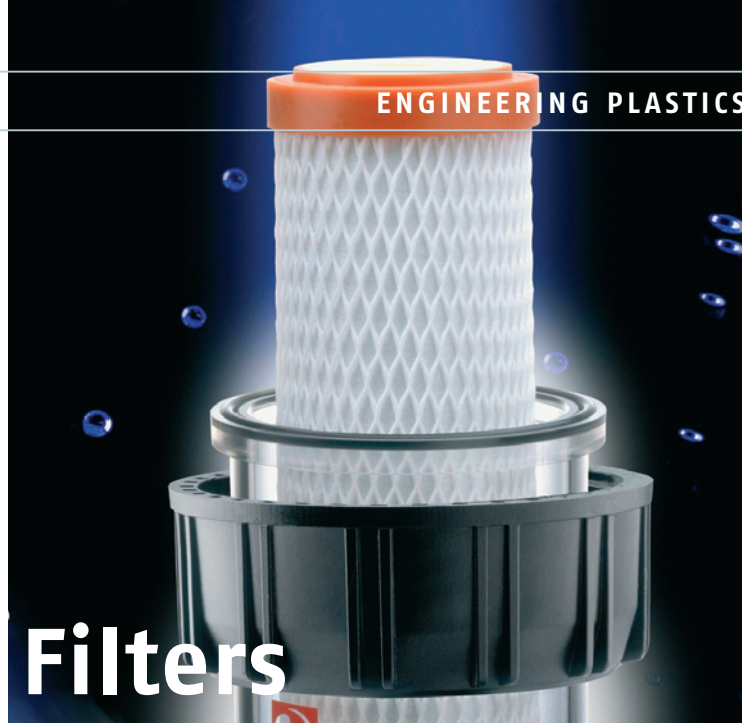


The filter bowls in Carbonit filter systems are produced from a transparent polyamide 12

# Transparency for Water Filters



**Filter Cups Made from Polyamide.** Modern filter systems would be inconceivable without plastics. The transparent filter cups in water filters made by Carbonit Filtertechnik are produced from Grilamid, a thermoplastic polyamide 12 that absorbs virtually no water and is approved for food and drinking-water contact applications.



Fig. 1. Domestic water filter in service

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Engineering plastics play a key role in professional filter systems. They allow the greatest possible freedom of design in manufacture, meet all legislative requirements governing use in contact with food and drinking water and stand up to continuous operation without any

problem. It is not surprising, then, that Carbonit Filtertechnik GmbH, Salzwedel/Germany, a leading supplier of filter systems, uses high-tech plastics in its filters.

The company's different filter models cover a wide spectrum from standard household use (Fig. 1) all the way to special industrial applications and are easy to install, for example between the angle valve and faucet, directly onto the faucet or in the supply line to the building. Common to all the filter systems is a sintered activated carbon filter block, which in certain types of cartridge is combined with a microfiltration membrane. Unlike filters consisting of loose, silvered activated carbon with an ion exchanger, the Carbonit system does not reduce the desirable calcium and magnesium content but leaves these taste-imparting elements in the filtrate. Without further chemical additives, the Carbonit system filters out mainly heavy metals but also numerous other substances, such as medical residues, polar pesticides and microorganisms. It also eliminates the taste of chlorine. The efficiency of the Carbonit system has been confirmed by the TÜV (German authorised body for compulsory inspection of motor vehicles and industrial equipment) and other organisations.

The special fineness of the pores in the filter cartridge prevents bacterial colonisation of the carbon, provided the car-

tridge is changed at the specified intervals. In addition, when the cartridge is saturated, the filter largely seals itself off. In this way there is no risk – as with loosely packed granular carbon – of absorbed contaminants “bleeding” into the filtrate.

## Up-to-date thanks to Engineering Plastics

In terms of processing and materials, Carbonit places special emphasis on using the most up-to-date and innovative filter technology available. Many customers require very high quality standards, since some of the products made by this filter manufacturer are used in sensitive sectors such as medical and pharmaceutical technology. After numerous tests, Carbonit decided to use engineering plastics at various points in the manufacture of the filter systems. In the production of the filter head and ring nut, polyoxymethylene

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(POM) is used. Another high-performance polymer is employed as a binder for the activated carbon block. The properties of this special thermoplastic ensure that the filter block has a high absorption capacity.

For the production of the filter bowls (title picture), Carbonit opted for a polyamide 12 from the Swiss company Ems Chemie AG. Grilamid TR 90 is a transparent, high-strength thermoplastic approved for use in contact with food and drinking water. It has optimum processing properties in injection moulding and retains its very good dimensional stability, even in the long term. The material has shown itself to be very robust when ex-

posed to UV radiation and other weathering effects.

### Polyamide – Material of Choice

Grilamid TR 90 is composed of aliphatic and cycloaliphatic elements and in comparison with other transparent materials has a remarkably low density of only 1 g/cm<sup>3</sup>. Although it is a polyamide, the material is characterised by very low water absorption. The influence of water on mechanical properties is negligible – which is an important requirement for the components of a water filter. This fully amorphous plastic has a glass transition temperature of 155 °C, so that it offers very good strength and rigidity, even at elevated temperatures. In addition to the familiar good properties of polyamides such as toughness and chemical resistance, Grilamid is distinguished by good stress cracking resistance and flexural fatigue strength. The latter property is especially important in the pulsating pressure test for filter units. This polyamide has no problem guaranteeing the required bursting pressure of 60 bar. Unlike other transparent materials, Grilamid exhibits ductile behaviour rather than

brittle fracture when it bursts – another advantage from the safety viewpoint.

This polyamide 12 has obtained all the required approvals for use in direct contact with food and drinking water. The plastic has been tested by the German Association of Gas and Water Engineers (DVGW) and complies with the European recommendations for use in contact with drinking water published by the Federal Institute for Risk Assessment (Bundesinstitut für Risikobewertung, formerly known as the BgVV). For some time now, Ems Grivory has adopted the philosophy that the properties of all plastics supplied for the fluid handling and drinking water sector should meet the requirements of international directives.

Besides filter cups, this polyamide 12 is processed into flow meters of all kinds, spectacle frames, visors for safety helmets and face shields, zip fasteners, baby feeding bottles, clock/watch cases, toothbrushes and transparent household articles for kitchens and bathrooms. ■

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