

Glass Technologies



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OSRAM SYLVANIA Glass Technologies

Worldwide Supplier of Glass Products

OSRAM SYLVANIA manufactures a wide range of glass tubing, bulbs, and other glass shapes primarily for use in the lighting industry. Other applications include consumer products, Christmas ornaments, and technical applications. With three high speed, state-of-the-art-manufacturing facilities we are one of the top glass producers in the world.

Why OSRAM SYLVANIA Glass Technologies?

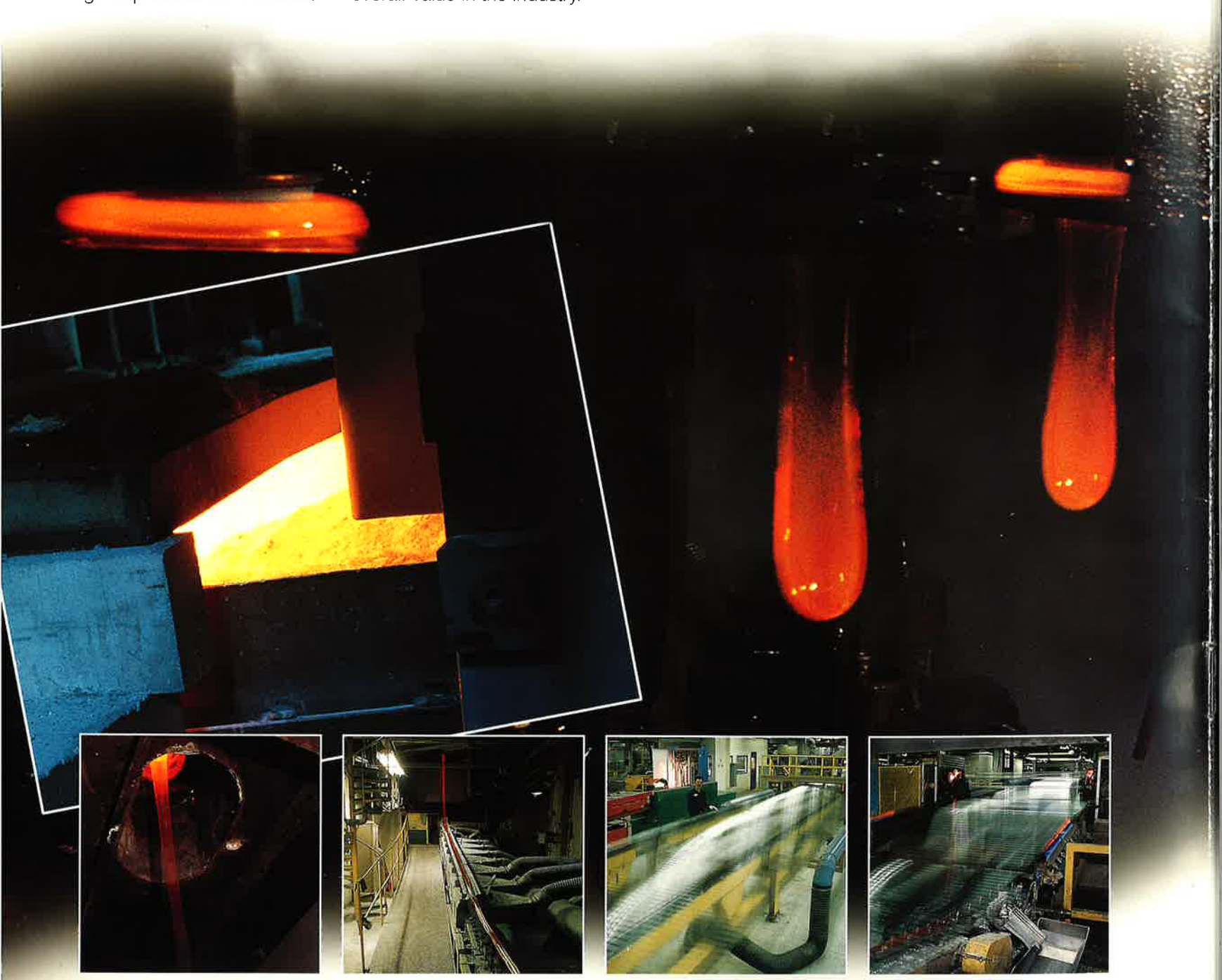
OSRAM SYLVANIA Glass Technologies has made a commitment to customer satisfaction at a world class level of excellence. To achieve this, we focus on Quality, On-Time Delivery, and outstanding Customer Service. Our objective is to provide our customer the best overall Value in the industry.

Quality

OSRAM SYLVANIA Glass Technologies' commitment to total quality assures the product integrity expected from a world class supplier.

Our quality approach starts with the monitoring of our suppliers and incoming raw

materials. The commitment to quality continues through automated production processes and quality vision inspection systems. Finally, automated packing assures the product arrives at your facility in a consistent manner.



We back-up this quality commitment with our performance guarantee that ensures our product will meet your manufacturing objectives.

All of our facilities are ISO certified confirming the world's standard of excellence.

On-Time Delivery

Our commitment to customer satisfaction is focused on delivering product to our customers on time, every time. We strive to minimize the response time from customer inquiry to delivery of the product.

Customer Service

Our customer service staff can help with in-house analytical services and corporate resources that provide solutions to address the ever-changing business and technical environment. Through access to the power of global networking, OSRAM SYLVANIA Glass Technologies will help drive your products to the leading edge of your market.

Value

High Quality, On-Time Delivery and Customer Service combined with low price gives you the best Value available.



Glass Products for Lighting and Beyond

OSRAM SYLVANIA Glass Technologies primarily supplies the diverse glass products needed for the worldwide lighting industry. We complement our lighting glass products by manufacturing other non-lighting items that lend themselves to our glasses and forming processes.

Christmas tree ornaments, clock domes, and decorative vases are examples of non-lighting products manufactured on machinery that also makes lighting glass blownware. Non-lighting applications for tubing include neon signs, fuse

bodies, and thermometers. OSRAM SYLVANIA Glass Technologies continues to explore new glass applications that match our capabilities.

In addition to manufacturing glass, finishing facilities include chemical frosting, ceramic painting, cutting, and metalizing.

Soda Lime Glass

Each of our plants, Central Falls, Rhode Island, Versailles, Kentucky, and Wellsboro, Pennsylvania melt a similar soda lime glass. These glasses have only minor compositional differences designed to



optimize the glass for the forming process and application. Soda Lime Glass is used as the outer shell for both incandescent and fluorescent lighting applications. This glass is also used in non-lighting applications such as Christmas ornaments and consumer products.

Lead-Silicate Glass

Lead-silicate glass is melted and drawn into small-diameter tubing at the Versailles, Kentucky plant. This glass has a much higher electrical resistivity and remains workable over a wider temperature range than soda lime glass. Its primary use is for flare and exhaust tubing in incandescent and fluores-

cent lighting products. It is also used extensively for neon signs.

Borosilicate Glass

Borosilicate glass is melted and formed into blown bulbs and small diameter tubing at our Central Falls, Rhode Island facility. This glass has high durability, high thermal shock resistance, and high electrical resistivity. Its optical trans-

mission is controlled to cut off harmful ultraviolet radiation. Borosilicate glass is designed for HID (High Intensity Discharge) lighting applications.

The tubing drawn from this glass seals well to both the tungsten lead wires and the blown bulbs, and therefore is used for flare and exhaust tubing in HID applications.



Performance Guaranteed!

Product Criteria and Specifications

We publish quality criteria (QC's) that describe the controlled dimensional and visual characteristics of our products, how measurements are made, standard limits, and how the characteristic is controlled in production. In addition, individual specifications are written for each blown bulb shape, each tubing size, and each fluorescent bulb.

Commitment to Stability

We recognize that customers who use our product continuously in their process are dependent upon us to maintain the properties of our glass to minimize any impact on their process. We use control charts and other

statistical methods to properly control the properties and dimensions of our glass. Our ability to control these characteristics ensures that they will meet or exceed our customer's performance requirements. We guarantee it!

Long-term Relationships

Over the years, Glass Technologies has developed many long-term, mutually beneficial relationships with customers in a multitude of industries throughout the world. By being sensitive to the major issues of quality control, pricing, customer service, technical assistance, and product availability, we've become known as the service industry leader in lighting glass technologies worldwide.



Glass Blownware Shapes

The shapes shown are representative and do not cover the full product line.

Lime Glass Shapes

G6F2



C7Z1



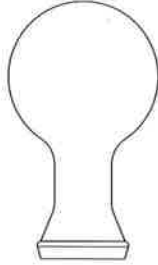
S8E1



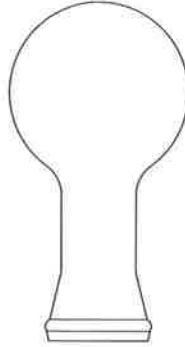
G16.5



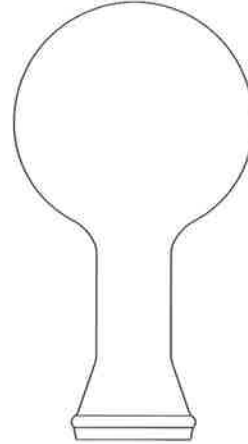
G25M1



G30E1



G40P4



A15E1



A19C3



A21G6



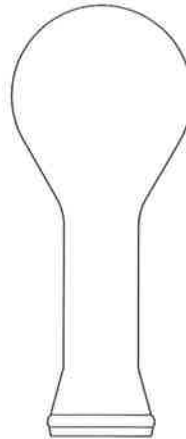
A23Z1



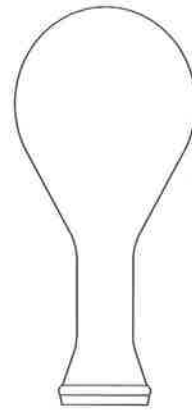
PS25N1



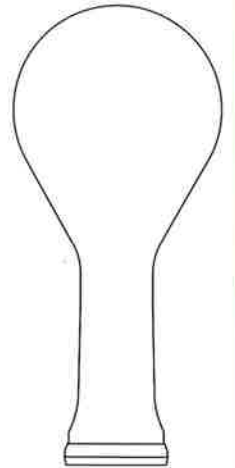
PS30D12



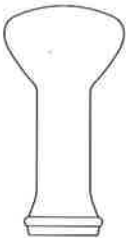
PS40C20



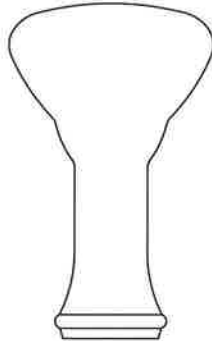
PS52



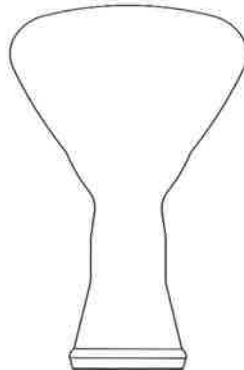
R20W1



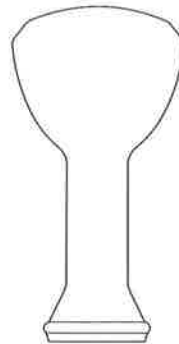
BR30A1



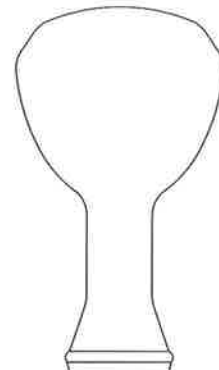
BR40Y1



ER30Z1



ER40Z1



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Lime Glass Shapes *(continued)*

T6R1



T6.5BL1



T10D8



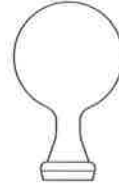
F15G1



X134



X214



X258



X314



Hard Glass Shapes

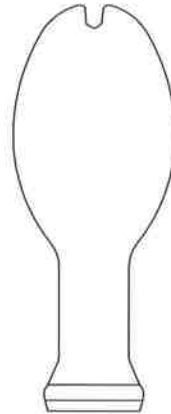
BD17B1



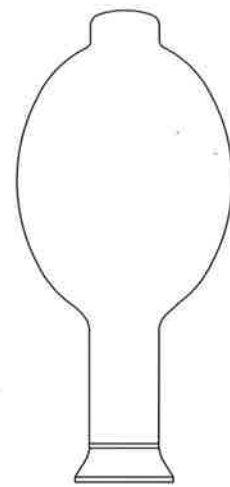
ED23.5Y1



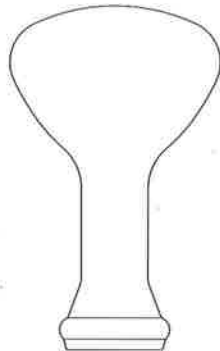
ED37Y1



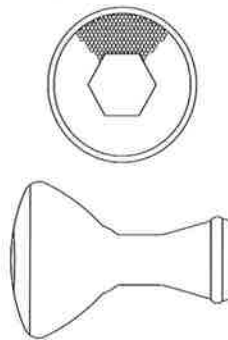
BT56



R40G1



BRL38F1



T14.4A10



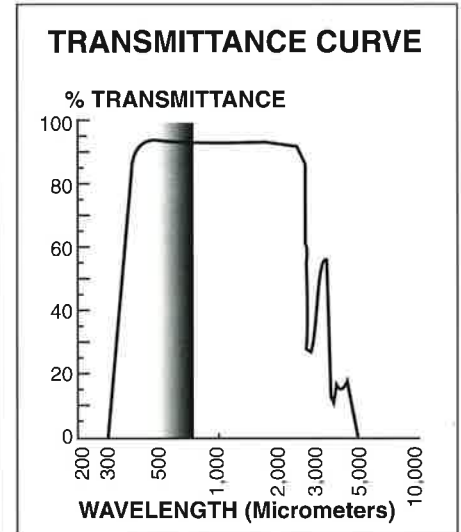
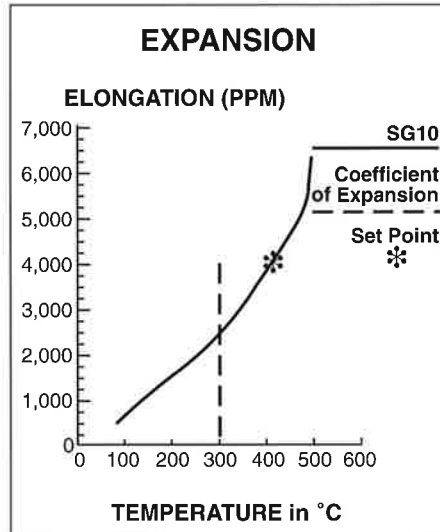
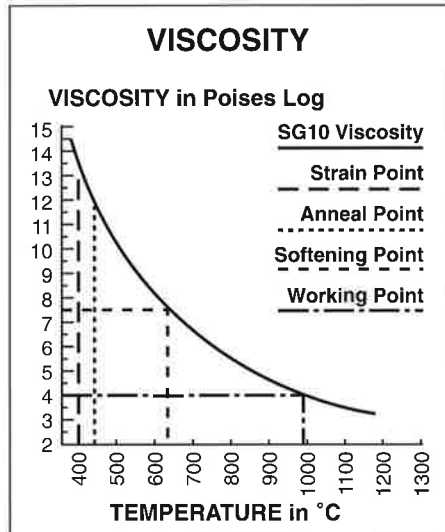
T14.5A9



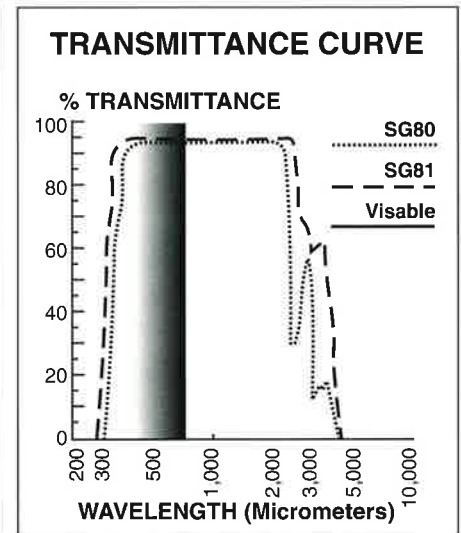
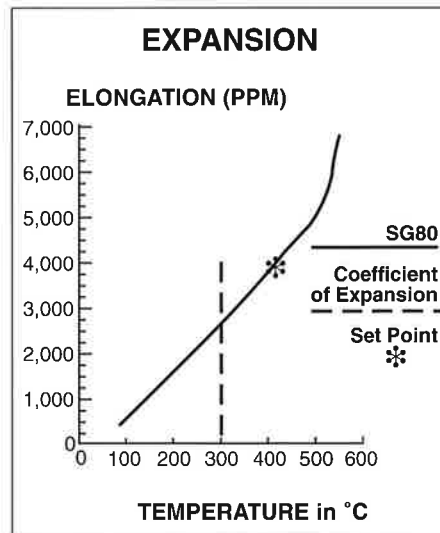
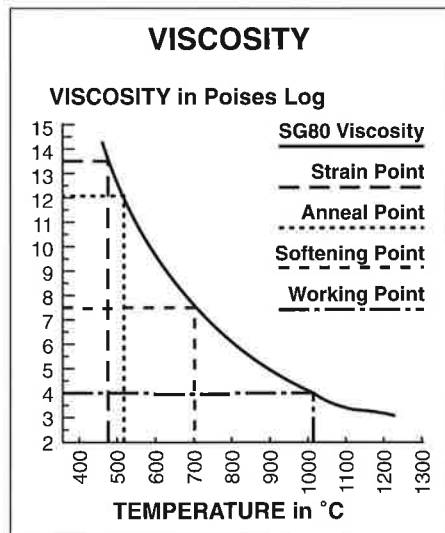
Viscosity, Expansion and Transmittance

SG10, SG80, SG81, SG91, and SG773

SG10 Lead Glass

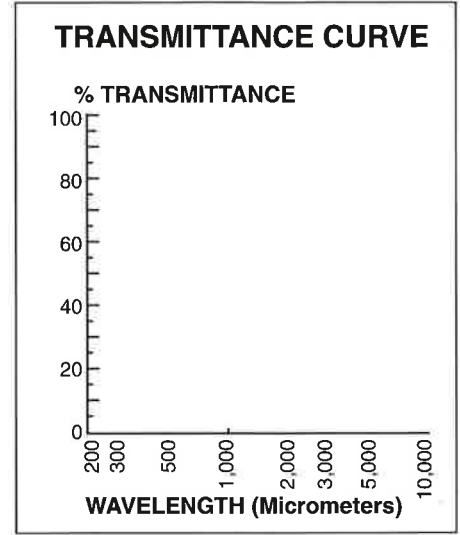
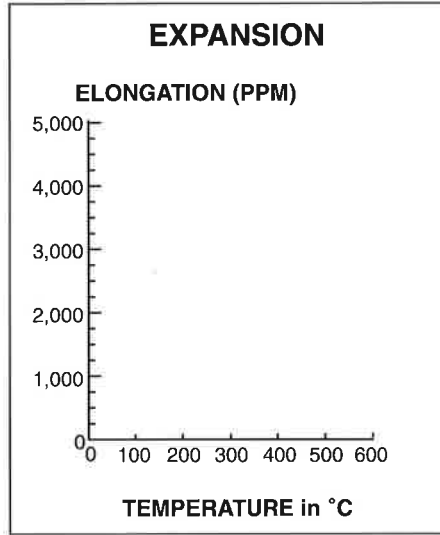
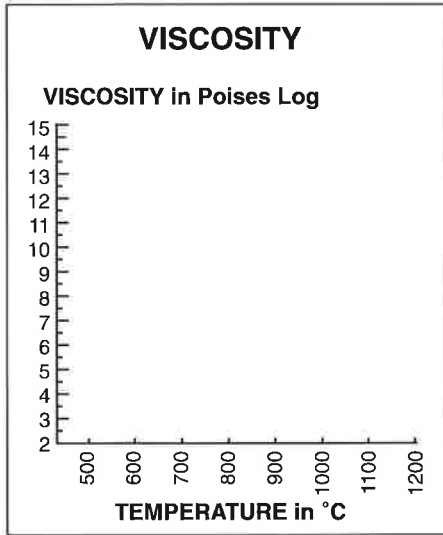


SG80, SG81, and SG91 Soda Lime Glass



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SG773 Borosilicate Glass*



* New product data being developed.

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Technical Data

The following is a summary of the typical glass properties and chemical composition of our glasses. If a "±" tolerance is shown, that property is guaranteed within

the tolerance. Additional data is shown on the Graphs sheet.

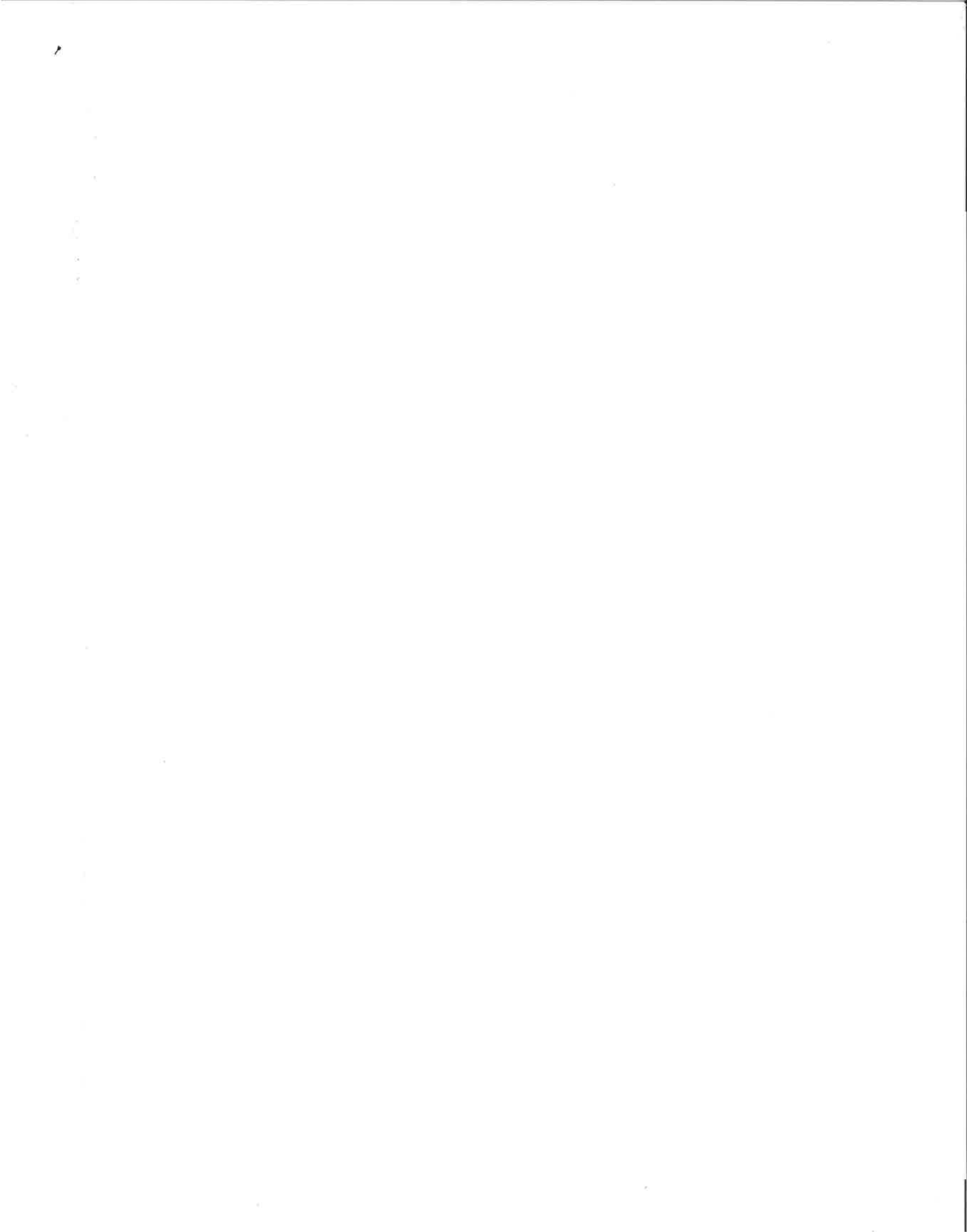
Typical composition (% by weight)

Glass	SG80	SG81	SG91	SG10	SG12	SG773*
SiO ₂	73.5	73.0	73.3	62.1	56.6	
Na ₂ O	16.3	16.2	15.4	6.8	3.8	
CaO	4.7	4.6	5.6	.1	.1	
K ₂ O	.3	.3	.2	7.4	8.5	
PbO	—	—	—	21.3	28.9	
B ₂ O ₃	—	—	—	—	—	
Al ₂ O ₃	1.6	1.3	1.4	2.1	1.8	
As ₂ O ₃	—	—	—	—	—	
Sb ₂ O ₃	.17	—	—	.12	.22	
MgO	3.4	3.3	3.9	—	—	
FeO	.03	.05	.05	.03	.03	
TiO ₂	—	—	—	—	—	
ZrO ₂	—	—	—	—	—	

Physical Properties

Glass	SG80	SG81	SG91	SG10	SG12	SG773*
Density @ 20 (±05g/cm ³)	2.46	2.47	2.48	2.85	3.05	
Expansion (11.5°C)	92.2	93.0	90.7	92.0	89.1	
Young's Modulus (x10 ⁹ kg/mm ²)	7.2	7.2	7.2	6.25	6.0	
Poisson's Ration	.23	.23	.23	.21	.22	
Viscosity (°C)						
Working Point	1005	1013	1015	985	985	
Softening Point	700	695	705	635	630	
Anneal Point	514	514	523	432	435	
Strain Point	473	473	485	392	395	
Resistivity (cm)						
@ 250°C	6.4	6.4	6.4	8.9	10.1	
@ 350°C	5.1	5.1	5.1	7.0	8.0	
Index of Refraction	1.512	1.512	1.512	1.539	1.560	
Birefringence Factor (μ/cm (kg/mm ²))	255	255	255	306	292	

* New product data being developed.



Customer Service

Inquiries and Product Quotations

Inquiries regarding the availability of new products, price quotations, or questions about product design or glass properties should be directed to our Sales Office in Exeter, New Hampshire at (603) 778-4570. Our Sales Department will answer your commercial questions, and our Product and Application Engineering staff will answer your technical inquiries.

As you do more repeat business with Glass Technologies, we encourage you to deal directly with our manufacturing plants in routine matters of releases, shipping information, and quality concerns.

Sales Office Exeter, New Hampshire

Telephone: (800) 368-6366
(603) 778-4570
Fax: (603) 778-0674

Central Falls, Rhode Island

Telephone: (401) 723-4100

Fluorescent and Hard Glass Ext. 220
Soft Glass Bulbs Ext. 221
Residential Ext. 209
Customer Service (Ware availability, releases, shipments) Ext. 219
Quality Control Ext. 230
Fax: (401) 727-6259

Products:

Soda Lime Glass

- Fluorescent Tubing
- Blown Bulbs for Incandescent Lamps
- Christmas Ornaments

Borosilicate Glass

- HID Bulbs
- Flare and Exhaust Tubing

Residential Decorative Glass

- Globes
- Votives
- Chimneys
- Hurricane Lamps

Versailles, Kentucky

Telephone: (606) 873-7351

All Products Ext. 240
Customer Service (Ware availability, releases, shipments) Ext. 300
Quality Control Ext. 215
Fax: (606) 873-4803

Products:

Lead Silicate Glass

- Small Diameter Tubing
- Neon Tubing

Soda Lime Glass

- Small Diameter Tubing
- Fluorescent Tubing
- Compact Fluorescent Tubing

Wellsboro, Pennsylvania

Telephone: (717) 724-8200

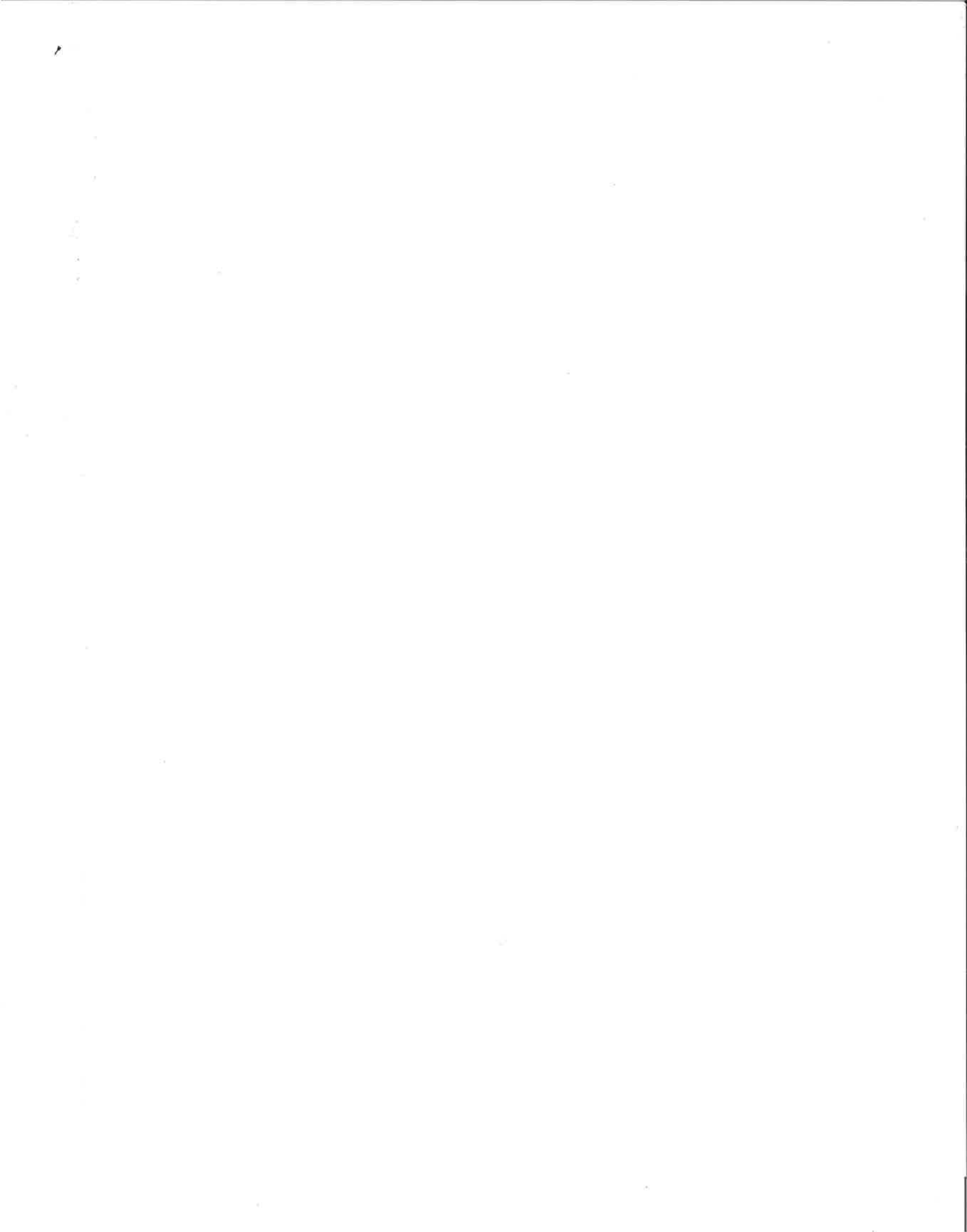
All Products Ext. 289
Customer Service (Ware availability, releases, shipments) Ext. 291
Quality Control Ext. 249
Fax: (717) 724-8232

Products:

Soda Lime Glass

- Small Incandescent Bulbs (less than the "23" size)
- Blown Bulbs for Christmas Ornaments

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