

## Difference – UPVC vs CPVC

PVC or polyvinyl chloride is one of the world's most widely produced synthetic polymers. It is a plastic material. In the manufacturing of PVC, plasticizers are added in order to make it easy to bend and to increase flexibility. But sometimes PVC is made without adding plasticizers in order to get a hard, rigid material. This material is known as UPVC. Sometimes PVC is chlorinated using free radical chlorination in order to obtain CPVC. It has more improved properties than both PVC and UPVC. The main difference between UPVC and CPVC is that **UPVC is made without adding plasticizers whereas CPVC is made by adding plasticizers and it is chlorinated as well.**

### Key Areas Covered

1. What is UPVC  
– *Definition, Properties, and Uses*
2. What is CPVC  
– *Definition, Production, and Properties*
3. What is the Difference Between UPVC and CPVC  
– *Comparison of Key Differences*

Key Terms: CPVC, Flexibility, Free Radical Chlorination, Plasticizers, PVC, UPVC

## UPVC      V E R S U S      CPVC

UPVC is unplasticized polyvinyl chloride	CPVC is chlorinated polyvinyl chloride
Not composed of any plasticizers	Composed of any plasticizers
Not bendable	Bendable
Cannot be used to carry high-temperature liquids	Can be used to carry high-temperature liquids
Has a high rigidity	Flexible
Not used for drinking water transmission	Used for drinking water transmission
	Visit <a href="http://www.pediaa.com">www.pediaa.com</a>

### What is UPVC

**UPVC** is the term that stands for **unplasticized polyvinyl chloride**. PVC or polyvinyl chloride is a polymer material that can be heated and molded to get desired products such as pipes. PVC pipes are strong and very hard. Therefore, manufacturers tend to add plasticizers to PVC in order to reduce rigidity. However, UPVC is the unplasticized PVC in which no plasticizer is included. Hence it is very rigid.

**UPVC** pipes are less bendable and are hard to work with due to their rigidity. A UPVC pipe is nearly rigid as an iron pipe. However, it is easy to cut with power tools. UPVC pipes are durable and fire-resistant. They are also recyclable.

**UPVC** can be used as a substitute for wood in construction sites. It is also used instead of cast iron for heavy-duty plumbing. Since it is incredibly resistant to chemical erosion, UPVC is a good choice for the production of plastic pipes. In addition, UPVC pipes can handle a wide range of temperatures. Therefore, a product obtained from UPVC material such as window frames do not change the shape depending on the weather condition. But at higher temperatures, UPVC can be reshaped.

## What is CPVC

CPVC or **chlorinated polyvinyl chloride** is a thermoplastic polymer. It is produced by the chlorination of PVC polymer. This chlorination is done to get the properties such as more flexibility and ability to withstand high temperatures.

The production process includes the chlorination of PVC via free radical chlorination. This reaction is initiated by using UV energy, which can decompose chlorine gas into radicals. These radicals then react with PVC and replace a portion of hydrogen atoms with chlorine atoms. Various additives are also introduced to the polymer material in order to make it easy to process.

**CPVC** can withstand very high temperatures (about 90°C). It is bendable, can be welded, and exhibit fire-retardant properties. This means it can slow or stop the spread of fire. CPVC is resistant to many acids, bases, alcohols, hydrocarbons, etc. But it is not resistant to chlorinated hydrocarbons. CPVC pipes can carry high-temperature liquids.

# Difference Between UPVC and CPVC

## Definition

**UPVC:** UPVC is unplasticized polyvinyl chloride.

**CPVC:** CPVC is chlorinated polyvinyl chloride.

## Plasticizers

**UPVC:** UPVC is not composed of any plasticizers.

**CPVC:** CPVC is composed of plasticizers.

## Bendability

**UPVC:** UPVC is not bendable.

**CPVC:** CPVC is bendable.

## Temperature Resistance

**UPVC:** UPVC pipes cannot be used to carry high-temperature liquids.

**CPVC:** CPVC pipes can be used to carry high-temperature liquids.

## Rigidity

**UPVC:** UPVC has a high rigidity.

**CPVC:** CPVC is flexible.

## Drinking Water Transmission

**UPVC:** UPVC is not used for drinking water transmission.

**CPVC:** CPVC is suitable and is used for drinking water transmission.

## Conclusion

PVC is a widely used plastic material. This polymer is often used for the production of pipelines. UPVC and CPVC are two types of PVC. UPVC is unplasticized PVC. This means plasticizers are not added to it. CPVC is Chlorinated PVC. Here, PVC is chlorinated with chlorine gas via free radical chlorination. The main difference between UPVC and CPVC is that UPVC is made without adding plasticizers whereas CPVC is made by adding plasticizers and undergoing the process of chlorination.

References:

1. "Chlorinated polyvinyl chloride." Wikipedia, Wikimedia Foundation, 13 Nov. 2017, [Available here](#).
2. "Plastic pipework." Wikipedia, Wikimedia Foundation, 7 Nov. 2017, [Available here](#).