

## Gel pens

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Gel pens are in many respects similar to standard ballpoint pens. They look very much like the latter. Like ballpoint pens they can be of various sizes and colors. Both types of pens are used almost for the same purposes: for writing and drawing some fine and thin patterns. The general design of both types is alike: they both have a barrel and a cap. They also have a rolling metal ball. Like ballpoint pens gel pens are made of metal, plastic, rubber, etc. But what make the gel pen different then?

The difference lies in ink. Well, a gel pen is a gel-inked ballpoint pen. As simple as that. The gel ink consists of pigments suspended in a water-based gel. The gel itself is made up of water and biopolymers. And the pigments that are contained in the gel are typically copper phthalocyanine and iron oxides. Those pigments are opaque, so gel writings look quite bright on dark paper.

One more specific feature of gel pens is that they resist common laboratory analysis. Well, there is such a thing as thin-layer chromatography. It can be applied to inks to trace their manufacturer and date of manufacture. On the contrary, gel pens can't be analyzed with the use of this method as the pigments in gel ink do not dissolve.

Gel pens come with the greatest variety of sizes, shapes, scents and colors. They can be scented with chocolate, orange, strawberry, mint, cola vanilla, coffee, etc. As for colors, there are several different styles of coloration: normal (including ordinary colors like black, blue, red, and green; insoluble durable pigments are used, e.g. phthalocyanine dyes, carbon black, or iron oxides), metallic (metallic versions of the normal colors including gold, silver and bronze; powdered aluminum is used as the additive), glittered (colors with glitter are added to them to give a sparkly effect) and mixed (different colors mixed together in the ink for an interesting effect).

All these makes collecting gel pens an inexhaustible and fascinating occupation!