

## *Solubility is the solution*

### **BELLAND® Polymer for hard coatings and adhesive bonding**

BELLAND® Polymer is soluble in organic solvents and aqueous alkaline solutions. When applied as a thin layer, such solutions form a film on drying, a property which can be used for protective coatings or bonding applications. Depending on which kind of solvent is used, these coatings can be removed with aqueous alkaline solutions or simply with water.

### **Preparation and processing of BELLAND® Polymer solutions**

#### **Organic solutions**

BELLAND® Polymer 88140 is readily soluble in many organic solvents, for example ethanol, methyl ethyl ketone (MEK), acetone, dimethyl sulfoxide (DMSO), dimethylformamide (DMF). The solubility and rate of dissolution depends on the selected solvent, temperature and the stirring conditions. A conventional reflux condenser must be used when preparing organic solutions.

For instance, a 10 wt% polymer solution in ethanol may be prepared by stirring the BELLAND® Polymer at reflux. If the high boiling solvent dimethylsulfoxide (DMSO) is used, 30 wt% solutions are readily obtainable. It is advisable to add the polymer gradually.

#### **Aqueous alkaline solutions**

The solubility and rate of dissolution depends on the pH-value of the solution, in addition to solvent, temperature and stirring conditions. For example, an alkaline solution of 10 wt% polymer having a pH-value of 10 may be prepared at room temperature. This polymer solution has a viscosity of approx. 16 Pa\*s.

Granules, grade 88140	100 g
Sodium hydroxide (NaOH)	20 g
Deionised water	880 g

If necessary, the viscosity of the solution may be adjusted via the concentration of the polymer. The pH-value of the solution can be adjusted by the quantity of base.

## Aqueous ammoniac solution

As previously described for a NaOH solution, BELLAND<sup>®</sup> *Polymer* is also readily soluble in an aqueous ammoniac solution. An aqueous ammoniac solution containing 5 wt% polymer may be prepared by stirring at room temperature:

Granules, grade 88140	50 g
25% ammonia solution	37 g
Deionised water	913 g

This solution has a viscosity of approx. 3 Pa\*s and a pH-value of approx. 8.

## Coating

The stated solutions may be applied by various coating methods like e.g. spraying. The coating is dried and cured by evaporation of the solvent at elevated temperatures (< 105 °C).

Solutions in protic solvents, for example ethanol, alkaline water, form hard layers on polar surfaces (metal, glass etc.) with very good adhesion. Polymer solutions in aprotic polar solvents (MEK and DMSO) are suitable not only for polar surfaces (aluminium, copper etc.) but also for nonpolar surfaces (thermosets and thermoplastics).

## Removal of the polymer layer

All the stated coatings can be removed in aqueous alkaline solutions with a pH-value of  $\geq 10$ . Coatings produced from aqueous alkaline solutions can be removed with water. The rate of dissolution depends on temperature, the pH-value of the solution and the thickness of the coating.

N.B.

Please read the Material Safety Data Sheets before using BELLAND<sup>®</sup> *Polymer*.

The information provided in this document is intended for guidance only. It is the users own responsibility to take all necessary safety precautions for the preparation of the polymer solutions and when applying and removing the polymer layers. BellandTechnology AG does not accept any liability.