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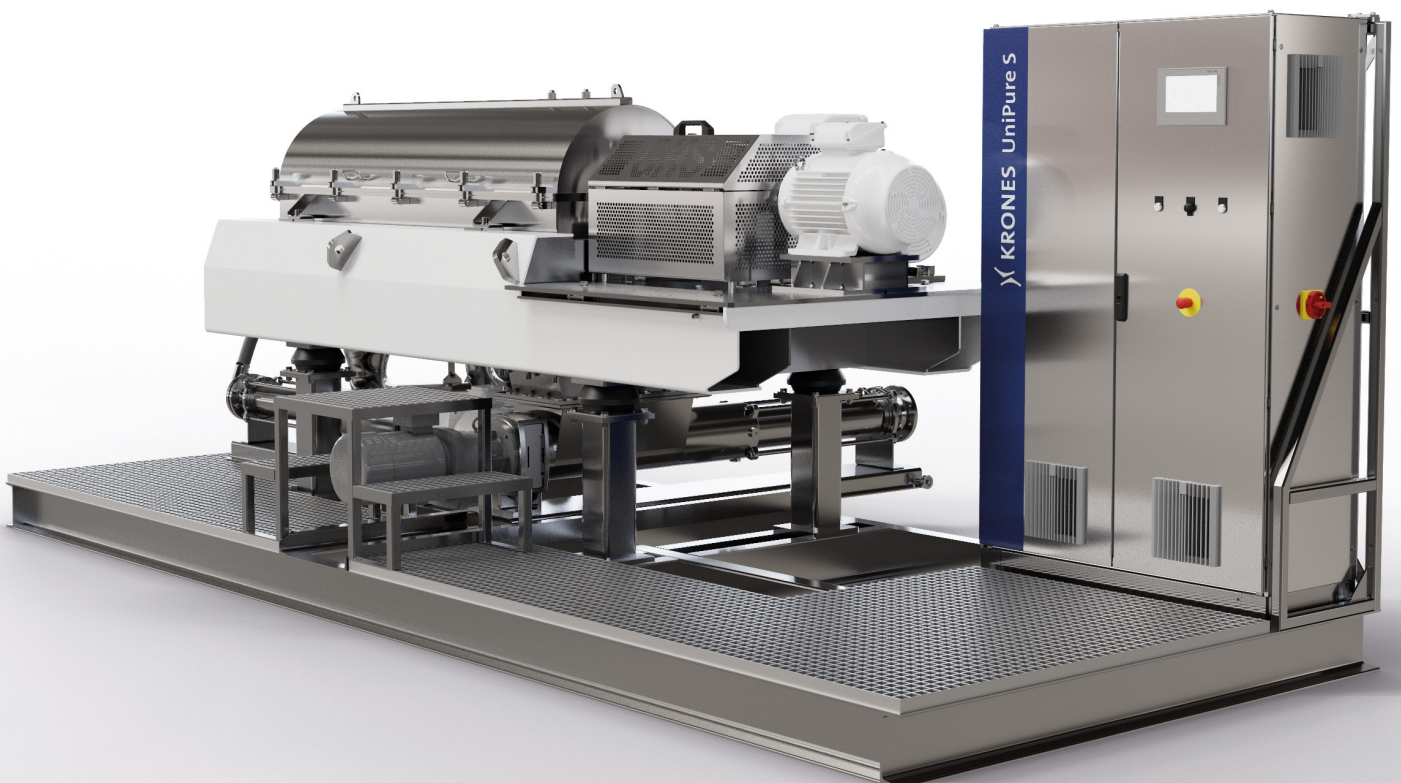
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## Modern juice production: decanters – one of the best solutions for producing high quality juices



# Are you still pressing, or are you already decanting?

| Decanter | Impeller Technology | Juice Extraction | Screw Design | Yield |

*Germany is still one of the world's leading countries in per capita consumption of fruit juice and fruit nectar. While consumption volumes have been declining continuously over the past few years and Germany no longer ranks first, sales increased slightly last year due to higher prices and diversification.<sup>4</sup>*

In addition to major growth segments in the beverage industry, such as the rising popularity of flavoured waters and energy drinks, consumers particularly appreciate innovative juice products that meet their demand for healthier, more nutritious, and more innovative options. While the consumption of orange juice varieties continues to decline, smaller, more exotic varieties are developing positively.<sup>1; 3; 4</sup>

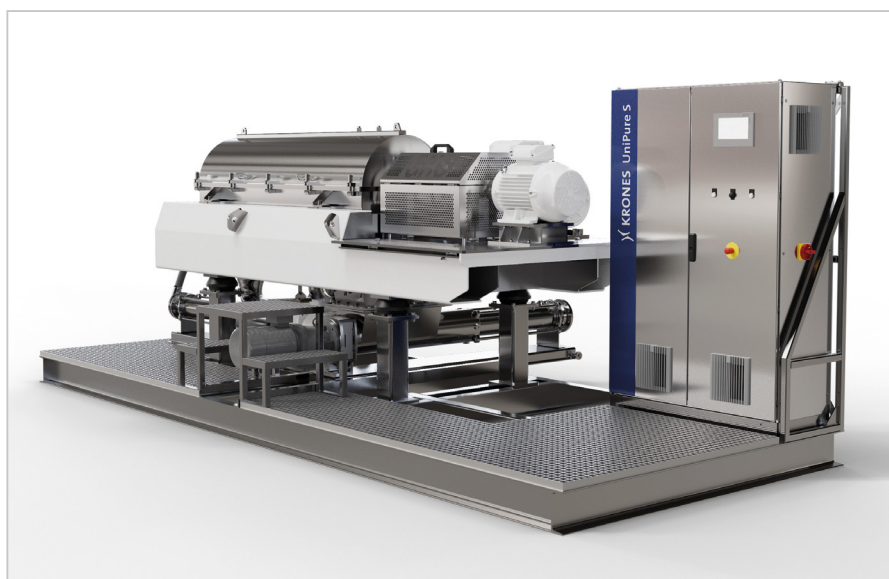
Sales of non-chilled direct juices, as well as organic vegetable and fruit juices, are continuously increasing, and the premium segment is proving to be more robust than the overall market in terms of volume. Popular high-priced “shots” also contribute to this strong performance, aligning perfectly with the health trend through ingredients such as ginger, turmeric, and citrus fruits.

The same applies to vegetable juices such as beetroot, tomato, and carrot, which also show stable growth.<sup>4</sup>

Overall, the fruit juice market is showing dynamic global development, characterised by changing consumer preferences and innovative products.<sup>3</sup>

The global juice market is growing steadily, with a compound annual growth rate (CAGR) of 2 % in sales and 4 % in product launches over the past five years. The USA is the largest market for juices, while India is the fastest-growing consumer country, and keeps consumers as well as plant manufacturers in a good mood while continuously driving innovation and new product development.<sup>1; 2; 3</sup>

Consumption data clearly show that consumers increasingly prefer fresh juices with additional health benefits. A growing trend toward more exotic juice options can also be observed, with 21 % of consumers worldwide increasing their juice consumption for health reasons. The main drivers of this trend are Generation Z and Millennials, who favour fresh juices with natural ingredients.<sup>2; 3</sup>



New design of the Unipure S decanter system

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In particular, “super juices” with high raw material costs require especially gentle and efficient production.

Filling juices into bottles in as natural and unaltered a state as possible begins with juice extraction. Oxidative processes triggered in early production stages can intensify throughout the process – especially during thermal stabilisation.

Decanters offer the best solution for producing high-quality juices. Compared to traditional methods, contact with air is reduced to an absolute minimum. The closed

system, often pressurised with inert gas, continuously separates liquid and solids with minimal oxidation and high efficiency. This increase in yield is particularly crucial for the economical production of trendy “super juices.”

## Unipure S Decanter – top performance in modern juice production

In line with the motto “Redefining the laws of nature,” GHS GmbH, together with Kronos AG, has developed a new hygienic decanter using advanced design and simulation methods.

The newly developed screw geometry now operates within a hygienically optimised design that meets the current state of the art in terms of cleanability and sealing technology.

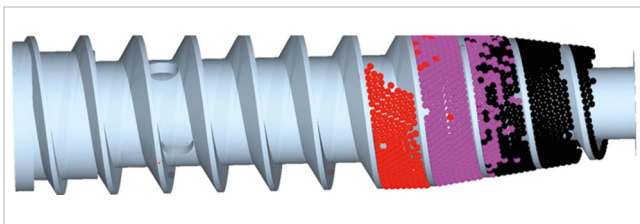
The Unipure S is the result of years of development, intensive practical testing, and close collaboration between engineering, food technology, and production.

GHS managing directors Günter and Benedikt Haider put the concept in a nutshell: “Our aim was not simply to develop another decanter. We wanted to create a system that treats the sensitive raw material, fruit, so gently that its natural properties are preserved as completely as possible.” This guiding principle shaped all design decisions – from short residence times and minimal shear forces to hygienic design and high process flexibility.

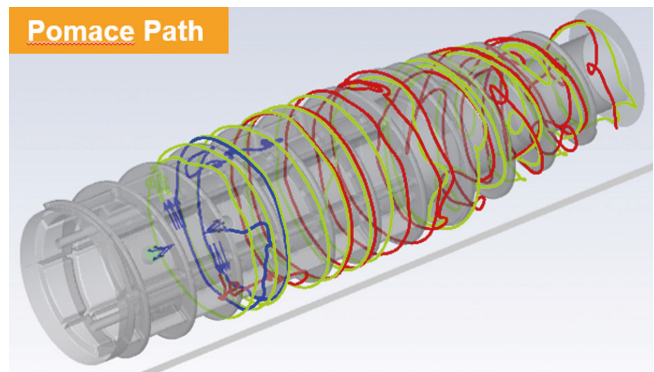
## Future-oriented screw design enabled by advanced simulation technology combined with many years of experience

Where in the past numerous complex design iterations and tests were required, simulation programs now provide highly efficient insights into fluid dynamics.

This has resulted in a screw geometry tailored specifically to juice processing, enabling stable and uniform process control with high selectivity. The new design allows for very short residence times, ensuring that colour pigments, vitamins, and natural flavour compounds are preserved as effectively as possible. This gentle process



CFD simulation: solid shells/kernels (black/purple) and liquid juice phase (red)



CFD simulation: solid shells/kernels (green/red) and liquid juice phase (blue)

management leads to a juice quality that stands out both visually and sensorially compared to conventional processes.

## Higher yield through innovative peeling disc (impeller) technology

Extensive testing over a prolonged period was conducted to determine optimal control of the separation point in the new machine concept. Various approaches, including pipette technology and new design concepts, as well as further development of the proven impeller, were evaluated.

The result is a newly interpreted impeller technology – an essential technical component that enables precise control of the separation point, especially during operation. This ensures that the decanter consistently operates at its optimal point, remains flexible with varying raw material properties, and conserves valuable resources by reducing energy, water, and raw material consumption through fewer production interruptions.

## Oxidation protection: pressurised centrate discharge

A key quality factor is the pressure-tight discharge of the centrate, which reliably prevents oxygen ingress – an essential prerequisite for reducing undesirable colour changes, aroma loss, or vitamin degradation.

Since the juice is produced continuously, it can be fed directly into subsequent closed processes without oxygen ingress for preservation and bottling.

The hygienic design not only minimises oxygen input but also reduces microbiological risks. All product-contact surfaces are designed for easy and safe cleaning, free from critical dead zones, and compliant with the highest hygienic standards. The Unipure S therefore ensures reliable safety – both in terms of process stability and microbiology.



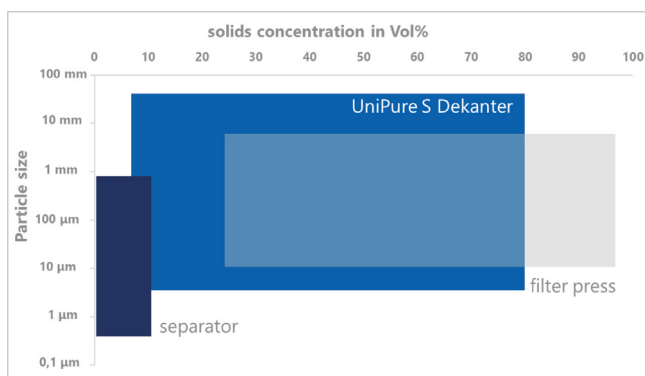
Trial production decanter vs. filter press

## Consistent product quality through reduced shear forces

The new decanter design consistently focuses on product protection. Reduced shear forces prevent unnecessary disruption of cell structures and the formation of ultra-fine particles that may lead to instability later.

The result is juices that are more homogeneous, exhibit stable turbidity, show less sedimentation, and offer a more harmonious flavour profile with a smoother mouthfeel.

This added “complexity” enables producers to differentiate and premium-position their juices. This is not merely a claim – it can be clearly demonstrated using Nephelo-



Schematic particle size distribution for different technologies



Benedikt Haider, Günter Haider, Dr. Roland Feilner (from left to right)

metric Turbidity Unit (NTU) measurements. Juices produced using decanters consistently show higher NTU values with advantageous particle size distribution – a quality characteristic that contributes to a fuller, more natural mouthfeel preferred by consumers, often described as having a light smoothie-like character.

## Unipure S – a decanter that sets new standards

A decanter is designed as a long-term investment – both technically and strategically. It offers measurable advantages in quality, efficiency, and process stability.

To answer the initial question with a counter-question: Why not produce juices using a continuous system that demonstrably delivers higher quality, reduces OPEX and microbiological risks, and increases flexibility, process reliability, and yield?

### Sources:

<sup>1</sup><https://www.about-drinks.com/deutschland-ist-weltmeister-bei-fruchtsaftkonsum/>

<sup>2</sup><https://www.frischeingeschenkt.de/news/detail/fruchtsaftkonsum-deutschland-weltweit-fuehrend> | Verlag W. Sachon

<sup>3</sup><https://www.innovamarketinsights.com/de/trends/saft-trends/>

<sup>4</sup>YouGov Shopper: DE YouGov CP+3.0 FMCG Panel Jahr 2025

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