

Glass Tubes for Reed Switches (KTRS 90 Series)

KTRS 92 Series Features:

- High IR absorption rate enables short sealing time with laser or halogen lamps
- Can be well sealed with 52 Ni-Fe alloy.
- Fire Polished. Available in one-side-sealed/ both-side-open format
- High dimensional accuracy. Dimensional tolerance as good as $\pm 0.01\text{mm}$
- ISO 14644-1 Class 6/ Federal Standard 209E Class 1,000/ M4.5 clean rooms with patented cleaning process provides excellent cleanliness and reliability
- Lead free. RoHS/ California Prop 65 compliant
- Special coating available upon request. Fully customizable size with color options

KTRS 90 Series Properties

PARAMETERS	UNITS	VALUES
Sealing Alloy		NiFe 52
Coefficient of Thermal Expansion (30~380°C)	$10^{-7}/\text{K}$	90 ± 0.5
Phase Transition Temperature	°C	440
Softening Point ($\eta=10^{7.6}$ dPas)	°C	650
Working Point ($\eta=10^4$ dPas)	°C	990
Density (20°C)	g/cm^3	2.5 ± 0.03
Modulus of Elasticity	GPa	72
Refractive Index	/	1.516
Tk-100MΩ·cm	°C	250
Electrical Volume Resistivity (log ρ at 250°C)	MΩ/cm	9 ± 0.2
Electrical Volume Resistivity (log ρ at 350°C)	MΩ/cm	6.4
Dielectric Constant (25°C, 1MHz)	/	6.5
Tangent of Loss Angle ($\tan \delta$) (25°C, 1MHz)	/	2.5×10^{-3}
Water Resistance Level (ISO 719)	Level	3
Acid Resistance Level (ISO 1776)	Level	1
Alkaline Resistance Level (ISO 695)	Level	2

KTRS 90 Series Dimensions

Outer Diameter (mm)	Wall Thickness (mm)	Length (mm)
1.702-5.0 $\pm 0.05^*$	0.25-0.67 ± 0.05	11.1-52.8 ± 0.05

*Special order with OD 5mm+ is available upon request

Kiseki New Material Co., Ltd.

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Glass Tubes for Reed Switches (KTRS 48 Series)

KTRS 48 Series Features:

- Low CTE for high-voltage resistance
- Fire Polished. Available in one-side-sealed/ both-side-open format
- High dimensional accuracy. Dimensional tolerance as good as $\pm 0.01\text{mm}$
- ISO 14644-1 Class 6/ Federal Standard 209E Class 1,000/ M4.5 clean rooms with patented cleaning process provides excellent cleanliness and reliability
- Lead free. RoHS/ California Prop 65 compliant
- Special coating available upon request. Fully customizable size with color options

KTRS 48 Series Properties

PARAMETERS	UNITS	VALUES
Coefficient of Thermal Expansion (30 ~ 380°C)	$\times 10^{-7}/\text{K}$	48
Annealing Point	°C	500
Phase Transition Temperature	°C	550
Softening Point ($\eta=10^{7.6}$ dPas)	°C	575 \pm 10
Working Point ($\eta=10^4$ dPas)	°C	1220
Density (20°C)	g/cm^3	2.25 \pm 0.05
Thermal Stability	°C	≥ 200
Tk-100M Ω ·cm	°C	≥ 305
Tangent of Loss Angle (tan δ) (20°C, 6MHz)	/	≤ 30

KTRS 48 Series Dimensions

OD (mm)	Wall Thickness (mm)	Length (mm)
1.702-5.0 \pm 0.05*	0.25-0.67 \pm 0.05	11.1-52.8 \pm 0.05

* Special order with OD 5mm+ is available upon request

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Glass Tubes for Diodes (KTDD 90 Series)
KTDD 90 Series Features:

- Can be well sealed with platinum wires and dumet wires
- Well applied in diode and thermistor sealing
- Fire Polished
- High dimensional accuracy. Dimensional tolerance as good as $\pm 0.01\text{mm}$
- ISO 14644-1 Class 6/ Federal Standard 209E Class 1,000/ M4.5 clean rooms with patented cleaning process provides excellent cleanliness and reliability
- Lead free. RoHS/ California Prop 65 compliant
- Special coating available upon request. Fully customizable size with color options

KTDD 90 Series Properties

PARAMETERS	UNITS	VALUES
Coefficient of Thermal Expansion (30 ~ 380°C)	$\times 10^{-7}/\text{K}$	90
Annealing Point	°C	450
Phase Transition ($\eta=10^{13.4}$ dPas)	°C	470
Softening Point ($\eta=10^{7.6}$ dPas)	°C	620
Working Point ($\eta=10^5$ dPas)	°C	870
Density (20°C)	g/cm^3	2.6
Modulus of Elasticity	MPa	77
Thermal Stability	°C	≥ 210
Tk-100MΩ·cm	°C	≥ 150
Electrical Volume Resistivity (log ρ at 250°C)	MΩ/cm	6.8
Dielectric Constant (20°C, 450MHz)	/	8.7
Water Resistance Level (ISO 719)	Level	1
Acid Resistance Level	Level	3
Sealing Point ($\eta=10^7$ dPas)	°C	600

KTDD 90 Series Dimensions

Outer Diameter (mm)	Wall Thickness (mm)	Length (mm)
1.6-2.5 \pm 0.05	0.7-1.47 \pm 0.05	2.13-4.26 \pm 0.03

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Glass Tubes/ Vials for Animal Identification Glass Tags (KTAI 70 Series)
KTAI 70 Series Features::

- Borosilicate glass. Well applied in animal identification chip sealing (for example, with EM 4305 chip)
- Excellent biocompatibility and safety.
- Fire Polished. Available in vial/ both-side-open tube format
- ISO 14644-1 Class 6/ Federal Standard 209E Class 1,000/ M4.5 clean rooms with patented cleaning process provides excellent cleanliness and reliability
- Lead free. RoHS/ California Prop 65 compliant
- Fully customizable size with color options

KTAI 70 Series Properties

PARAMETERS	UNITS	VALUES
Coefficient of Thermal Expansion (30 ~ 380°C)	$\times 10^{-7}/K$	70
Annealing Point	°C	540
Phase Transition ($\eta=10^{13.4}$ dPas)	°C	560
Softening Point ($\eta=10^{7.6}$ dPas)	°C	780
Working Point ($\eta=10^4$ dPas)	°C	1060
Density (20°C)	g/cm^3	2.46
Modulus of Elasticity	MPa	77
Thermal Stability	°C	≥ 230
Tk-100M Ω -cm	°C	≥ 250
Electrical Volume Resistivity (log ρ at 350°C)	M Ω/cm	8.0
Water Resistance Level (ISO 719)	Level	1
Acid Resistance Level	Level	1

KTAI 70 Series Dimensions

Outer Diameter (mm)	Wall Thickness (mm)	Length (mm)
1.4–4.0 \pm 0.05	0.13–0.4 \pm 0.03	7–35 \pm 0.05

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Glass Tubes/ Capillaries for Optical Connectors and Splices (KTOP 48 Series)

KTOP 48 Series Features:

- Similar coefficient of expansion with molybdenum and kovar alloy
- Well applied in optical connectors, photomultiplier tubes, and photoelectric sensors
- Fire Polished
- High dimensional accuracy. Dimensional tolerance as good as $\pm 0.001\text{mm}$
- ISO 14644-1 Class 6/ Federal Standard 209E Class 1,000/ M4.5 clean rooms with patented cleaning process provides excellent cleanliness and reliability
- Lead free. RoHS/ California Prop 65 compliant
- Fully customizable size

KTOP 48 Series Properties

PARAMETERS	UNITS	VALUES
Coefficient of Thermal Expansion (30 ~ 380°C)	$\times 10^{-7}/\text{K}$	48
Annealing Point	°C	500
Phase Transition ($\eta=10^{13.4}$ dPas)	°C	520
Softening Point ($\eta=10^{7.6}$ dPas)	°C	705
Density (20°C)	g/cm^3	2.23
Thermal Stability	°C	≥ 200
Tk-100M Ω -cm	°C	≥ 305
Tangent of Loss Angle ($\tan \delta$) (20°C, 6MHz)	/	≤ 30
Water Resistance Level	Level	5

KTOP 48 Series Dimensions

Outer Diameter (mm)	Wall Thickness (mm)	Length (mm)
1.4-4.0 ± 0.02	1.01-3.0 ± 0.02	2.5-26 ± 0.05

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Glass Tubes for Glass Fuses (KTFS 70 Series)

KTFS 70 Series Features:

- Borosilicate glass. Contains high percentage of SiO₂ and low percentage of R₂O
- Small coefficient of linear expansion, small dispersion, good chemical stability, high thermal stability, and good electrical insulation.
- Well applied in pharmaceutical and electronics applications, like ampoules, blood collection tubes, animal tags, fuses, and photoelectric sensors.

KTFS 70 Series Properties

PARAMETERS	UNITS	VALUES
Coefficient of Thermal Expansion (30 ~ 380°C)	×10 ⁻⁷ /K	70
Annealing Point	°C	540
Phase Transition (η=10 ^{13.4} dPas)	°C	560
Softening Point (η=10 ^{7.6} dPas)	°C	780
Working Point (η=10 ⁴ dPas)	°C	1060
Density (20°C)	g/cm ³	2.46
Modulus of Elasticity	MPa	77
Thermal Stability	°C	≥230
Tk-100MΩ·cm	°C	≥250
Electrical Volume Resistivity (log ρ at 350°C)	MΩ/cm	8.0
Water Resistance Level (ISO 719)	Level	1
Acid Resistance Level	Level	1

KTFS 70 Series Dimensions

Outer Diameter (mm)	Wall Thickness (mm)	Length (mm)
3.0-10±0.05	0.5-1.2±0.05	10-50±0.1

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Glass Tubes for Ampoules and Tube Injections (ZTAM 70 Series)

ZTAM 70 Series Properties

PARAMETERS	UNITS	VALUES
Average Coefficient of Linear Expansion (20-300°C)	$10^{-7}/K$	70
Strain Point	°C	510
Annealing Point	°C	550
Softening Point	°C	730
Working Point	°C	1050
Density (20°C)	g/m^{-3}	2.45
Water Resistance Level (YBB00252003)	Level	1
SiO ₂	%	70
B ₂ O ₃	%	6.8
Al ₂ O ₃	%	5.9
CaO	%	3.3
BaO	%	2
K ₂ O/Na ₂ O	%	11.8

ZTAM 70-1 Series Dimensions

Parameter (ml)	Outer Diameter (mm)		Wall Thickness (mm)			Length (mm)		Straightness 1,000mm
	Nominal	Tolerance	Nominal	Tolerance	Skewness	Nominal	Tolerance	
1	10.00	±0.22	0.50	±0.03	≤0.04	700- 2000	±6	≤2.5‰
2	11.50							
5	16.00	±0.26	0.55	±0.04	≤0.05			
10	18.40	±0.30	0.60					
20	22.00		0.70					

ZTAM 70-2 Series Dimensions

Parameter (ml)	Outer Diameter (mm)		Wall Thickness (mm)			Length (mm)		Straightness 1,000mm
	Nominal	Nominal	Nominal	Nominal	Skewness	Nominal	Tolerance	
5	10.00	±0.25	0.80	±0.04	≤0.05	700- 2000	±6	≤2.5‰
	18.40				≤0.06			
7	22.00	±0.30	0.90					
10	22.00		1.00					
20	26.00	±0.35	1.20	±0.05	≤0.07			
25	28.00		1.30					

Glass Tubes for Liquid Medicine Bottles (ZTMB 70 Series)

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ZTMB 70 Series Properties

PARAMETERS	UNITS	VALUES
Average Coefficient of Linear Expansion (20-300°C)	10 ⁻⁷ /K	70
Strain Point	°C	510
Annealing Point	°C	550
Softening Point	°C	730
Working Point	°C	1050
Density (20°C)	g/m ⁻³	2.45
Water Resistance Level (YBB00252003)	Level	1
SiO ₂	%	70
B ₂ O ₃	%	6.8
Al ₂ O ₃	%	5.9
CaO	%	3.3
BaO	%	2
K ₂ O/Na ₂ O	%	11.8

ZTMB 70 Series Dimensions

Parameter (ml)	Outer Diameter (mm)		Wall Thickness (mm)			Length (mm)		Straightness 1,000mm
	Nominal	Tolerance	Nominal	Tolerance	Skewness	Nominal	Tolerance	
10	18.00	±0.30	0.90	±0.05	≤0.05	700- 2000	±6	≤2.5‰
	18.40							
20	22.00	±0.33	1.10	±0.06	≤0.06			
25	28.00		1.20					

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