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(54) Title: GLASS FIBER FORMING COMPOSITIONS

(57) **Abstract:** Mathematical relationship for ingredients for fiber glass compositions are used to identify properties of the glass. In particular the forming temperature and delta T. In one embodiment, the mathematical relationship of the ingredients is of a generic quaternary SiO₂, CaO, Al₂O₃ and MgO glass system. The relationship of SiO₂, CaO, Al₂O₃ and MgO of interest include RO = CaO + MgO, SiO₂/CaO, SiO₂/RO, SiO₂/Al₂O₃; Al₂O₃/CaO; SiO₂ + Al₂O₃; SiO₂ - RO and Al₂O₃/RO or RO/Al₂O₃. when other ingredients or components are added to the glass batch materials to alter the forming and/or liquidus temperatures of the glass, for example Na₂O, Li₂O, K₂O and B₂O₃ the following mathematical relationships are of interest, (SiO₂ + Al₂O₃)/(R2O + RO + B₂O₃) where RO is as previously defined and R2O = Na₂O + Li₂O + K₂O. Each of the compositional features of the glass identified above reflects the relative balance between the fluidity (i.e. viscosity) of the glass melt and its crystallization potential. Low boron or boron free fiber glass compositions having a low forming temperature, e.g. 1178 to 1240 °C and a delta T greater than 50 °C in order that the composition can be processed at a low temperature while reducing the possibility of devitrification of the molten glass in the bushing area during a glass fiber forming operation. Fiber glass compositions having low boron, e.g. less than 5.10 percent by weight has a low forming temperature, e.g. 1193 to 1240 °C and a delta T greater than 50 °C.



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