

Identifying and Specifying Direction of Extrusion For Glazing Applications

When specifying TUFFAK polycarbonate sheet for transportation, heavy equipment or architectural glazing applications, Direction of Extrusion (DOE) can be specified for improved viewer comfort. Extruding polycarbonate sheet inherently induces roll wave distortion, also known as ripple. A person viewing straight through polycarbonate sheet would not typically be able to detect the inherent optical distortion. This roll wave distortion becomes more apparent as the viewing angle increases. Viewing sheet at an oblique angle will highlight inherent optical distortion and roll wave distortion. Thin gauge sheet 0.080 - 0.250" (2.032-6.35 mm) will have relatively low levels of optical distortion and roll wave distortion, but even the best sheet has some distortion, and an oblique angle will highlight it. Optical distortion and roll wave typically increase as sheet gauge is increased, with 0.500" (12.7mm) being the most prominent.

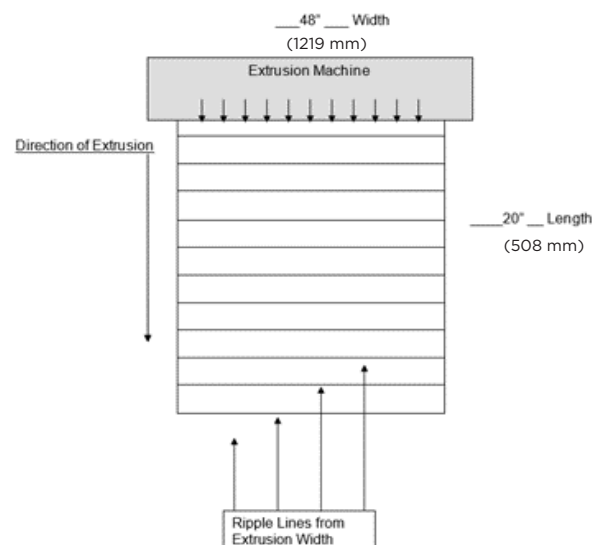
A range of TUFFAK products are targeted to address specific applications requiring the highest quality levels. These specialty grades minimize distortion and roll wave. TUFFAK TG and TUFFAK HV have been created specifically for transit and heavy equipment applications.

For side facing windows, glazing is most commonly installed with roll wave ripple distortion running horizontal (parallel to the ground) in the final assembly. If the ripples are installed running vertically in the final assembly, the distortion is much more apparent when viewing passing objects. In the case of a rail passengers, the viewing angle can be quite oblique for a passenger sitting next to the window. The moving objects viewed in the oblique angle intensifies the roll wave effect on optical distortion.

For forward facing windshields, glazing is most commonly installed with roll wave ripple distortion running vertical (perpendicular to the ground) in the final assembly. If the ripples are installed running horizontally in the final assembly, the distortion effect can be much more visible as the passenger/operator looks through the windshield while the vehicle is moving forward. The view is more likely to move up and down highlighting any horizontal roll wave distortion.

Many vehicles are being designed with lower sloped windshields for better aerodynamics and aesthetics. In this case, the increased viewing angle intensifies the visibility of distortion. One exception to this scenario is for a windshield installed on a turret-based cab where the majority of vehicle operation involves side-to-side movement. In this case, roll wave distortion may be preferred to be positioned horizontally / parallel to the ground.

In the example below, if the train windows are 48" (1219 mm) wide and 20" (508 mm) tall, the direction of extrusion would be specified as depicted to the right. The DOE would be specified in the 48" (1219 mm) dimension. If masking is intact, the video jet ink printer information on the sheet's edge will also give the indication of extrusion direction as the ink is laid down in the direction of extrusion.



These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use are beyond our control. We recommend that the prospective user determines the suitability of our materials and suggestions before adopting them on a commercial scale.

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