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SUMMARY~~DISCLOSURE OF THE INVENTION~~

Problems to be Solved ~~by the Invention~~

As mentioned above, consideration into suppressing the generation of blisters has been actively conducted. With the above-mentioned methods of improving liquid crystalline resin compositions, it becomes necessary to consider whether or not the properties are suited to the application. In other words, in a case of suppressing blister generation of a liquid crystalline resin composition that is preferable in a particular application, since the above-mentioned liquid crystalline resin composition is changed in the method of improving the conventional materials, it is necessary to reconsider whether or not the liquid crystalline resin composition has the desired properties. Therefore, technology for suppressing the generation of blisters irrespective of the type of liquid crystalline resin composition to be used has been demanded so that it is not necessary to make the above-mentioned property considerations.

In addition, it is possible to suppress the generation of blisters if lowering the injection rate when injection molding a liquid crystalline resin material. However, it is strongly demanded to raise the injection rate from the viewpoint of a productivity improvement in the molding product.

The present ~~invention~~disclosure has been made in order to solve the

above-mentioned issues, and an object thereof is to provide a method of manufacturing a molded article that can curb the generation of blisters irrespective of the type of liquid crystalline resin composition to be used, as well as can raise the productivity of the molded article to close to the limit, and a method of suppressing the generation of blisters.

Means for Solving the Problems

The present inventors focused on the matter of liquid crystalline resin compositions holding air in the molten state during molding, and carried out diligent research in order to solve the above such problems. As a result, it was found that the holding of air mainly causing blister generation occurs due to the sprue, and further, found the that above-mentioned problems could be solved by deriving the relationship between the maximum injection volume (Vc_{max}) for which blisters do not generate and the ratio ($\Phi s/\Phi n$) between the exit diameter of the sprue and the exit diameter of the nozzle by a function of a predetermined form ($Vc_{max}=f(\Phi s/\Phi n)$), and injection molding a liquid crystalline resin composition under conditions satisfying $Vc_{max}<(\Phi s/\Phi n)$, thereby arriving at completion of the present ~~invention~~disclosure. More specifically, the present ~~invention~~disclosure provides the following.

According to a first ~~aspect~~embodiment of the ~~invention~~present disclosure, a method manufacturing a molded article includes: a step of measuring a maximum injection volume $(Vc_{max})_1$ which does not generate a blister on a surface of the molded article when a liquid crystalline resin composition is injection molded under a

predetermined molding condition; a step of measuring a maximum injection volume $(Vc_{max})_2$ which does not generate a blister on the surface of the molded article when the liquid crystalline resin composition is injection-molded changing a ratio ($\Phi s/\Phi n$) of an exit diameter (Φs) of a sprue and an exit diameter (Φn) of a nozzle; and a step of deriving the relation between a maximum injection volume (Vc_{max}) which does not generate a blister and the ratio ($\Phi s/\Phi n$) of the sprue exit diameter and the nozzle exit diameter by a function ($Vc_{max} = f(\Phi s/\Phi n)$) of a predetermined form, wherein the liquid crystalline resin composition is injection molded under conditions satisfying Vc_{max} (cm^3/sec) $< f(\Phi s/\Phi n)$.

According to an aspect of the present disclosure, there is provided a method of manufacturing a molded article characterized in comprising:

a step of measuring a maximum injection volume $(Vc_{max})_1$ which does not generate a blister on a surface of the molded article when a liquid crystalline resin composition is injection molded under a predetermined molding condition,

a step of measuring a maximum injection volume $(Vc_{max})_2$ which does not generate a blister on the surface of the molded article when the liquid crystalline resin composition is injection-molded changing a ratio ($\Phi s/\Phi n$) of an exit diameter (Φs) of a sprue and an exit diameter (Φn) of a nozzle, and

a step of deriving the relation between a maximum injection volume (Vc_{max}) which does not generate a blister and the ratio ($\Phi s/\Phi n$) of the sprue exit diameter and the nozzle exit diameter by a function ($Vc_{max} = f(\Phi s/\Phi n)$) of a predetermined form; wherein

the liquid crystalline resin composition is injection molded under conditions satisfying Vc_{max} (cm^3/sec) < $f(\Phi s/\Phi n)$, and wherein the exit diameter (Φ_n) of said nozzle is no more than 3 mm.

According to a second ~~aspect~~embodiment of the ~~invention~~present disclosure, in the method of manufacturing a molded article as described above~~in the first aspect~~, the function of predetermined form is represented by the following Equation (I), and the liquid crystalline resin composition is injection molded under molding conditions satisfying the following Equation (II):

$$Vc_{max}(cm^3/sec) < -45(\Phi s/\Phi n) + 240 \cdots (I)$$

$$\Phi n < 3\ mm \cdots (II)$$

According to a third ~~aspect~~embodiment of the ~~invention~~present disclosure, in the method of manufacturing a molded article as described above~~in the first or second aspect~~, the nozzle exit diameter (Φn) is no more than 2 mm.

According to a fourth ~~aspect~~embodiment of the ~~invention~~present disclosure, in the method of manufacturing a molded article as described above~~in any one of the first to third aspects~~, the liquid crystalline

resin composition contains a glass fiber.

According to a fifth ~~aspect~~embodiment of the ~~invention~~present disclosure, in the method of manufacturing a molded article as described above~~in any one of the first to fourth aspects~~, the ratio (Φs/Φn) of the exit diameter of the sprue and the exit diameter of the nozzle is no more than 4.5.

According to another ~~sixth~~ aspect of the ~~invention~~present disclosure, there is provided a method of suppressing blister generation when injection molding a liquid crystalline resin composition by making a ratio of an exit diameter (mm) of a sprue and an exit diameter (mm) of a nozzle (Φs/Φn) no more than a predetermined value.

According to a further~~seventh~~ ~~aspect~~embodiment of the ~~invention~~present disclosure, in the method of suppressing blister generation as described in the above~~sixth~~ aspect, the predetermined value is no more than 4.5 and the exit diameter (Φn) of the abovementioned nozzle is no more than 3 mm.

Effects of the ~~Invention~~Present Disclosure

According to the present ~~invention~~disclosure, it is possible to easily derive the conditions with the largest injection volume possible. The productivity of a molding product obtained is higher with a larger injection volume. As a result, it is possible to raise the productivity of a molding product to near the limit when molding a liquid crystalline resin composition. In addition, the present ~~invention~~disclosure has no restrictions in the liquid crystalline resin composition to be used therewith. Therefore, reconsideration of the properties due to material changes also become unnecessary, and it is