

CUSTOMIZED  
SOLUTIONS

**Schill+Seilacher**

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**WHITEPAPER**

**FINISHING FOR PAPER**

**WATER-BASED BARRIER COATINGS**

# WATER-BASED BARRIER COATINGS

## THE KEY TO THE FUTURE OF SUSTAINABLE PACKAGING

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It would be easy to forget when you consider that we are currently experiencing war in Europe, the continued effects of COVID 19 on supply chains and the escalating cost of living, that still the most serious and imminent threat to mankind is that of Climate Change.

The focus of development efforts over the past 2 years has inevitably been to ensure that the mills keep running and despite the best efforts of pioneers in sustainable food packaging, progress to replace plastic in packaging has been slow. Today the use of oil and gas supply as weapons in the new 'Hot war' by Russia only serves to highlight the necessity for strategic and more sustainable alternatives now.

These sustainable alternatives, however, often cannot achieve the same barrier properties in packaging compared to plastics. There is always the question first to the end user: "Do you really need a 100% barrier?" The reality is that most plastic packaging creates too great a barrier and consequently the food contents of the package decompose faster as a result. On the other hand, most effective alternative fully sustainable formulations will struggle to provide the desired functionality necessary to achieve a homogeneous and effective barrier to grease, oil and moisture. It is therefore necessary to understand that in many cases a fully sustainable solution cannot yet provide sufficient barrier properties. Schill & Seilacher Paper Division are the experts in this field and always search for the 'most sustainable option' when it comes to developing coatings for food packaging. They are confident that very soon they will be able to offer to the market a fully sustainable solution with excellent recyclability and providing the desired comprehensive barrier performance.

Solutions are finally within reach for the replacement of fluorocarbon-containing packaging papers (POFA / POFS / PFHxA-free) with medium fat density, which are suitable for use in food packaging and have sufficient barrier properties.



Tensor



Contract Dryer

## THE KEY TO THE FUTURE OF SUSTAINABLE PACKAGING

The group of substances, which is still mainly used for greaseproof papers, is described under the generic term “perfluorinated compounds”. Germany and other northern European countries are already actively taking action against this group of substances, with the aim of banning the manufacture, marketing, import and use of perfluorohexanoic acid (PFHxA) and all other perfluorinated compounds in Europe, if not already in force.

The reason for this action is that this group of substances consists of non-degradable organic compounds which do not occur in nature, and yet are to be found everywhere as “environmental toxins” due to their diverse industrial use. They may be detected in many environmental media and organisms and accumulate in living organisms which is of serious concern. They have already reached the human organism via the natural food chain.

Schill+Seilacher has developed a PFHxA-free treatment of the paper surface in cooperation with several European paper manufacturers. This can be applied both by coating units or in size presses directly during paper production. These surface treatments give paper and board both oleophobic and hydrophobic properties. As a result, the appropriately treated papers and board may be used for the packaging of foodstuffs such as fast food, French fries and fresh cheese and sausage products in compliance with the food contact recommendations of BfR XIV and XXXVI.

In addition, and in contrast to fluorocarbon-treated papers, these treated papers can be composted in accordance with DIN 13432. Due to their excellent recyclability, the treated papers can be fed back into the waste paper material flow and rejects can be processed thus giving a truly sustainable alternative solution.

### CASE STUDY: TO ACHIEVE MEDIUM OGR WITHOUT FLUORO-CHEMICALS IN A FLOODED NIP SIZE PRESS

Objectives:

1. Medium oil and grease resistance without fluorochemicals (POFA, POFS, PFHxA-free)
2. Barrier values suitable for e.g. fast food packaging such as burger wraps
3. Low Cobb60 and Cobb1800 values for humid filling contents
4. Food contact approved (BfR XXXVI, FDA 21 FCR 176.170 and 176.180)
5. Realistic pick-up volumes for flooded-nip size presses

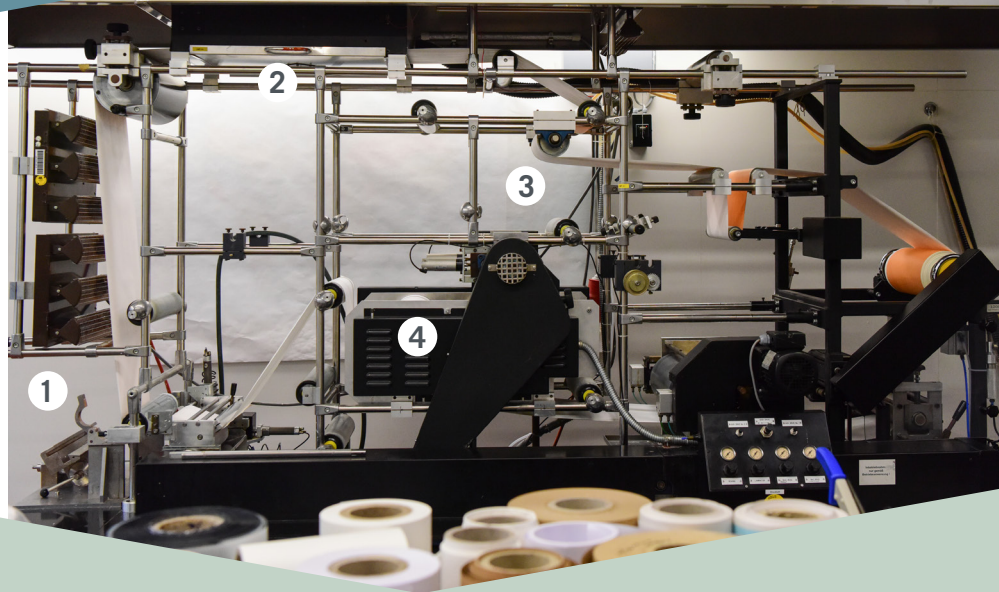
Paper Output



## Substrate:

37gsm base paper, virgin pulp, unsized, porosity ca. 90ml/minute

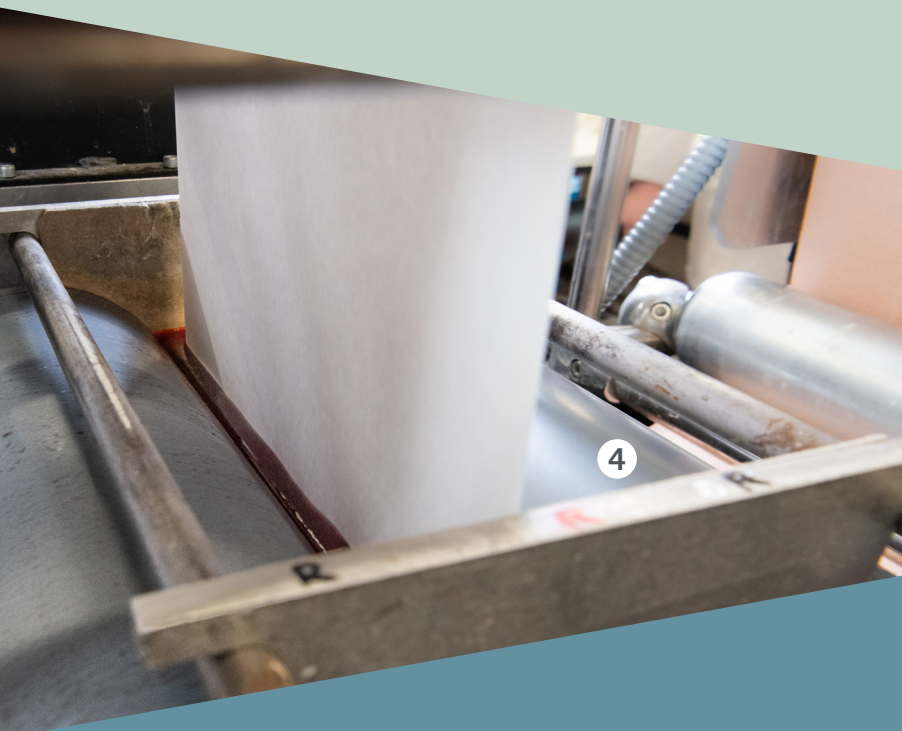
- 1 IR Dryers
- 2 Hot Air Channel
- 3 Contact Dryers



## Formulation and Conditions:

5% solution of a modified potato starch (70%) UKAPHOB HR530 (30%)

- Target viscosity at 50°C = < 50 mPas
- Temperature of the size press bath ca 45-50°C at the nip
- Treatment both sides
- Target pick-up ca 2.0-2.5 gsm (dry)



- 4 Laboratory size Press Application

## RESULTS

Sample	Application (g/m <sup>2</sup> )	Cobb60 (g/m <sup>2</sup> )	Cobb1800 (g/m <sup>2</sup> )	KIT	Slip Angle	MVTR 23/85 (g/m <sup>2</sup> )
Base Paper	--	--	--	<1	31°	1500
UKAPHOB HR530	2	13	26	6-7	14°	396

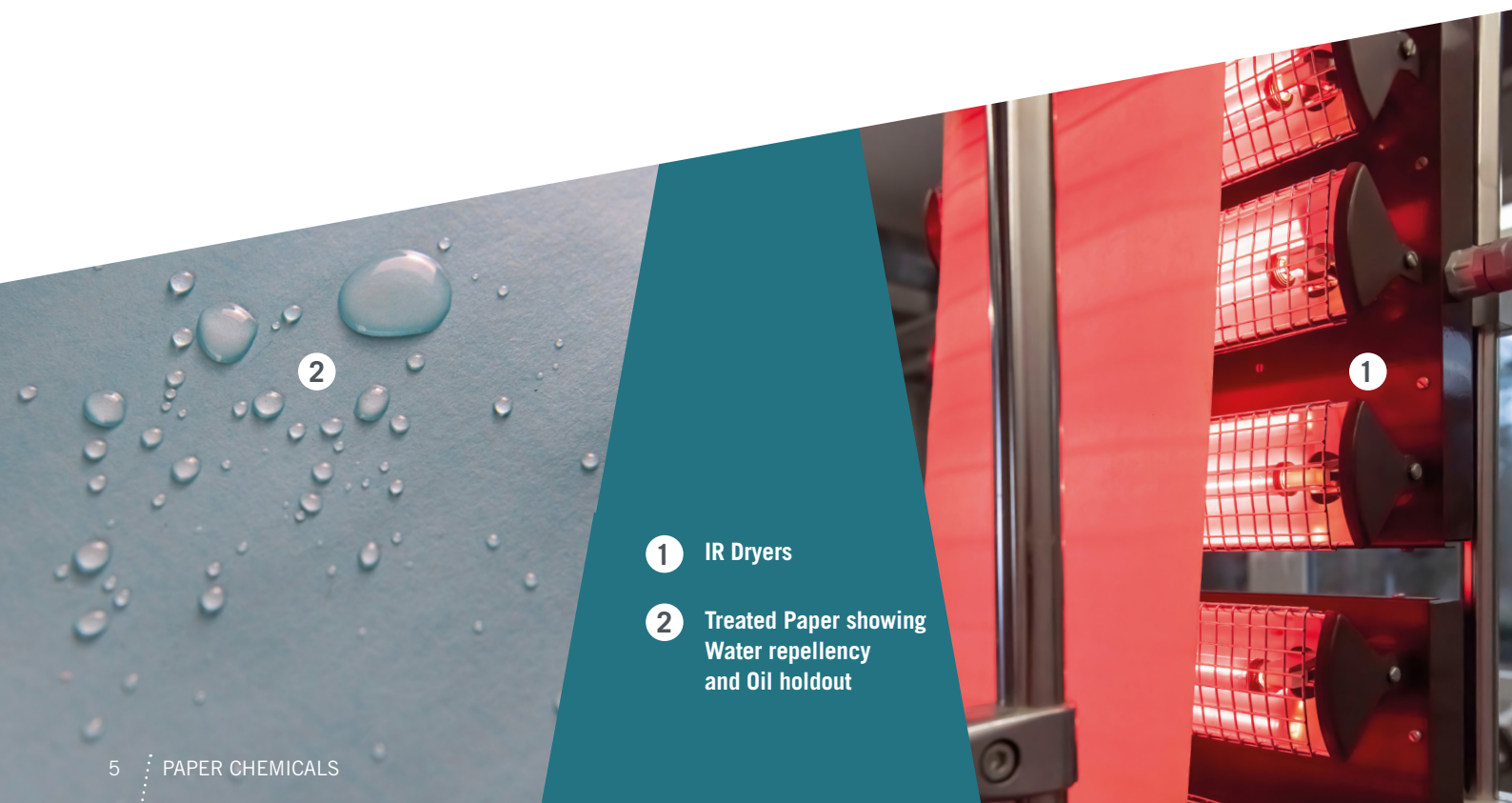
## CONCLUSION:

The application proposed by Schill+Seilacher has been proven in full scale production. It provides sufficient barrier properties to make treated papers perfectly suitable for fast food packaging. It provides a modern, recyclable and compostable alternative solution to fluorocarbons in food packaging.

## ABOUT SCHILL+SEILACHER:

Schill+Seilacher GmbH was founded 140 years ago and today employs 1,000 people in 6 independent production sites supplying speciality chemicals on all five continents. The Group is owned by a foundation and is well prepared for the future with a very high level of research & development activities and an orientation to the market and satisfying customer needs.

G.B.C. (Speciality Chemicals) Ltd., has represented Schill+Seilacher GmbH., paper division in the U.K. and Ireland for more than 25 years.



1 IR Dryers

2 Treated Paper showing  
Water repellency  
and Oil holdout

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