

Junkosha Fluid Transfer Tubing

Barrier Tubing

Barrier tubing



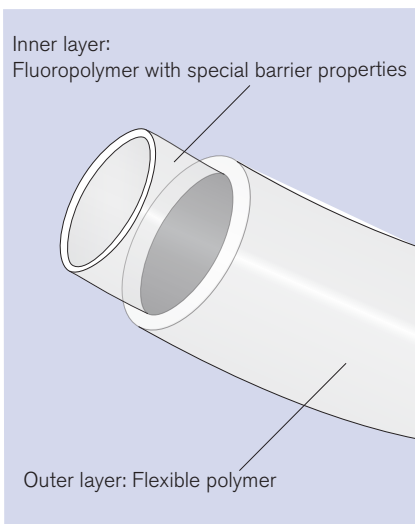
- Inner layer (exposed to liquid) is comprised of fluoropolymer with barrier properties.
- Repels and is highly resistant to solvents, chemicals, and oil.
- Hybridization confers flexibility, which conventional fluoropolymer tubing lacks.
- Intermediate layer (HB2) is comprised of a gas barrier polymer.
- Outer layer is comprised of a special UV polymer that shields against long wave UV radiation while maintaining the visibility of the tubing interior (HB3).

Tube types

Barrier tubes are divided into three types based on their usage.

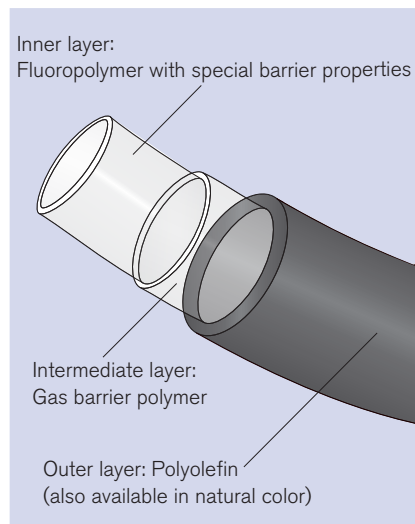
HB1

Solvent/moisture barrier tubing



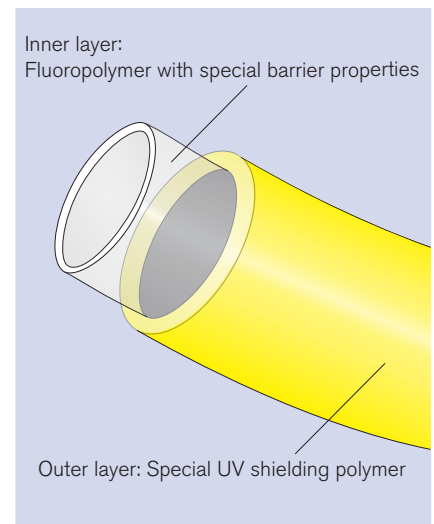
HB2

Gas/oxygen barrier tubing



HB3

Transparent UV shielding tubing



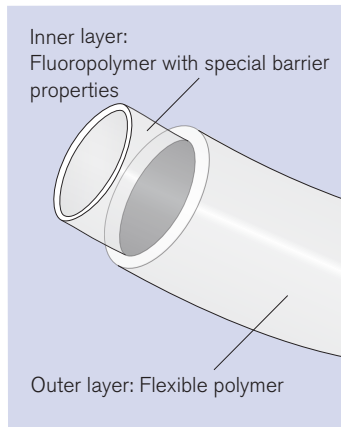
Chemical resistance of barrier tubing

	Chemical	Inner layer	Outer layer		
			HB1	HB2	HB3
Inorganic acid	Hydrochloric acid	◎	×	○	○
	Sulfuric acid	◎	×	○	○
	Nitric acid	◎	×	×	×
	Hydrogen peroxide	◎	▲	○	○
Inorganic base	Sodium hydroxide	◎	○	○	○
	Ammonia water	◎	◎	○	○
Hydrocarbon	Benzene	◎	▲	×	×
	Toluene	◎	▲	×	×
	Xylene	◎	▲	×	×
	Hexane	◎	▲	○	○
	Mineral oil	◎	○	×	×
Water	Water	◎	◎	◎	◎
	Seawater	◎	◎	◎	◎

	Chemical	Inner layer	Outer layer		
			HB1	HB2	HB3
Ester	Ethyl acetate	◎	○	▲	▲
	n-Butyl acetate	◎	○	▲	▲
	Amyl acetate	◎	○	▲	▲
Alcohol	Methanol	◎	×	○	○
	Ethanol	◎	×	○	○
	Propyl alcohol	◎	×	○	○
Ketone	Glycols	◎	○	○	○
	Acetone	◎	▲	○	○
	Methyl ethyl ketone	◎	▲	○	○
	Methyl isobutyl ketone	◎	▲	○	○
Ether	Tetrahydrofuran	◎	▲	×	×

◎ : Unaffected ○ : Highly resistant
 ▲ : Resistance degrades × : Affected

HB1 Solvent/moisture barrier tubing



Part No.	Tube size I.D. (mm) × O.D. (mm)	Maximum working pressure (MPa)	Minimum bending radius (mm)
HB1-0320	2.0×3.0	0.50	19
HB1-0430	3.0×4.0	0.35	36
HB1-0640	4.0×6.0	0.50	33
HB1-0860	6.0×8.0	0.35	78

- Color: Natural or black
- Continuous service temperature range: 0 to 70°C

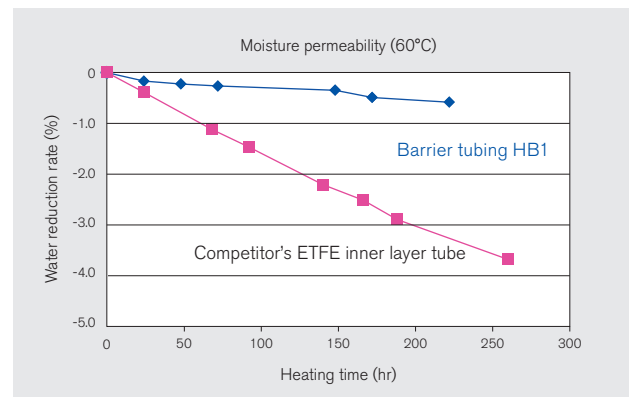
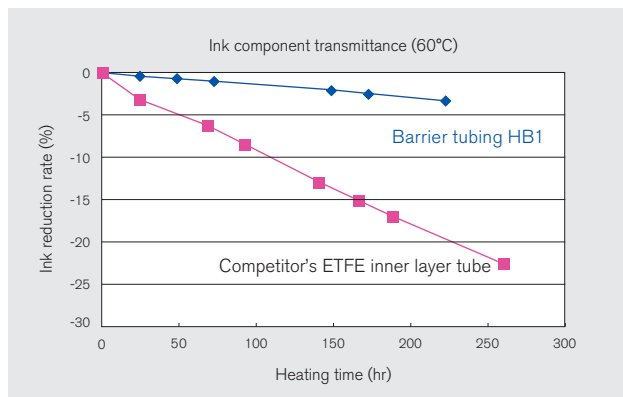
Features

- Inner layer is comprised of fluoropolymer with barrier properties.
- Repels and is highly resistant to solvents, chemicals, and oil.
- Strong solvent and moisture barrier properties help suppress changes in composition of fluid in the tube.
- Hybridization confers flexibility, which conventional fluoropolymer tubing lacks.

Applications

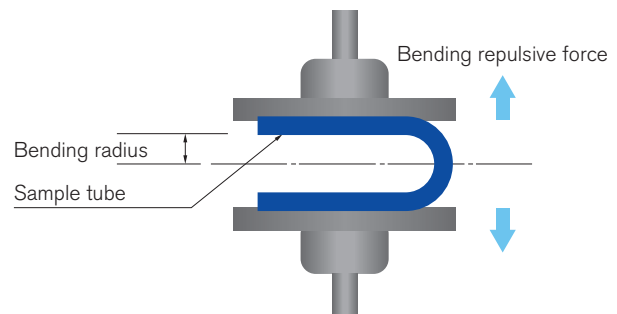
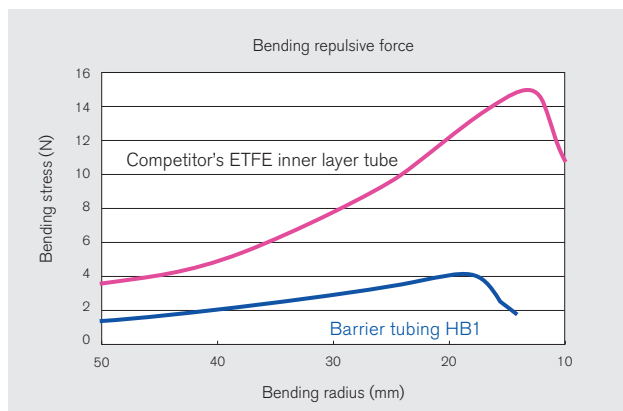
- Transfer tubes for paint, ink, and solvents
- Transfer tubes for chemicals used for LCD and organic EL display production
- Tubes for food colors, binders, and pure water used for food and pharmaceutical manufacturing systems

Solvent and moisture barrier performance

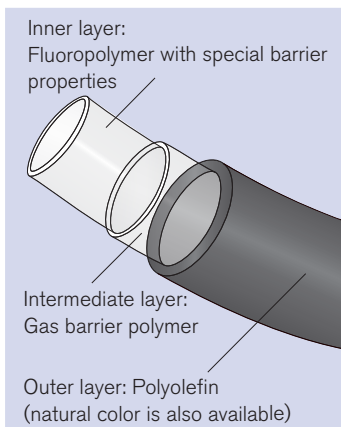


Flexibility comparison

Sample tubes (ø 6 × 4 mm) are bent into a U-shape and the repulsive force is measured by varying the bend radius from 50 mm to 10 mm.



HB2 Gas/oxygen barrier tubing



Part No.	Tube size I.D. (mm) × O.D. (mm)	Maximum working pressure (MPa)	Minimum bending radius (mm)
HB2-0320	2.0×3.0	0.50	28
HB2-0430	3.0×4.0	0.35	45
HB2-0640	4.0×6.0	0.50	45
HB2-0860	6.0×8.0	0.35	90

- Color: Natural or black
- Continuous service temperature range: 0 to 70°C

Features

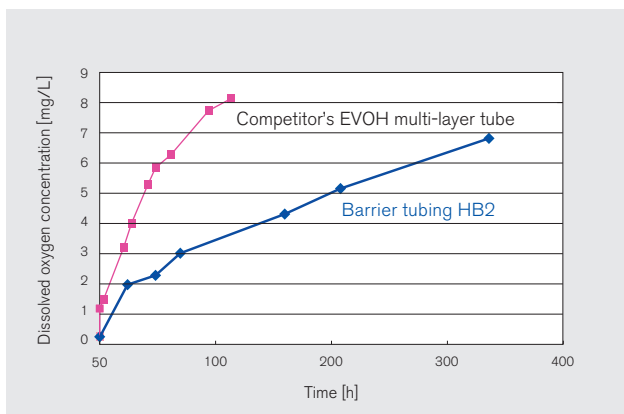
- Inner layer is made of fluoropolymer with barrier properties.
- Repels and is highly resistant to solvents, chemicals, and oil.
- Intermediate layer is composed of a gas barrier polymer.
- Conventional gas barrier polymers are brittle. In contrast, the gas barrier polymer used for the intermediate layer of the HB2 tube is flexible, making it ideal for uses that require bending or sliding.
- Hybridization confers flexibility, which conventional fluoropolymer tubing lacks.

Applications

- Transfer tubes for paint, ink, and solvents
- Transfer tubes for chemicals used for LCD and organic EL display production
- Transfer tubes required to prevent oxidation of fluid inside the tube—e.g., metallic paste
- Tubes required to prevent oxygen or other gas from dissolving into a fluid inside the tube
- Tubes for food colors, binders, and pure water used for food and pharmaceutical manufacturing systems

Oxygen transmission test

Sample tubes are filled with degassed water and changes in concentration of dissolved oxygen passing through the tubes measured.



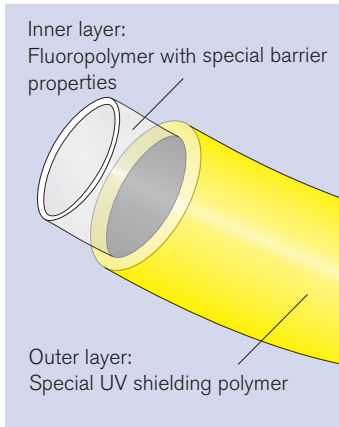
Test conditions

Tube size: $\varnothing 3 \times 4$ mm
 Test environment: 35°C, 80% RH

Result

The HB2 barrier tubing suppresses the dissolution rate of oxygen and exhibits excellent oxygen barrier properties.

HB3 Transparent UV shielding tubing



Part No.	Tube size I.D. (mm) × O.D. (mm)	Maximum working pressure (MPa)	Minimum bending radius (mm)
HB3-0430	3.0×4.0	0.35	35
HB3-0640	4.0×6.0	0.50	37
HB3-0860	6.0×8.0	0.35	77

- Color: Yellow
- Continuous service temperature range: 0 to 70°C

Features

- Inner layer is comprised of fluoropolymer with barrier properties.
- Outer layer is comprised of a special UV polymer that shields against long wave UV radiation while maintaining the visibility of the tubing interior (HB3).
- Hybridization confers flexibility, which conventional fluoropolymer tubing lacks.

Applications

- Transfer tubes for UV-curable paint and ink
- Tubes required to prevent UV from affecting fluid inside the tube

Comparison of ink solidification prevention and visibility

The tubes are filled with ink and exposed to black light (365 nm) for two hours, after which their cross sections are observed.



Non-shielding tube

The ink solidifies.



UV-shielding tube

The ink does not solidify.



Black tube

The ink does not solidify.

Ink visibility



From top to bottom:
 Non-shielding tube
 HB3 barrier tubing (Interior is visible.)
 Black tube (Fluid inside is not visible.)

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