[008] Processing aids in small quantities in thermoplastic polymer compositions in general and in halogenated polymer compositions in particularly can improve the processing characteristics through an acceleration of the fusion process of said thermoplastic polymer compositions in general and of halogenated polymer compositions in particularly.

[009] With a filler added to the composition, the processing aid used for the non-filled composition does not possess the same performance as in a filled composition, especially in view of fusion efficiency of the composition, but also in view of impact strength.

[010] The objective of the present disclosure is to propose a polymer composition which acts as processing aid for filled halogenated polymer compositions.

[011] The objective of the present disclosure is as well to propose a polymer composition which acts as processing aid for filled halogenated polymer compositions independently of the ratio of the filler in the final composition.

[012] An objective of the present disclosure is also to have a polymer composition that can be used to optimize the melt behaviour especially the speed of fusion of filled halogenated polymer compositions.

[013] Another objective of the present disclosure is to avoid the change of the polymer composition acting as processing aid depending on the ratio of the filler in the filled halogenated polymer compositions.

[014] An additional objective of the present disclosure is the reduction of the price of a polymer composition which acts as processing aid for filled halogenated polymer compositions by addition of low cost components without influencing the fusion efficiency.

[015] Still another objective of the present disclosure is a method for manufacturing a polymer composition which act as processing aid for filled halogenated polymer compositions.

[016] Still an additional objective is having a process for preparing a polymer composition that can be used to increase the melt behaviour of filled halogenated polymer compositions.

[017] Still a further objective is to obtain a filled halogenated polymer composition that is easily processable independently of the ratio of the filler and has the same (meth) acrylic processing aid.

[018] A still further objective of the present disclosure is also to have a polymer composition that can be used to optimize the melt behaviour especially the speed of fusion of filled halogenated polymer compositions and does not influence in a important way the impact performance, latter meaning keeping the level or a decrease of less than 50%.

[BACKGROUND OF THE INVENTION]Prior art

[019] The document US 2009/0111915 discloses acrylic copolymers for use in highly filled compositions. In particular the document disclosed filled polyvinylchloride (PVC) materials as a composition for flooring comprising 70wt% to 95wt% filler, 1wt% to 15wt%PVC and 0.5wt% to 4wt% of acrylic copolymer or a composition for siding or pipe comprising 15wt% to 35wt% filler, 50wt% to 95wt%PVC and 0.25 to 6wt% of acrylic copolymer.

[020] The document WO 2010/099160 discloses composite polymer modifiers. The document discloses a composite polymer modifier consisting of 99wt% to 1wt% of inorganic filler and from 1wt% to 99wt% of a polymeric processing aid and 0wt% to 80% of an impact modifier.

[021] The document US 3,373,229 discloses vinyl polymer compositions. The compositions comprises polyvinyl chloride and high molecular weight polymers of methyl methacrylate or

copolymers of methyl meth acrylate with a small amount of an alkyl acrylate as processing aid. The composition might comprise a filler.

[022] The document US 4,329,276 discloses molding components. The molding component is based on polyvinyl chloride comprising a component composition. The component composition and comprises between 40-85wt% of an acrylic polymer preferably having a Tg between 70°C and 90°C, and comprising preferably methyl methacrylate and butyl methacrylate in a proportion 50/50 to 85/15.

[023] The document US2012/189837 discloses an acrylic process aid for vinyl foam extrusion. The acrylic process aid is an acrylic copolymer preferably having a Tg less than 60°C. In the examples a copolymer of methy methacrylate (70%) with butyl acrylate (30%) is disclosed. The acrylic copolymer used does not comprise a filler.

[024] None of the prior art documents discloses a filled polymer composition comprising a halogen containing thermoplastic polymer and a (meth)acrylic copolymer with a filler where a part of the filler is added to the composition with the (meth)acrylic copolymer and a part of the filler is added to the composition with the halogen containing thermoplastic polymer.

[Brief description]

[025] Surprisingly it has been found that a composition comprising

a) a (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b)

b) a filler (F) or a mixture of two fillers (F1) and (F2)

c) a halogen containing thermoplastic polymer

characterized that the glass transition temperature Tg of the (meth)acrylic copolymer (A1) is less than 105°C and that the quantity of the filler (F) or the mixture of two fillers (F1) and (F2) is between 1phr and 250phr relative to the halogen containing thermoplastic polymer, gives a composition with a short fusion time.

[025a] In an aspect, there is provided a composition comprising:
a) a (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b)
b) a filler (F) or a mixture of two fillers (F1) and (F2)
c) a halogen containing thermoplastic polymer
characterized that the glass transition temperature Tg of the (meth)acrylic copolymer (A1) or the mixture of two (meth)acrylic copolymers (A1a) and (A1b) is less than 105°C and that the quantity of the filler F or the mixture of two fillers (F1) and (F2) is between 1phr and 250phr relative to the halogen containing thermoplastic polymer.

[026] Surprisingly it has also been found that a process for preparing a composition comprising

a) a (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b)

b) a filler (F) or a mixture of two fillers (F1) and (F2)

c) a halogen containing thermoplastic polymer

said process comprises the step of

blending a compositions P1 with a halogen containing polymer and a filler (F) or (F2) characterized that

the composition P1 comprises an (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b) and a filler (F) or (F1) and

wherein the glass transition temperature Tg of the (meth)acrylic copolymer (A1) or the mixture of two (meth)acrylic copolymers (A1a) and (A1b) is less than 105°C and that the quantity of the filler (F1) and (F2) together is between 1phr and 250phr in view of the halogen containing thermoplastic polymer, gives a composition with a short fusion time.

[026a] In another aspect, there is provided a process for preparing a composition as defined above, said process comprises the step of blending a compositions P1 with a halogen containing polymer and a filler (F) or (F2)

characterized that the composition P1 comprises an (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b) and a filler (F) or (F1) and

wherein the glass transition temperature Tg of the (meth)acrylic copolymer is less than 105°C and that the quantity of the filler (F) or (F1) and (F2) together is between 1phr and 250phr in view of the halogen containing thermoplastic polymer.

[027] Surprisingly it has also been found that a process for preparing a composition comprising

a) a (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b)

b) a filler (F) or a mixture of two fillers (F1) and (F2)

c) a halogen containing thermoplastic polymer

said process comprises the step of

blending two compositions P1 and P2 characterized that

the composition P1 comprises an (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b) and a filler F1 and

the composition P2 a halogen containing polymer and a filler F2

wherein the glass transition temperature Tg of the (meth)acrylic copolymer (A1) or the mixture of two (meth)acrylic copolymers (A1a) and (A1b) is less than 105°C and that the quantity of the filler (F1) and (F2) together is between 1phr and 250phr in view

of the halogen containing thermoplastic polymer, gives a composition with a short fusion time.

[027a] In another aspect, there is provided a process for preparing a composition as defined above, said process comprises the step of

blending two compositions P1 and P2 characterized that

the composition P1 comprises an (meth)acrylic copolymer (A1) or mixture of two (meth)acrylic copolymers (A1a) and (A1b) and a filler F or F1 and the composition P2 comprises a halogen containing polymer and a filler F or F2

characterized that the glass transition temperature Tg of the (meth)acrylic copolymer (A1) or mixture of two (meth)acrylic copolymers (A1a) and (A1b) is less than 105°C and that the quantity of the filler F or F1 and F2 together is between 1phr and 250phr in view of the halogen containing thermoplastic polymer.

[028] Surprisingly it has also been found that a composition P1 comprising an (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b) and a filler (F) or (F1) can be used to decrease the fusion time of composition comprising a halogen containing polymer and a filler (F) or (F2) wherein the glass transition temperature Tg of the (meth)acrylic copolymer is less than 105°C and that the quantity of the filler (F) or (F1) and (F2) together is between 1phr and 250phr in view of the halogen containing thermoplastic polymer.

[029] Surprisingly it has also been found that a composition P1 comprising an (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b) and a filler (F) or (F1) can be used to decrease the fusion time of composition P2 comprising halogen containing polymer and a filler (F) or (F2) wherein the glass transition temperature Tg of the (meth)acrylic copolymer is less than 105°C and that the quantity of the filler (F) or (F1) and (F2) together is between 1phr and 250phr in view of the halogen containing thermoplastic polymer.

[029a] In another aspect, there is provided the use of a composition P1 comprising an (meth)acrylic copolymer (A1) or a mixture of two

(meth)acrylic copolymers (A1a) and (A1b) and a filler F or F1 to decrease the fusion time of a composition comprising a halogen containing polymer and a filler (F) or (F2), characterized that the glass transition temperature Tg of the (meth)acrylic copolymer (A1) or the mixture of two (meth)acrylic copolymers (A1a) and (A1b) is less than 105°C and the quantity of the filler F or the mixture of two fillers (F1) and (F2) is between 1phr and 250phr relative to the halogen containing thermoplastic polymer.

[029b] In another aspect, there is provided the use of a composition P1 comprising an (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b) and a filler F1 to decrease the fusion time of composition P2 comprising halogen containing polymer and filler F2, characterized that the glass transition temperature Tg of the (meth)acrylic copolymer (A1) or the mixture of two (meth)acrylic copolymers (A1a) and (A1b) is less than 105°C and the quantity of the two fillers (F1) and (F2) is between 1phr and 250phr relative to the halogen containing thermoplastic polymer.

[029c] In another aspect, there is provided an article comprising a composition as defined above or a composition prepared by a process as defined above.

[Detailed description of the invention]

[030] According to a first aspect, the present invention relates to a composition comprising

a) a (meth)acrylic copolymer (A1) or a mixture of two (meth)acrylic copolymers (A1a) and (A1b)

b) a filler (F) or a mixture of two fillers (F1) and (F2)

c) a halogen containing thermoplastic polymer

characterized that the glass transition temperature Tg of the (meth)acrylic copolymer (A1) or the mixture of two (meth)acrylic copolymers (A1a) and (A1b) is less than 105°C and that the quantity of the filler (F) or the mixture of two fillers (F1) and (F2) is between 1phr and 250phr relative to the halogen containing thermoplastic polymer.