



SoliQz

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## A FLYING START WITH SOLIQZ

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Melt crystallization & hydraulic wash column

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# A FLYING START WITH SOLIQZ

## Melt crystallization & hydraulic wash column

For large companies it is not always easy to develop and validate new production processes. In-house testing at pilot scale or even building of pilot plants is very costly and takes a long time. That is what process engineer Steve regularly experiences. So he started a partnership with the Dutch separation technology specialist SoliQz to help his company with the development of their new separation process. This way of working gives his company more knowledge quicker, and at much lower costs. A triple win.

In 2021 the large chemical company where Steve is working, wants to expand their production plant for a specialty chemical product in the United States. (Because of competitive sensitivity names cannot be mentioned). The demand for the chemical that is being produced is growing considerably and the purity requirements for one of the health-related applications of the product is increasing. That is why purification step in the process receives a lot of attention during the design phase.



The company was looking for more cost-efficient alternatives for their existing processes. Steve: 'We currently separate solids from liquids in a kind of centrifuge. The drums spins round very fast, separating the liquid from the crystals. By repeating this process a few times, we do meet the present purity requirements but would have difficulty meeting the future demand.'

Due to the moving parts in the centrifuges, the present process also requires a lot of maintenance. Moreover, repeating the process takes extra time. So Steve and his Team went looking for a better alternative. When he googled, he encountered the Dutch company SoliQz. On it's website SoliQz claims to offer a highly efficient and innovative alternative. The technology starts from melt crystallisation in combination with an hydraulic wash column. The SoliQz method would deliver products with purity up to 99,9% in one step and a reduction in energy consumption from 20% up to 90% compared to distillation.

#### **Fascinating environment**

The idea immediately caught Steve's attention and he promptly sent an email to the SoliQz Team in Rotterdam. That was eighteen months ago. After that, a meeting followed. Steve: 'We immediately felt a huge click. They really understood what we needed. From the first moment onward, I believed that the method of SoliQz would work for our process.'





That confidence was put to the test last year in the first series of pilot testing at the SoliQz multi-purpose pilot plant in Rotterdam. 'The first period of six weeks did not deliver the expected results. But we learnt a lot from it. The purification step was redesigned in the subsequent months which resulted in the installation of some additional equipment. Both Steve's company and SoliQz both gathered new valuable information about the process. At the moment I am back in Rotterdam for a second testing period. In the first five days we made much more progress than in the six weeks before. We needed the trial and error to make progress.'

Steve is also enthusiastic about Plant One, the location in the industrial port of Rotterdam where the SoliQz testing facility is situated. Among other pilot plants. 'I have never seen an innovative testing environment like this before. I'm very excited about the possibilities.' It's a place where creativity meets technical knowledge and practical thinking. 'A fascinating environment filled with good ideas!'

#### **Head start**

In the case of the company of Steve, the approach with the pilot testing resulted in more speed and much lower costs. 'We have a very aggressive time schedule. In 2021 we want to start the construction of the new plant. If we had to build a pilot plant for the new separation process in-house, we would have needed at least 24 months. In a big company approvals and things like procurement takes a lot of time. We just don't have that time. And the costs of SoliQz are very reasonable. Ten, may be twenty times lower than when we had to build the pilot in-house. I really do not exaggerate.'

With SoliQz, the chemical company of Steve hit the ground running, mainly because they could make use of the already existing pilot plant.

Steve: 'The people at SoliQz know exactly what they are doing. We did not have that expertise at the start. And still their knowledge gives us the edge we are looking for. We have learned a lot from them.'

As a result of the positive outcome of the pilot scale testing, the business team back in the US is reacting very enthusiastically. 'For them it is important that both the operational costs of the new process and the investments turn out to be much lower than in the past. This offers many opportunities for wider application of the product from the plant. The innovation may become a business integrated technology.'

## THE TECHNOLOGY OF SOLIQZ

The SoliQz technology delivers products with very high purity in a fully continuous processes that takes much less energy than conventional routes like distillation. The company combines melt crystallization with the hydraulic wash column that was originally developed at the Dutch Technology Institute TNO. The technology is extremely suitable for the purification step of a broad range of bulk chemicals such as paraxylene, caprolactam, naphthalene and phenol as well as a multitude of specialty chemicals.

### Removed

It sounds almost too simple to be true, and yet the principle works. SoliQz can remove the very large majority of impurities from chemicals by cooling them off first. The people of SoliQz draw the parallel with a water ice lolly. If you suck on it, you pull out the sweet color and the white (pure) crystal structure remains.

A medium to be purified is fed to a crystallizer and is then cooled until the desired product starts to form crystals. That does not take long, fifteen minutes to a maximum of one and a half hours. The crystals are led with the residual liquid to the SoliQz hydraulic washing column where a bed of crystals forms. The washing column pushes the liquid through the bed and impurities still adhering to the crystals are removed. The end result is a reduction of the impurities on the crystals by a factor of 100 to 1000.

### Scaled up

The process is completely continuous and no solvents or washing liquids are added. It only uses its own medium. And there are no rotating parts in the washing column. From a mechanical point of view this is a great advantage over, for example, a centrifuge.

To convince decision-makers at companies of the possibilities of this innovative technology, SoliQz has built an installation at Plant One in Rotterdam where it can carry out tests on a pilot scale. Researchers of SoliQz can determine quite quickly whether the hydraulic washing column is suitable for purifying a stream. Then SoliQz helps in determining the separation parameters and can perform a test in the pilot plant. After good test results the installation can be scaled up fairly easily. The design and construction of the commercial scale installations is carried out in close co-operation with the SoliQz mother company Armstrong Chemtec Group.

*For more information please revert to [www.soliqz.com](http://www.soliqz.com) where you can also download our white paper on the SoliQz technology.*