



## ISO standards in drip irrigation - Clarification

---

The intention of this document is to provide an overview on the importance of the ISO 9261 (Product Standard) that consistently ensures that products certified under it fit for their purpose as declared by the manufacturer. This in order to assist our customers avoiding purchase based on misunderstanding of the terminology and the misleading use of other quality measures by some manufacturers.

### **But first, an historical fact**

Until the early 2000s, the ISO 9261 standard categorized the quality of the drippers into two categories:

- **Category A** - CV\* is equal to or less than 5%
  - **Category B** - CV is greater than 5% and smaller than 10%
- \*CV = Coefficient of Variation (see detailed explanation below)

Pressure was exerted by drip companies that could not meet the requirements of Category A followed by two years of discussions in the international committee.

In fact, only one company in the world produced drippers that met the requirements of category A, so all the other manufacturers hoped to benefit their products by abolishing these difficult demands.

In 2004, the ISO committee decided that the two categories would be annulled and 7% CV was determined as a binding requirement for all.

Netafim™ took an internal decision, to keep the more stringent requirements in place." If we were able to meet these criteria first, there is no reason to lower the quality of our products". Consequently, to this day, the internal requirements for our production are much more stringent than the ISO standards currently in effect.

## Definitions

### **ISO**

Stands for "International Organization for Standardization"

The ISO works with standards institutes from over 150 countries to develop technology and product standards. These standards lead to a more efficient, safer, and cleaner development of products. It also leads to more standardized products for consumers.

The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.



## ISO 9001

ISO sets out the criteria for a quality management system and is the only standard in the family that can be certified to (although this is not a requirement). It can be used by any organization, large or small, regardless of its field of activity. In fact, there are over one million companies and organizations in over 170 countries certified to ISO 9001.

This standard is based on a number of quality management principles including a strong customer focus, the motivation and implication of top management, the process approach and continual improvement. Using ISO 9001 helps ensure that customers get consistent, good quality service, which in turn brings many business benefits.

## ISO 9261

This International Standard gives mechanical and functional requirements for agricultural irrigation emitters and emitting pipes (dripperlines) and their fittings, and provides methods for testing conformity with such requirements. It also specifies the data to be supplied by the manufacturer to permit correct information, installation and operation in the field.

It is applicable to emitters, emitting and dripping (trickling) pipes, hoses, including collapsible hoses ("tapes") and tubing of which the emitting units form an integral part, to emitters and emitting units with or without pressure regulation and with flow rates not exceeding 24 l/h per outlet (except during flushing), and to fittings dedicated to the connection of emitting pipes, hoses and tubing. It is not applicable to porous pipe (pipe that is porous along its entire length), nor does it cover the performance of pipes for clogging resistance.

### **The essential differences between ISO 9001 manufacturing standard and product-oriented standards**

**The ISO 9001 group of standards** checks and ensures that the entire organization functions and maintains the rules set forth by the standard. Mainly ensures that the entire organization functions in an organized manner, which upholds clear rules and which, at the end of the process, maintain or prevent companies that do not perform the processes correctly / for the benefit of the consumer and society as a whole. We can find in our field dozens of companies who meet this standard requirement.

**Product-oriented standards**, in our case the ISO 9261 standard, assures the customer that what the manufacturer is presenting to him is what he actually receives. This is the most objective external inspection that secures the consumer by periodical inspection of the means of production (factories) and product results against manufacturer's statements.

No doubt complying with the requirements of ISO 9261 is the best tool we can present to our customers as a completely objective examination and approval of the products purchased from us.

All the drippers and dripperlines manufactured by Netafim™, in all of our production plants, are compatible with and approved by ISO 9261.

Some of our competitors hold such certificates for some of their products. None of these competitors holds and maintains these certifications as we do for all of our emitters.

## **Coefficient of Variation (CV)**

In probability theory and statistics, the coefficient of variation (CV), also known as relative standard deviation (RSD), is a standardized measure of dispersion of a probability distribution or frequency distribution. It is a coefficient which mainly checks the uniformity of the production.



### How is dripper production CV measured?

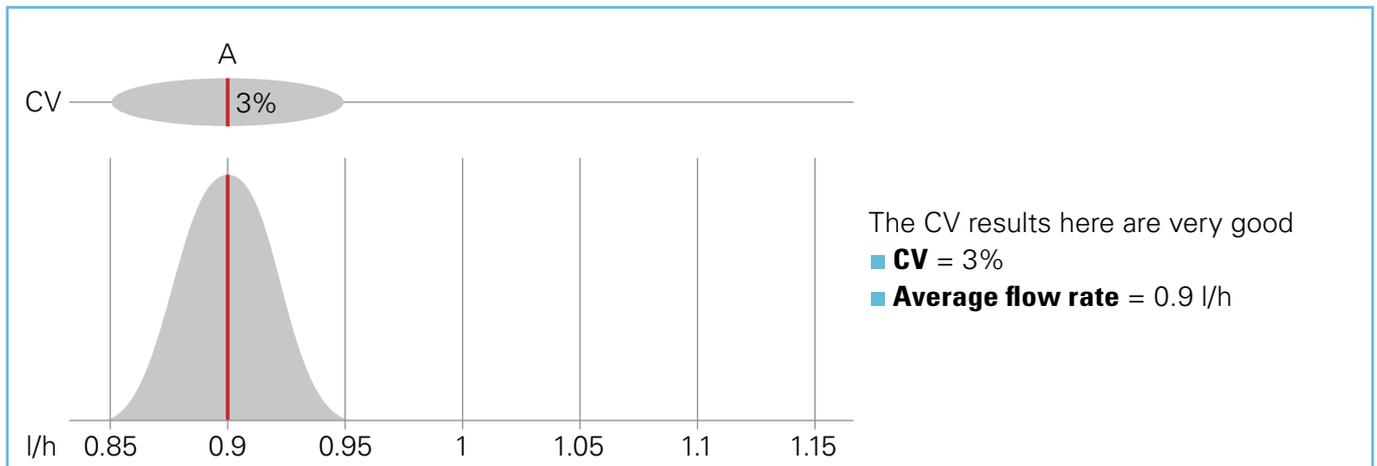
The flow rate of the sampled emitters from a single production line is measured with the water pressure at the inlet equal to the nominal test pressure. The measured flow rate of each emitter is recorded separately.

**Drippers CV** = the standard deviation of the flow rates for the sample, in liters per hour divided by the mean flow rate of the sample, in liters per hour.

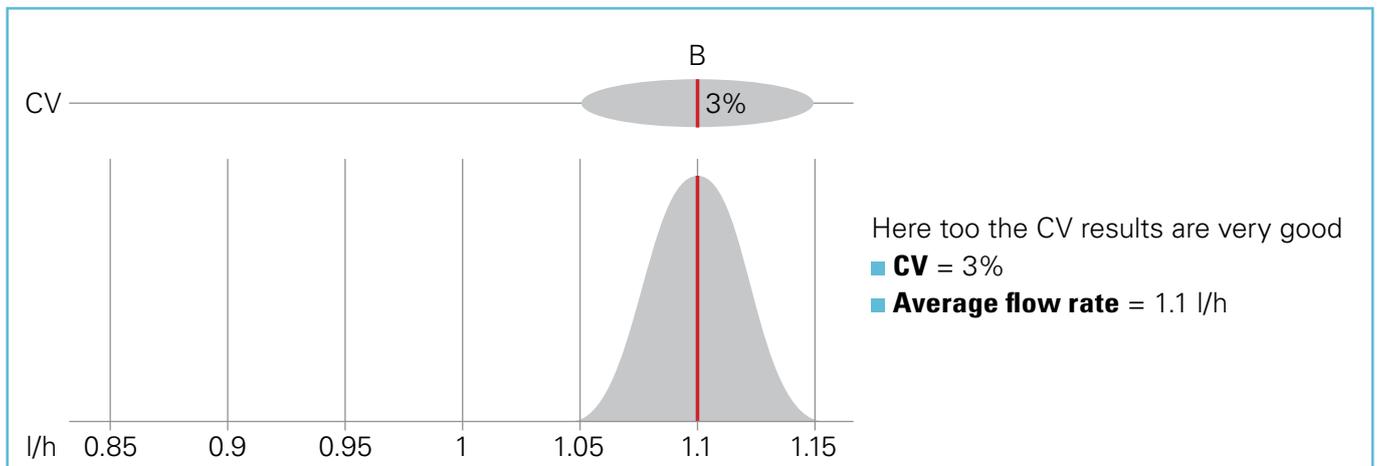
A good and effective way to check the quality of dripper production - as long as the particular "item population" and the performance of those drippers are known.

### For example:

If there is an injection molding machine [A] that produces drippers of a nominal flow rate of 1.0 l/h, and the CV check presents the following results:

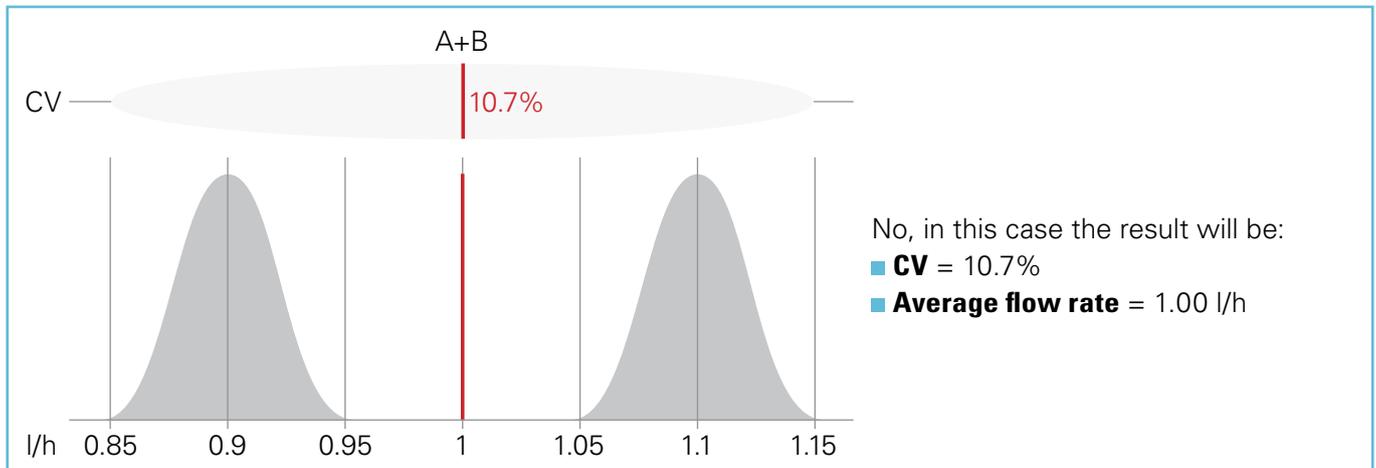


Next to it a second injection molding machine [B] that also produces drippers of a nominal flow rate of 1.0 l/h, and the CV check presents the following results:



**In fact, the manufacturer can declare that its production CV = 3%, and it will be true!**

But what will happen if we mix these two crates of drippers together [A+B], and create a dripperline? What will be the resulting CV? Will it still be 3%?



## And why is this clarification so important?

In order to explain that in fact any manufacturer who declares to its clients solely the term and/or result of the CV, actually makes a statement that cannot be proven or verified. He can always claim that his statement was directed at the production process of each machine. I.e. As with most results of statistical calculations, this is associated with a particular "item population".

ISO 9261 explicitly states that the product must comply with a 7% CV and at the same time with a maximum deviation of  $\pm 7\%$  from the declared flow uniformity.

The mean flow rate of the test sample shall not deviate from the nominal flow rate,  $Q_n$ , by more than  $\pm 7\%$ . The coefficient of variation, CV, of the flow rate of the test sample shall not exceed 7 %.

There is no mistaking the two concepts, although both talk about 7% (which causes some confusion). These are two entirely different concepts.

Only the ISO 9261 standard takes into account both parameters and ensures that products that meet the same standards year after year receive the certificate as evidence that the manufacturer's statement matches the actual result.

Some of our competitors talk only about CV (as a marketing tool), some of them brag that this is proof of the quality of their product. In fact they do not tell their customers the whole truth.

## Conclusion

Only compliance with the requirements of the ISO 9261 standard ensures that products certified under it fit for their purpose as declared by manufacturer, tested and approved by an objective institution.