

JIS

JAPANESE INDUSTRIAL STANDARD

Glasswares for testing apparatus of petroleum products

JIS K 2839-1990

Translation without guarantee
In the event of any doubt arising, the original
standard in Japanese is to be evidence

Translated

by

Japanese Standards Association

1. Scope

This Japanese Industrial Standard specifies the glasswares to be used for testing petroleum products, which are shown in Tables 1 and 2.

- Remarks
1. Applicable standards to this Standard are shown in Attached Table 1.
 2. International standards corresponding to this Standard are shown in Attached Table 2.
 3. The units and numerical values given in { } in this Standard are based on the traditional unit system and are currently the criteria in force.

2. Classification

Table 1 shows the glassware specified in this standard as classified according to the specifications of testing methods to be used, and Table 2 shows the glassware not specified herein as classified according to product specifications.

Table 1. Classification According to Testing Method Specification

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
C 2101	Testing methods of electrical insulating oils	Test for evaporated quantity	Sample container	1	
		Test for oxidation stability	Sample container	29	
		Test for oxidation stability	Regulator for gas pressure	30	
		Test for oxidation stability	Manometer	31	
K 2249	Testing methods for density of crude oil and petroleum products, and petroleum measurement table based on a reference temperature 15°C	Method using hydrometer	Cylinder (for type I and type II)	35	
		Method using Type I picnometer with graduations	Type I picnometer with graduations	37	
		Method using Type II picnometer with graduations	Type II picnometer with graduations	38	
		Method using Ostwald picnometer	Ostwald picnometer	39	
		Hubbard type specific gravity bottle method	Hubbard type specific gravity bottle	223	
		Inspection on graduation of type I hydrometer	Overflow type cylinder	224	
K 2251	Method of sampling crude oil and petroleum products	Weighted sampler	Glass sampler	41	
K 2254	Petroleum products - Determination of distillation characteristics	Distillation test at normal pressure	Distillation flask (125 ml)	42	
		Distillation test at normal pressure	Receiver (100 ml)	43	
		Distillation test at reduced pressure	Type I distillation flask	232	
		Distillation test at reduced pressure	Type II distillation flask	233	
		Distillation test at reduced pressure	Type I distillation column and condenser	234	
		Distillation test at reduced pressure	Type II distillation column	235	
		Distillation test at reduced pressure	Type II condenser	236	
		Distillation test at reduced pressure	Condenser cap	237	
		Distillation test at reduced pressure	Adapter for holding thermocouple (for type I and Type II)	238	
		Distillation test at reduced pressure	Receiver	239	
K 2256	Testing methods for aniline point and mixed aniline point of petroleum products	Method using test tube	Test tube	45	
		Method using test tube	Outer tube	46	
		Method using test tube	Glass tube for inserting stirring rod	47	

Table 1. (Continued)

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2256 (cont'd)		Method using test tube	Heating and cooling bath	48	
		Method using U-tube	U-tube	49	
		Method using U-tube	Sample stirrer	50	
		Method using U-tube	Lamp cover	51	
		Method using thin film	Sample tube	52	
		Method using thin film	Pump tube (type I and type II)	53	
K 2261	Testing method for existent gum in gasoline and aviation fuels	Test for existent gum	Sample container	58	K 2514, K 2601
K 2269	Testing methods for pour point and cloud point of crude oil and petroleum products	Test for pour point	Test tube	13	K 2503
		Test for cloud point	Test tube	13	K 2503
K 2270	Crude petroleum and petroleum products - Determination of carbon residue	Method for preparation of 10 % residual oil	Distillation flask (250 ml)	75	K 2208
		Method for preparation of 10 % residual oil	Measuring cylinder (200 ml)	76	
K 2275	Testing method for water content of crude oil and petroleum products	Test for water content (distillation method)	Distillation flask (500 ml)	83	
		Test for water content (distillation method)	Cooler	84	
		Test for water content (distillation method)	Water test tube with co-ground type taper (10 ml)	85	
		Test for water content (distillation method)	Water test tube with co-ground type taper (25 ml)	86	
		Test for water content (distillation method)	Water test tube with spherical ball-and-socket type ground glass joint (10 ml)	87	
		Test for water content (distillation method)	Water test tube with spherical ball-and-socket type ground glass joint (25 ml)	88	
		Test for water content (distillation method)	Water test tube with co-ground type taper (25 ml with cock)	225	
		Test for water content (distillation method)	Water test tube with co-ground type taper (2 ml)	226	
K 2276	Testing methods for aviation fuels	Test for precipitation point	Sample container	91	
		Test for precipitation point	Dewar bottle	22	
		Test for precipitation point	Type I moisture preventing vessel	92	
		Test for precipitation point	Type II moisture preventing vessel	93	

Table 1. (Continued)

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2276 (cont'd)		Test for total acidity	Flask	186	K 2287
		Doctor test	Test tube	187	
		Silver corrosion test	Test tube	188	
		Silver corrosion test	Glass cradle for silver strip	189	
		Test for oxidation stability (method of latent sediment)	Sample container	94	
		Test for oxidation stability (method of latent sediment)	Lid	95	
		Test for explosiveness	Hot water container	147	
		Test for explosiveness	Sample container	148	
		Test for explosiveness	Drying tube	149	
		Test for explosiveness	Measuring flask	151	
		Test for total acid number	Burette (10 ml)	99	
		Test for sulfur content of mercaptanes (method of potentiometric titration)	Burette (10 ml)	101	
K 2279	Testing method for heat of combustion of liquid hydrocarbon fuel by bomb calorimeter	Test for calorific power	Sample dish	71	K 2541
		Test for calorific power	Thin glass capsule	96	
K 2283	Testing method for kinematic viscosity and calculating method for viscosity index of crude oil and petroleum products	Test for kinematic viscosity	Pipette for BS/IP reverse flow U-type viscometer	97	K 2207
		Test for kinematic viscosity	Moisture preventing device for Cannon-Fenske and Ubbelohde viscometer	98	
		Test for kinematic viscosity	Ubbelohde viscometer	190	
		Test for kinematic viscosity	Cannon-Ubbelohde viscometer	191	
		Test for kinematic viscosity	Cannon-Ubbelohde semimicro viscometer	192	
		Test for kinematic viscosity	BS/IP small type suspended-level viscometer	193	
		Test for kinematic viscosity	Atlantic viscometer	194	
		Test for kinematic viscosity	Cannon-Fenske viscometer	195	
		Test for kinematic viscosity	Cannon-Manning semi-micro viscometer	196	
		Test for kinematic viscosity	Zeitfuchs viscometer	197	
		Test for kinematic viscosity	Cannon-Fenske opaque viscometer	198	

Table 1. (Continued)

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2283 (cont'd)		Test for kinematic viscosity	Zeitzfuchs cross-arm viscometer	199	K 2207
		Test for kinematic viscosity	Lantz-Zeitzfuchs viscometer	200	
		Test for kinematic viscosity	BS/IP U-tube reverse-flow viscometer	201	
K 2287	Testing method for oxidation stability of gasoline (Induction period method)	Test for oxidation stability	Sample container stability	94	K 2276
		Test for oxidation stability	Lid	95	K 2276
K 2288	Testing method for cold filter plugging point of gas oil	Test for plugging point	Test tube	221	
		Test for plugging point	Pipet (20 ml)	222	
K 2501	Testing methods for neutralization number of petroleum products	Method of indicator titration	Burette (10 ml)	99	K 2276
		Method of indicator titration	Burette (50 ml)	100	K 2503, K 2609
		Method of potentiometric titration	Burette (10 ml)	101	K 2276
		Method of potentiometric titration	Beaker	102	
K 2503	Testing methods of lubricating oil for aircraft	Test for saponification value (method of indicator titration)	Erlenmeyer flask	103	K 2233
		Test for saponification value (method of indicator titration)	Condenser	104	
		Test for saponification value (method of indicator titration)	Burette (50 ml)	100	K 2501
		Test for precipitation value	Type I graduated test tube	105	K 2601
		Test for corrosion oxidation stability	Sample container	9	
		Test for corrosion oxidation stability	Condenser	10	
		Test for corrosion oxidation stability	Air introducing tube	11	
		Test for dilute pour point	Test tube	13	K 2269
		Test for oxidation stability	Sample container	106	
		Test for oxidation stability	Air blowing tube	107	
K 2510	Testing method for rust-preventing characteristics of lubricating oil	Test for rust-preventing characteristics	Sample container	108	K 2514
K 2513	Testing method for copper corrosion of petroleum products	Test for copper strip corrosion	Flat glass tube	112	K 2220
		Test for copper strip corrosion	Test tube	111	

Table 1. (Continued)

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2514	Testing methods for oxidation stability of lubricating oils	Test for oxidation stability of lubricating oil for internal combustion engine	Sample stirring rod	113	K 2510
		Test for oxidation stability of lubricating oil for internal combustion engine	Varnish rod	114	
		Test for oxidation stability of lubricating oil for internal combustion engine	Sample container	108	
		Test for oxidation stability of turbine oil	Test tube	116	
		Test for oxidation stability of turbine oil	Oxygen blowing tube	117	
		Test for oxidation stability of turbine oil	Condenser	118	K 2261, K 2601
		Test for oxidation stability by rotating bomb	Sample container	202	
		Total acid value test (semi-micro method)	Titration beaker	58	
		Total acid value test (semi-micro method)	Whole pipette (40 ml)	229	
		Total acid value test (semi-micro method)	Measuring pipette (0.1 ml)	230	
		Total acid value test (semi-micro method)	Buret for mixed solvent (500 ml)	231	
K 2518	Testing method for foaming characteristics of lubricating oils	Testing method for foaming	Sample container	126	
K 2520	Testing methods for emulsion characteristics of lubricating oils	Testing method for demulsibility	Sample container	128	
		Testing method for steam emulsibility	Flask for steam generation	119	
		Testing method for steam emulsibility	Emulsifying bath and separating bath	120	
		Testing method for steam emulsibility	Sample container	121	
		Testing method for steam emulsibility	Steam introducing tube	122	
		Testing method for steam emulsibility	Steam injecting tube	123	
		Testing method for steam emulsibility	Steam tube	124	
		Testing method for steam emulsibility	Steam regulating tube	125	

Table 1. (Continued)

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2536	Testing method for hydrocarbon types in petroleum products by fluorescent indicator adsorption	Test for hydrocarbon components	Type II adsorbing tube	145	
		Test for hydrocarbon components	Upper adapter	146	
		Test for depentanization	Distillation column	203	
		Test for depentanization	Light-ends trap	204	
		Test for depentanization	Receiver and lid	205	
		Test for depentanization	Reflux condenser head	206	
		Test for depentanization	Dewar bottle	207	
K 2540	Testing method for thermal stability of lubricating oils	Test for thermal stability	Sample container	153	K 2220
K 2541	Testing methods for sulphur in crude oil and petroleum products	Bomb method	Sample dish	71	K 2279
		Combustion tube method (quartz tube-oxygen method)	Combustion tube	77	
		Combustion tube method (quartz tube-oxygen method)	Adapter	78	
		Combustion tube method (quartz tube-oxygen method)	Lower absorbing tube	64	
		Combustion tube method (quartz tube-oxygen method)	Trap	65	
		Combustion tube method (quartz tube-oxygen method)	Upper absorbing tube	79	
		Combustion tube method (quartz tube-oxygen method)	Vacant bottle	81	
		Combustion tube method (air method)	Combustion tube	154	
		Combustion tube method (air method)	Stopper	155	
		Combustion tube method (air method)	Adapter	156	
		Combustion tube method (air method)	Lower absorbing tube	64	
		Combustion tube method (air method)	Upper absorbing tube	79	
		Combustion tube method (air method)	Trap	65	
		Combustion tube method (air method)	Vacant bottle	81	
		Lamp method (volumetric method)	Burner standard type and burner (for highly aromatic content sample)	61	

Table 1. (Continued)

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2541 (cont'd)		Lamp method (volumetric method)	Sample container [(25 ml) standard type] and sample container [(25 ml) for highly aromatic content sample]	62	K 2279
		Lamp method (volumetric method)	Muffle	63	
		Lamp method (volumetric method)	Absorbing tube	64	
		Lamp method (volumetric method)	Trap	65	
		Lamp method (volumetric method)	Washing bottle for mixed gas	66	
		Lamp method (volumetric method)	Manometer for pressure regulator	68	
		Lamp method (volumetric method)	Vacuum regulator	69	
		Lamp method (volumetric method)	Water level bottle	67	
		Lamp method (volumetric method)	Trap bottle	70	
		Combustion tube method (porcelain tube-oxygen method)	Adapter	162	
		Combustion tube method (porcelain tube-oxygen method)	Absorbing bottle (with filter)	163	
		Combustion tube method (porcelain tube-oxygen method)	Absorbing bottle (without filter)	164	
		Combustion tube method (porcelain tube-oxygen method)	Vacant bottle	81	
K 2580	Testing methods for color of petroleum products	Test for ASTM-color	Test tube	109	
		Test for Saybolt-color	Glass tube for sample	73	
		Test for Saybolt-color	Glass tube for standard color	74	
K 2601	Testing method for crude oil	Test for atmospheric distillation	Distillation flask	178	
		Test for atmospheric distillation	Receiver	181	
		Test for atmospheric distillation	Whole pipette	182	
		Test for salt content (titration method)	Flask	54	
		Test for salt content (titration method)	Hopkin's reflux condenser	55	
		Test for salt content (titration method)	Thistle tube	56	

Table 1. (Continued)

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2601 (cont'd)		Test for salt content (conductivity method)	Beaker for cell	58	K 2261, K 2514
		Test for sediment content	Type I graduated test tube	105	K 2503
		Test for sediment content	Type II graduated test tube	183	
		Test for hydrogen sulfide content	Müncke scrubbling bottle	240	
		Test for hydrogen sulfide content	Sample container	241	
		Test for wax content	Glass filter	242	
		Test for wax content	Cooling bath	243	
K 2605	Testing method for bromine number of petroleum products	Electrometric titration method	Glass stirring rod	227	
		Electrometric titration method	Titration container	228	
K 2609	Testing method for nitrogen in crude oil and petroleum products	Test for nitrogen content by macro kjeldahl method	Burette (50 ml)	100	K 2501, K 2503
		Test for nitrogen content by macro kjeldahl method	Sample container	208	
		Test for nitrogen content by macro kjeldahl method	Suction adapter	209	
		Test for nitrogen content by macro kjeldahl method	Aspirator	210	
		Test for nitrogen content by macro kjeldahl method	Blowing apparatus with funnel	211	
		Test for nitrogen content by macro kjeldahl method	Cooling apparatus	212	
		Test for nitrogen content by macro kjeldahl method	Connecting tube	213	
		Test for nitrogen content by micro kjeldahl method	Aspirator	214	
		Test for nitrogen content by micro kjeldahl method	Flask for steam generation	215	
		Test for nitrogen content by micro kjeldahl method	Sample distillation tube	216	
		Test for nitrogen content by micro kjeldahl method	Liquid discharge tube	217	
		Test for nitrogen content by micro kjeldahl method	Connecting tube	218	
		Test for nitrogen content by micro kjeldahl method	Cooling apparatus	219	
		Test for nitrogen content by micro kjeldahl method	Receiver	220	

Table 2. Classification According to Product Specification

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2207	Petroleum asphalt	Cone penetration test	Glass container	139	K 2208
		Test for softening point	Heating bath	140	
		Test for kinetic viscosity at elevated temperature	Cannon-Fenske opaque viscometer	198	K 2283
		Test for kinetic viscosity at elevated temperature	Zeitfuchs cross-arm viscometer	199	K 2283
		Test for kinetic viscosity at elevated temperature	BS/IP U-tube reverse-flow viscometer	201	K 2283
		Test for kinetic viscosity at elevated temperature	Pipette for BS/IP reverse flow U-type viscometer	97	K 2283
		Test for Saybolt-Furol second viscometer	Receiver	4	K 2208, K 2220
		Freass breaking point test	Test tube	184	
		Freass breaking point test	Cylinder	185	
K 2208	Emulsified asphalt	Engler viscometer test	Receiver	3	
		Test for Saybolt-Furol second viscometer	Receiver	4	K 2207, K 2220
		Storage stability test	Cylinder	5	
		Mixing test for aggregate with earth	Measuring cylinder (200 ml)	76	K 2270
		Cone penetration test for evaporation residue	Glass container	139	K 2207
K 2220	Lubricating greases	Test for dropping point	Air bath	173	
		Test for dropping point	Heating bath (400 ml)	174	
		Evaporation loss test	Sample container	153	K 2546, K 2540
		Test for copper strip corrosion	Test tube	111	K 2513
		Test for oxidation stability	Sample container	176	
		Test for separating oil	Tall beaker	177	
		Test for apparent viscosity	Receiver for correction of flow rate of oil hydraulic pump	4	K 2207, K 2208

Table 2. (Continued)

No. of standard	Title of standard	Test items	Name of glassware	No. of figure	No. of standard which stipulates to use same glassware
K 2233	Non-petroleum base motor vehicle brake fluids	Test for boiling point	Flask	14	K 2503
		Test for boiling point	Cooler	15	
		Test for wet boiling point	Glass bottle	16	
		Test for metallic corrosion	Glass bottle	16	
		Low temperature resistance test	Sample bottle	17	
		Evaporation loss test	Sample bottle	17	
		Test for oxidation resistance	Test tube	19	
		Test for swelling of rubber	Glass bottle	20	
		Test for oxidation resistance	Erlenmeyer flask	103	
K 2234	Engine antifreeze coolants	Test for freezing temperature	Cooling bath	21	
		Test for freezing temperature	Cooling tube	23	
		Test for metallic corrosion	Container	24	
		Test for metallic corrosion	Vent tube	26	
K 2235	Petroleum wax	Test for melting point of paraffin wax	Sample container (A)	129	
		Test for melting point of micro wax	Sample container (B)	129	
		Test for oil content	Filter	130	
		Test for oil content	Mercury pressure regulator	131	
		Test for oil content	Evaporating flask	132	
K 2236	Polish for automobile	Test for stability	Transparent flat-bottomed cylindrical test tube	18	
K 2241	Cutting fluid	Test for surface tension	Sample container	134	K 2207
K 2242	Heat treating oil	Test for stability	Test tube	136	
		Test for stability	Air blowing tube	137	
		Test for stability	Blowing out tube	138	
K 2246	Rust preventive oil	Film removability test	Glass tube for wiper	27	K 2220, K 2540
		Test for evaporated quantity	Sample container	153	

3. Shape and Dimensions

Shapes and dimensions shall be as shown in Figs. 1 to 243.

Remarks 1. Dimensions prefixed by the term "about" in Figure indicate the dimensions of rough standard.

2. Dimensions without the tolerance nor the term "about" in Figures indicate standards and their tolerances shall be as follows:

Dimension under 10 mm: ± 0.5 mm

Dimension 10 mm to 100 mm: ± 5 %

Dimension over 100 mm: ± 5 mm

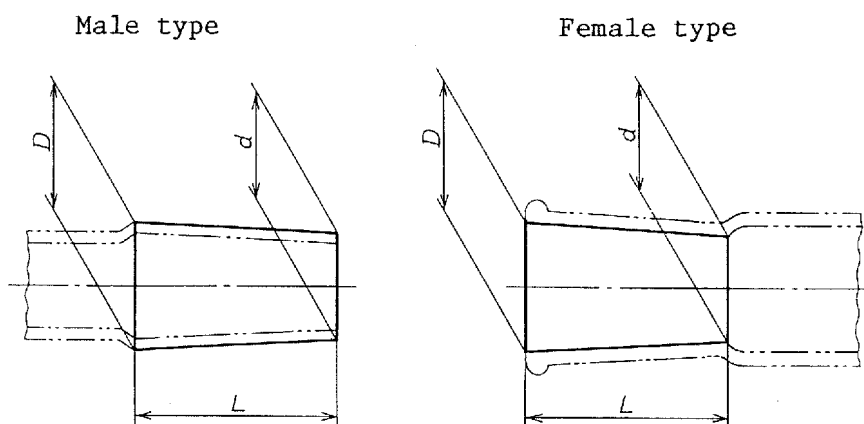
3. To the dimensions without wall thickness indication in Figure, appropriate wall thicknesses not likely to adversely affect the use and manufacture shall be assigned.
4. The glassware whose corresponding international standard is shown below the figure as remarks, are the glassware that conforms to the shape and the dimensions specified in the relevant international standard. Further, in the figure, the dimensions, dimensional deviations and specifications shown in braces have been formulated to serve as a guide for manufacturers who seek to maintain interchangeability and performances of their products even though they are not indicated in the International Standard.

Informative references 1. Some of the items of glassware with the related standard shown below their figures for reference are the ones that have no corresponding international standard and conform to ISO/DIS, ASTM Standards or IP Standards.

2. For the glassware whose detailed shape has not been specified in the corresponding international nor in the related foreign standard, the most commonly used shape is shown as tentative examples, and the conditions for exemplification are shown as reference below the figure.
3. The numbers of figure enumerated below are wanting. 2, 6 to 8, 12, 25, 28, 32 to 34, 36, 40, 44, 57, 59, 60, 72, 80, 82, 89, 90, 110, 115, 127, 133, 135, 141 to 144, 150, 152, 157 to 161, 165 to 172, 175, 179 and 180.

3.1 Symbols of Interchangeable Grinding Symbols of interchangeable grinding shall be in accordance with JIS R 3646, JIS R 3647, JIS R 3648, JIS R 3649 and JIS R 3650, as given in Tables 3 to 7.

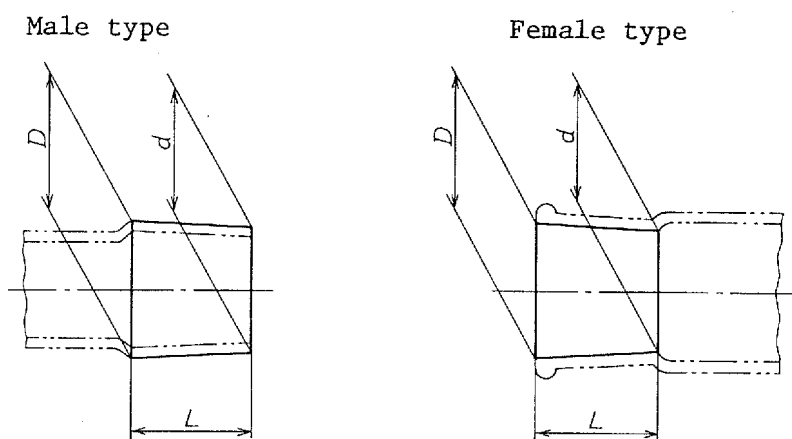
Table 3. Symbol of Interchangeable Ground Glass Joint (Full Length)



Unit: mm

Name		Interchangeable ground glass joint (full length)																	
Symbol		5/20	7/25	10/30	12/30	14/35	15/25	15/35	19/38	24/40	29/42	34/45	40/50	45/50	50/50	55/50	60/50	71/60	100/60
Dimension of taper	Large dia. D	5.0	7.5	10.0	12.0	14.5	15.5	15.5	18.8	24.0	29.2	34.5	40.0	45.0	50.0	55.0	60.0	71.0	100.0
	Small dia. d	3.0	5.0	7.0	9.0	11.0	13.0	12.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	65.0	94.0
	Length L	20 $\pm$ 1	25 $\pm$ 1	30 $\pm$ 1	30 $\pm$ 1	35 $\pm$ 1	25 $\pm$ 1	35 $\pm$ 1	38 $\pm$ 1	40 $\pm$ 1	42 $\pm$ 1	45 $\pm$ 1	50 $\pm$ 1	50 $\pm$ 1	50 $\pm$ 1	50 $\pm$ 1	50 $\pm$ 1	60 $\pm$ 1	60 $\pm$ 1

Table 4. Symbol of Interchangeable Ground Glass Joint (Medium Length)



Unit: mm

Name		Interchangeable ground glass joint (medium length)											
Symbol		5/12	7/15	10/18	12/18	14/20	15/20	19/22	24/25	29/26	34/28	40/35	45/40
Dimension of taper	Large dia. D	5.0	7.5	10.0	12.0	14.5	15.5	18.8	24.0	29.2	34.5	40.0	45.0
	Small dia. d	3.8	6.0	8.2	10.2	12.5	13.5	16.6	21.5	26.6	31.7	36.5	41.0
	Length L	12 $\pm$ 1	15 $\pm$ 1	18 $\pm$ 1	18 $\pm$ 1	20 $\pm$ 1	20 $\pm$ 1	22 $\pm$ 1	25 $\pm$ 1	26 $\pm$ 1	28 $\pm$ 1	35 $\pm$ 1	40 $\pm$ 1

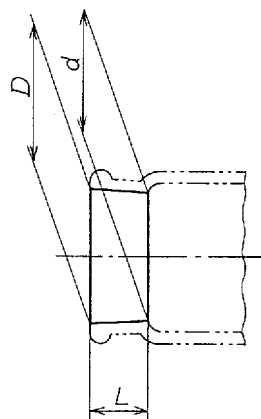
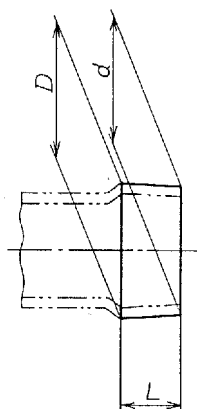
Unit: mm

Name		Interchangeable ground glass joint (medium length)						
Symbol		12/21	14/23	19/26	24/29	29/32	34/35	40/38
Dimension of taper	Large dia. D	12.5	14.5	18.8	24.0	29.2	34.5	40.0
	Small dia. d	10.4	12.2	16.2	21.1	26.0	31.0	36.2
	Length L	21 $\pm$ 1	23 $\pm$ 1	26 $\pm$ 1	29 $\pm$ 1	32 $\pm$ 1	35 $\pm$ 1	38 $\pm$ 1

Table 5. Symbol of Interchangeable Ground Glass Joint (Short Length)

Male type

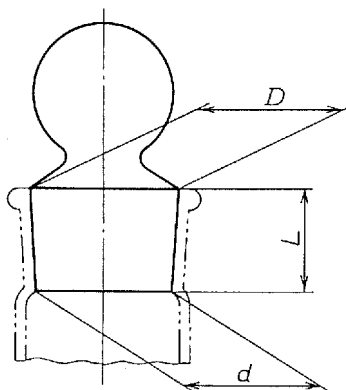
Female type



Unit: mm

Name		Interchangeable ground glass joint (short length)													
Symbol		♀10/10	♀12/10	♀14/10	♀15/10	♀19/10	♀24/12	♀29/12	♀34/12	♀40/12	♀45/12	♀50/12	♀55/12	♀60/12	♀71/15
Dimension of taper	Large dia. D	10.0	12.0	14.5	15.5	18.8	24.0	29.2	34.5	40.0	45.0	50.0	55.0	60.0	71.0
	Small dia. d	9.0	11.0	13.5	14.5	17.8	22.8	28.0	33.3	38.8	43.8	48.8	53.8	58.8	69.5
	Length L	10±1	10±1	10±1	10±1	10±1	12±1	12±1	12±1	12±1	12±1	12±1	12±1	12±1	15±1

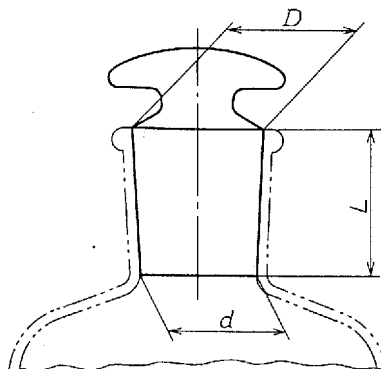
Table 6. Symbol of Interchangeable Ground Glass Joint for Measuring Flask



Unit: mm

Name		Interchangeable ground glass joint for measuring flask							
Symbol		♀9	♀13	♀16	♀19	♀22	♀27	♀32	♀38
Dimension of taper	Large dia. D	9.4	13.4	16.5	19.7	22.05	27.15	32.15	38.0
	Small dia. d	8.0	12.0	15.0	18.0	20.0	25.0	30.0	35.0
	Length L	14 ± 1	14 ± 1	15 ± 1	17 ± 1	20.5 ± 1	21.5 ± 1	21.5 ± 1	30 ± 1

Table 7. Symbol of Interchangeable Ground Glass Joint for Narrow Mouth Bottle



Unit: mm

Name		Interchangeable ground glass joint for narrow mouth bottle					
Symbol		¥14	¥19	¥24	¥29	¥34	¥45
Dimension of taper	Large dia. D	14.5	18.8	24.0	29.2	34.5	45.0
	Small dia. d	12.5	16.6	21.0	25.7	30.5	40.3
	Length L	20 ± 1	22 ± 1	30 ± 1	35 ± 1	40 ± 1	47 ± 1

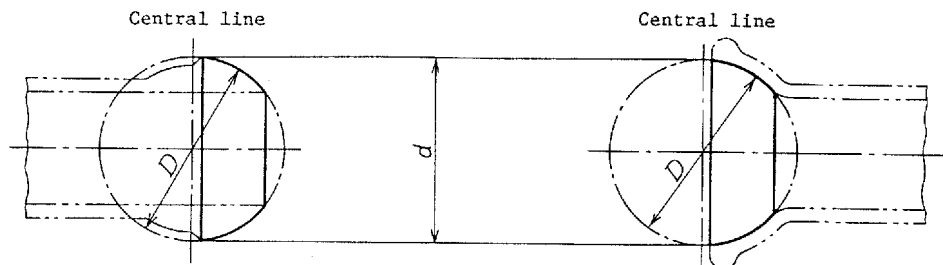
- Remarks 1. The Taper of ground sections shall be 1/10 and its angle shall be the cone generating angle $43' 30''$ measured in the cross section containing the axis.
2. Tolerances of tapers shall be ± 0.006 mm for 10 mm in length.
3. Dimensions without tolerance indication in the Tables shall be regarded as standard dimensions.

3.2 Symbol of Interchangeable Ground Glass Joint for Spherical Ball-and-Socket Type Symbols of interchangeable ground glass joint for spherical ball-and-socket type shall be as given in Table 8, which are stipulated in JIS R 3651.

Table 8. Grinding for Interchangeable Spherical Ball-and-Socket Type

Male type

Female type



Unit: mm

Name		Interchangeable spherical ball-and-socket type									
Symbol		S7	S13	S19	S29	S35	S41	S51	S64	S76	S102
Dimension of sphere	Dia. of sphere D	7.144	12.700	19.050	28.575	34.925	41.275	50.800	63.500	76.200	101.600
	Tolerance of dia.										
	Male type	0 -0.025	0 -0.025	0 -0.025	0 -0.025	0 -0.025	0 -0.025	0 -0.025	0 -0.035	0 -0.040	0 -0.050
	Female type	+0.025 0	+0.025 0	+0.025 0	+0.025 0	+0.025 0	+0.025 0	+0.025 0	+0.035 0	+0.040 0	+0.050 0
Dia. of hole d		6.9	12.5	18.7	28.0	34.3	40.5	50.0	62.5	75.0	100.0

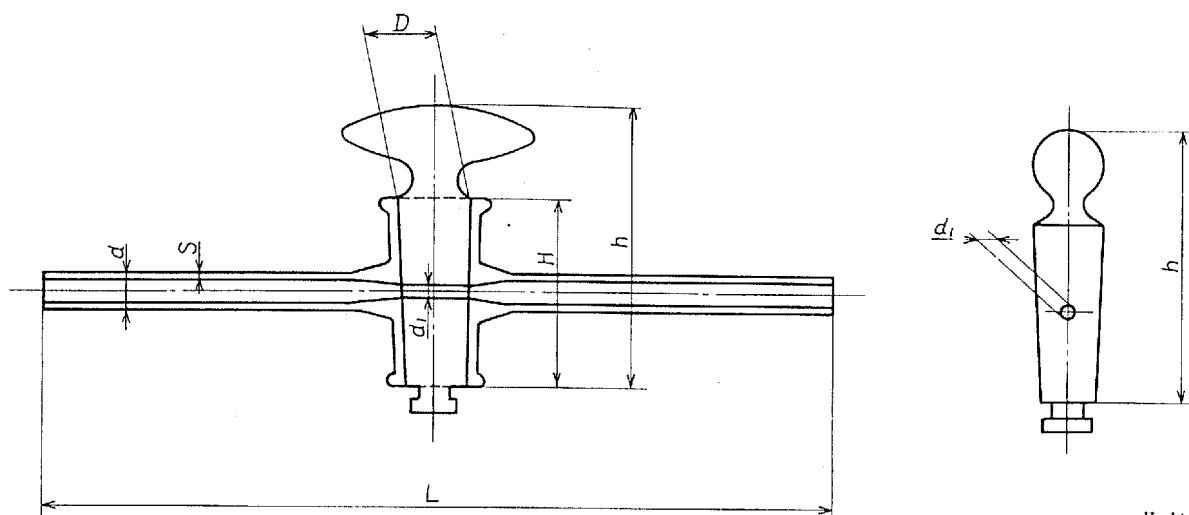
Remarks 1. The diameter of the interchangeable ground glass joint for spherical ball-and-socket type shall conform to the upper class or the precision class specified in JIS B 1501.

2. Dimensions without tolerances in the table are the standard dimensions.

3.3 Symbol of Grinding for One-way Stopcock Symbols of grinding for one-way stopcocks shall be as given in Table 9, which are stipulated in Attached Fig. 64 in JIS R 3503.

Table 9. Symbol of Grinding for One-way Stopcock

Side View of Stopper



Unit: mm

Symbol		K-11	K-13	K-16	K-17	K-19	K-22	K-27
Connecting tube	Outside dia. d	6±0.3	8±0.4	9±0.5	10±0.5	12±0.5	15±0.6	16±0.6
	Thickness S	1.2±0.2	1.2±0.2	1.6±0.2	1.6±0.2	1.6±0.2	1.6±0.2	1.6±0.2
	Length L (about)	240	240	240	240	240	280	280
Stopper	Dia. of hole d_1	2±0.2	2.5±0.2	3±0.2	4±0.3	5±0.3	7±0.3	8±0.3
	Diameter D	11.5	13.5	16	17.5	19	22	27
	Length H (about)	30±1	35±1	39±1	42±1	45±1	50±1	56±1
	Length h (about)	45	50	57	61	62	70	80

4. Quality

The glassware shall meet the quality requirements specified in 4. Quality of JIS R 3503.

5. Inspection

5.1 Appearance Glassware shall be uniform in thickness and free from flaws and foams.

5.2 Shapes, Dimensions, Volumetric Capacity and Mass These shall meet the requirements specified in Figures.

5.3 Quality and Performance These shall satisfy the requirements specified in 4. Quality and Figures.

6. Marking

The glassware shall bear the following particulars marked in its conspicuous place.

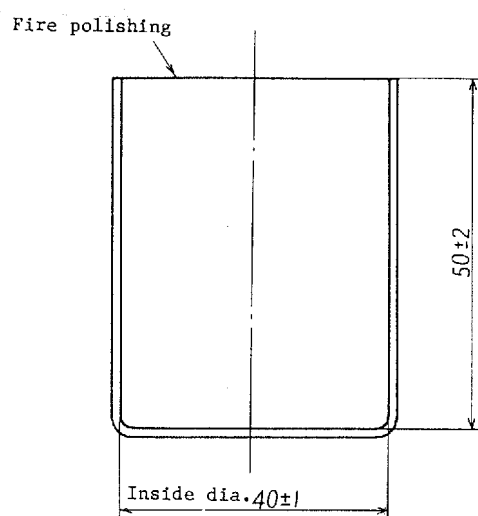
- (1) Symbol of grinding
- (2) Manufacturer's name or its mark

Fig. 1

No. of ref. standard	Title of standard and testing item	Name of glassware
C 2101	Testing methods of electrical insulating oils Test for evaporated quantity	Sample container

Unit: mm

Quality:
Grade 2
hardness or
superior to
it



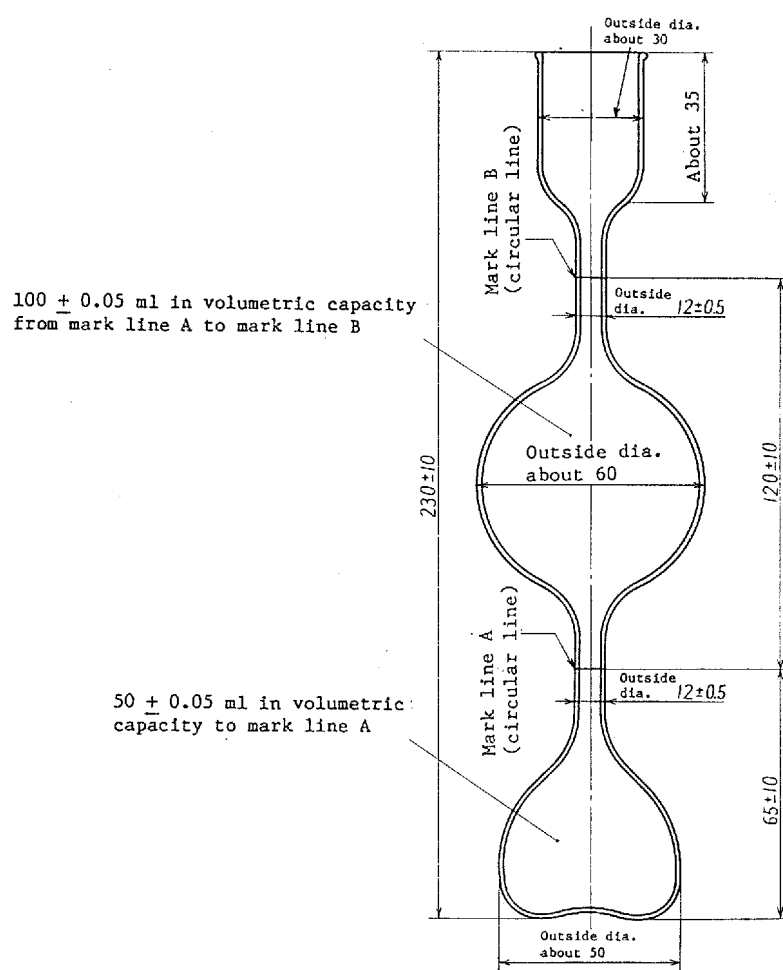
Mass 20 g max.

Fig. 3

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2208	Emulsified asphalt Engler viscometer test	Receiver

Unit: mm

Quality:
Grade 2
hardness or
superior to
it



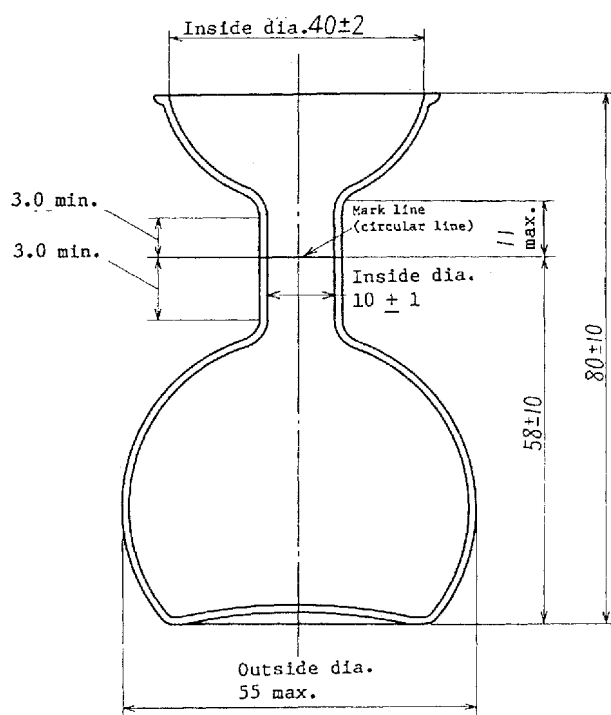
Informative Reference: Related Foreign Standard ASTM D 977

Fig. 4

Unit: mm

Quality:
Grade 2
hardness or
superior to
it

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2207	Petroleum asphalt Test for Saybolt-Furol second viscometer	Receiver
K 2208	Emulsified asphalt Test for Saybolt-Furol second viscometer	Receiver
K 2220	Lubricating greases Test for apparent viscosity	Receiver for correction of flow rate of oil hydraulic pump



60 $\pm$ 0.05 ml
at 20°C in volumetric
capacity to mark line

Remark: Shall be verified according to the measurement law.

Informative Reference: Related Foreign Standard ASTM D 88.

Fig. 5

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2208	Emulsified asphalt Storage stability test	Cylinder

Unit: mm

Quality:
Grade 2
hardness or
superior to
it

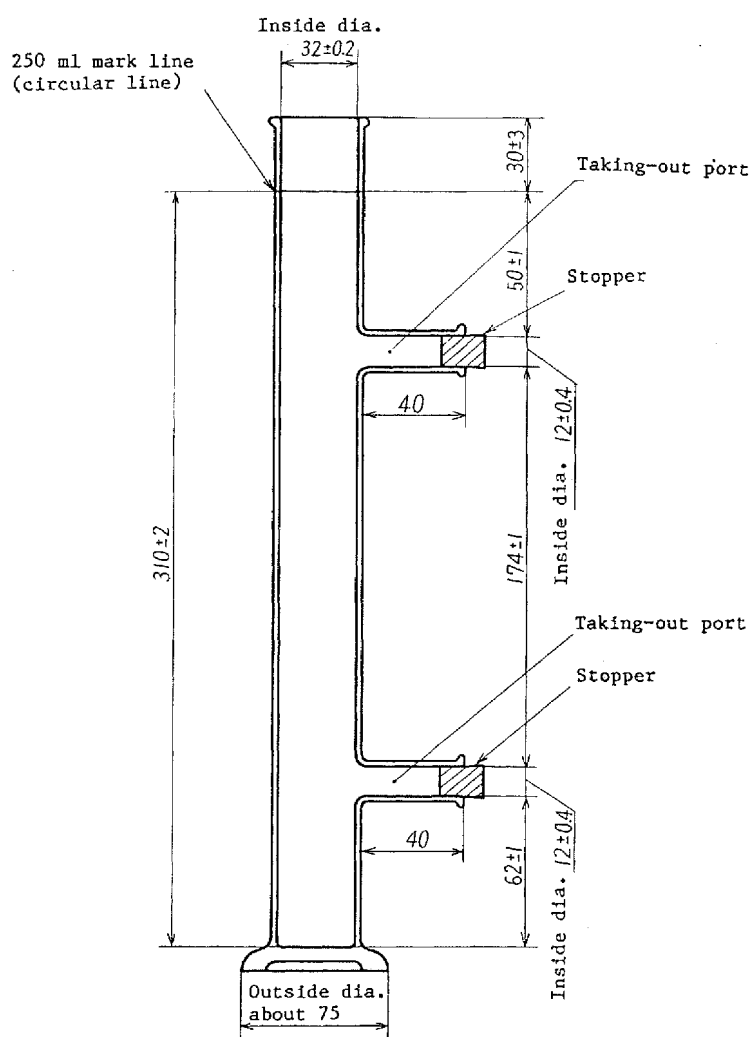


Fig. 9

Unit: mm

Quality:
Grade 1
hardness

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2503	Testing methods of lubricating oil for aircraft Test for corrosion oxidation stability	Sample container

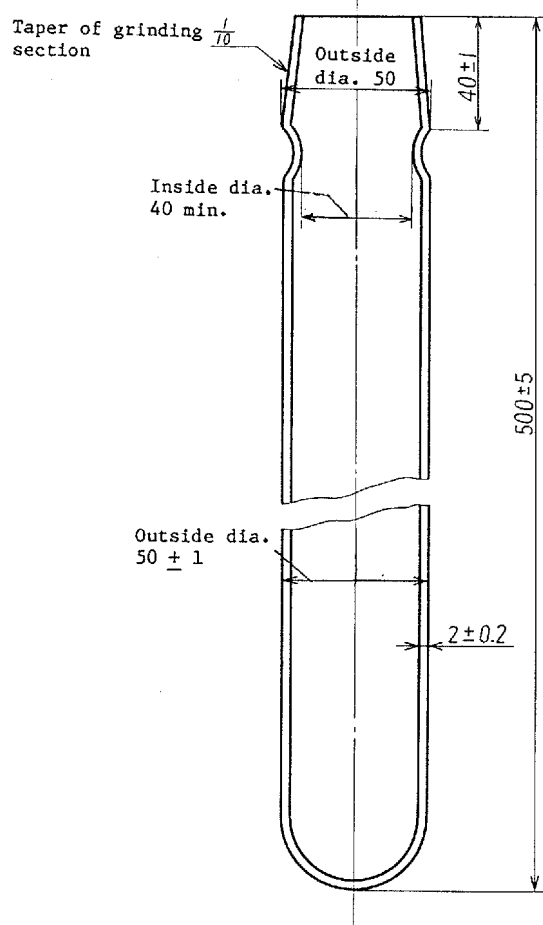


Fig. 10

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2503	Testing methods of lubricating oil for aircraft Test for corrosion oxidation stability	Condenser

Unit: mm

Quality:
Grade 1
hardness

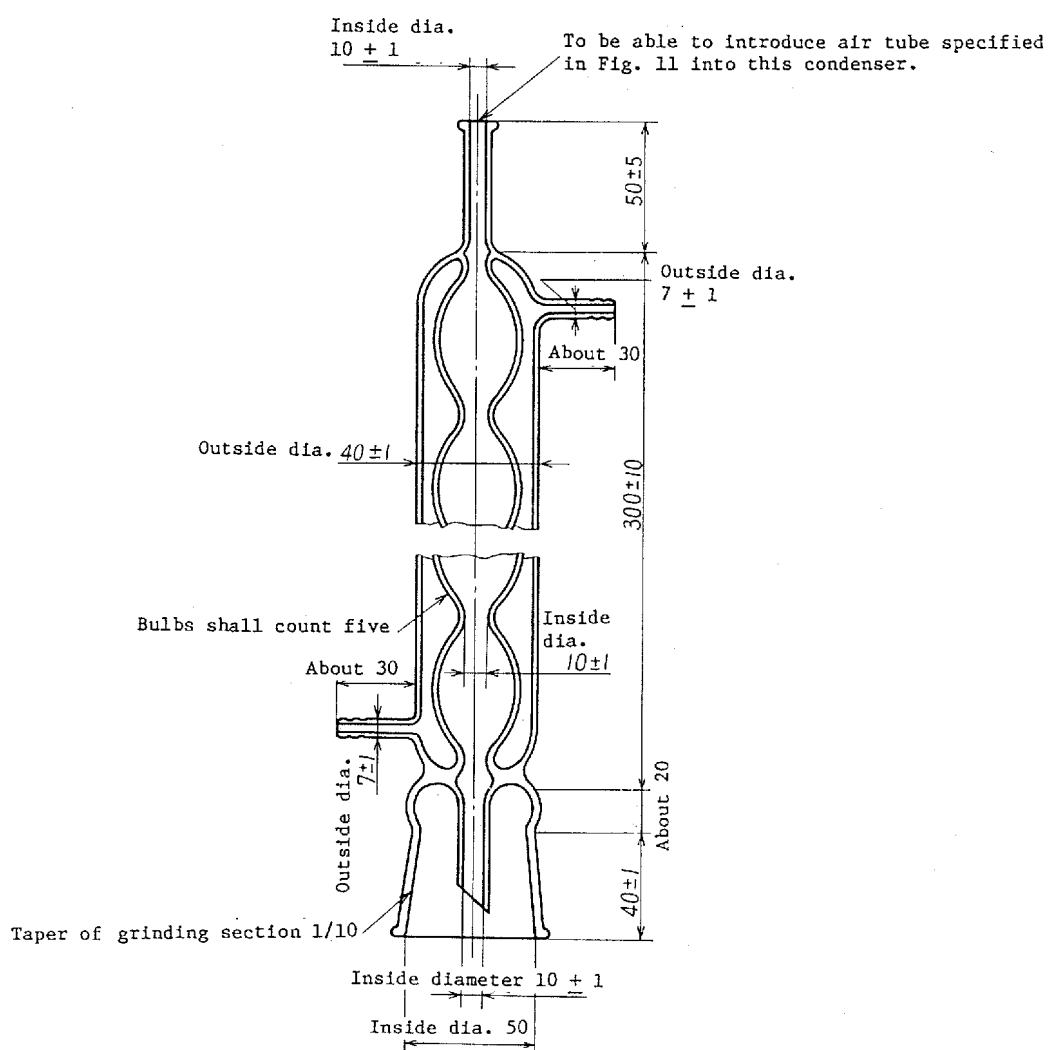


Fig. 11

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2503	Testing methods of lubricating oil for aircraft Test for corrosion oxidation stability	Air introducing tube

Unit: mm

Quality:
Grade 1
hardness

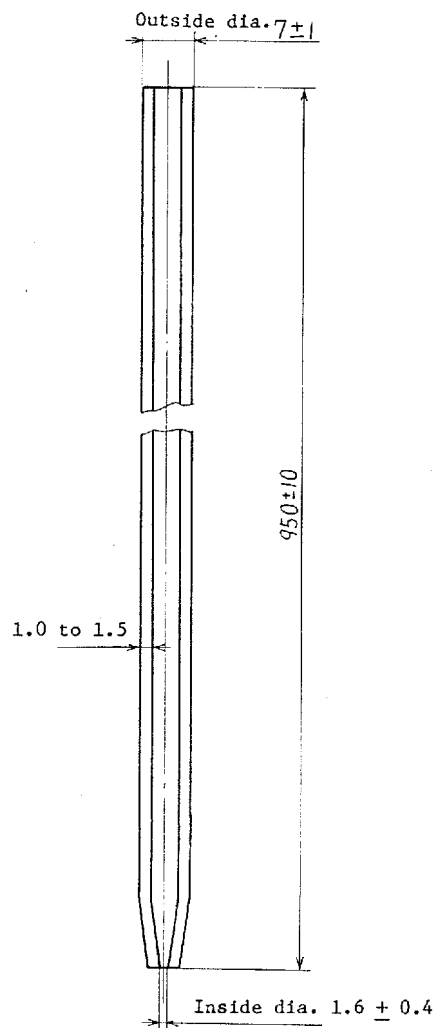
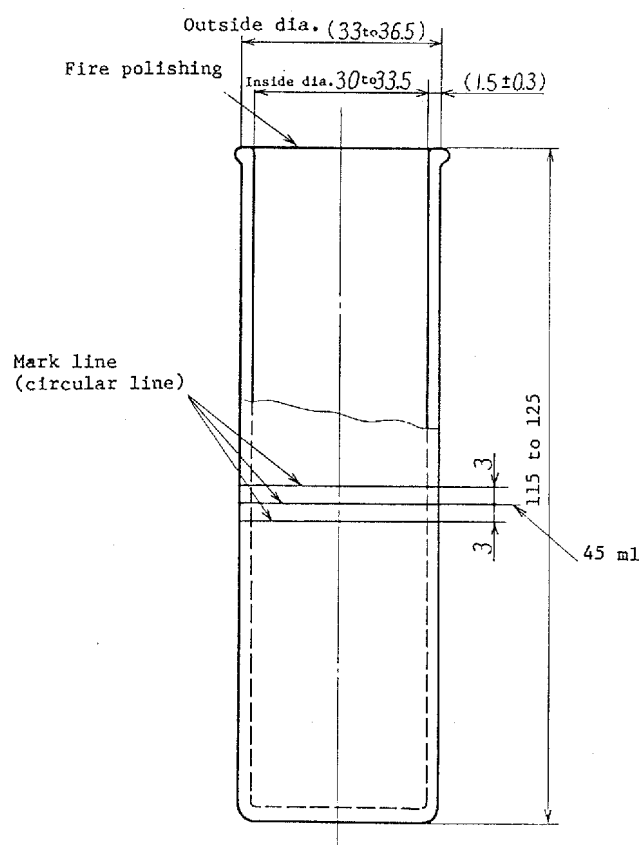


Fig. 13

Unit: mm

Quality:
Grade 1
hardness

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2269	Testing methods for pour point and cloud point of crude oil and petroleum products Test for pour point	Test tube
	Testing methods for pour point and cloud point of crude oil and petroleum products Test for cloud point	Test tube
K 2503	Testing methods of lubricating oil for aircraft Test for dilute pour point	Test tube



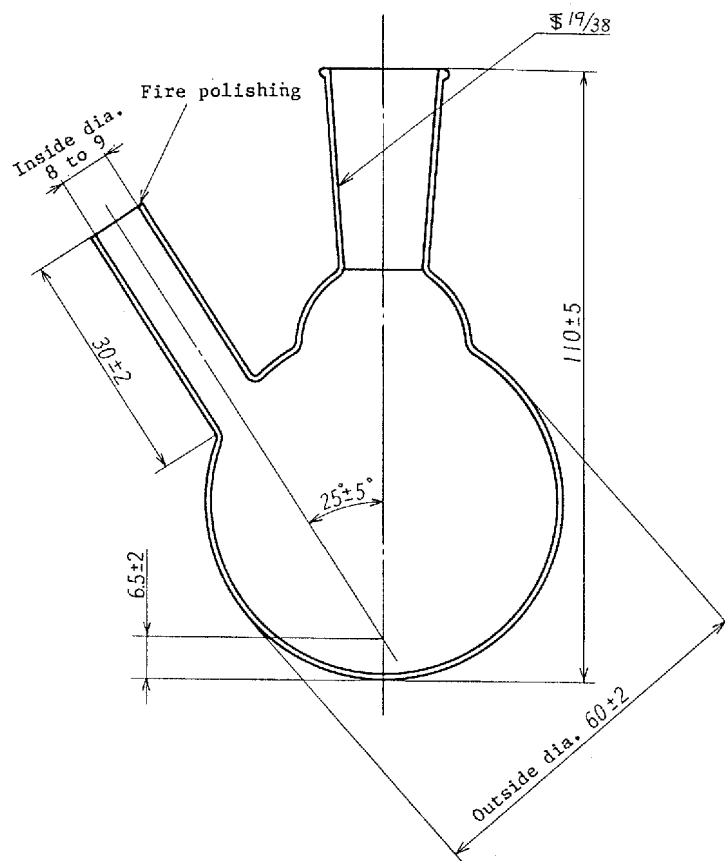
Remark: Corresponding International Standards ISO 3015 and ISO 3016

Fig. 14

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2233	Non-petroleum base motor vehicle brake fluids Test for boiling point	Flask

Unit: mm

Quality:
Grade 1
hardness



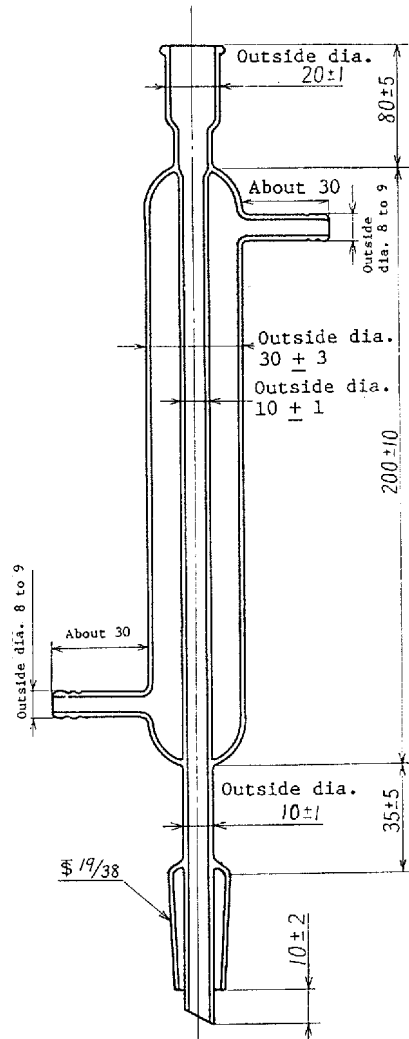
Remark: Corresponding International Standard ISO 4925

Fig. 15

Unit: mm

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2233	Non-petroleum base motor vehicle brake fluids Test for boiling point	Cooler

Quality:
Grade 2
hardness or
superior to
it



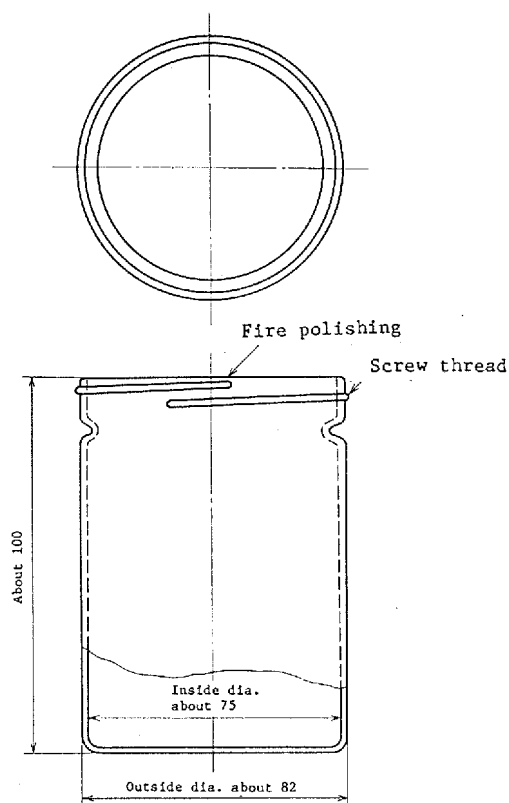
Remark: Corresponding International Standard ISO 4925

Fig. 16

Unit: mm

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2233	Non-petroleum base motor vehicle brake fluids Test for wet boiling point	Glass bottle
	Non-petroleum base motor vehicle brake fluids Test for wet boiling point.	Glass bottle

Quality:
Grade 2
hardness or
superior to
it



Remark: The lid shall be made from tin plate to the shape without packing and coating of organic substance, and the lid used for metallic corrosion test shall have a hole of $\phi 0.8 \pm 0.1$ at the center.

Informative Reference: The figure shows a tentative example. Different shapes and dimensions are allowable so long as the function is the same.

Fig. 17

Unit: mm

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2233	Non-petroleum base motor vehicle brake fluids Low temperature resistance test	Sample bottle
	Non-petroleum base motor vehicle brake fluids Evaporation loss test	Sample bottle

Quality:
Grade 2
hardness or
superior to
it

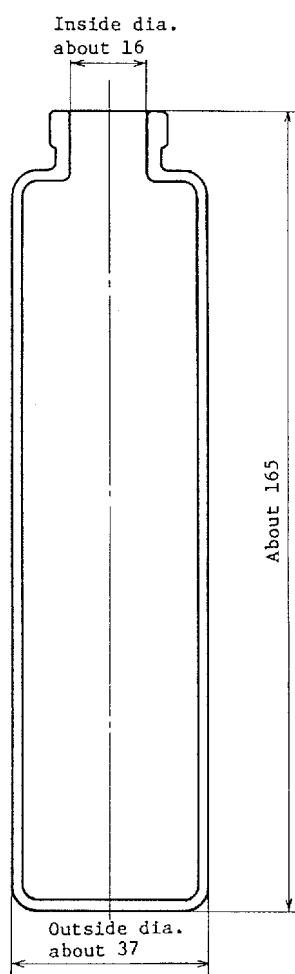


Fig. 18

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2236	Polish for automobile Test for stability	Transparent flat-bottomed cylindrical test tube

Unit: mm

Quality:
Grade 1
hardness

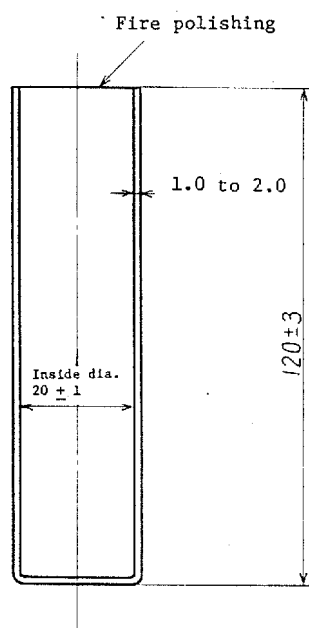


Fig. 19

Unit: mm

Quality:
Grade 1
hardness

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2233	Non-petroleum base motor vehicle brake fluids Test for oxidation resistance	Test tube

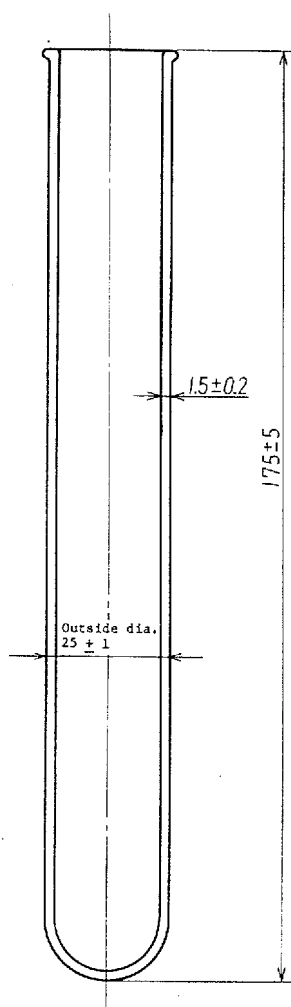
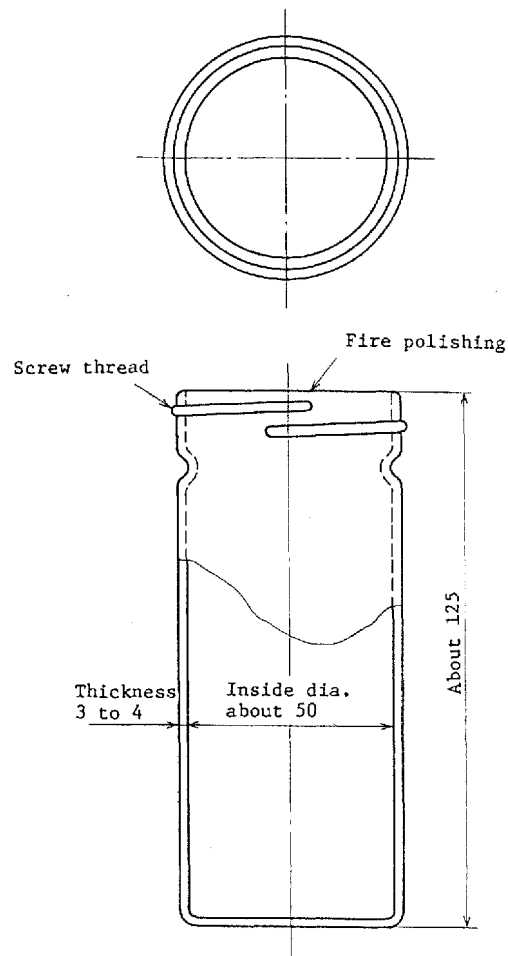


Fig. 20

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2233	Non-petroleum base motor vehicle brake fluids Test for swelling for rubber	Test bottle

Unit: mm

Quality:
Grade 2
hardness or
superior to
it



Remarks: The lid shall be made from tin plate to the shape without packing and coating of organic substance.

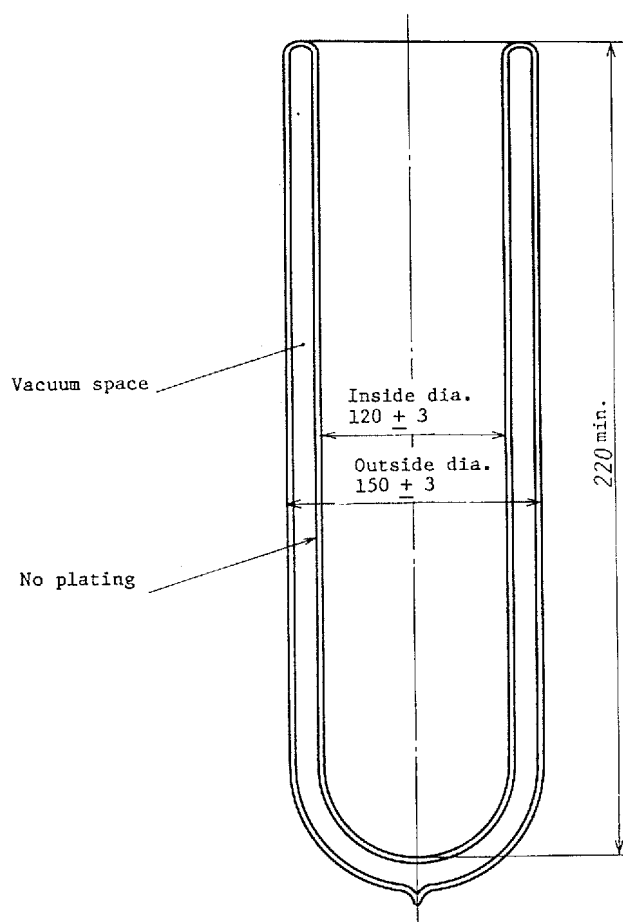
Informative Reference: The figure shows a tentative example. Different shapes and dimensions are allowable so long as the function is the same.

Fig. 21

Unit: mm

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2234	Engine antifreeze coolants Test for freezing temperature	Cooling bath

Quality:
Grade 1
hardness



Remark: When cooled to -70°C , no cloud shall appear in the vacuum space.

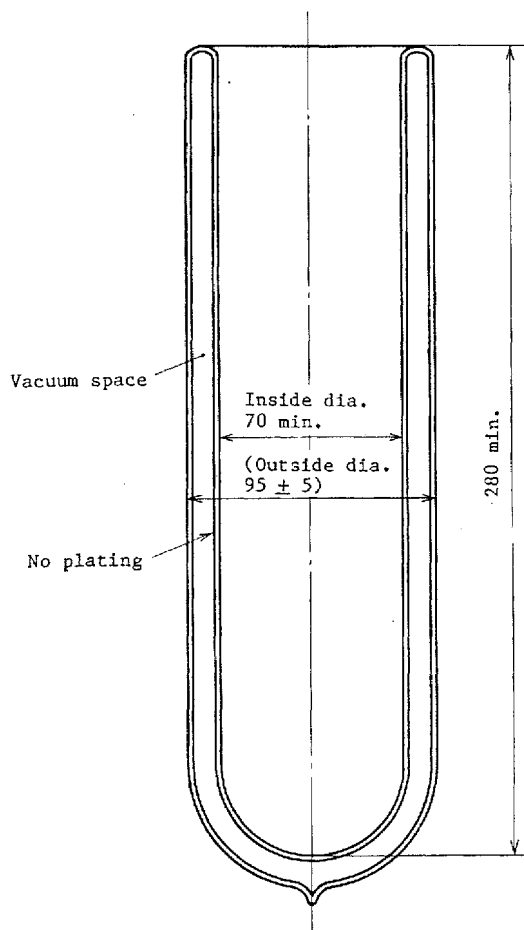
Informative Reference: Related Foreign Standard ASTM D 3306

Fig. 22

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2276	Testing methods for aviation fuels Test for precipitation point	Dewar bottle

Unit: mm

Quality:
Grade 1
hardness



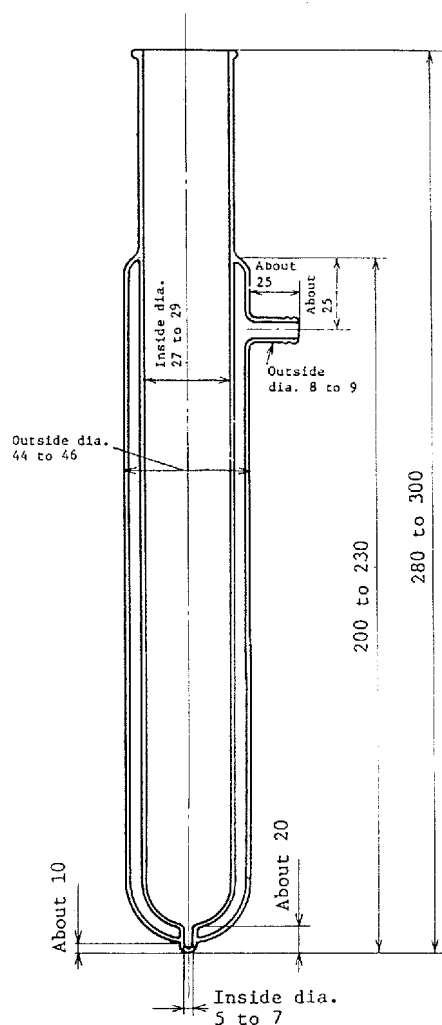
- Remarks 1. When cooled to -70°C , no cloud shall appear in vacuum space.
2. When plating, viewing windows of about 30 mm or more in width shall be provided in front and back.
3. Corresponding International Standard ISO 3013

Fig. 23

Unit: mm

Quality:
Grade 1
hardness

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2234	Engine antifreeze coolants Test for freezing temperature	Cooling tube



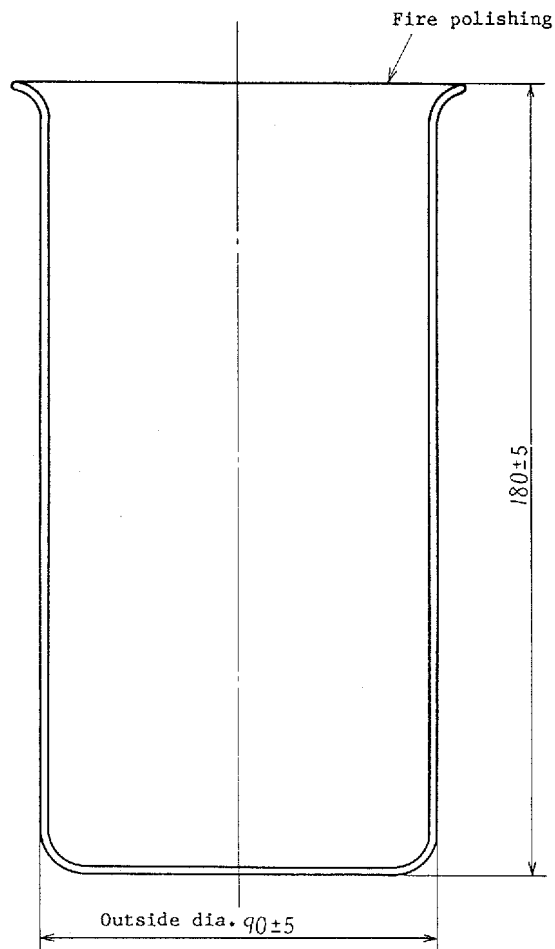
Informative Reference: Related Foreign Standard ASTM D 3306

Fig. 24

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2234	Engine antifreeze coolants Test for metallic corrosion	Container

Unit: mm

Quality:
Grade 1
hardness



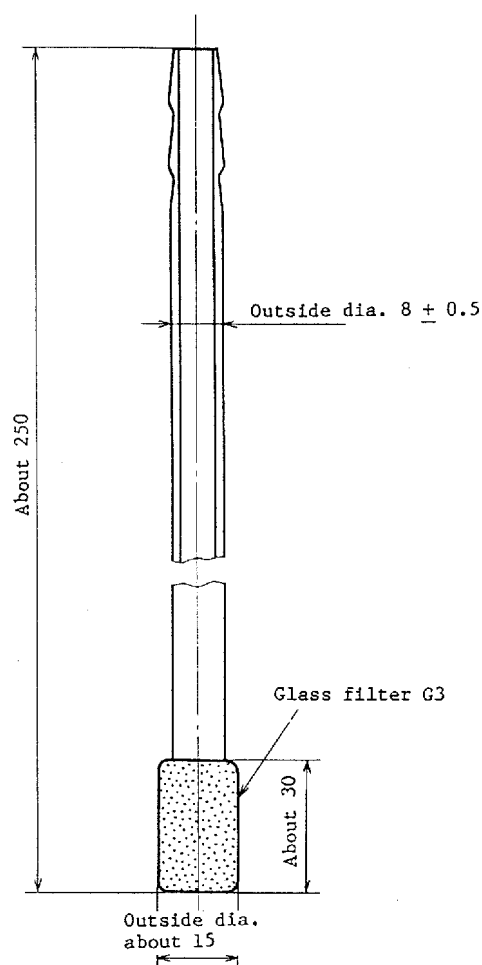
Informative Reference: Related Foreign Standard ASTM D 3306

Fig. 26

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2234	Engine antifreeze coolants Test for metallic corrosion	Vent tube

Unit: mm

Quality:
Grade 2
hardness or
superior to
it



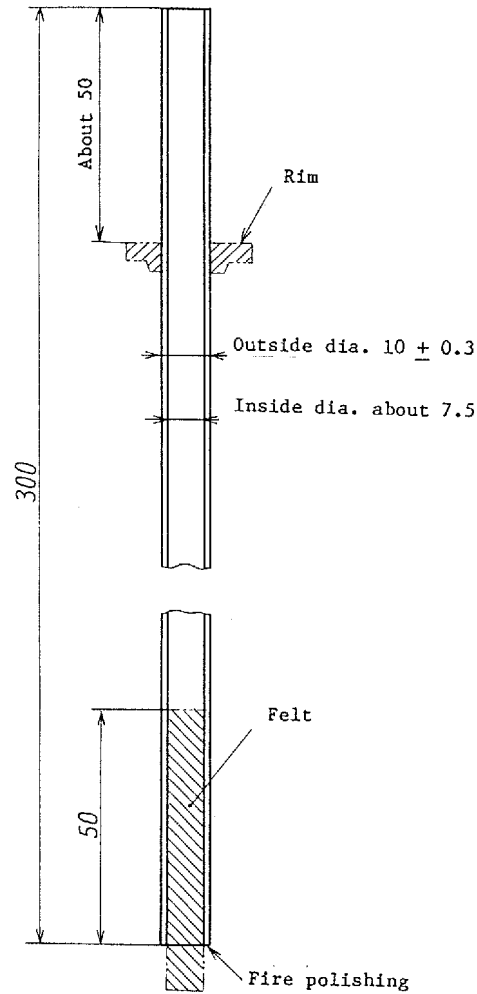
Informative Reference: Related Foreign Standard ASTM D 3306

Fig. 27

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2246	Rust preventive oil Film removability test	Glass tube for wiper

Unit: mm

Quality:
Grade 2
hardness or
superior to
it



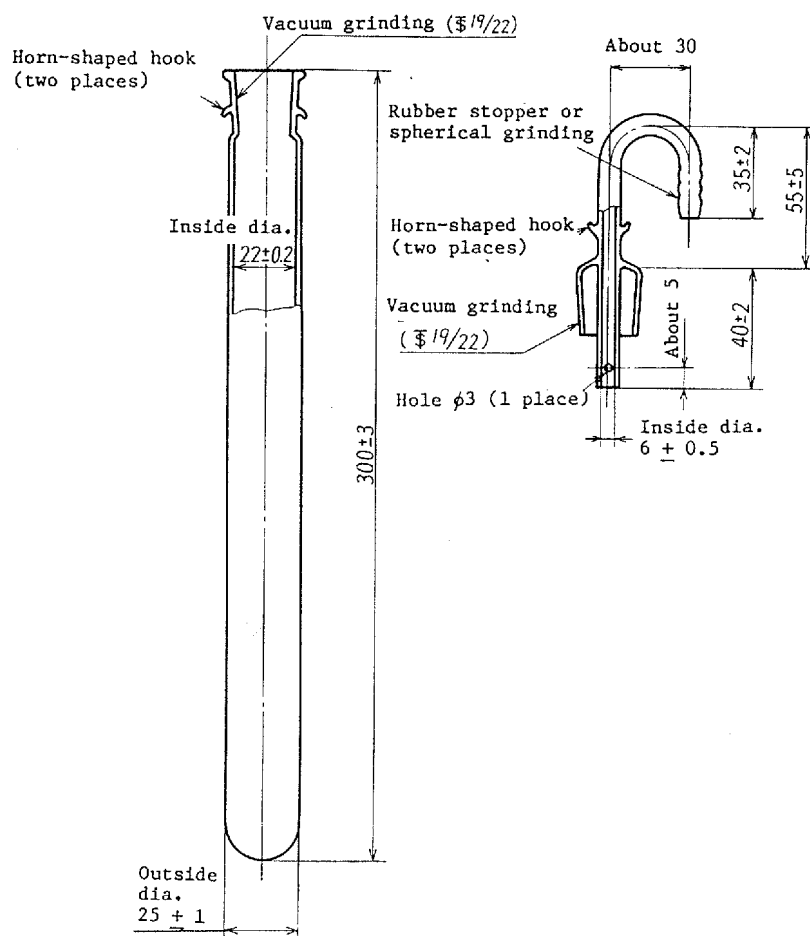
Remark: Glass tube for wiper and rim shall be fixed by adhering.

Fig. 29

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2101	Testing methods of a electrical insulating oils Test for oxidation stability	Sample container

Unit: mm

Quality:
Grade 2
hardness or
superior to
it



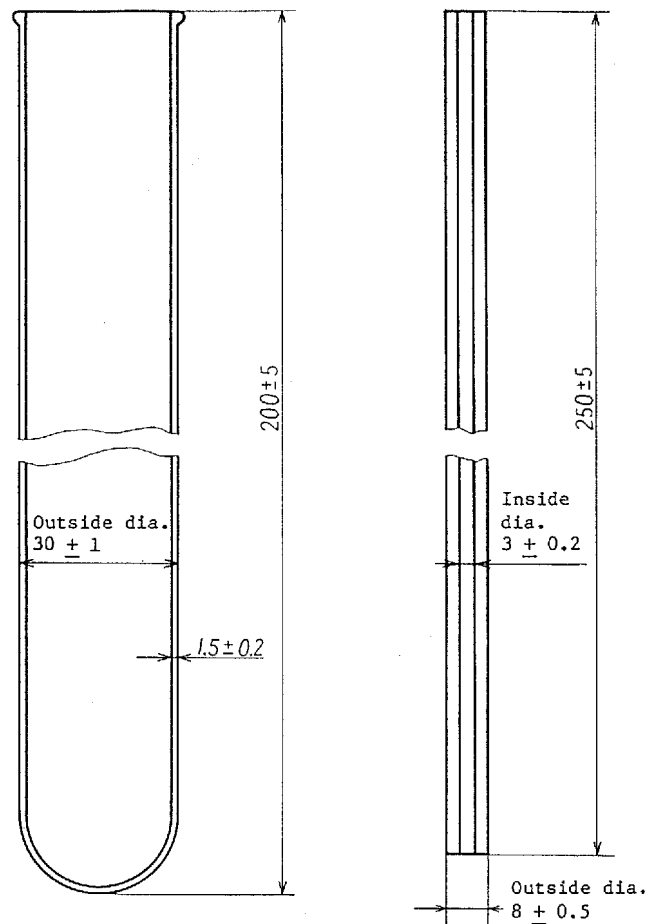
Informative Reference: Related Foreign Standard ASTM D 2440

Fig. 30

Unit: mm

Quality:
Grade 1
hardness

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2101	Testing methods of a electrical insulating oils Test for oxidation stability	Regulator for gas pressure



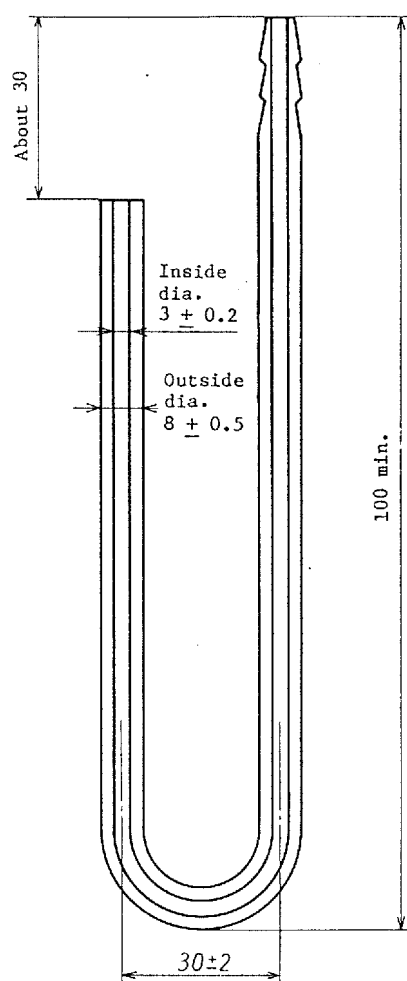
Informative Reference: Related Foreign Standard ASTM D 2440

Fig. 31

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2101	Testing methods of a electrical insulating oils Test for oxidation stability	Manometer

Unit: mm

Quality:
Grade 1
hardness



Informative Reference: Related Foreign Standard ASTM D 2440

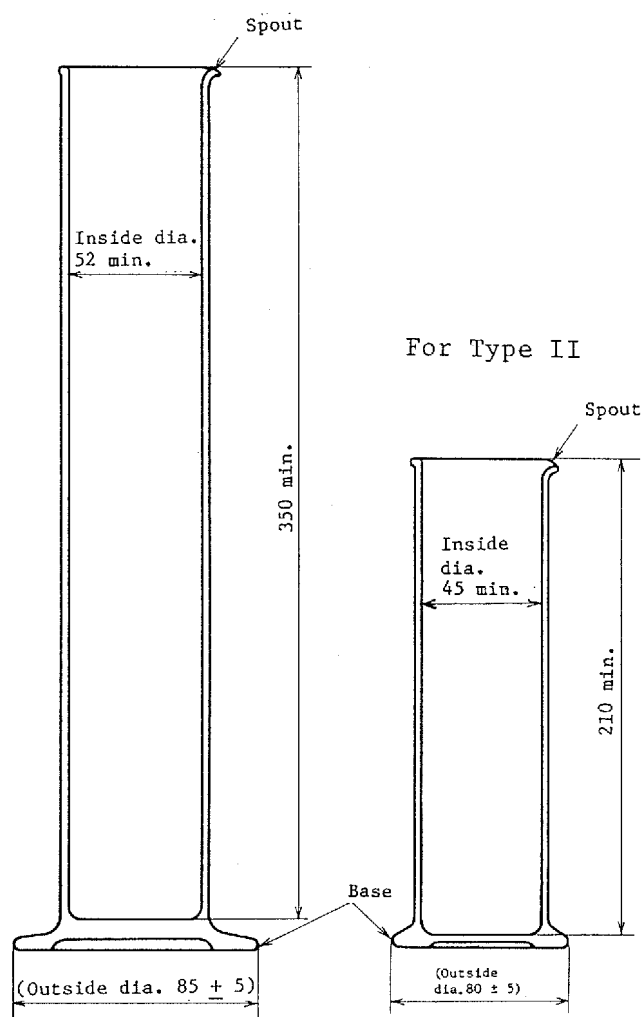
Fig. 35

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2249	Testing method for density of crude oil and petroleum products, and petroleum measurement table based on a reference temperature 15°C Method using hydrometer	Cylinder (for type I and type II)

Unit: mm

Quality:
Regular
grade or
superior
to it

For Type I



Remarks 1. The base may be omitted.

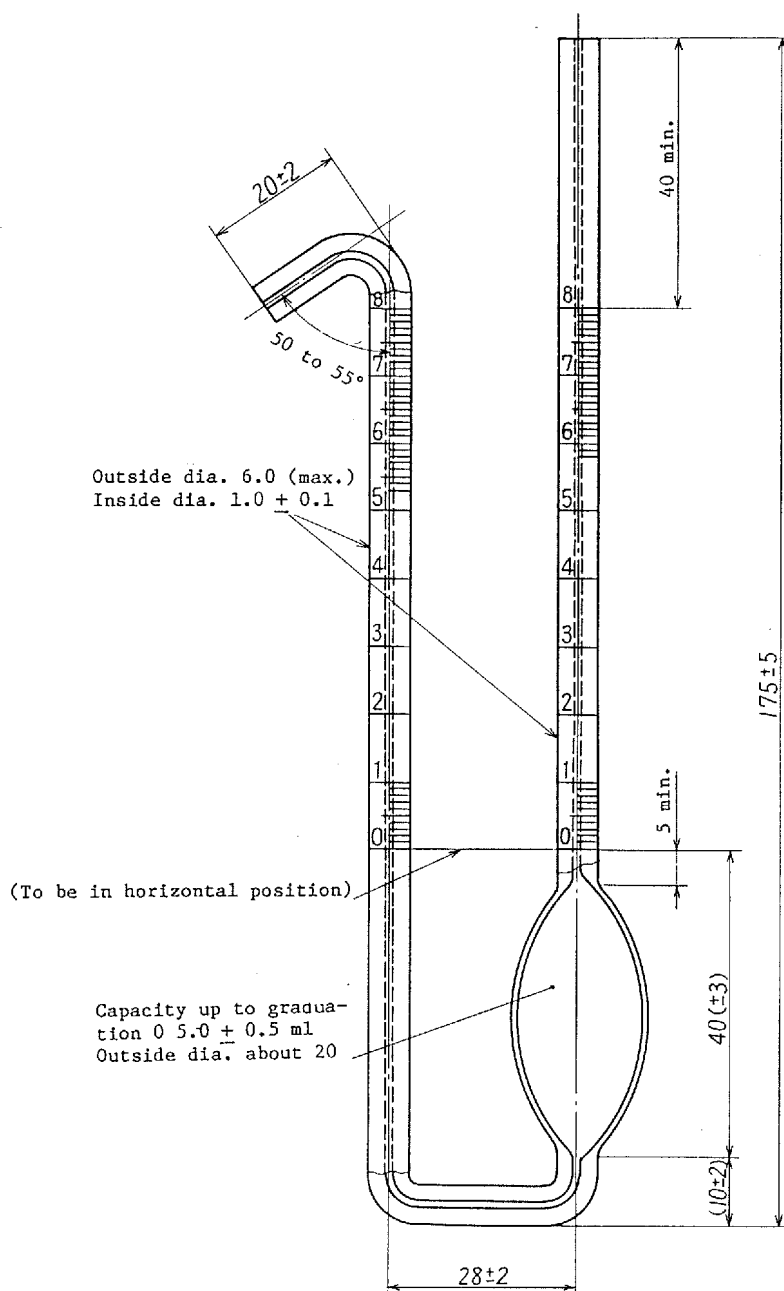
2. Corresponding International Standard ISO 3675

Fig. 37

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2249	Testing method for density of crude oil and petroleum products, and petroleum measurement table based on a reference temperature 15°C Method using Type I picnometer with graduations	Type I picnometer with graduations

Unit: mm

Quality:
Grade 2
hardness
or superior
to it



Graduation

Unit: ml

Scale interval	1
Marked line (quarter of circular line)	At every 10
Half of marked line	At every 5
Quarter of marked line	At every 1
Graduation figure	At every 10
Thickness of graduation line	0.4 max.

Remarks 1. The mass shall be 30 g max.

2. Corresponding International Standard ISO 3838.



Documents

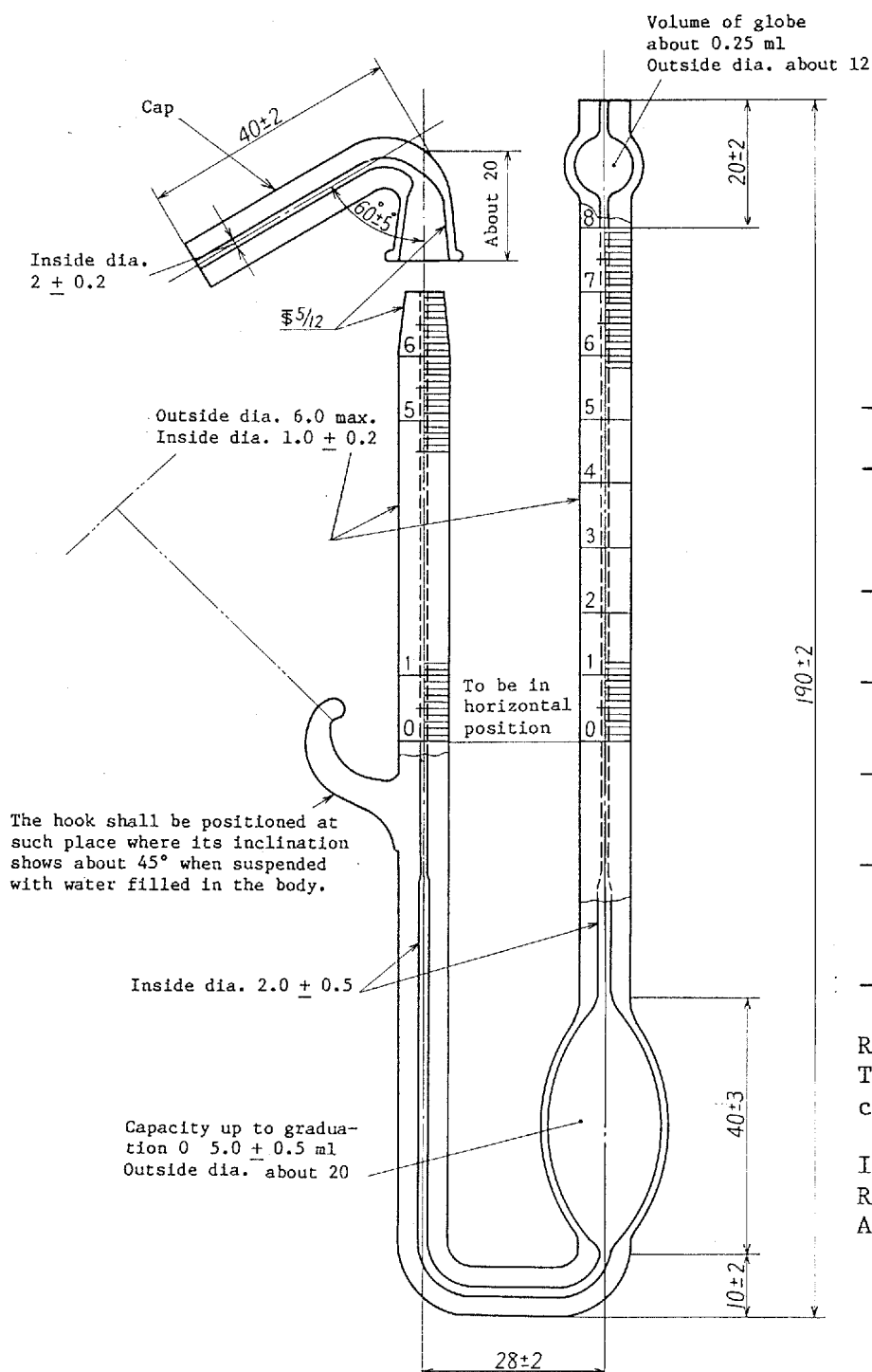
Document Sharing Hub

Fig. 38

Unit: mm

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2249	Testing method for density of crude oil and petroleum products, and petroleum measurement table based on a reference temperature 15°C Method using Type II picnometer with graduations	Type II picnometer with graduations

Quality:
Grade 2
hardness
or superior
to it



Graduation

Unit: ml

Scale interval	1
Marked line (quarter of circular line)	At every 10
Half of marked line	At every 5
Quarter of marked line	At every 1
Graduation figure	At every 10
Thickness of graduation line	0.4 max.

Remarks:

The mass (excluding the cap) shall be 35 g max.

Informative Reference:

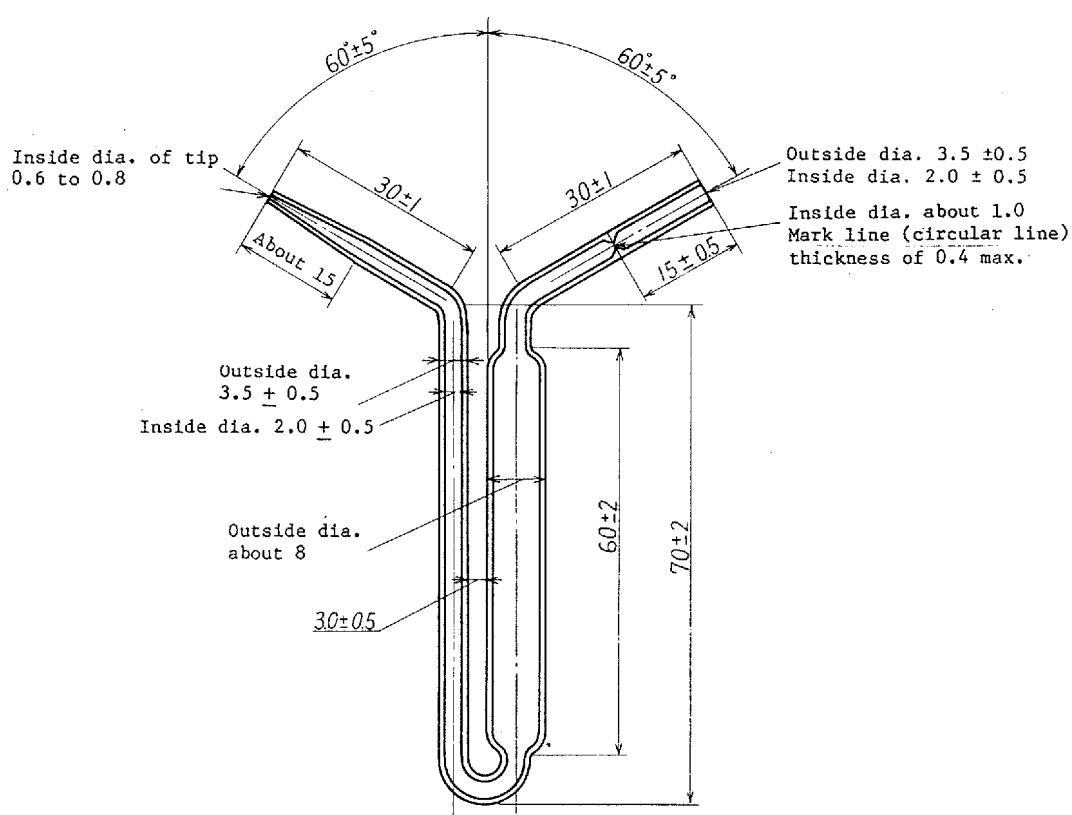
Related foreign Standard
ASTM D 1481

Fig. 39

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2249	Testing method for density of crude oil and petroleum products, and petroleum measurement table based on a reference temperature 15°C Method using Ostwald picnometer	Ostwald picnometer

Unit: mm

Quality:
Grade 2
hardness
or superior
to it



Remarks 1. Volumetric capacity to the marked line (circular line) 2 ± 0.2 ml.

2. Mass 6 g max.

Fig. 41

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2251	Method of sampling crude oil and petroleum products Weighted sampler	Glass sampler

Unit: mm

Quality:
Regular
grade or
superior to
it

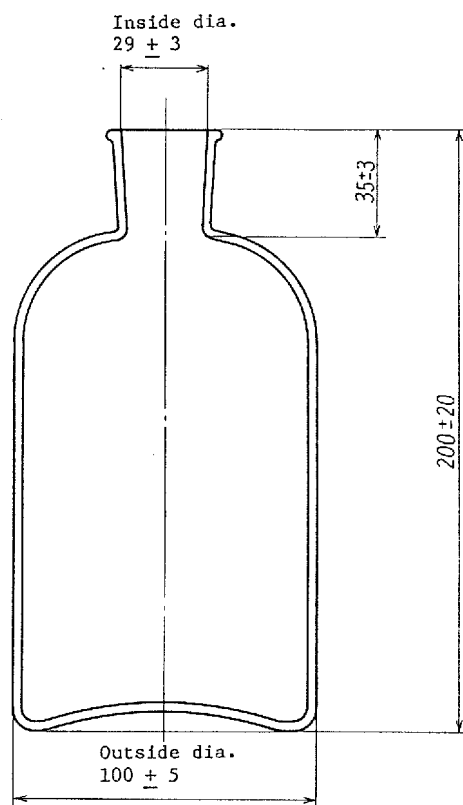
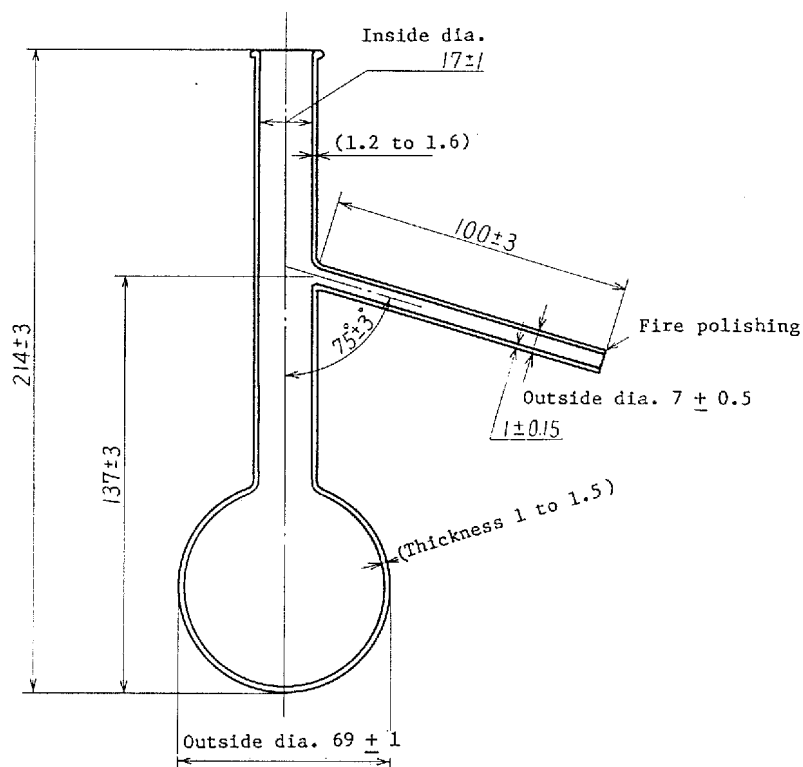


Fig. 42

Unit: mm

Quality:
Grade 1
hardness

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2254	Petroleum products - determination of distillation characteristics Distillation test at normal pressure	Distillation flask (125 ml)



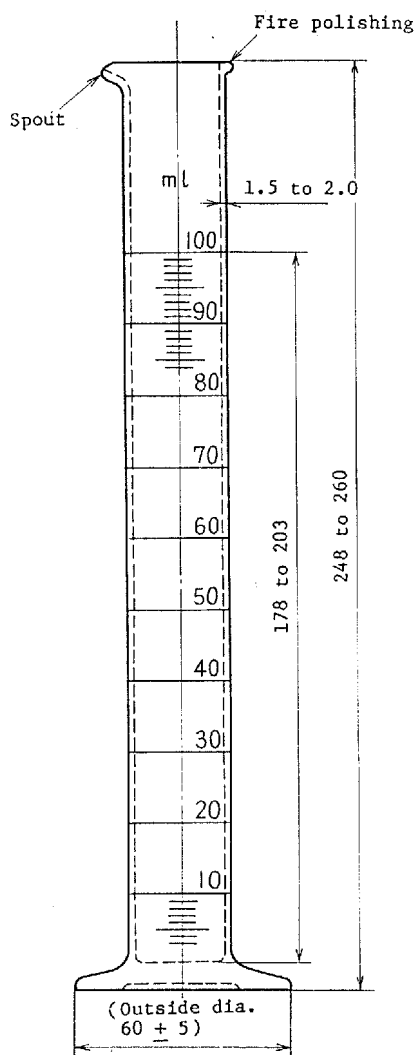
Remark: Corresponding International Standard ISO 3405

Fig. 43

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2254	Petroleum products - determination of distillation characteristics Distillation test at normal pressure	Receiver (100 ml)

Unit: mm

Quality:
Regular grade or superior to it



Graduation

Unit: ml

Range of graduation	0 to 100
Scale interval	1
Long line	At every 5
Circular line section	At every 10
Graduation figure	At every 10

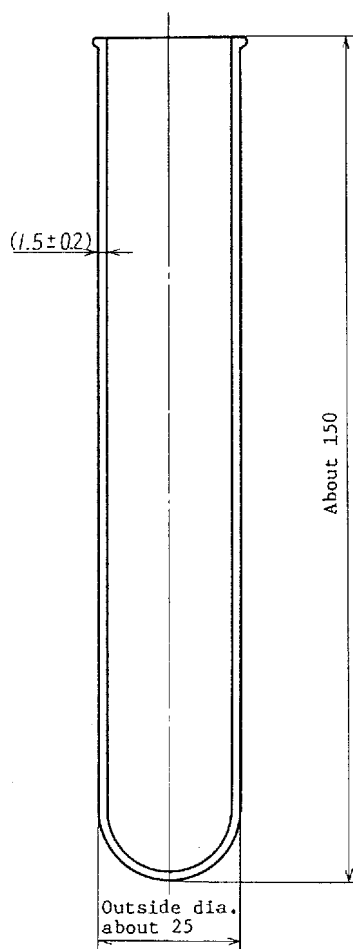
- Remarks
- Two graduation lines positioned at the bottom may be omitted.
 - Glassware shall have been verified as a volumeter according to the Measurement Law.
 - Corresponding International Standard ISO 3405.

Fig. 45

Unit: mm

Quality:
Grade 1
hardness

No. of ref. standard	Title of standard and testing item	Name of glassware
K 2256	Testing methods for aniline point and mixed aniline point of petroleum products Method using test tube	Test tube



Remark: Corresponding International Standard ISO 2977