

Glass-ribbon

Glass Substrate

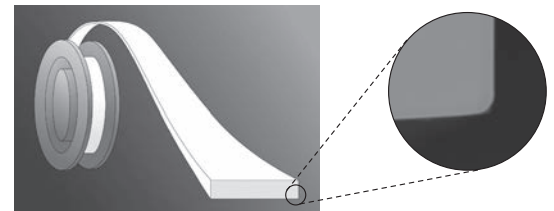
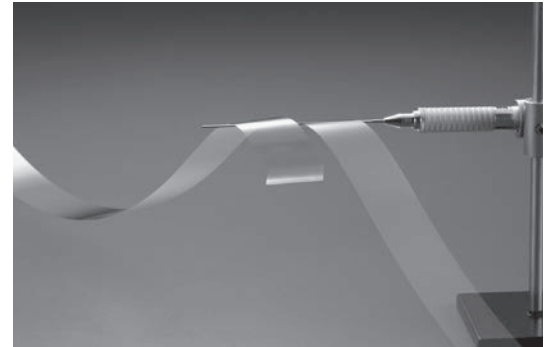
Glass-ribbon is so thin that it can be bent or rolled up like resin film. The glass surface is unpolished, but it is extremely flat and smooth. Glass-ribbon is characterized by rounded edges on both sides, as shown in the bottom photo. This enables enhanced durability in the face of bending and twisting pressure.

Features

- Super thin
- High flexibility
- Chemical durability

Properties

Glass Material		A	D
Coefficient of thermal expansion	$\times 10^{-7}/K$	66	38
Softening point	$^{\circ}C$	740	940
Dielectric constant	1MHz, 25 $^{\circ}C$	6.5	5.3
Refractive index (n_d)		1.51	1.52
Young's modulus	GPa	77	73



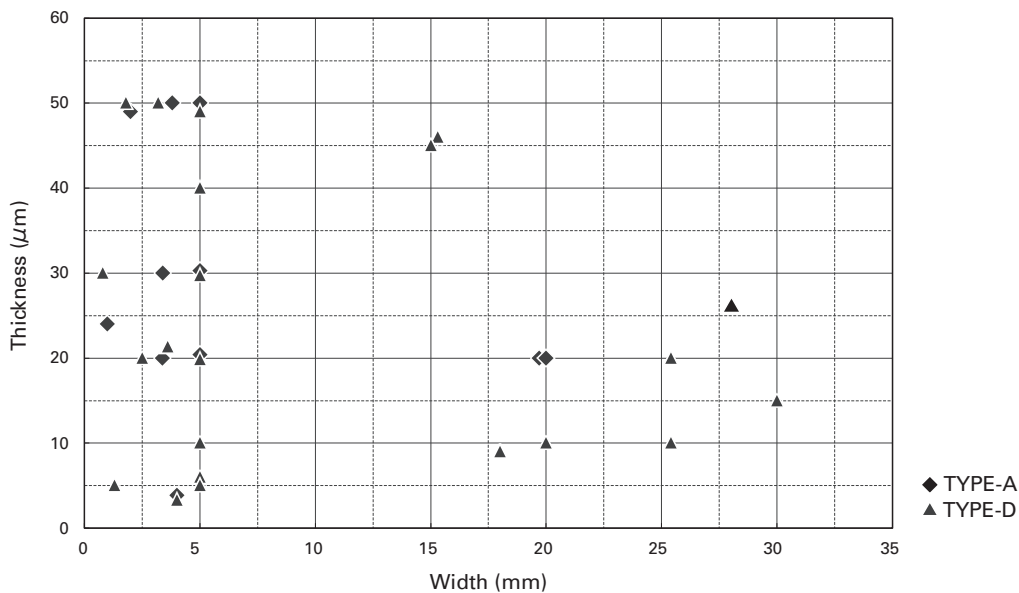
SEM image of enlarged edge

Dimensions

Thickness	4 μm -50 μm	Thickness tolerance : $\pm 0.002mm$ with thickness of 0.010mm and over $\pm 0.001mm$ with thickness under 0.010mm
Width	0.5mm-30mm	Width tolerance : $\pm 0.5mm$ with width of 10mm and over $\pm 0.1mm$ with width under 10mm
Aspect ratio (width/thickness)	Up to 2500	
Length	Up to 100m	

We are able to accommodate individual requests.

Sample Lineup

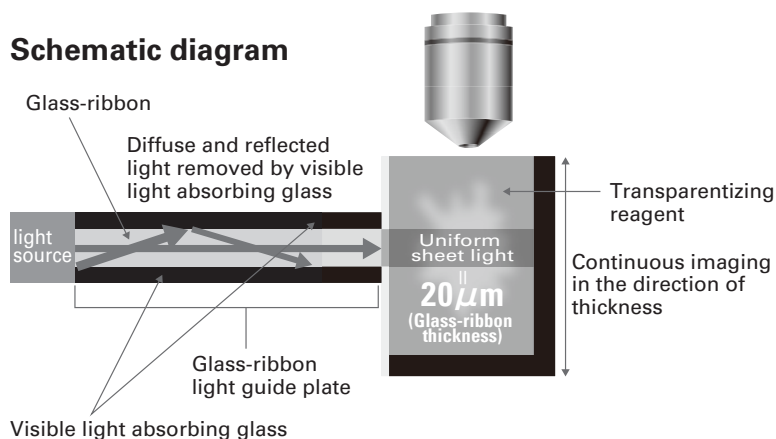


Applications

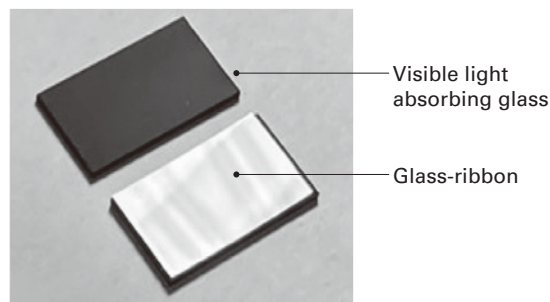
Light Guide Plate

Glass-ribbon is applied as a light guide plate for the optical sheet microscope light source, HandySPIM, developed by PhotonTech Innovations Co., Ltd. Glass-ribbon with high precision thickness can generate uniform sheet light, contributing to high-resolution specimen observation.

Schematic diagram

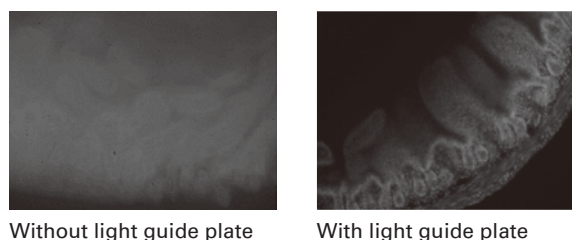


Structure of the light guide plate



Structure with glass-ribbon sandwiched between visible light absorbing glass

Sample : Image of mouse small intestine

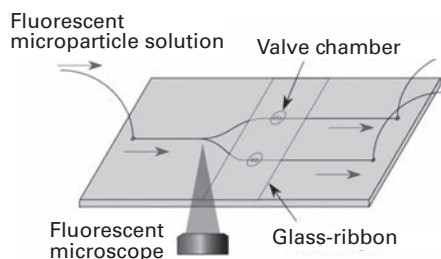


Microchip for Micro Total Analysis System

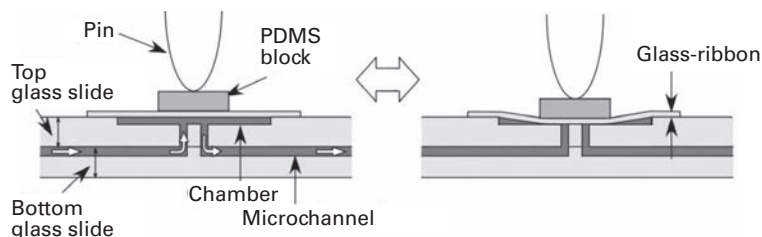
Glass-ribbon has been adopted for microchip stop valves of the Micro Total Analysis System that was developed by RIKEN. Glass-ribbon is extremely thin (4-6 μm) and can be created

in precisely required sizes. RIKEN has highly appreciated Glass-ribbon and has adopted it as a suitable material for valves to control solution flows.

Design and observation method of a prototype chip for valve demonstration



Cross-sectional view showing the working principle of the valve



Patentee : RIKEN Patent : JP Patent No. 6172711; US Patent No. 9073054
Reference

"Electric actuating valves incorporated into an all glass-based microchip exploiting the flexibility of ultra-thin glass"

Tanaka RSC Advances, 3(26), 10213-10220 (2013)

Images courtesy of RIKEN