

## Technical Information

# Additive loading in ACCUREL® MP/XP porous polymer carriers

### Introduction

ACCUREL® MP porous polymer carriers are based on PP, HDPE, LDPE, LLDPE and made in a 2-step process. They do have an open cell structure with interconnected cells. The cell size distribution is roughly between 5 and 20 µm. Depending on the polymer, the porosity ranges from 65 to 78% and the maximum additive loading from 50 to 70%.

ACCUREL®XP porous polymer carriers are based on PP, HDPE, LDPE, LLDPE, EVA, EMA, PA6, PA12, PS, SAN, SBC, ABS, PET, PC, PMMA, PLA resp. water soluble PVOH. They are made in a 1-step physical cell forming process. ACCUREL®XP grades mainly have an open cell structure. The cell size distribution is between 20 and 80 µm. The porosity ranges from 35 to 85% and the maximum additive loading level from 25 to 70%.

The porous polymers act like sponges. Loading of additives into a porous polymer is solely a physical absorption process. Due to capillary forces the accessible porous structure will be filled with additive.

The absorption rate is mainly determined by the viscosity of the additive. Depending on the viscosity the maximum additive loading may be achieved in a time frame from 30 min up to 72 h. ACCUREL®MP/XP is most suitable for liquid, low melting, thermally sensitive, reactive or otherwise difficult to handle additives that cannot be processed by conventional extrusion compounding or masterbatching techniques.

### Requirements

- If the additive is liquid at room temperature, loading can be done at room temperature.
- If the additive is a solid or a paste with a melting point at slightly elevated temperatures, the additive can be melted and loaded at temperatures slightly above the melting point of the additive. However, the loading temperature has to be approx. 40°C below the melting or softening point of the polymer, otherwise the porous structure might collapse.
- If the additive is liquid but highly viscous at room temperature, the viscosity can be reduced in many cases by increasing the temperature. Again, the temperature should be approx. 40°C below the polymer melting or softening point.
- The additive can be dissolved in an organic solvent (ethanol, acetone, IPA).
- The viscosity of the additive should not exceed 30.000 cSt.
- Both hydrophilic/hydrophobic and polar/non polar additives can be loaded. In some cases the addition of wetting agents is required.

## Overview ACCUREL® MP/XP porous polymer carriers

Grade	Polymer	Shape	Bulk Density (typical)	Additive Loading (maximum)
ACCUREL® MP100	PP	Pellets	130 kg/m <sup>3</sup>	70%
ACCUREL® MP1000	PP	Powder	125 kg/m <sup>3</sup>	65%
ACCUREL® MP200	HDPE	Pellets	150 kg/m <sup>3</sup>	65%
ACCUREL® MP300	LLDPE	Pellets	120 kg/m <sup>3</sup>	70%
ACCUREL® MP400	LDPE	Pellets	120 kg/m <sup>3</sup>	65%
ACCUREL® XP100	PP	Pellets	100 kg/m <sup>3</sup>	70%
ACCUREL® XP100-60	PP	Pellets	220 kg/m <sup>3</sup>	40%
ACCUREL® XP200	HDPE	Pellets	110 kg/m <sup>3</sup>	60%
ACCUREL® XP300	PVOH	Pellets	120 kg/m <sup>3</sup>	60%
ACCUREL® XP400	LDPE	Pellets	170 kg/m <sup>3</sup>	50%
ACCUREL® XP500	EVA	Pellets	120 kg/m <sup>3</sup>	50%
ACCUREL® XP550	EMA	Pellets	280 kg/m <sup>3</sup>	30%
ACCUREL® XP601	PC	Pellets	100 kg/m <sup>3</sup>	60%
ACCUREL® XP650	PMMA	Pellets	120 kg/m <sup>3</sup>	50%
ACCUREL® XP700	PA6	Pellets	100 kg/m <sup>3</sup>	60%
ACCUREL® XP712	PA12	Pellets	120 kg/m <sup>3</sup>	65%
ACCUREL® XP800	GPPS	Pellets	100 kg/m <sup>3</sup>	60%
ACCUREL® XP850	SBC	Pellets	240 kg/m <sup>3</sup>	50%
ACCUREL® XP851	SAN	Pellets	100 kg/m <sup>3</sup>	60%
ACCUREL® XP900	PET	Pellets	160 kg/m <sup>3</sup>	50%
ACCUREL® XP950B	BASF Ecoflex	Pellets	210 kg/m <sup>3</sup>	50%
ACCUREL® XP951B	PLA	Pellets	170 kg/m <sup>3</sup>	60%

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**Evonik Nutrition & Care GmbH**  
 Glanzstoffstraße  
 63785 Obernburg, Germany  
 Phone +49 6022-81-2434  
 Fax +49 6022-81-2823  
[interface-performance@evonik.com](mailto:interface-performance@evonik.com)  
[www.evonik.com/interface-performance](http://www.evonik.com/interface-performance)

