A particular intention is that the said process be capable of operation with short cycle times and with a low scrap rate or low production defects.

Another intention is that the process be economic for average output rates of from 1000 to 100 000 units/year.

A very particular object of the present invention was to provide a process which can produce transparent plastics mouldings without pimples or other defects on the surface, and at the same time without optically relevant stresses in the polymer matrix.

Summary

In a first aspect of the present disclosure, there is provided a vacuum thermoforming process for producing transparent mouldings, characterized in that the process is composed of the following steps:

a) prior temperature control of the mould and of a preform made of a transparent plastic,

b) premoulding of the said preform,

c) shaping within the mould, under sub-atmospheric pressure and at a mould temperature which is above the Vicat softening point of the transparent plastic,

d) cooling of the shaping mould, and also of the component, and

e) removal of the transparent moulding.

In a second aspect of the present disclosure, there is provided the use of a transparent moulding which has been produced as defined above for automobile glazing, as window in a building, as lamp covering or as decorative element.

Achievement of object

The objects were achieved by providing a novel vacuum thermoforming process. The said novel process can for the first time produce transparent mouldings such as those that can be used by way of example for automobile glazing with economic cycle times. The said process is composed of the following steps:

a) prior temperature control of the mould and of a preform made of a transparent plastic,

b) premoulding of the said preform, preferably by means of compressed air or under sub-atmospheric pressure, e.g. in a vacuum,

c) shaping within the mould, at a mould temperature which is above the Vicat softening point of the transparent plastic, under sub-atmospheric pressure, e.g. in a vacuum,

d) cooling of the shaping mould, and also of the component, and

e) removal of the transparent moulding.

The prior temperature control in step a) can preferably be achieved by means of induction by a Variotherm mould, by means of IR radiation or by an electrical cartridge heater.

In general terms the fact that transparent mouldings of this type can be produced with high optical quality by means of a vacuum thermoforming process is in itself already surprising. Mouldings produced by means of a vacuum thermoforming process according to the prior art exhibited relatively high levels of stress in the polymer matrix, which in turn led to relatively high levels of distortion for an observer of an image viewed through the panel. Surprisingly,