RKW SWEDEN ab

UNIQUE MATERIAL
FOR BETTER WORKABILITY

solutions in film 'n' fiber

FPO®
OFFERS INCREASED OUTPUT AND BETTER PROFITABILITY

Remember the name FPO® from RKW Sweden AB. It stands for Filled Polyolefins – a unique material that offers your company increased productivity and great potential for creating better solutions. Our FPO® material is available as compound as well as processed film and sheet.

FPO® is made from the polymers PP or PE, to which we add talc and carbonates in various degrees of fineness to create a material with the best possible performance. FPO® is used today in many different areas, from manufacturing and printing to the food industry. The compound as well as the film and sheet have EU and FDA approval for use with foodstuffs.

Increased output

The minerals in FPO® improve its heat conductivity and reduce its heat capacity, which together with the higher density leads to faster processes and higher output.
In thermoforming, this means a higher stroke rate in your processes. In profile extrusion, the material stabilises more quickly, giving you higher output from the extruder.
In injection moulding, you get considerably faster cooling. And in film blowing, FPO® gives higher output from the extruder, plus a more stable bubble that also cools more quickly.
All this means increased productivity and lower energy costs for your company.

More dimensionally stable material

The minerals reduce after-shrink and make your applications more dimensionally stable, which reduces waste. The minerals also increase the reliability of tolerances, which means that your company can manufacture products to closer tolerances. FPO thus enables more sophisticated design while facilitating tooling.

Increased rigidity

FPO® has considerably greater rigidity than unfilled polymers. This gives the opportunity to make structures more rigid, or to maintain rigidity while using thinner material.

Constant R&D

RKW invests heavily in research and development. Today we are further improving our unique material by combining nature's own resources with advanced cutting-edge technology. The competence and experience of our staff make us one of Europe's leading manufacturers in this area.

Price stability and cost-effectiveness

With less than 50% oil-sourced material and the rest technical minerals FPO is more price stable than material build up of pure polymers. A rice in oil price hence only influences a minor part of the FPO material. As oil prices rise, FPO will therefore become an even more cost-effectiv material.

Lower environmental impact

We use considerably less fossil raw materials in the manufacture of FPO® than are required for pure polymers, which means a far lower environmental impact. Our compounds are also available with biodegradable properties.

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FPO® COMPOUND
FOR EXTRUSION AND INJECTION MOULDING

FPO® Compound has been developed for the extrusion and injection moulding of products for various types of applications. The material's properties have great technical advantages in production. For example, the material not only increases rigidity but is also dimensionally stable. The increased productivity possible with the material also offers the potential for lower production costs.

Minerals cannot be used as additives in ordinary extrusion equipment. However, RKW offers pre-compounded FPO® as ready-to-use compound or high-concentrate masterbatch that enables you to benefit from the advantages mentioned above.
We offer standard compound as well as solutions to meet your company's needs. We also offer toll compounding for when you need a specific formula.
FPO® Compound based on the polymers PE-LD, PE-LLD, PE-HD, PP-H and PP-C is available. We use various finenesses of $CaCO_3$ and talc as standard fillers, with a filling ratio up to 75%. Our know-how means we can offer a solution with the right polymer and an optimised combination of fillers and filling ratio tailored precisely to your needs and requirements.

Applications for FPO® Compound

Extrusion		FPO® Compound
■ Tubing and profiles		023 (PP-C) 024 (PE-HD)
■ Sheet		023 (PP-C)
■ Film	■ Paper-like	097 (PP-C) 018 (PE-HD)
	■ Antiblock	173 (PE-LD)
	■ Delustering agent	173 (PE-LD)
	■ Reinforcing additives	271 (PE-LLD)
	■ Breathable films	Customer-specific

Injection moulding	FPO® Compound
■ Furniture	040 (PP-C)
■ Tube fittings	239 (PP-C)
■ Automotive components	Customer-specific
■ Food packaging	Customer-specific

FPO® Compound example

The following example shows the advantage of using FPO® Compound in film blowing. There are of course corresponding advantages in other areas of use.
You can increase the strength of unfilled PE film appreciably by adding finely dispersed $CaCO_3$ in the form of FPO® masterbatch. The advantages include both improved properties and higher output from the extrusion line. As a manufacturer you can choose improved properties or down-gauging with retained properties and hence lower material costs.
The example below compares HDPE film without and with the addition of 23% FPO® masterbatch 271, which contains 75% $CaCO_3$ based on PE-LLD.

	HDPE	HDPE+ 23% 271
Thickness	15 µm	13 µm
Grammage	14.6 g/m²	14.0 g/m²
Dart drop resistance	105g	115 g
Elmendorf tear resistance MD	90 mN	160 mN
Tensile strength at break (min MD/CD)	42N/mm²	37N/mm²
Elongation at break (min CD/MD)	380%	370%
Blown film output	139 kg/h	172 kg/h
Raw material costs	100%	91%

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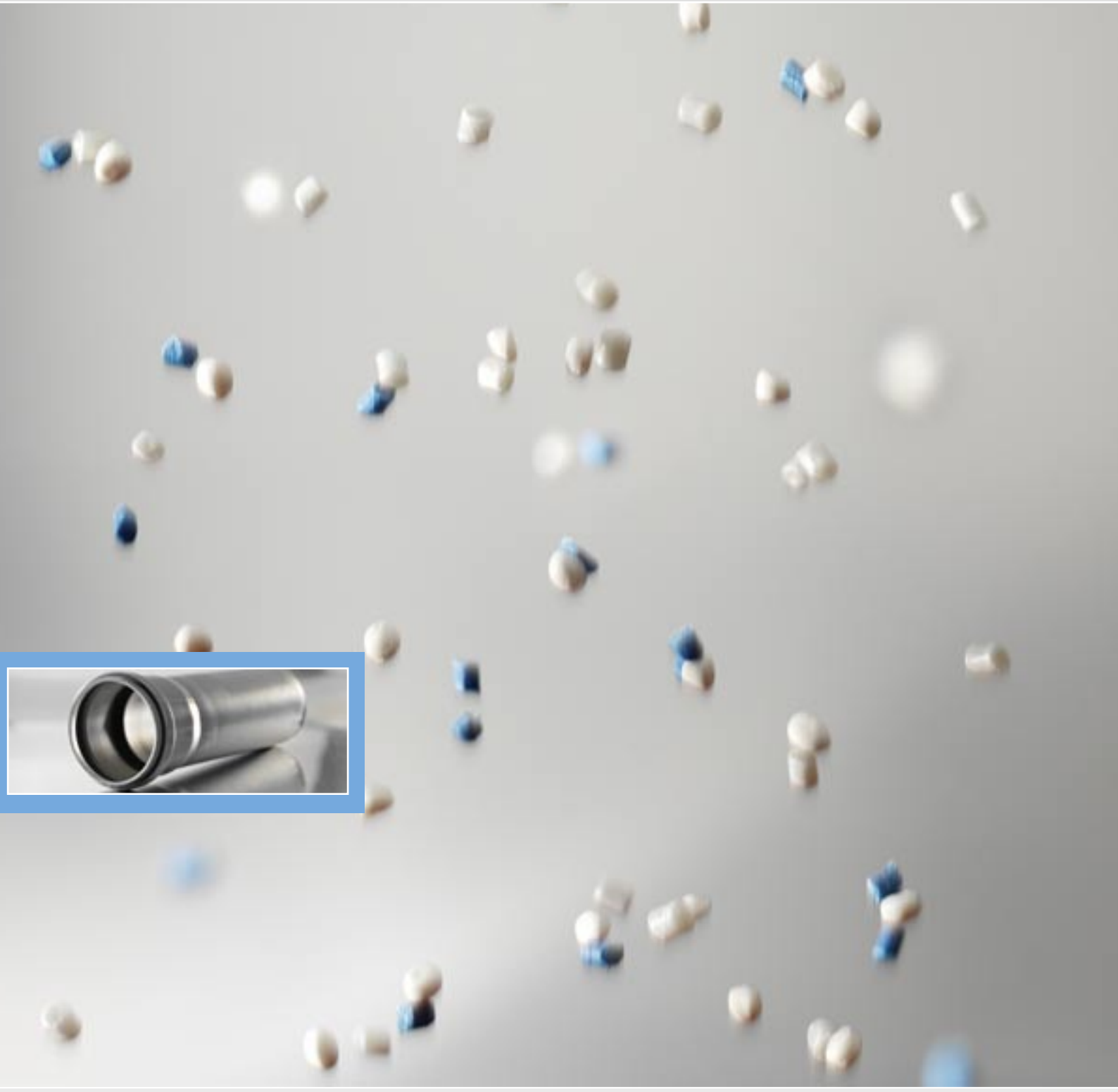

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FPO® FILM AND FPO® SHEET FOR PRINTING AND PACKAGING

In addition to compounding we offer our unique FPO® material both as thin film (so-called synthetic paper) and as rigid calendered sheet supplied in rolls. Naturally both products have EU and FDA approval for use with foodstuffs.

FPO® Film

FPO® Film has a paper-like feel and superior foldability and printability. It is also oil- and water-resistant.
Compared with pure polymers, FPO® Film is twice as effective a barrier to light, oxygen and water vapour. This means that the FPO® films can replace more complex laminate solutions such as PE/Paper.
One major advantage is that moderately filled FPO® Film has considerably improved tear-resistance and dart drop (see example on p. 4).
Standard capability is up to 1200 mm wide and 40-150 µm thick.
Stock standard FPO® films in PP and PE are available in many different thicknesses, and as sealable and light-barrier material.

FPO® Sheet

FPO® Sheet is considerably more rigid than ordinary unfilled sheet material, and has better workability. In addition, FPO® Sheet has superior thermal properties due to FPO®'s lower heat capacity, higher heat conductivity and higher softening temperature. Together, these advantages offer the possibility of lower material consumption and considerably higher output in, for example, thermoforming.
Thanks to its low shrinkage, FPO® Sheet can replace PS polystyrene in existing tools in thermoforming processes. FPO® Sheet gives more uniform shaping and better punchability.
FPO® Sheet is also twice as good a barrier to light, oxygen and water vapour.
Standard capability is up to 1400 mm wide and 170-1200 µm thick. Special products can be up to 2300 mm wide.

FPO® Sheet example

Using FPO® Sheet 750 in thermoforming has technical and economic advantages as shown in the example table. Please contact us for further examples.

	PP	FPO 40% filled
Thickness (µm)	1000	750-800
Grammage (g/m²)	901	945-990
Strokes/min*	~33	~40
Shrink	1.8%	0.7-1.1%
Heat Capacity per unit area (kJ/m² K)	1.53	1.36
Heat Conductivity (W / m K)	0.22	0.51
Heat Deflection Temperature A	85 °C	70 °C
Price per unit area	100%	80-90%

* Higher speed due to shorter heating and/or cooling times specific for application and machine.

Applications for FPO® Film

- Packaging wrap
- Labels
- Cover leaf
- FFS (bags)
- Laminating film for packaging material
- Surface foils
- Display signs
- Release liners

Applications for FPO® Sheet

- Folded boxes
- Thermoforming:
  - Food packaging
  - Plant pots
  - Consumer, industrial and construction products
- Punched or cut products, e.g. signs

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RKW SWEDEN AB

RKW Sweden AB was founded in 1987 as Filltech R&D AB, a development centre within the Tetra Pak Group. In 1998 Filltech was acquired by the RKW Group and changed its name to RKW Sweden AB.
RKW Sweden AB is located in Helsingborg in southern Sweden, a well-known transport hub for the Nordic countries. We have an ultra-modern plant, and our turnover exceeds SEK 130M (EUR 14M). RKW Sweden AB is a company within RKW AG, whose headquarters are in Worms, Germany.

RKW AG

RKW AG was founded in 1957. By offering customers and partners tailor-made solutions, the company has become one of Europe's leading players in processed polyolefin products. The company has 2,650 employees in 17 factories in eight countries, and a turnover of approx. EUR 500M.

Common goals

You will find us easy to work with. Our company can fulfil your needs and requirements, thanks to the professionalism of our staff. We always work with defined goals – so that you will achieve yours.

Printed on FPO®