



CIPTEC

CIP Data Analysis and Optimisation

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Diversey CIPTEC technology enables the efficiency of CIP cleans to be determined and the hygiene of production lines to be verified. Effective cleaning cycles impact the time and resources you are investing in cleaning, improving your operational efficiency and generating savings. The CIPTEC system combines our unique, patented spectrophotometric measurements and statistical data analysis.

Diversey CIPTEC identifies:

- How long each CIP clean takes to remove product and therefore determines the optimal length for the clean.
- The recoverable product left in the processing vessel at the end of a production run reducing product waste.

The system reduces loss of raw materials and your COD on effluent, preventing unnecessary load due to excess cleaning solution. Implementing CIPTEC improves cleaning performance and allows optimised cleaning times to be set, leading to water, energy and chemical savings as well as increasing production time as the cleaning cycle shortens.



Quality

- Efficient washes
- Improved quality control
- Secured hygiene level



Savings

- Water, energy and chemicals
- Product recovery
- Production time



Environment

- Less wasted water
- Less CO₂ emissions
- Smaller COD load

Annual savings Dairy Industry per plant type

Plant Intake		100 M l	200 M l	300 M l	500 M l
Total Savings		310 k €	560 k €	780 k €	1,2 M €
Product Recovery	0,50 € / litres*	200,000 l	380,000 l	540,000 l	850,000 l
Water & Effluent	2, 50 € / m ³ *	20,000 m ³	33,000 m ³	43,000 m ³	63,000 m ³
Energy & Electricity	45,00 € / MWh*	1,000 MWh	1,900 MWh	2,600 MWh	3,900 MWh
Chemicals	0,45 € / kg*	5,000 kg	13,000 kg	24,000 kg	60,000 kg
CIP Time	30,00 € / h*	3,600 h	6,600 h	9,000 h	13,500 h

Estimate values are based on data from over 200 factories.

* Rounded average cost

Are most of your CIP washes too long?

You don't need a 30 minute hot caustic cycle to clean a simple stainless steel pipe.

But do you have occasional problems with your cleaning results?

Although most washes take too long, you may still have some challenging objects, that will not clean during the standard cycle time.

Statistical analysis reveals the length of the safety margins of your cleaning cycles.

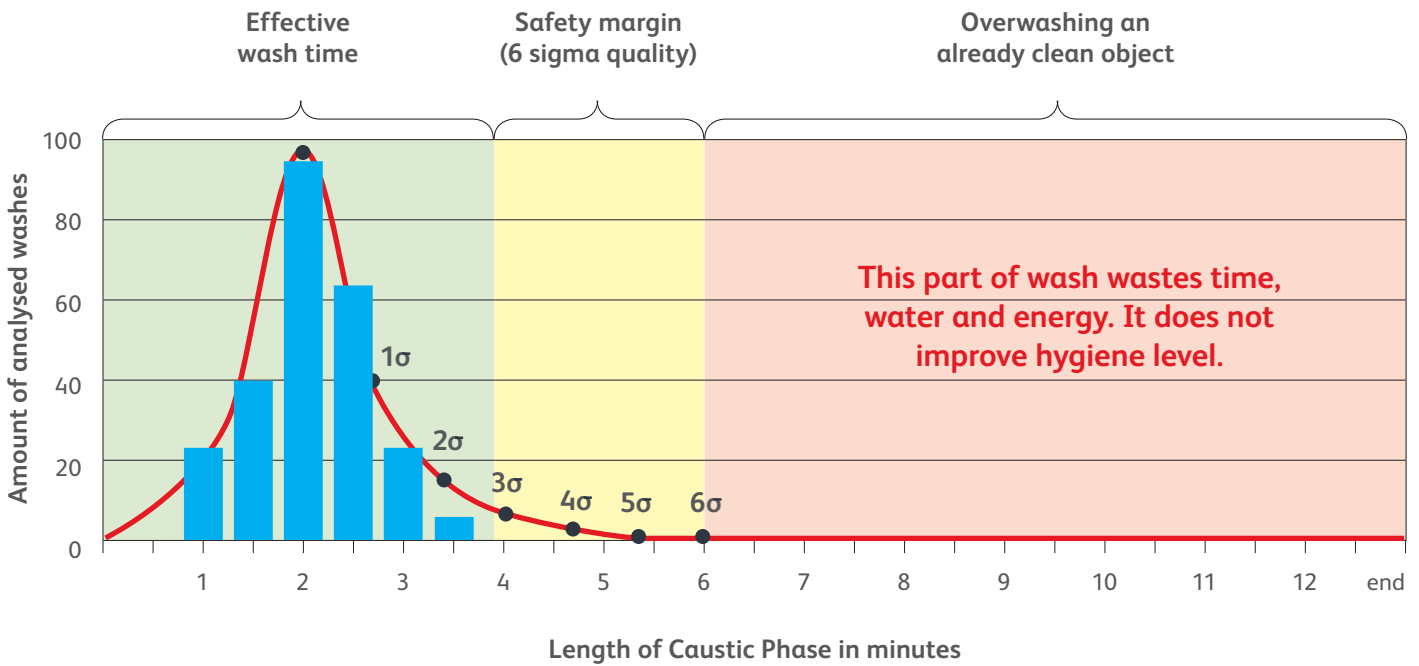


Safety to 6 sigma level

If an object is washed once per day, increasing your safety margin from 4 sigma to 6 sigma will reduce the number of times the object is still unclean from twice a year to less than once in 800 years.

Reduce your CIP times by up to 60%

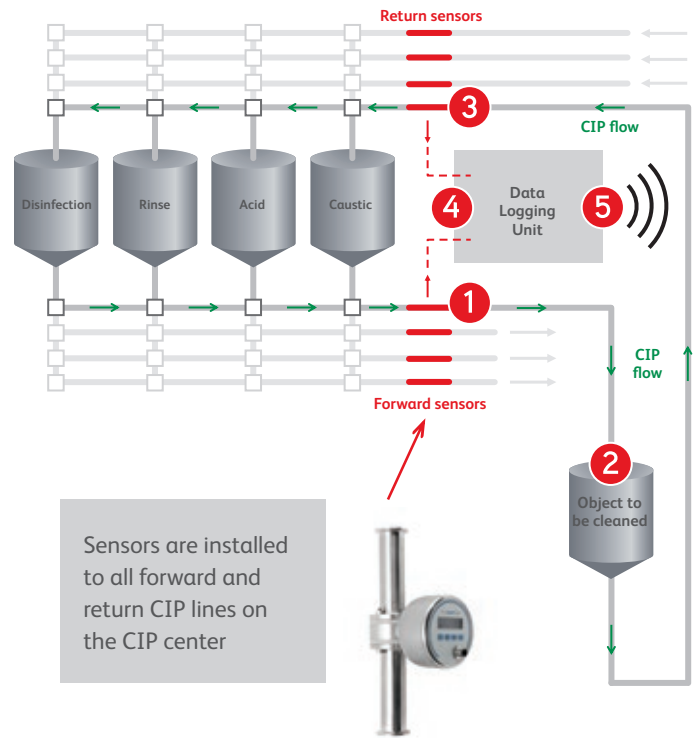
Most CIP objects are easy to clean but the safety margins are dictated by the challenging objects. Data from over 200 sites globally show that majority of washes can be cut to half of the original times.



Measuring what goes in and what comes out

What happens during the wash?

- 1 Forward sensors detect the spectrum and clarity of the ingoing cleaning solution.
- 2 The CIP wash removes product soil from the object being washed.
- 3 A mix of product remains, and cleaning liquids return through CIPTec sensors.
- 4 All sensors transmit their data to Diversey CIPTec's Data Logging Unit (DLU) in the plant.
- 5 The DLU sends data packets wirelessly to Diversey CIPTec's data analytics centre for analysis.



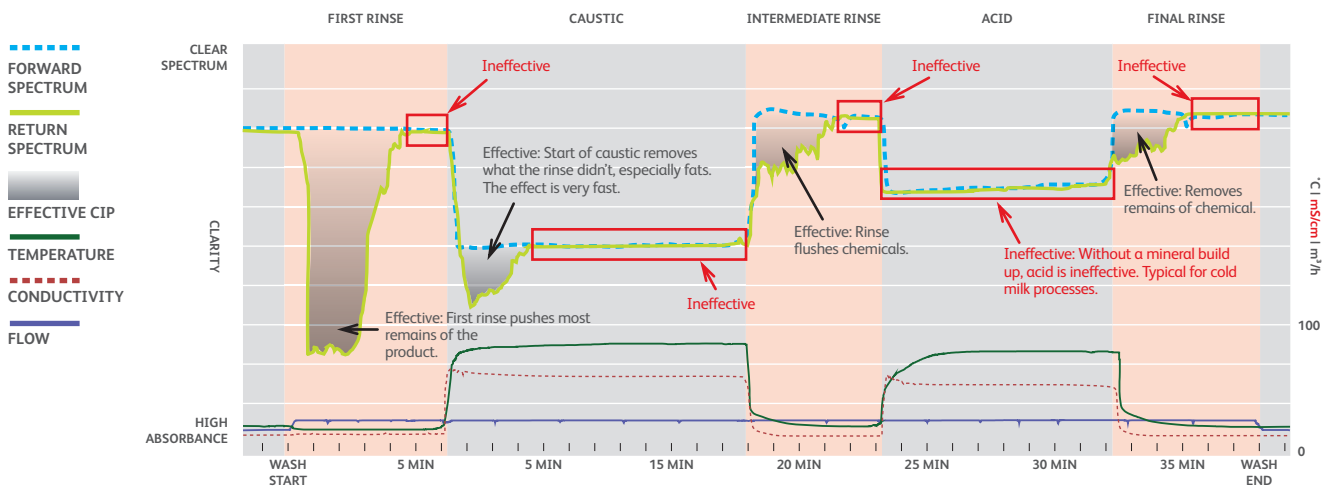
Effectiveness of each CIP phases

Comparing the return and forward spectrum

When there is more light absorbing material in the return than in the forward CIP line the cleaning phase is still removing soil from the object. When both signals are at the same level, soil is no longer being removed from the object being cleaned. This defines effective and ineffective phase time.

Seeking variance from other parameters

The Diversey CIPTec system include other measurements such as conductivity, flow and temperature during the cleaning cycle. This additional data enables analysis of different phenomena of the cleaning cycle and the discovery of anomalies causing variance.



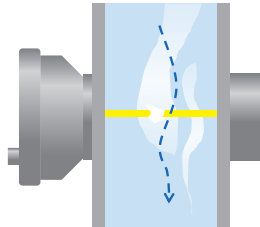
An example of intake pipeline wash which has been utilized for raw milk transfer. The example shows that wash phases consist of effective and ineffective time. It also shows that acid has no effect as there is no heat treatment and thus no mineral build up. Acid could be used once per week to passivate the stainless steel.



Spectrophotometers detect contaminants at level

Spectrum absorption measurement enables you to detect the amount of soil in your cleaning liquids.

A spectrophotometer measures a light beam going through the CIP line. Most of the light passes through the water, but CIP chemicals and product residues in the water will absorb the light.



Spectrophotometers can detect



Milk or other product amounts in first rinse.



Down to 0.5 ppm of product residue in cleaning chemicals.



Chemical residues in the final rinse.

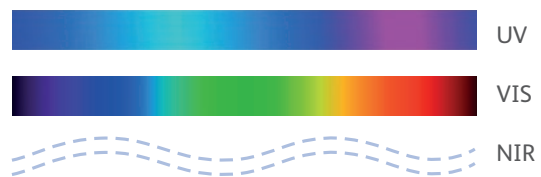
Why is Spectrum absorption better than conductivity?

The difference in conductivity between tap water and cleaning solutions makes conductivity meters practical for controlling the chemical concentration and phase separation in CIP lines. Whereas conductivity can detect a 0.1% change in chemical/water concentration, it is limited in detecting product residues from water or from chemicals, as

- The conductivity of milk for example is relatively close to that of water.
- Both the milk residues and water will lower the conductivity of the CIP chemical phase.

But milk residues will be seen accurately by absorption, either from CIP chemicals or water, as milk residues absorb much more light than water or CIP chemicals.

Multiple spectrums for maximum detection





Diversey has been, and always will be, pioneers and facilitators for life. We constantly deliver revolutionary cleaning and hygiene technologies that provide total confidence to our customers across all of our global sectors. Led by Dr. Ilham Kadri, President & CEO, and headquartered in Charlotte, North Carolina, USA, Diversey employs approximately 9,000 people globally, generating net sales of approximately \$2.6 billion in 2016.

For more information, visit www.diversey.com or follow us on social media.