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How to Deal With Residual Stress in ... - Plastics Technology

Residual stresses are the main cause of part shrinkage and warpage. The process conditions and design elements that reduce shear stress during cavity filling will help to reduce flow-induced residual stress. Likewise, those that promote sufficient packing and uniform mold cooling will reduce thermal-induced residual stress.

Residual Stress - Industrial Metallurgists

Residual Stress Analysis in Injection Moulded Polycarbonate Samples A. Magnier, B. Scholtes, T. Niendorf Abstract. The current paper presents results of residual stress measurements in injection moulded polycarbonate samples, which have been processed in various ways to introduce different residual stress states. The hole drilling as well as the ring-core method were used and methodological [...]

Measuring Residual Stress In Transparent Plastics ...

A special version of the MTS3000 – Restan system can be used to determine residual stress on plastic and polymeric materials. It is actually the ONLY system in the world specifically designed to carry out these tests, thanks to a modification of standard drilling technology. Drilling is done at very low speed (200 RPM) in order not to generate local heat in the material, and at reduced feed speed to minimize the effect of drilling in determining residual stresses (approx. 0.1 mm/min).

What is Residual Stress? - TWI

The quality of molded parts made of clear thermoplastic polymers is determined by the absence or presence of residual stresses. In this work we analyzed the flow-induced residual stresses, which cause serious damage to plastic parts used in automotive and optical applications. Plastic cover lenses (PCLs) are important components of LED and bulb headlights that are produced by the injection molding process (IMP).

Residual Stress, molded plastic parts, China mold supplier

Residual stress affects significantly the quality of plastic lenses. In this paper, the influence of process parameters on the residual stress of injection compression molded plastic lenses was investigated by orthogonal simulation.

Residual stress - Wikipedia

Residual stress in ceramics and glasses can not be relieved by plastic deformation like in metals. They can be caused by chemical treatments and ion implantation of surfaces as well as during...

Relaxation of residual stresses in plastic cover lenses ...

Residual stresses are those stresses that remain in an object (in particular, in a welded component) even in the absence of external loading or thermal gradients. In some cases, residual stresses result in significant plastic deformation, leading to warping and distortion of an object. In others, they affect susceptibility to fracture and fatigue.

Is it possible to have residual stress without plastic ...

These regions are left in a state of residual tension and the regions which were plastically deformed are in a state of residual compression. In general, the sign of the residual stress produced by non-uniform deformation will be opposite the sign of the plastic deformation which produced the residual stress.

Stresstech Bulletin 12: Measurement Methods of Residual ...

Residual stresses are determined from the diffraction data by calculating the strain from the diffraction peak positions. Any stress, including applied or residual stresses, induces a strain which corresponds to changes in lattice spacing.

Residual stress for molded parts - Plastic Mold

In-cavity residual stress While the part is still constrained in the mold cavity, the internal stress that accumulates during solidification is referred to as in-cavity residual stress. This in-cavity residual stress is the force that drives post-ejection part shrinkage and warpage.

Residual Stress In Plastics Home

This is an issue in all injection molded parts and the fact is, we cannot mold even the simplest plastic part without some residual stress. This residual stress should be evaluated during design, molding, fixturing and part performance. Residual stress can be significant and often shows up as part failures after the part has been shipped, assembled and in use for a while. How and why is this?

Bing: Residual Stress In Plastics Home

Residual stresses are introduced by nearly all techniques used for polymer manufacturing. They form as a result of extrusion, stretching, drawing, molding, casting, joining, or other strain-inducing processes. Strains can be introduced by differential shrinkage, uneven cooling, or nonuniform flow.

DEPC (MN) 027 - NPL

Current methods for detecting residual stress in plastics include birefringence, layer removal, hole drilling [3- 7] and the chemical probe technique. All of these techniques have their limitations. The birefringence technique measures changes in the optical properties of a polymer that occur when residual stresses are present.

Stress: Diagnose It Before It Ruins Your Parts : Plastics ...

Residual stress is an inherent result of plastics manufacturing processes and occurs when molten polymer is cooled and shaped. Sometimes, these stresses are intentionally produced to impart desirable characteristics, such as in oriented PET films and bottles.

Residual stress on plastic materials - SINT TECHNOLOGY

Additionally, the polymer chains cannot always get back into the state they want to be in, which leaves those areas of the part in a non-ideal state that develops stress from molding. This stress is often referred to as residual stress, or molded-in stress.

Residual Stress Analysis in Injection Moulded ...

Residual stresses can result from a variety of mechanisms including inelastic (plastic) deformations, temperature gradients (during thermal cycle) or structural changes (phase transformation). Heat from welding may cause localized expansion, which is taken up during welding by either the molten metal or the placement of parts being welded.

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