

CORNING

Lighting Glasses
for
Halogen Cycle
Lamps

Introducing Vycor[®]
7902

CORNING

Corning's Lighting Products Group has been manufacturing high temperature, high precision, optical quality tubing for halogen cycle lamps for over 20 years.

In the late 1960's **Vycor®** tubing was adopted as the standard product in Europe based on its excellent optical quality, dimensional control, thermal and chemical properties.

In 1977, aluminosilicate glasses, specifically code **1720**, was adopted for tungsten halogen lamps by the industry.

In 1980, Corning introduced a new higher operating temperature, low alkali aluminosilicate glass, code **1725**, to meet the needs for smaller diameter tubing packages.

In 1981, we introduced glass code **1724**, another new product with a low alkali content and thermal properties that allowed the lamp maker to overcome the technical objections of 1720 glass.

In 1983, the **conversion from 1720 to 1724** was started and in 1984, halogen lamp manufacturers worldwide have acknowledged the improvements in both the glass tubing and the lamp performance by exclusively using 1724.

In 1984, Corning continued the product development of aluminosilicate glass code **1725** to further improve its quality to meet the growing needs for a more refractory hard glass.

In 1984, Corning introduced a new Vycor® composition to meet the market needs for lower sealing temperatures. **This new glass is code 7902** and it will be available in production quantities in 1985.

This **growing family of Corning halogen cycle glasses** allows the lamp manufacturer to select the specific glass for the required performance of existing lamps as well as meeting the requirements for new product designs.

Aluminosilicate Compositions

Introduced in 1981, code **1724's** low alkali content, outstanding optical quality, coupled with all the excellent properties of its predecessor, code 1720, make 1724 the best material to meet the technical and high speed manufacturing requirements for today's halogen cycle lamps. In 1984, it has become **the new industry standard.**

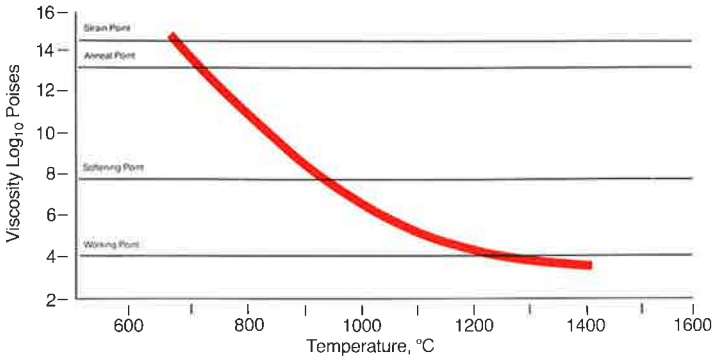
First introduced in 1980, code **1725** was developed to meet the requirements of the future higher wattage, compact designed halogen lamps. In 1984 Corning has continued the manufacturing development of this glass in order to meet the market needs for a **low alkali, high quality refractory glass.**

Physical Properties	<u>1725*</u>	<u>1724</u>	<u>1720</u>
Softening Point °C	1015	926	915
Annealing Point °C	789	726	712
Strain Point °C	739	674	667
Thermal Expansion x 10 ⁻⁷ /°C	43	44	42
Total Alkali %	<0.15	<0.15	1.50
Soda %	<0.10	<0.10	1.00
Density gm/cc	2.56	2.64	2.52

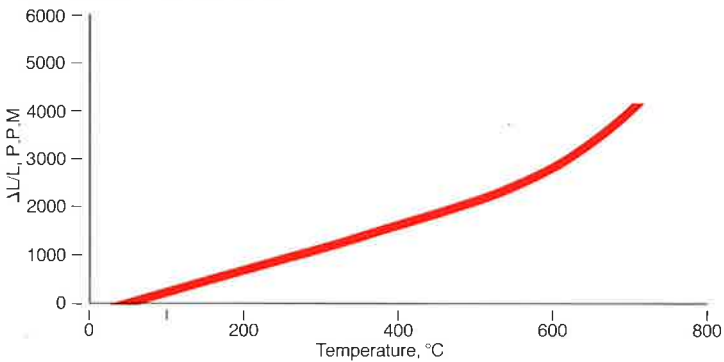
*Target properties

1724

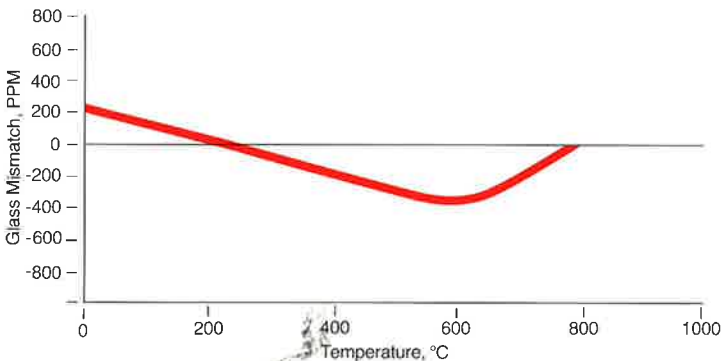
Viscosity Curve



Thermal Expansion

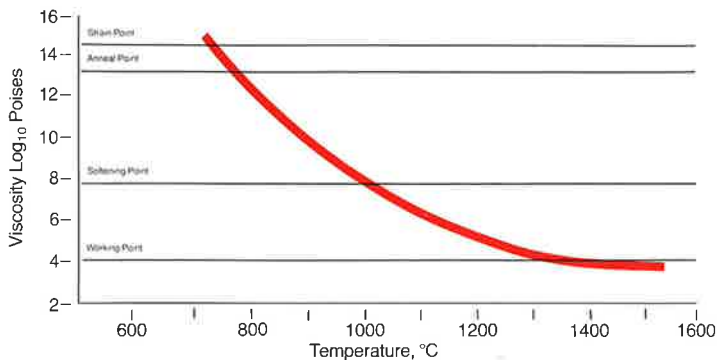


Molybdenum-Glass Seal Mismatch Curve

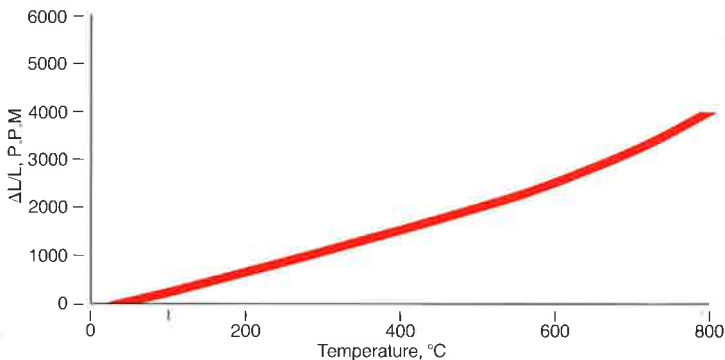


1725

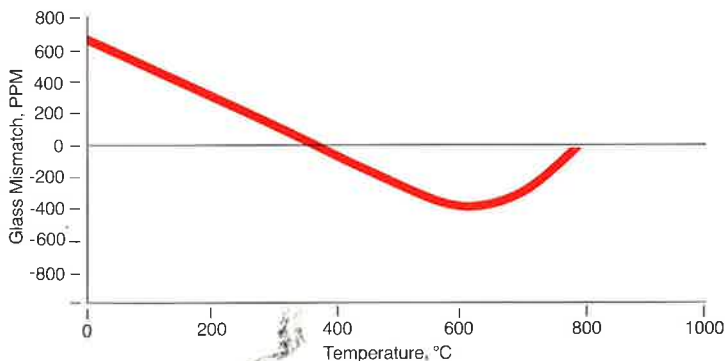
Viscosity Curve



Thermal Expansion



Molybdenum-Glass Seal Mismatch Curve



7902

Vycor® Compositions

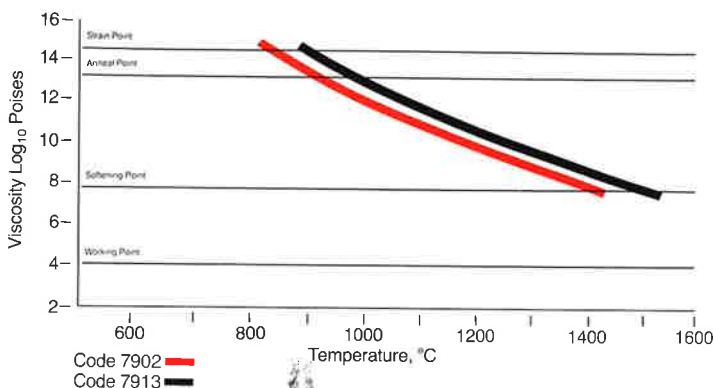
Vycor® tubing has been the industry standard for high silica halogen lamps since the 1960's and to maintain this leadership position Corning developed and introduced in 1984 a new product, code **7902**, to meet the market requirements for a **lower sealing temperature glass**.

The properties of code **7902** allow the lamp manufacturer to either reduce the costs for the energy required to seal the lamps or increase the line production speed at the energy levels used with code 7913.

In both cases, the precision optical and dimensional quality associated with **Vycor®** tubing has been maintained.

Physical Properties	7902*	7913	7918
Softening Point °C	1425	1530	1530
Annealing Point °C	915	1020	1020
Strain Point °C	810	890	890
Thermal Expansion x 10 ⁻⁷ /°C	10.5	7.5	7.5
Soda %	<300 ppm	<300 ppm	<300 ppm
Density gm/cc	2.18	2.18	2.18
BETA _{OH}	<0.4	<0.4	0.04 - 0.09

Viscosity Curve



Halogen Cycle Glass Properties

Aluminosilicate Compositions

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Vycor[®] Compositions

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Soda %	<300 ppm	<300 ppm	<300 ppm
Density gm/cc	2.18	2.18	2.18
BETA _{OH}	<0.4	<0.4	0.04 - 0.09

*Target properties

CORNING

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