

What COE To Chose?

One of the most difficult decisions glass artisans must make is deciding what glass to use. Too often glass instructors will steer their students to the instructor's personal preferences. Flameworking instructors that prefer boro will tell students that's the only glass worth working with. Those working with soft glass are most likely to tell students they should use 104. That's fine if the student is sure they'll not later want to expand their collection of skills to include blowing, casting, and fusing. Perhaps more consideration should be given to the greater versatility of 90 or 96. When a beginner student makes a decision what glass to work with, it should be a reasonably well informed decision based on their present as well as anticipated future needs.

You can't mix non-compatible glass and few can afford to keep a stock of more then one kind. Some artisans will alternate their work with different makes of glass but most prefer to choose just one and use it exclusively. Those that are involved only with flameworking are likely to choose a different glass then those involved only with kilnforming, and those that alternate working in different methods might make an entirely different choice. Whatever you are doing, there are advantages and disadvantages to different makes of glass.

COE 33 (Borosilicate)

- **ADVANTAGES**

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|---------------------|---|
| Cost | Clear glass very low cost
Inexpensive silver glass |
| Quality | Exceptional clarity |
| Properties | More forgiving of temperature variances than soft glass.
Allows complex constructions by joining of separate components.
Excellent for organic flowing shapes.
Finished object can be safely used in high heat applications.
Glass tubing makes for easy glass blowing. |
| Availability | Colored rods made in USA.
Clear rod and tubing available in a wide size range. |

- **DISADVANTAGES**

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|---------------------|--|
| Properties | Higher melting temperature requires larger torch and oxygen supply.
More susceptible to devitrification than soft glass.
Not as good as soft glass for fine detail and definition. |
| Availability | Very limited availability of sheet material. |
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COE 90

- **ADVANTAGES**

Quality Tested for compatibility.
Excellent technical support.
Extensive color selection in frit, rods, and sheet.

Properties Equally suitable for both torching & kilnforming.

Availability Available in billets, frit, rod, and sheet
Made in the USA.

- **DISADVANTAGES**

Cost Sheet more expensive than 90, rods more than 104.

Quality Sheet glass more difficult work with.
Textured surface more likely to trap air.

Properties Higher temperature required to melt.
More prone to devitrification than 96 on multiple firings.

COE 96

- **ADVANTAGES**

Cost Sheet glass lower cost than 90.
Cullet for casting or blowing very low cost.

Quality Probably the most compatibility consistency of all glass.
Consistent texture makes it easiest to work with.

Properties Smooth sheet glass is less likely to entrap air.
Equally suitable for casting, fusing, and torching.

Availability Excellent color variety in frit and sheet.
Most colors available in casting cullet.
COE 96 is the industry standard for most blowing and casting.
Made in the USA.

- **DISADVANTAGES**

Selection Less rod color selection than 90 or 104.

COE 104

- **ADVANTAGES**

- Cost** Rods less expensive than 90 or 96.
- Quality** Excellent for fine detail torch work.
- Properties** Slightly lower melting temperature than 90 or 96.
- Selection** Much more rod color selection than any other soft glass.

- **DISADVANTAGES**

- Cost** Imported - price likely to steadily increase.
- Quality** Questionable compatibility consistency.
Very susceptible to devitrification when fused.
- Properties** Unsuitable for large work.
- Selection** Very limited availability of sheet material and frit.
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COE 120 (Satake)

- **ADVANTAGES**

- Properties** Holds heat – longer working time.
Melts at low temperature and can be worked without adding oxygen.
Lead content glass melts at low enough temperature produces no fumes.
- Selection** Available with or without lead content.
Has many colors unavailable in other glass.

- **DISADVANTAGES**

- Cost** Imported – price likely to steadily increase.
- Properties** Melts very quickly and can be difficult to control with regular torches.
- Selection** Less color selection than other glass.
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COE 82 (clear float)

- **ADVANTAGES**

- Cost** Clear float is the least expensive glass.
- Selection** Armstrong and Youghiogheny have a variety of float fusible sheet glass and frit.

- **DISADVANTAGES**

- Quality** Not as compatibility reliable as COE 90 or 96.
Clear float is more susceptible to devitrification than 90 or 96.
- Properties** Requires higher heat to melt.
- Selection** Very limited selection of colors.
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COE 108 (Schott clear)

- **ADVANTAGES**

- Quality** Exceptionally clear – favoured for paperweights.

- **DISADVANTAGES**

- Properties** Unreliable compatibility with any other glass
Available only in billets.
Not used for anything other than paperweights.
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This list of advantages and disadvantages is intended to help artisans (new and old) decide what glass to use. There are new materials and new techniques being introduced constantly. If you have any suggestions for amendments or additions to this list, please let us know and we'll update it.