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Nota di contenuto	Introduction -- Theoretical Principles -- Glass and their Photoelastic Behaviour -- Photoelastic Methods for Measuring Anisotropy Effects -- Photoelastic Measurements on Tempered Flat Glass.-Experimental Field Studies on Tempered Flat Glass -- Methods for evaluating Anisotropy Effects in Glass -- Evaluation and Concept -- Summary and further Research -- Experiments Results -- Field Study Test Results.
Sommario/riassunto	Optical anisotropy eects can occur in building envelopes made of tempered glass. The visual eect has been neglected in the evaluation of the building product and increasingly leads to disputes between the parties involved. This thesis extends the state of knowledge on the cause and perception of optical anisotropic eects and presents a concept for measuring and evaluating them in at monolithic tempered architectural glass. Initially, an overview and description of current photoelastic measurement methods are given, and the accuracy of the used measurement setups is veried for the rst time. The experimental basis for the concept is formed by extensive full-eld retardation measurements in the laboratory and eld studies of the maximum visibility of the anisotropy eects in an outdoor test rig with accompanying polarization measurements of the sky. Various glass types, geometries, and tempering levels are selected based on typically used products, and their inuence on the resulting retardation image is investigated. Determining a correlation of the retardation images with

the reection images of selected test specimens in the outdoor test rig complements the experiments. Based on this, digital evaluation methods are presented, further developed, and applied to the measured retardation images. From the critical analysis of these results, limit values for dierent anisotropy quality classes are derived, and the concept is complemented. With the implementation of the evaluation methods and the limit values in commercial anisotropy scanners, the quality of each glass pane can be determined directly after tempering in the future. By choosing the highest quality class A, it will be possible to signicantly reduce anisotropy eects in constructions made of tempered glass panes. The Author Steffen Dix, began his career at seele GmbH in 2003 as a technical draftsman apprentice. In 2015, he received a Master's degree in civil engineering with a focus on steel, lightweight, and glass construction from the University of Applied Sciences in Munich. During his studies from 2009 to 2015, he worked in the Labor für Stahl- und Leichtmetallbau, starting as a working student and later as a Research Assistant. His research focused on adhesives in façade design and the strength and quality of pre-stressed glass products, culminating in his dissertation on the measurement and evaluation of optical anisotropy effects in tempered architectural glass. From 2016 to 2022, he also worked as a freelance expert in glass and façade construction for the Ingenieurbüro für Bautechnik Schuler in Karlsruhe. Since 2022, the author is working as Technical Solution Manager at Josef Gartner GmbH (Permasteelisa), where he develops individual and innovative façade constructions.