

Carrier sheet for preparing skin packaging

The present invention relates to a carrier sheet for preparing skin packaging.

The DE-A-41 42 796 describes a carrier sheet for packed articles for the preparation of skin packaging where the carrier sheet is made of plastic and is joined over its surface to a film-like skin to form a seal. Both the carrier sheet and the film-like skin may be made of polyethylene. This offers the advantage that the used skin packaging can be readily recycled as a single-substance packaging material.

The following requirements are placed on carrier sheets:

1. Uniform pore diameter distribution.
2. A certain ultimate tensile strength.
3. A uniform surface quality which permits printing.
4. A bubble point of roughly 30 to 100 μm .

Good carrier sheets made of polyethylene in accordance with the present invention have an average pore diameter of 20 to 50 μm , in particular 25 to 35 μm , a bubble point of 30 to 100 μm , in particular 50 to 60 μm , and an ultimate tensile strength of 4 to 7 N/mm^2 . Said carrier sheets ensure that the film-like skin can be drawn easily and uniformly around the article to be packed by means of a vacuum source

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located underneath the carrier sheet and that the carrier sheet can then be welded to the skin.

Surprisingly, it was discovered that a good carrier sheet is always produced when a low-pressure polyethylene having a density of 0.92 to 0.96 g/cm³, a viscosity number of 250 to 2000 ml/g and an average grain size of 80 to 120 µm is used as the starting material for preparing the carrier sheet and is sintered at a temperature of 170 to 250°C.

The property values of the low-pressure polyethylene are determined according to the following methods:

Density: DIN 53479

Viscosity number: DIN 53728

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The average grain size was determined according to the laser diffraction method with an analysis instrument from Sympatec GmbH, Burgstätter Straße 6, D-3392 Claustal-Zellerfeld, and using the analysis method developed by this company.

The quality of the carrier sheet was determined according to the following methods:

Pore diameter and bubble point are determined according to ASTM F 316-86.

Ultimate tensile strength: DIN 53455



The drawing shows a section through a skin package.

The skin package consists of the carrier sheet 1 on which the article to be packed 2 is tightly enveloped by the film-like skin 3. The skin 3 and the carrier sheet 1 are welded to each other at seam 4.

The invention is explained with the aid of the following examples:

The carrier sheets examined in the following examples were obtained by rolling the polyethylene powder to be analysed onto an aluminium sheet as a 1 mm thick film and conducting the sintering process in a circulating-air furnace of Heraeus, Hanau, at 170°C for a period of 20 minutes.

For comparative example 4 the sintering process was conducted at 190°C for 40 minutes.

Example 1

A polyethylene powder having a density of 0.94 g/cm³, a viscosity number of 600 ml/g and an average grain size of 120 µm was sintered.

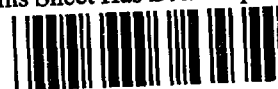
With a uniform surface quality an average pore diameter of 28 µm, a bubble point of 55 µm and an ultimate tensile strength of 6.5 N/mm² were determined.

Comparative example 2

A polyethylene powder having a density of 0.95 g/cm³, a viscosity number of 320 ml/g and an average grain size of 210 µm was sintered.

An average pore diameter of 85 μm , a bubble point of 130 μm and an ultimate tensile strength of 8.0 N/mm^2 were determined. The surface quality was too uneven for printing.

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Comparative example 3

A polyethylene powder having a density of 0.94 g/cm^3 , a viscosity number of 280 ml/g and an average grain size of 300 μm was sintered.

An average pore diameter of 98 μm , a bubble point of 138 μm and an ultimate tensile strength of 2.5 N/mm^2 were determined. The surface quality was too uneven for printing.

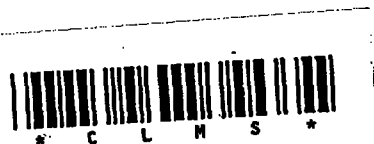
Comparative example 4

A polyethylene powder having a density of 0.93 g/cm^3 , a viscosity number of 2400 ml/g and an average grain size of 120 μm was sintered.

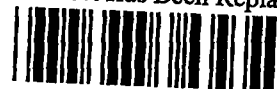
With a uniform surface quality, an average pore diameter of 25 μm , a bubble point of 52 μm and an ultimate tensile strength of 2 N/mm^2 were determined. This product is unsuitable as a carrier material owing to its lack of rigidity.

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Claims



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1. A carrier sheet for preparing skin packaging made of polyethylene having an average pore diameter of 20 to 50 μm , in particular 25 to 35 μm , a bubble point of 30 to 100 μm , in particular 50 to 60 μm , and an ultimate tensile strength of 4 to 7 N/mm^2 .
2. A carrier sheet according to claim 1, characterised in that low-pressure polyethylene having a density of 0.92 to 0.96 g/cm^3 , a viscosity number of 250 to 2000 ml/g and an average grain size of 80 to 200 μm is sintered.
3. A carrier sheet according to claims 1 and 2, characterised in that the low-pressure polyethylene is sintered at a temperature of 170 to 250°C.