SCHOTT
glass made of ideas

AR-GLAS®

Tubing and Rod
of Special Glass

SCHOTT is a leading international technology group in the areas of specialty glass and glass-ceramics. With more than 130 years of outstanding development, materials and technology expertise we offer a broad portfolio of high-quality products and intelligent solutions that contribute to our customers' success.

With a production capacity of more than 140,000 tons and production sites in Europe, South America and Asia, SCHOTT Tubing is one of the world's leading manufacturers of glass tubes, rods and profiles. Approximately 60 glass types are produced in large outside diameters and a variety of lengths based on strategies in development, production and quality assurance applying to all sites. SCHOTT Tubing provides customized products and services for international growth markets such as pharmaceutics and electronics as well as industrial and environmental engineering.

Content


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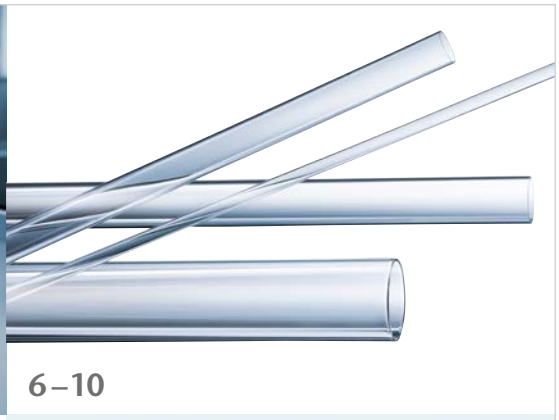
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AR-GLAS®
The best in quality and service

AR-GLAS® for Solar Collectors

AR-GLAS® in the Laboratory

AR-GLAS® for Artistic Applications

AR-GLAS® for Food Packaging

All dimensions shown in this brochure can be ordered online at:
www.schott.com/tubing/ecom

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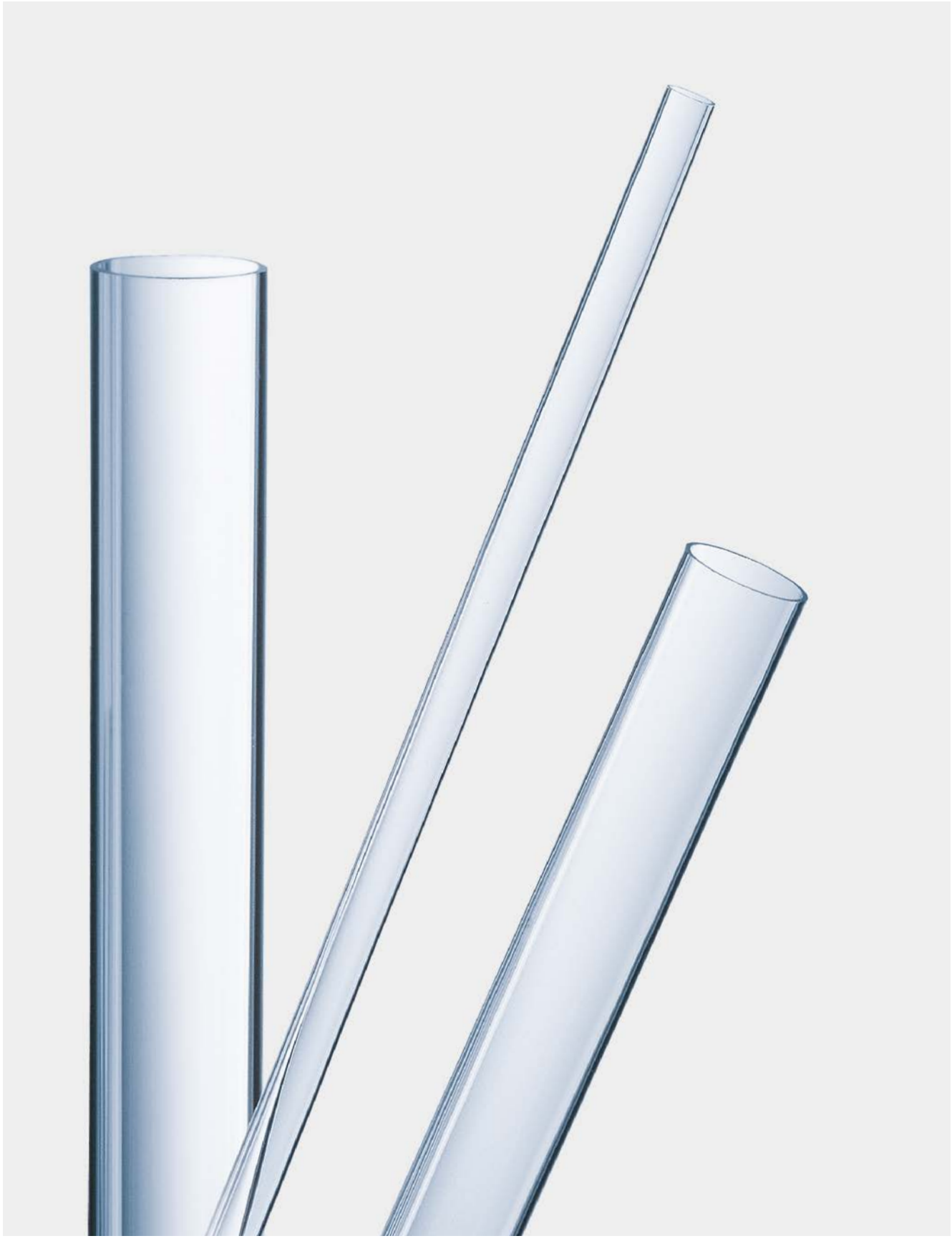
Ordering around the clock

AR-GLAS® can be ordered around the clock using our convenient and easy to use online shop. The comprehensive and secure login features make ordering simple. Further information and individual login data are available by phone +49 (0)9633/80-100 or by email at customerservice.tubing@schott.com

Scientific Services

The Scientific Services department of SCHOTT is available to customers for all questions concerning glass properties, processing and the various applications of AR-GLAS®. Equipped with its own chemical and physics laboratories this team of qualified experts is optimally suited to handle any question.



AR-GLAS®
Tubing

Outside Diameter (OD)		Wall Thickness (WT)		Weight per Tube Length approx. 1500 mm	Carton/ DENSOPACK®		Pallet Load
mm		mm		g	Number of Tubes	Weight approx. kg	Weight approx. kg
4	±0.09	**0.50**	±0.02	21	582	12.0	540.0
	±0.09	**0.70**	±0.03	27	551	15.0	540.0
	±0.12	**0.90**	±0.03	33	548	18.0	486.0
5	±0.09	**0.50**	±0.02	27	378	10.0	450.0
	±0.09	**0.70**	±0.03	36	367	13.0	468.0
	±0.12	**0.90**	±0.03	44	391	17.0	459.0
6	±0.10	**0.50**	±0.02	33	618	20.0	420.0
	±0.10	**0.70**	±0.03	44	252	11.0	495.0
	±0.10	**0.90**	±0.03	54	278	15.0	540.0
	±0.12	**1.10**	±0.03	64	252	16.0	432.0
7	±0.10	**0.50**	±0.02	38	418	16.0	448.0
	±0.10	**0.70**	±0.03	52	193	10.0	450.0
	±0.10	**0.90**	±0.03	65	186	12.0	540.0
	±0.12	**1.10**	±0.03	77	196	15.0	540.0
8	±0.10	**0.50**	±0.02	44	380	16.8	352.8
	±0.10	**0.70**	±0.03	60	342	20.6	432.6
	±0.10	**0.90**	±0.03	76	266	20.0	420.0
	±0.12	**1.10**	±0.03	90	234	20.9	438.9
9	±0.12	**0.50**	±0.02	50	340	17.0	357.0
	±0.12	**0.70**	±0.03	69	289	19.8	415.8
	±0.12	**0.90**	±0.03	86	238	20.4	428.4
	±0.14	**1.10**	±0.03	103	204	20.9	438.9

AR-GLAS®
Tubing

Outside Diameter (OD)		Wall Thickness (WT)		Weight per Tube Length approx. 1500 mm	Carton/ DENSOPACK®		Pallet Load
mm		mm		g	Number of Tubes	Weight approx. kg	Weight approx. kg
10	±0.12	**0.60**	±0.03	67	270	17.9	375.9
	±0.12	**0.80**	±0.03	87	240	20.8	436.8
	±0.14	**1.00**	±0.03	106	165	17.5	367.5
	±0.15	**1.20**	±0.04	125	165	20.5	430.5
11	±0.12	**0.60**	±0.03	74	256	18.8	451.2
	±0.12	**0.80**	±0.03	96	208	20.0	420.0
	±0.14	**1.00**	±0.03	118	169	19.9	417.9
	±0.15	**1.20**	±0.04	139	143	19.8	415.8
12	±0.12	**0.60**	±0.03	81	238	19.2	345.6
	±0.12	**0.80**	±0.03	106	196	20.7	372.6
	±0.14	**1.00**	±0.03	130	156	20.2	424.2
	±0.15	**1.20**	±0.04	153	126	19.2	345.6
13	±0.12	**0.60**	±0.03	88	208	18.2	436.8
	±0.12	**0.80**	±0.03	115	182	20.9	376.2
	±0.14	**1.00**	±0.03	142	143	20.2	363.6
	±0.15	**1.20**	±0.04	167	117	19.5	351.0
14	±0.12	**0.60**	±0.03	95	180	17.0	408.0
	±0.12	**0.80**	±0.03	125	168	20.9	376.2
	±0.14	**1.00**	±0.03	154	120	18.4	386.4
	±0.15	**1.20**	±0.04	181	110	19.9	417.9
15	±0.14	**0.60**	±0.03	102	154	15.7	376.8
	±0.14	**0.80**	±0.03	134	143	19.1	343.8
	±0.14	**1.00**	±0.04	165	121	19.9	358.2
	±0.18	**1.20**	±0.04	195	100	19.5	409.5

AR-GLAS®
Tubing

Outside Diameter (OD)		Wall Thickness (WT)		Weight per Tube Length approx. 1500 mm	Carton/ DENSOPACK®		Pallet Load
mm		mm		g	Number of Tubes	Weight approx. kg	Weight approx. kg
16	±0.14	**0.60**	±0.03	109	143	15.6	374.4
	±0.14	**0.80**	±0.03	144	132	18.9	453.6
	±0.14	**1.00**	±0.04	177	110	19.4	349.2
	±0.18	**1.20**	±0.04	210	99	20.7	434.7
17	±0.14	**0.80**	±0.03	153	120	18.3	439.2
	±0.14	**1.00**	±0.04	189	100	18.8	451.2
18	±0.18	**0.80**	±0.03	163	110	17.8	427.2
	±0.19	**1.00**	±0.04	201	99	19.8	356.4
	±0.19	**1.20**	±0.04	238	81	19.2	345.6
	±0.23	**1.50**	±0.05	292	72	21.0	441.0
19	±0.18	**0.80**	±0.03	172	99	17.0	408.0
	±0.19	**1.00**	±0.04	212	90	19.1	343.8
	±0.23	**1.50**	±0.05	310	63	19.5	351.0
20	±0.19	**0.80**	±0.04	181	64	11.6	417.6
	±0.19	**1.00**	±0.04	224	72	16.1	386.4
	±0.19	**1.20**	±0.05	266	72	19.1	343.8
21	±0.19	**0.80**	±0.04	191	80	15.2	364.8
	±0.19	**1.00**	±0.04	236	80	18.8	451.2
22	±0.19	**0.80**	±0.04	200	72	14.4	432.0
	±0.19	**1.00**	±0.04	248	72	17.8	427.2
	±0.19	**1.20**	±0.05	294	64	18.8	451.2
23	±0.19	**0.80**	±0.04	209	63	13.2	316.8
	±0.19	**1.00**	±0.04	260	63	16.3	391.2
	±0.23	**1.50**	±0.05	380	49	18.6	446.4

AR-GLAS®
Tubing

Outside Diameter (OD)		Wall Thickness (WT)		Weight per Tube Length approx. 1500 mm	Carton/ DENSOPACK®		Pallet Load
mm		mm		g	Number of Tubes	Weight approx. kg	Weight approx. kg
24	±0.19	**1.00**	±0.04	271	56	15.2	364.8
	±0.19	**1.20**	±0.05	323	56	18.0	432.0
	±0.23	**1.50**	±0.05	398	49	19.5	351.0
25	±0.19	**0.80**	±0.04	228	56	12.8	307.2
	±0.24	**1.50**	±0.05	416	42	17.4	365.4
26	±0.19	**1.00**	±0.04	295	48	14.1	338.4
	±0.24	**1.20**	±0.05	350	48	16.8	403.2
	±0.24	**1.50**	±0.05	433	48	20.8	374.4
28	±0.19	**1.00**	±0.04	318	42	13.4	402.0
	±0.24	**1.20**	±0.05	379	42	15.9	381.6
	±0.24	**1.50**	±0.05	468	42	19.7	354.6
30	±0.24	**1.20**	±0.05	407	35	14.2	340.8
	±0.29	**1.50**	±0.06	503	35	17.6	422.4
32	±0.24	**1.20**	±0.05	435	30	13.1	393.0
	±0.29	**1.50**	±0.06	539	30	16.2	388.8
34	±0.24	**1.20**	±0.05	463	30	13.9	333.6
	±0.29	**1.50**	±0.06	574	30	17.2	412.8
36	±0.40	**1.20**	±0.06	492	20	9.8	343.0
	±0.40	**1.50**	±0.07	609	20	12.2	427.0
38	±0.40	**1.20**	±0.06	520	20	10.4	249.6
	±0.40	**1.50**	±0.07	645	20	12.9	309.6
40	±0.50	**1.20**	±0.07	549	20	11.0	264.0
	±0.50	**1.50**	±0.07	680	20	13.6	326.4

In addition to the dimensions above, different lengths and outside diameters up to 70 mm are available upon request.

Standard length: 1500 mm
Special sizes of tubing between 1200 and 4000 mm long and with an outside diameter range of 18 to 38 mm are available upon request.

Tubing with outside diameters between 5 – 30 mm can be additionally coated to protect from scratches (minimum quantity is 2 tons).

AR-GLAS®
Rod

Outside Diameter		Carton Contents		Pallet
mm		Number of Rods	Weight approx. kg	Weight approx. kg
3	±0.10	510	13.5	445.5
4	±0.15	308	14.5	478.5
5	±0.15	217	16.0	528.0
6	±0.15	142	15.0	495.0
7	±0.20	104	15.0	495.0
8	±0.20	80	15.0	495.0
9	±0.20	60	14.3	471.9
10	±0.25	49	14.4	475.2
12	±0.25	33	14.0	462.0
14	±0.30	24	13.8	455.4
16	±0.35	20	15.1	543.6
20	±0.50	16	18.8	507.6
25	±0.70	9	16.6	448.2

Rod with an outside diameter of up to 30 mm is available upon request.

Standard length: 1500 mm

All tubing and rod dimensions shown in this brochure are available on short notice. All carton contents and weights are approximate.

AR-GLAS®
Physical and Chemical Properties

Physical Properties		
Coefficient of mean linear thermal expansion α (20 °C; 300 °C) acc. to DIN ISO 7991		$9.1 \cdot 10^{-6}\ K^{-1}$
Transformation temperature T_g		525 °C
Temperature of the glass at viscosity η in dPa · s:	10^{13} (annealing point) $10^{7.6}$ (softening point) 10^{4} (working point)	530 °C 720 °C 1040 °C
Density ρ at 25 °C		$2.50\ g \cdot cm^{-3}$
Modulus of elasticity E (Young's modulus)		$73 \cdot 10^{3}\ N \cdot mm^{-2}$
Poisson's ratio μ		0,22
Thermal Conductivity λ_w at 90 °C		$1.1\ W \cdot m^{-1} \cdot K^{-1}$
Temperature for the specific electrical resistance of $10^8\ \Omega \cdot cm$ (DIN 52 326) $t_{k\,100}$		200 °C
Logarithm of the electric volume resistivity ($\Omega \cdot cm$)	at 250 °C at 350 °C	7.1 5.7
Dielectric properties (1 MHz, 25 °C)	Dielectric constant (permittivity) ε Dielectric loss factor (dissipation factor) tan δ	7.2 $70 \cdot 10^{-4}$
Refractive index (λ = 587.6 nm) n_d		1.514
Stress-optical coefficient (DIN 52 314) K		$2.7 \cdot 10^{-6}\ mm^2 \cdot N^{-1}$

Chemical Composition

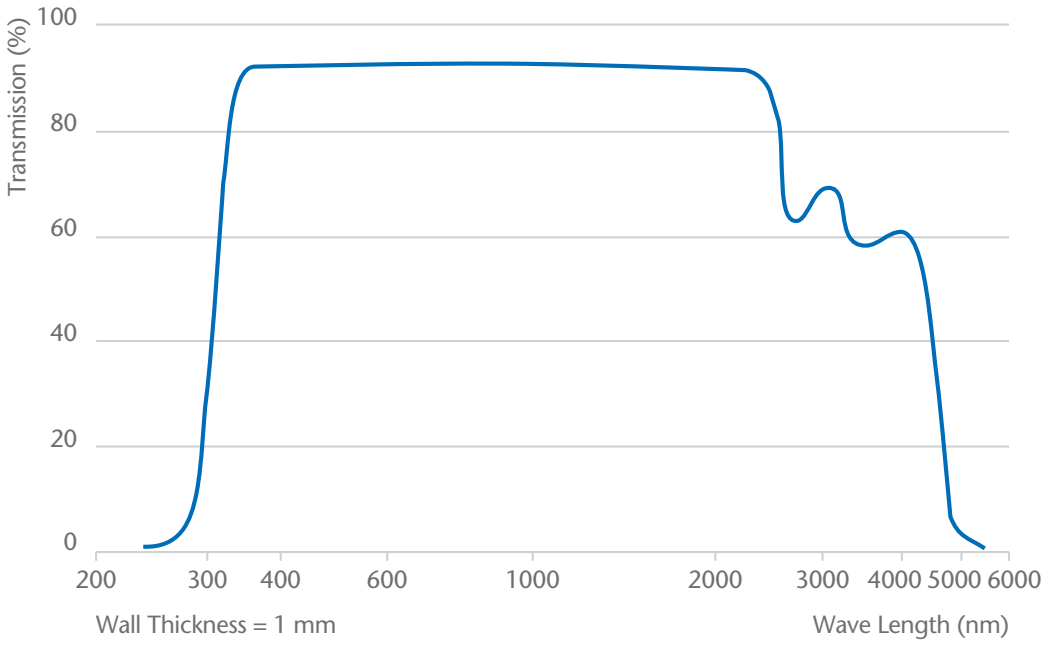
SiO_2	B_2O_3	K_2O	Al_2O_3	Na_2O	BaO	CaO	MgO
69	1	3	4	13	2	5	3

main components in approx. weight %

AR-GLAS®
Physical and Chemical Properties

Chemical Resistance	
Hydrolytic Class (DIN ISO 719)	HGB 3
Acid Class (DIN 12116)	Class S 1
Alkali Class (DIN ISO 695)	Class A 2

Transmission



AR-GLAS®

Packing

≤ OD 7 mm = Cartons
≥ OD 8 mm = DENSOPACK®

DENSOPACK®:
Tightly packed and covered with shrink film = effective transport protection

Technical Terms of Supply

Detailed information on permissible faults, definition of faults, testing methods and testing units are available upon request. Reduced tolerances are also available upon request. In case of quality complaints the relevant “Technical Terms of Supply” for the application apply to all sales and are binding unless separate written agreements with respect to quality have been entered into.

Subject to technical alterations.

We thank our customers and partners for their kind assistance in providing product samples and photos.

Notes

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