

# KÖPP Filter materials VYON<sup>®</sup> and GURON<sup>®</sup>



**KÖPP Filter Technology**

# Individual shape and properties

KÖPP has offered individual solutions for liquid filtration, ventilation and aeration, sound insulation and dust filtration since 1968. As a customer, you benefit from a range of products that convinces in terms of quality and price.

A big advantage is that we stock everything – filter materials and filter equipment.

Our **VYON®** and **GURON®** filter materials are perfectly suited to depth filtration. Different pore sizes enable accurate filtration at different filtration ratings. The material can also be moulded for specifically tailored solutions. This ensures that the shape and properties can be adjusted individually to your requirements.

You, too, can also benefit from our expert knowledge throughout the entire filtration process.

**We will be happy to help you.**

**Markus Peitz and Victor Asselberghs**  
Key Account Managers for Filtering Technology



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## KÖPP Filter materials

Liquid and dust filtration | Ventilation and aeration | Sound insulation

## Overview of the advantages

- Physiologically safe: perfect for the food and beverage sector
- Chemical-resistant against most acids, alkaline and organic chemicals
- Highly porous, versatile applications:
- Solid, lightweight and pliable
- Available with a variety of properties: hydrophobic, hydrophilic and self-sealing



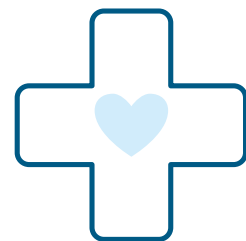
## Markets We Serve



Laboratory



Industrial



Medical and Healthcare



Food Industry



Automotive

# Explaining VYON® and GURON®

**VYON®** and **GURON®** are produced using pure plastic polymers, specifically high density and ultra-high molecular polyethylene as well as polypropylene. Using controlled sintering conditions, porous structures are formed, consisting of intricate interconnected pathways with very few dead-end pores. These characteristics provide a wider distribution of pores, regulated flow of liquid and gaseous media, and the capability to manufacture products that are well-suited for filtration, separation, and the retention of biological and chemical substances.

**VYON®** and **GURON®** are frequently made into a variety of shapes (such as square or round) and sizes to suit particular applications, ranging from flat discs to 3D moulded structures. Critical properties like thickness, diameter, and porosity are produced with consistent, repeatable, and controlled processes thanks to closely monitored manufacturing procedures.

## Main VYON® and GURON® characteristics

### Pore Diameter

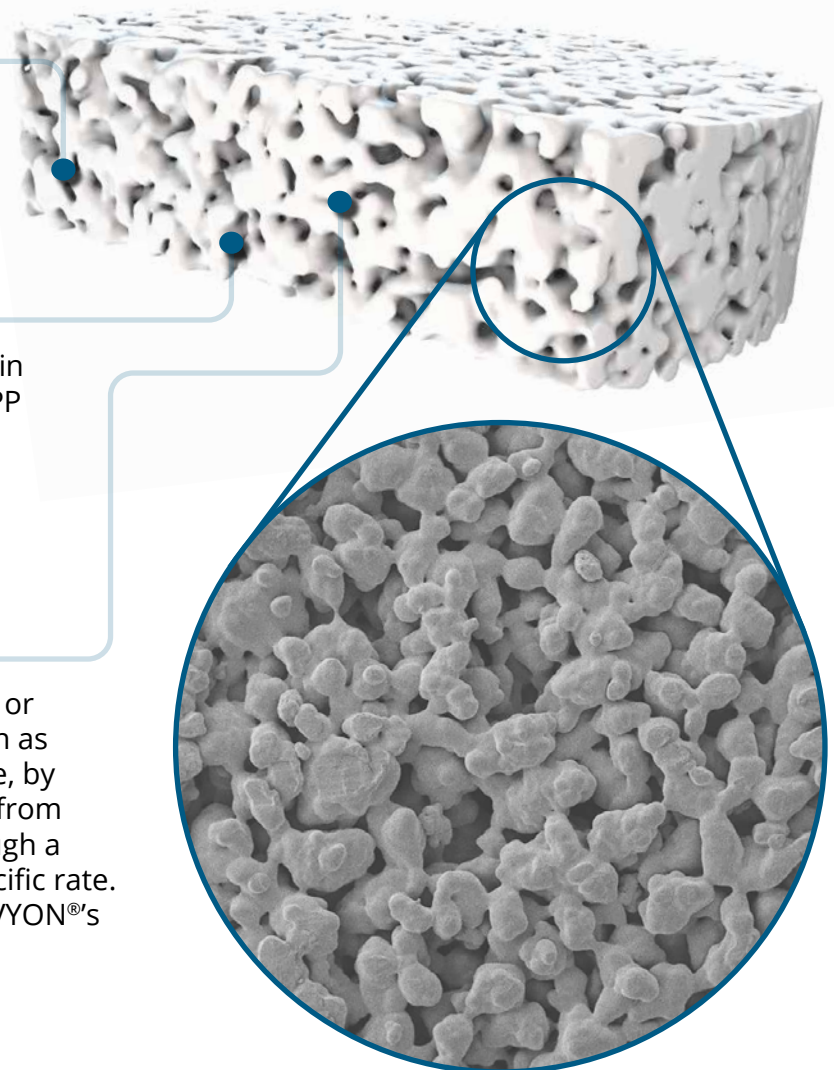
Essential features controlling the efficacy of liquid and gas filtration through VYON® and GURON® materials, are the size and distribution of open pores within their porous structures.

### Porosity

The amount of pore space or empty space in a porous material is called its porosity. KÖPP provides GURON® and VYON® in a broad variety of porosities, ranging from 25 % to 65 %. Because of this, the materials can be used in many processes, such as filtration and diffusion.

### Permeability

The ability of a medium to transfer liquids or gases through a porous structure is known as permeability. It is determined, for example, by measuring the pressure drop that results from passing a gas with a known viscosity through a porous sample with a known size at a specific rate. The permeability will affect GURON® and VYON®'s liquid and airflow rate characteristics.



For certain applications which require extra high cleanliness our business partner in Wrexham, UK, can offer processing in a cGMP room.



# VYON® and GURON® applications



## Filtration

GURON® and VYON® are porous plastics that have been sintered. They provide a range of filtration solutions for different industries. These porous polymers are excellent at filtering both liquids and gases, which makes them ideal for industrial, medical, and healthcare usage. Excellent depth filtration is provided by GURON® and VYON® thanks to the tortuous paths within the porous structure.



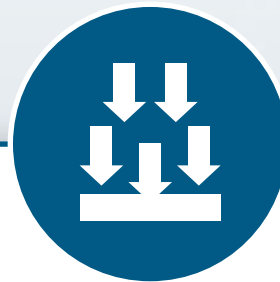
## Muffling

The sintered polyethylene body of the GURON® and VYON® silencers are combined with an adapter made of high-density polyethylene. Because of its complex structure, air is forced to expand through the porous material, which lowers noise levels. It lowers noise from about 90 dB to 60–70 dB when connected to an exhaust port, making prolonged human exposure safer.



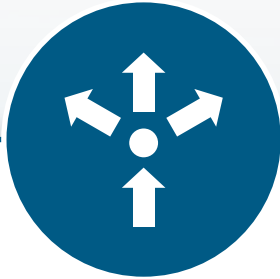
## Venting

Our porous materials perform exceptionally well in venting applications, giving sealed enclosures the essential breathability. These qualities allow us to provide vents that also guard against microbiological contamination while allowing sufficient ventilation. This is why the pharmaceutical and medical industries benefit from our porous plastics, VYON® and GURON®.



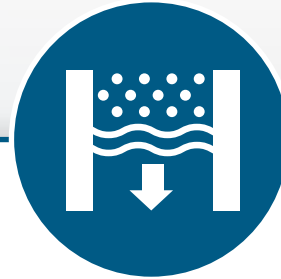
## Absorbance

Porous plastics like GURON® and VYON® are ideal for wicking and fluid transfer applications because of their consistent porosity. The precise release of substances, such as chemicals, fragrances, and medications, is made possible by this porosity. In addition, surface chemical alterations can improve the performance and characteristics of the material.



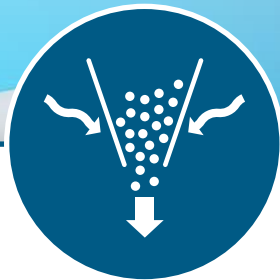
## Diffusion

GURON® and VYON® have an intricate network of pores that allows for a homogenous airflow distribution. These materials were refined by controlling pore size precisely and keeping density constant. Applications include industrial water aeration and sparging as well as medical inhalation devices. We offer specialized diffusion and sparging solutions.



## Media retention

GURON® and VYON® provide a stiff, self-supporting structure that will contain dry media without breaking. To satisfy industry standards, our custom-designed porous plastics are optimized with particular flow and pore size characteristics. Media support is an important use in a wide range of products, including dialysis cartridges and SPE columns for chromatography.



## Fluidizing

Because of its consistent quality, our porous plastic excels in the powder handling industry through the pore structure that encourages even airflow in beds and hoppers. Vyon is manufactured from FDA Approved Polymers, it guarantees uniform fluidization without dead spots. Furthermore, unlike traditional canvas and felt media, VYON® and GURON® are self-supporting, meaning they do not require the external support structures that they do.

**Would you like to find out more – about KÖPP and our filter materials and filter devices?**

**Visit our website:**



# Applications

At KÖPP, we offer custom porous plastic products to satisfy our clients' demands. Both **VYON®** and **GURON®** are at the core of a broad range of applications across laboratory, medical, automotive, and pharmaceutical applications, such as small drug delivery vents and large-scale process chromatography bed supports. We keep coming up with new, creative, high-quality products that meet market and regulatory requirements and keep you ahead of the competition through partnerships and collaborations.



## Drug Delivery

Drug delivery vents  
Inhalation device filters  
and diffusers  
Absorber/wicks for  
ophthalmic dispensing



## Medical and Healthcare

Catheter vents  
Fluid collection vents  
Bone cement filters  
Media support and filters for  
dialysis equipment



## Laboratory

Diagnostic pipette filters  
Microplate filters  
Water purification filters  
Biological sample homogenisers  
Solid phase extraction frits  
Process and flash  
chromatography bed supports



## Industrial applications

Filtration  
Fluidisation  
Silencing



## Automotive

Battery vents  
Venting



## Silencers

Standard M5  
BSP thread  
Push-in  
Custom made



# VYON® material overview

Ultra High Molecular Weight Polyethylene (UHMWPE), polypropylene (PP), and high density polyethylene (HDPE) are the three thermoplastic base materials that make up our lightweight and adaptable VYON® porous plastics. They display a range of chemical resistance, strengths, densities, and thermal properties. These can be used to exacting specifications and requirements to create VYON® products.

An overview of the most popular VYON® materials, including base material, thickness, and pore size, is provided below based on widely used design specifications.

## VYON® PE range

Both HDPE (high density polyethylene) and UHMWPE (ultra-high molecular weight polyethylene) can be used to make VYON®. Strong, highly dense porous plastics with good chemical resistance and mechanical strength characterize these materials. Because it can be used in a variety of industries and for a wide range of purposes, PE is the most widely used material. VYON® PE's extensive regulatory approvals make it a perfect material for use in the pharmaceutical and medical sectors.

VYON® quality	Material Type	Operating Temperature (°C)	Pore Size Range (µm)	Available Thickness (mm)
M	UHMWPE	-70 - +80	7 - 10	1.50, 2.00, 3.20, 4.75, 6.00
PT	UHMWPE	-70 - +80	10 - 30	3.55, 4.00
D	HDPE	-70 - +80	15 - 25	3.20, 4.75, 6.00
F	HDPE	-70 - +80	20 - 40	0.75, 1.00, 1.50, 2.00, 2.50, 3.20, 4.75, 6.00
HP	HDPE	-70 - +80	80 - 100	2.00, 2.50, 3.20, 4.75, 6.00

## VYON® PP range

Although polypropylene (PP) materials are equally chemical and mechanical resistant, they are more resilient and have a higher temperature tolerance than polyethylene (PE) materials. The main uses for VYON®, made from PP, are in industrial settings where its superior hardness and thermal properties are desired.

VYON® quality	Material Type	Operating Temperature (°C)	Pore Size Range (µm)	Available Thickness (mm)
PPD	PP	-10 - +110	15 - 25	3.20, 4.75, 6.00
PPF	PP	-10 - +110	20 - 40	1.50, 2.00, 2.50, 3.20, 4.75, 6.00
PP HP	PP	-10 - +110	80 - 100	2.00, 2.50, 3.20, 4.75, 6.00

# GURON®



## Range of GURON® materials

**GURON®** is the alternative for all those whose needs cannot be covered with the **VYON®** qualities. The **GURON®** brand name is applied to all porous sintered PE parts that are manufactured in accordance with customer specifications. Customers can choose from a variety of different shapes and properties thanks to outstanding processing skills. Depending on the shape, an average pore size of 1-400  $\mu$  can be achieved. Dyes and active carbon can also be included.

Thanks to our **GURON®**, we can also guarantee the previously mentioned positive material characteristic for our moulded parts.

### Custom GURON® Materials

GURON® quality	Version	Thickness	Approx. average pore diameter
PE	Reel material, sheet products, pipes, moulded parts	0.50 - 10 mm	1 - 400 $\mu$ (-70 to +80°C)
PTFE	Reel material, sheet products	0.1 - 3.00 mm	1 - 50 $\mu$
TEM	Membrane	6 - 50 $\mu$	0.01 - 30 $\mu$

# Functionalisation possibilities

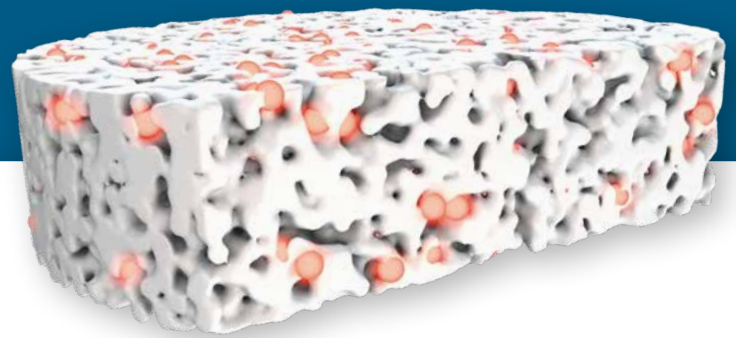
## Adding properties

The sintering process lends itself to adding other than plastic media into the sintered matrix. Media in powder form and resistance to heat, can be mixed into the base powder. The sintering process will lock this media into the open porous structure. This way, liquids or gases passing through the porous structure will interact with the functional media. Examples are active carbon and colouring.

## Hybrids

Hybrids offer clients a special opportunity to create mixtures with chemically active agents immobilized within the GURON® matrix.

Carbon, SPE resins, controlled pore glass (CPG), and carboxymethylcellulose (CMC) powders are common additives. Products and applications utilizing this novel hybrid technology provide benefits over conventional manufacturing processes and marketing differentiation by offering advantages in pore size and controlled flow over traditional layered systems.



## Making VYON® and GURON® hydrophilic

Since HDPE and UHMWPE are inherently hydrophobic, it may be challenging for water and other aqueous solutions to enter or exit the porous structure.

These materials can have their surface energy raised through specific treatments so that they will wet out when exposed to water and other aqueous solutions. This makes it possible for liquids to seep into the porous structure. In addition to being ideal for wicking, absorption, and chromatography hydrophilic VYON® and GURON® can also be used to enhance liquid passage through the structure or allow the porous structure to function as a liquid reservoir (sponge-like).



# Manufacturing capabilities

## Fine form – we make practically anything possible

At KÖPP, we are not just a supplier of filtration material and equipment but also a service provider. We have gained decades of knowledge in this challenging and far-reaching field, making us experts when it comes to filtration technology. This is why customers increasingly involve us in their processes.

We work with you from the outset to advise and create a plan, and meticulously check the application, required characteristics and our processing options. Before we start delivering small through to large batches, our customers can take advantage of the luxury of testing sample parts, that have been produced by us using water jet or laser technology in real-time. This enables us to always provide individual solutions that fit.

### Punching

Punching is the technology of choice when you need consistency and repeatability. With a range of different machines, we are able to die-cut the various grades of VYON® to tight tolerances. This allows our customers to use the die-cut filters in their high-speed, high-volume automation. From tens of thousands to millions of disks run through our punching presses every day.

### Laser cutting

Laser cutting, which we also offer and use if the materials must not come into contact with water, is also suitable for the efficient production of prototypes.

### Water jet cutting

Thanks to our water jet cutting system, we can offer fast throughput times for the production of prototypes in small quantities. No tools are required for water jet cutting. This process is therefore ideal for testing the functionality of a part made from VYON® material quickly and cost-effectively.

### Welding

We use welded VYON® pipes in various lengths and diameters in our water filter systems. For their manufacture, we use a welding process that makes it possible to weld VYON® grades of low thickness (from 1 mm) into pipes. As we do not use any additives during welding, the pipes can also be used for drinking water filtration. The maximum length of our VYON® pipes is up to 2 meters, depending on the wall thickness.





## Cutting/Sawing

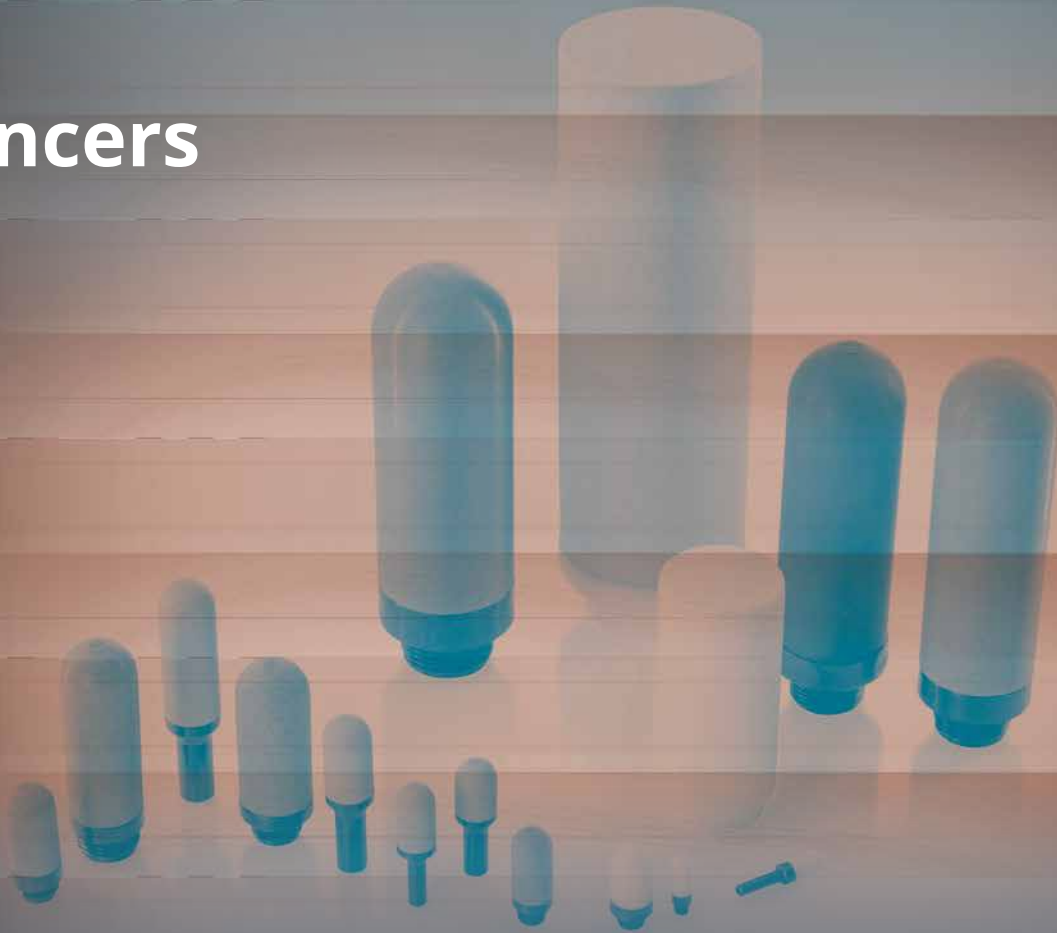
In addition to punching, we can also cut and saw strips from VYON®. There are barely limits to the dimensions. No matter whether it is larger cut parts or narrow strips on rolls.

## Moulded parts

Cutting Edge Components can be made to be simple, complex, or intricate thanks to the GURON® moulding approach. We create complex designs with a wide range of material choices. Thanks to our experience, we can provide moulded products in a range of shapes and sizes, from basic pipette tip filters or sample preparation frits to extremely intricate shapes. Additives such as color, activated compounds like silica to create a composite frit for SPE, or CMC for its self-sealing properties can be used to further improve GURON® moulded three dimensional parts.



# Silencers



## Available in any size

Noise is a health hazard. Reducing noise levels is thus an important task in the health and safety sector. The porous structure of our **VYON®** and **GURON®** materials provides noise reduction of up to 30 dBA. We also provide tailored solutions in addition to our standard silencers. The shape can be adjusted to your exact application.

## Applications

- Standard silencers with BSP and M5 thread for pneumatic systems and motors
- Noise reduction in artificial pneumatic joints (medicine)
- Noise reduction in electric equipment
- Silencers for membrane pumps

Our silencers are generally available from stock in all qualities. Specifications for the available versions and additional information can be found here:



Do you have any questions? Then we look forward to receiving your e-mail at [filter@koepp.de](mailto:filter@koepp.de).

# Why KÖPP?

It is important to know that you are working with professionals when thinking of using porous plastic. Our team specializing in filter technology is always ready to offer you professional solutions that will set you apart from the competition. Learn about us. Our team of professionals is eager to hear from you.

## Smart Engineering

- High precision
- A range of different pore sizes
- Tailored solutions

## Relationships for Life

It's important to comprehend not just the specifications but also the application and performance requirements in order to match your product with the appropriate technology. Every project has a key contact and team assigned to it who will collaborate closely with your business all the way through to completion. Because of the flexibility with which our team operates, we are able to work closely together to successfully complete the project.

## Your Center for Excellence in Quality

You can be sure that our manufacturing processes are optimally controlled and that our raw materials are carefully chosen because we have a high standard for quality and are dedicated to continuous improvement. W. KÖPP is an ISO9001-certified company that welcomes audits on a regular basis.

From its beginnings as a trader in 1938, KÖPP is now a specialist manufacturing and processing cellular materials such as sponge and cellular rubber. With outstanding levels of quality awareness, a high degree of expertise and an extensive range of services, since the 1980s KÖPP has grown into a company with business contacts and customers in the whole of Europe and the world.

Nowadays, we have two production and processing sites in Germany as well as a manufacturing plant in Rumania and one in India. Take advantage of 80 years of production, processing and trade experience.

**KÖPP – experts in foam**

## Your KÖPP filter technology team will be happy to help you at any time:



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# Filter equipment

## Wide range of filter equipment

We offer our customers tried and tested solutions for **domestic, industrial and heating water filtration** applications from a deliberately large range of high-quality water filters, protective filters for heating water, magnetic filters and special filters.

Quality and versatility are appealing. Our products are used in a variety of different applications:

- **Process water filtration**
- **Air filtration**
- **Lab equipment**



[filter@koep.de](mailto:filter@koep.de)



Would you like to learn more about our various filter equipment and their applications? Then request a copy of our "Filter equipment" brochure or download it from our homepage.

## Sealing | Insulating | Isolating | Filtering ... **Solutions in Foam**



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