PNC 400
Thickening agent

Chemical and Physical Characteristics (*)

- **Chemical Name**: Carboxyvinyl polymer sodium salt
- **INCI Name**: Sodium Carbomer
- **Appearance**: Hygroscopic white powder
- **Bulk density**: 0.3-0.45 g/cm³
- **pH (0.5% water dispersion)**: 6.0-7.5
- **Viscosity (mPa·s) of water dispersions (Brookfield RV, 20 rpm, 25°C)**:

<table>
<thead>
<tr>
<th>% Dispersion</th>
<th>Viscosity Min.</th>
<th>Viscosity Max.</th>
<th>Spindle</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>13,000</td>
<td>25,000</td>
<td>6</td>
</tr>
<tr>
<td>0.5</td>
<td>35,000</td>
<td>55,000</td>
<td>7</td>
</tr>
</tbody>
</table>

(*) Typical values not qualified for quality control purpose

Applications

PNC 400 is a pre-neutralized synthetic polymer that can be used as a thickening, suspending agent and stabilizer in most cosmetic products. PNC 400 possesses all the characteristics and advantages of a 940-type carbomer, without the typical problems of dispersion and neutralization.

The use of pre-neutralized carbomers provides several advantages:
- superior handling (low dusting powder);
- quick dispersion;
- simplification of production process (elimination of neutralizing phase);
- constant pH during all the production process;
- possibility to modify the viscosity of finished products.

PNC 400 dispersions are characterized by high viscosity and clarity (see Fig. 1 and 2).

Use

Contrary to traditional carbomers, PNC 400 does not require any pre-dispersion. It thickens the formulation as soon as it is sprinkled into water or a water/alcohol blend (up to 70:30), giving a clear viscous gel.

The shape of the agitator and the agitation speed are different from those used to disperse the acid polymer. The best procedure is to use the equipment normally employed during the neutralizing phase of carbomer (anchor type). Slow addition of the powder avoids the formation of lumps and guarantees quick thickening.

During the preparation of emulsions, PNC 400 can be dispersed into the oil or the water phase before the emulsification step. It can also be sprinkled directly into the emulsion, stirring until a homogeneous system is obtained.

![Figure 1 - Viscosity vs. polymer concentration](image1)

![Figure 2 - Viscosity vs. pH of polymer dispersion](image2)
The pH achieved at 0.5% in water is around 7. If a lower pH is required, small adjustments are possible by the addition of acids (e.g. HCl, H$_3$PO$_4$, citric and lactic acid). High amounts of acid should be avoided because of the formation of salt that negatively affects the viscosity.

If a strong reduction of pH is needed, a blend of PNC 400 and the corresponding acid polymer (i.e. SYNTALEN® K) provides good viscosity in a broad range of pH without using any neutralizing agent.

Under normal conditions, gels prepared with PNC 400 neither prevent nor promote the growth of microorganisms; therefore the addition of a suitable preservative system, such as ABIOL (Imidazolidinyl Urea), is advisable.

UV radiation can cause the loss of viscosity in PNC 400 gels. The addition of water-soluble UV-absorbers, such as UVASORB® S5 (Benzophenone-4), can help to prevent polymer degradation.

**Toxicological Information**

- **LD$_{50}$ (oral)**: > 2000 mg/kg
- **Acute skin irritation**: non-irritant
- **Acute eye irritation**: non-irritant
- **Skin sensitization (max. test)**: non-sensitizing

(Toxicological tests performed on the acid form)

**Transport, Storage and Handling**

**Labeling:** Product is not classified as hazardous according to international transport regulations.

Store in the original closed containers in a dry cool place. Protect from moisture.

Do not breathe dust and avoid contact with skin, eyes and mucous membranes. In case of contact, wash immediately with plenty of water.

**For further information, please refer to safety data sheet.**