Business from technology

Monitoring
liquid polymer

Solution and its benefits

For monitoring polymer in liquid state to reduce inhomogeneities, such as incompletely dispersed additives, impurities from polymerization or compounding, spatial variation in molar mass and gel particles. At the inspection point, electromagnetic radiation in the form of UV light or polarised electromagnetic radiation is passed through the flow chamber and received by a detector and the absorption of the UV light or the changes in the state of polarisation of the electromagnetic radiation caused by the inhomogeneities are used to observe.

Competitive advantage

The method efficiently detects phase heterogeneities, such as gels at an early stage in the liquid state polymer, such as polymer melt or resin. The monitoring method allows to visualize different areas in the polymer liquid which has not undergone solidification and one dimensionally oriented, and is still in an original free-flowing state before any exposure to air or cooling that changes its material or mechanical properties.

The method removes all background inhomogeneities automatically with slow rate of change, and without interrupting the monitoring of the polymer melt, such as when monitoring and extrusion process, without missing impurities due to an interrupting background measuring procedure. The flow of the polymer liquid can also be monitored inside an extruder (single-screw or multiple-screws) or continuous kneader, in the transition region between the screw(s) and die, or inside the die of an extruder or continuous kneader.

Technical description

Method for monitoring polymer in liquid state, such as a polymer melt or resin, to detect inhomogeneities, such as the presence of other phase objects, especially gels in a matrix formed of the liquid state, involves monitoring the liquid polymer flowing past an inspection point, to form an image, and passing electromagnetic radiation in the form of UV light or polarized electro-magnetic radiation, through the flow, at the inspection point. The absorption of the UV light or the changes in the state of polarization of the electro-magnetic radiation caused by the inhomogeneities are used to observe the inhomogeneities in the formed image.

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10 reasons for technology partnering with VTT

1. Key factor in Finland's success story with a track record to prove it
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4. New business and product concepts based on strong IP and world class research
5. Combined experience of more than 2,000 motivated researchers in eight focused areas of technology
6. Active member in hundreds of scientific & business communities
7. Excellent track record as coordinator and partner in EU projects
8. Collaboration with TOP 50 R&D companies in Finland
9. Global R&D partnership with 50 Fortune 500 companies
10. Market driven multi-disciplinary solutions

Intellectual property

Ettmuller J; Heffels C; Huber P; Mours M; Reindel K; Sadowski J; Salminen J: Method for monitoring of polymer in liquid state

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Additional information

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