looks to be impossible at first blush, but we don't give up easily and work hard to make the impossible possible. The result has been the delivery of ground-breaking innovation on many occasions.

This was exactly the scenario in a recent project with Nestlé. UNITED CAPS received a procurement request from the company in July 2015 seeking a new closure with a metal brushed effect for its Nescafé Gold coffee. They wanted a closure that would support the high-quality image of Nescafé and stand out on the shelf. And they wanted it as quickly as possible, of course!

The ultimate success of this project was largely due to UNITED CAPS' Relate-Perform-Sustain model to bring to market differentiated packaging solutions. Relate refers to our in-depth relationships with our customers so that we can truly understand their needs and requirements and provide the best possible solution – whether it be a standard or bespoke offering. Perform means that the solutions we deliver will meet or exceed customer expectations – on the filling line and on the shelf. Sustain refers to the efforts to continue to innovate in a sustainable manner – for our company, for our customers, for consumers and for the environment.

The Nescafé Gold story highlights the value of deep partnerships, the flexibility of both parties to make adjustments in order to achieve desired goals, and the dedication of the UNITED CAPS team to making the impossible possible.

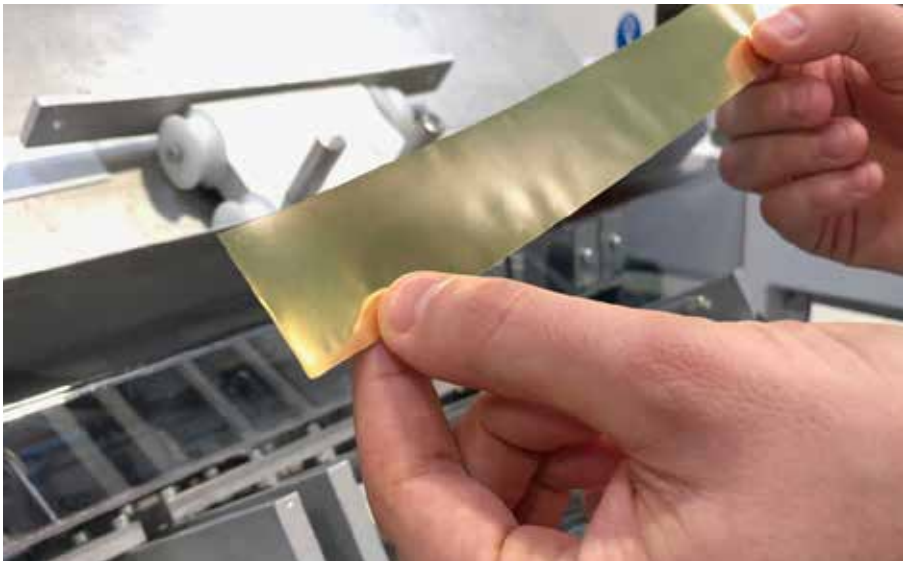
# The Story

# A Golden Moment

People have moments in their lives that they look back on as golden. A seemingly impossible challenge conquered, a successful collaboration or maybe an event that touched them deeply. Companies, too, have those Golden Moments. The Nescafe collaboration was a golden moment for UNITED CAPS and its partner. We faced significant challenges, but undaunted, we created, we invented and even crossed new technical boundaries to scale new peaks. Here's the story of our Golden Moment with Nescafé Gold.


NESCAFÉ
NESCAFÉ
GOLD

# The Nestlé Request



*A metal label, used in-mould was thought to be impossible.*

Nestlé wanted to create a classy package for its Nescafé Gold coffee to present a premium image in line with market trends for coffee products. The company was aiming for a classy brushed metal look for its new Nescafé Gold packaging. This required a 100% metallic material to be wrapped around the skirt of a closure, something that had never been done before.

The experts at UNITED CAPS were excited to take on this challenge. The first approach considered was to use in-mould labelling, although they were not sure whether metallized in-mould labeling (IML) was even possible. However, the company decided to provide a quote with the understanding the project would require significant development work. The result was a development partnership (services agreement) entered into between Nestlé and UNITED CAPS in October of 2015. And then the real work began!

**“This required a 100% metallic material to be wrapped around the skirt of a closure, something that had never been done before.”**

**“Partnering is an inherent part of the UNITED CAPS heritage.”**

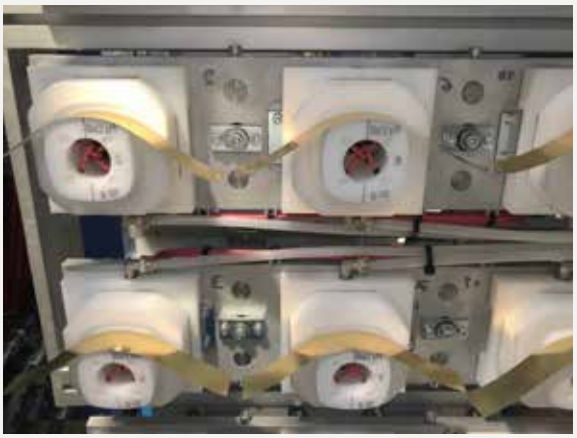
# Partnering for Success

Good companies know they can't do everything themselves. Partnering is an inherent part of the UNITED CAPS heritage. Nestlé understands partnering as well, and engaged its mould maker, ROUXEL, as well as PAGES, a robot manufacturer, for the project. ROUXEL confirmed that as far as they were aware, UNITED CAPS was the only supplier who could possibly complete this challenging project successfully. The key to a successful project of this nature is to gather the information and experts together as early in the process as possible. And projects of this nature require investment – and patience – on the part of all parties.

As a result of the UNITED CAPS proposal and the validation from a trusted supplier, both UNITED CAPS and the existing vendor developed a prototype to embody the vision of the project. The UNITED CAPS proposal was chosen due to its ability to deliver stand-out performance on the shelf and in the consumer's hand. At UNITED CAPS, we understand the importance of the look and feel of caps and closures, and how important they are to the overall success of the enclosed product. Our mock-up reflected that dedication to detail and aesthetics. The next step was to engage the cross-functional UNITED CAPS team. For a successful bespoke project of this nature, the design is important, of course, but its manufacturability and compatibility with the filling line is also critical, including how the caps will be screwed onto the jar.

# The Research & Development Process

Once R&D was engaged, the search began for any previous 100% full metallic IML solutions currently on the market; we found that there were none, and none of the labels for IML on the market are 100% fully metallic. This was step one of encountering the impossible. This had never been done. It was not clear it could even be done. Label suppliers believed it was impossible because of the static effect in the mould when using 100% metal. But UNITED CAPS doesn't give up easily. Nor does Nestlé, who provided authorisation for the project to continue. Working together, the team was determined to find an innovative solution.



*Label suppliers believed 70% metallic labels were the technical ceiling. UNITED CAPS and Nestle pushed that to a 100% full metallic solution.*

After some experimentation, a second prototype was presented to Nestlé that approached the appearance they were seeking and would also function with the robotics. But it still needed that brushed metal effect! Again, the conclusion was the task was impossible, producing a brushed metal effect in-mould, not on the label.

***"The closure's golden appearance had to be kept pristine through its entire life cycle."***

Technically, one degree of draft angle is required for each 0.01 millimetre of engraving; in this case, to achieve the look they wanted, it would require 0.03 millimetres, requiring a draft angle of 3 degrees. The engraving would be inside the mould so the look would not be damaged with processing or use. Experimentation proved that was technically possible but would be the limit of depth of engraving. But again, this had never been done before.

The UNITED CAPS lab did extensive testing on the concept including acquiring a special instrument that is typically used in auto factories to test the label's resistance to wear. This was important to overcome, since there are many steps along the way from cap manufacturing to home use where scratches can occur. This was another reason why painting the golden look was not an option – too much risk of scratching that would mar the look of this high-end product.

Inspiration comes from many places, often unexpected. During lunch at a restaurant, one of the developers noticed that the paper menu was laminated to give it durability. He wondered why the same approach couldn't be used for this project. Another issue was a seamless look for the cap. In the normal course of IML production, when the label is wrapped around the cap, it leaves a line. Is it even possible to have an overlap on the IML to give that seamless experience with a metal label? Another challenge for R&D.

So far, three impossibles had been pursued – UNITED CAPS didn't think they were possible but was willing to try – brushed metal look with in-mould labelling, using engraving to accomplish this, and a seamless look for the cap.

# Making the Impossible Possible

After months of patient research and collaboration, UNITED CAPS began producing a pilot mould in its Messia plant.

A standard pilot mould would have a single cavity, but this special mould had four. It was produced in three different sizes based on the coffee jar sizes: 50 grams, 100 grams and 200 grams.

*Unusually, multiple moulds were created.*


*Pilot moulds were developed after months of careful research.*

Four cavities helped with time to market by enabling the testing of four different ideas simultaneously, including different depths of engraving, the feasibility of the IML process for each, repeatability, and other project aspects. This cap would be the first ever cap in the market with IML on the side.

***"Nestlé required three closure sizes."***

By now it is July 2017, just 12 months from the start of the project, and the first prototype caps for the 100 gram jar were ready! The caps looked great, and the 100 gram cap was 20% less in weight than previous Nescafé caps. For a project of this complexity, the timeline was stunning. Line testing for the 100 gram jar was ready to start, followed by testing 200 grams, then 50 grams. Three cap sizes, two moulds for each, so a total of six moulds. It required making a great deal of space in the factory to test everything, and the use of three different assembly machines in order to produce all three versions in the required time. The factory was quite busy, and to make space, several projects were moved to other factories and to other locations within the same factory. This included moving 20 different machines to create enough space to manufacture the caps. Plus, infrastructure changes were needed; this included adapting the air grid to gain more air power, enhancing the electrical supply, adapting the lift to accommodate the weight, and enlarging the door to fit the machine into the room. In the end, the room was too small. In another burst of creative energy, the team designed a conveyor system to enable the manufacturing to occupy space on the first and second floor. The conveyor system had to avoid scratching the pieces – friction would damage the pieces. The solution: a conveyor designed for use in Italian pasta factories to carry the fragile pasta!

In addition, new equipment had to be purchased, and extra staff had to be arranged and trained. Luckily, the moulds arrived from ROUXEL two weeks earlier than expected, and we were able to retrofit an existing machine with new parts to adapt to the design. Everything else was on time, and this approach allowed the timeline to be compressed somewhat. Nestlé had a hard deadline when their manufacturing needed to start in the UK.

**“Increase of production by 30,000 pieces per day, a truly Golden Moment for the team!”**

# Achieving the Golden Moment

With production in place, there was another bump in the road – the 100 gram line was not producing sufficient quantities per day. Examination of the production process unearthed the fact that one small part on the machine was slowing down production. Within one hour, production had increased by 30,000 pieces per day, a truly Golden Moment for the team! It allowed production to reach the goal of 50 million pieces per year.

# Why the Impossible Became Possible

This project was one of the most complex bespoke projects UNITED CAPS had ever undertaken. In the end, it was the source of a Golden Moment for everyone involved.

*After scaling impossible peaks the UNITED CAPS team knew they'd engineered a golden moment.*

There were so many impossibles along the way, and they were all overcome, largely due to UNITED CAPS' "Relate, Perform, Sustain" pillars of product development. There were five reasons for this success in turning the impossible into possible and achieving that Golden Moment that can be instructive for other organisations who may also be inspired to achieve their own Golden Moments.

# 5 reasons why

## 1

### NEVER SAY NEVER

Just because it has never been done before doesn't mean it can't be done, as this project demonstrated. Thinking out of the box, collaborating with a dedicated team, and finding inspiration in small moments is the key to innovation.

## 2

### ENGAGE

Engage with partners who are willing to share the risk. In this case, both UNITED CAPS and Nestlé made significant investments, not knowing whether they would pay off in the end. But at each step of the way, there was encouragement, and the decision to keep pursuing the goal.

## 3

### UNDERSTAND

Fully understand the customer's requirements and think beyond the packaging itself. This includes understanding the business drivers, timelines, budgets, aesthetics, branding and more. UNITED CAPS went beyond the call of duty in making sure they thoroughly understood Nestlé's goals and objectives and came up with a proposal that met all of them. This innovative closure enabled Nestlé to embark on an ambitious rebranding, repositioning and communications strategy that that went beyond the package itself.

## 4

### DARE TO CHANGE

Even small changes can have a big impact. In this case, the small adjustment to the production machine enabled huge production increases! And finding a pasta conveyor that could gently move product from one floor to another was a stroke of genius.

## 5

### CAN-DO ATTITUDE

Approach challenges and barriers with a can-do attitude, and maintain open, transparent communications across the entire team. Innovation rarely happens in a vacuum. It is spurred by the sharing of ideas amongst a group of dedicated people. And with full and honest communications, compromises where necessary, and keeping the final goal in mind, amazing things can be done, and Golden Moments do occur.

# Learn More

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**To see the results of this Golden Moment effort,** be sure to check out Nestlé's Nescafé Gold coffee in your local grocery store.

**To learn more about UNITED CAPS products and services,** visit www.unitedcaps.com.

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TECHNICAL ADDENDUM

# Physical Characteristics

## PROTECTIVE FINISHING

This metalled IML did not exist on the market and was specifically developed for this product. A specific composition was developed in comply exactly with Nestlé's unique specifications. In particular, a specific surface finishing protects the metal brush look from damage during closure usage.

## THE CLOSURE CONSISTS OF 3 PIECES

An "inner" (inside piece), a "liner" (a foam gasket ensuring isolation of the coffee from the exterior) and an "outer" (outside piece) that includes an in-mould label.

## SEVERAL MATERIALS ARE USED

- the outer is made with special polypropylene (PP)
- the inner is made with a different type of polypropylene
- the liner is in polyethylene (PE) foam with an aluminium seal
- the in-mould labelling (IML) is multi-layer. The base is in polypropylene in order to stick to the cap and includes aluminium to attain the metallic appearance.

The microscopic layer of aluminium is not significant in the total weight of the closure and does not prevent recyclability of the closure.

> **"A REDUCTION IN WEIGHT WAS ACHIEVED AS COMPARED TO THE PREVIOUS CLOSURE."**

## THIS CLOSURE COMES IN THREE SIZES

| FORMAT | WIDTH | HEIGHT | NECK | WEIGHT | REDUCTION IN WEIGHT |
|---|---|---|---|---|---|
| 50 g format | 56,8 mm | 25,6 mm | 48 mm | 11,85 g | 17% |
| 100 g format | 64,9 mm | 28,3 mm | 57 mm | 15,80 g | 20% |
| 200 g format | 83,1 mm | 34,5 mm | 74 mm | 25,93 g | 11% |

# Design

## AROMA

The “aroma lock” is achieved through discontinuous thread with dedicated male-female shape.

## MOULDING

For de-moulding purposes, the outer has been designed with a light draft angle. Hence, the IML is not straight but rather, slightly conical.

# Technical Production

- Totally new dedicated equipment has been put in place for this production. This includes 3 assembly lines with 6 injection machines (full electric high-speed injection machines).
- Clamping strength of injection machines: 420 T for outer and 280 T for inner.
- The 3 components are directly assembled with an in-line assembling machine.
- The mould has 24 cavities for outer and 18 cavities for inner so that, combined with the 2 different cycle times, the same amount of outers and inners arrive for assembly.
- The IML label is wrapped around the outer during the injection process.
- The original IML is flat and sleek. The outer mould cavity has been brushed with a laser system in order to give the closure its metal brushed effect in the injection phase. This laser engraving is specially designed to avoid IML scratch at de-moulding (as the 3D effect is opposed to the de-moulding direction).
- The IML is rolled around a core with a vacuum system and is blown into the cavity to follow the shape of the outer cap. Once plastic injection is performed, the IML follows the 3D metal brush pattern of the cavity.
- The cycle time is a bit longer due to the in-mould labelling process but has been shortened by 7% in comparison with the previous closure without IML.
- Production output is up to 1 million closures per week

**“A SPECIFIC COMPOSITION WAS DEVELOPED IN EXACT COMPLIANCE WITH NESTLÉ’S UNIQUE SPECIFICATIONS.”**

## STORAGE

| FORMAT | PIECES PER BOX |
|---|---|
| 50 g format | 840 |
| 100 g format | 590 |
| 200 g format | 280 |

# Quality Control

- **All pieces are individually inspected in our quality control process.**

- **Various automatic controls are performed during the production process:**

  **Before assembly of the 3 components (outer, inner and liner):**
  The outer is inspected via 2 cameras per line (so 6 cameras in total):

  - One to check the top: to ensure that “Nescafé” is correctly engraved, and that coloration is uniform.
  - One laterally: to check if the IML has been correctly sealed.

  **After assembly:**

  - One camera to check the interior of the closure: to ensure that the liner is well placed, components are properly assembled, and there is no flash.
  - 4 cameras to check the 4 sides for scratches, air bubbles, etc.

- **Manual checks are additionally performed, with specifically trained and experienced technicians:**

  - Every hour, a shot from each mould is extracted from the production chain for visual inspection: 10 criteria are checked (engraving, coloration, labelling, odour, juncture, assembly, etc.).
  - Every hour, 10 assembled closures are randomly pulled and visually checked with a control checklist performed by the technicians (dimension, aspect, colour, etc.).
  - Finally, for each batch, the first closures being produced are individually checked with a 3D optics machine to measure compliance with Nestlé specifications.

# R&D and Organization

- The development was managed by UNITED CAPS R&D in Messia (France). The development team comprised 20 people (R&D production, quality, technical, sales).
- The full development was achieved in a record time of 2 years in total (from initial brief to industrial line in place). Most of the time was dedicated to fine tuning.
  - July 15, 2015: first concept discussed with Nestlé.
  - July 3, 2017: industrialisation began.
- The production follows a continuous flow 24/7. It is performed in the UNITED CAPS plant in Messia (France).

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