



*Full, fresh roast and ground flavour  
in liquid coffee extracts and concentrates.*



*Concentrated tea extracts (Black, Green,  
Oolong) with complete delicate flavour profile.*

## **THE FLAVOURTECH INTEGRATED EXTRACTION SYSTEM**

*The world's finest processing technology  
for the world's finest flavours and concentrates*



**flavourtech**

## WHAT IS THE FLAVOURTECH IES?

Flavourtech's Integrated Extraction System (IES) is a unique and revolutionary way to produce premium liquid extracts. Although specifically tailored for coffee and tea, the IES may be used with a variety of botanicals. Two key characteristics of the IES are:

**1. Ability to capture and preserve key flavour notes for inclusion into the final extract.** Aromatic compounds of fresh-brewed roast and ground coffee, or distinctive varietal characteristics exclusive to tea blends, are captured at their peak quality, neither damaged nor destroyed.

**2. Flexibility of a continuous modular system.** The unmatched flexibility of this modular approach means that some of the individual modules can actually be combined with existing processes. Some users have elected to adopt the IES on a graduated basis (see opposite page for module details).

## WHAT IS UNIQUE ABOUT THE IES?

The IES is the first system in the world to couple state-of-the-art flavour-recovery technology, as used by Japan's leading flavour houses, with the extraction of soluble solids.

Several of the IES modules are unique in themselves. A combination of all of them into an integrated system has no equal in the world for the processing of coffee or tea.

At the core of the system is Flavourtech's patented Spinning Cone Column (SCC), now widely acknowledged as the world's premier flavour-recovery technology.

The SCC is the fastest, most efficient method in the world for the capture and preservation of volatile flavour components, from all kinds of liquid and slurry substances. When a slurry of coffee beans or tea leaves and water is introduced into the SCC, the beverage is literally brewed within the closed system. The SCC effectively performs the dual roles of flavour extraction and soluble-solids extraction simultaneously, thus avoiding intermediate flavour loss or degradation.

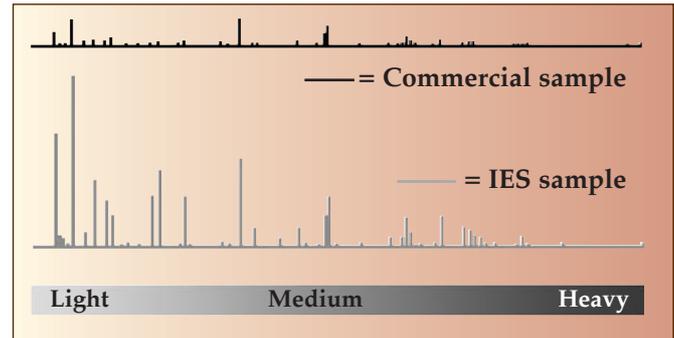
The Spinning Cone Column's ability to process slurries (see below) is a breakthrough in flavour-recovery techniques.

Also unique is the Centritherm Evaporator,

which uses Spinning Cone technology to effect rapid evaporation with low thermal impact.

## WHAT'S THE SIGNIFICANCE OF SLURRY PROCESSING?

When solids are present, capture of key flavour compounds is far more complete than when a liquid extract alone passes through the flavour-extraction process. In the case of coffee, the IES generates a coffee extract with a high level of flavour that is generously weighted in desirable front-end components.



A comparative GC flavour analysis of a coffee extract produced using the IES and a commercially available sample.

## AN EXTRACT WITH MORE FLAVOUR THAN FRESH-BREWED?

Most commercially available coffee and tea extracts simply don't contain the aroma characteristics reminiscent of a good fresh brew. Even the best fresh brew rarely captures all the distinctive aroma of the raw material (consider the aroma which escapes during coffee grinding).

IES modules utilise techniques — virtually unknown outside the flavour industry — to minimise flavour loss from the moment the flavour is at its freshest (with coffee, immedi-

<u>Component</u>	<u>Commercially available extract</u>	<u>IES extract</u>	<u>Factor</u>
	<u>µg/litre</u>	<u>µg/litre</u>	
Hexanal	17	193	11.4
2-Pentenal	14	71	5.1
cis-Hex-2-enal	4	53	13.3
trans-Hex-3-enol	44	85	1.9
trans-Hex-2,4-dienal	27	58	2.1
cis-Linalool Oxide	34	53	1.6
cis-Hept-2,4-dienal	15	237	15.8
trans-Linalool Oxide	128	168	1.3
Benzaldehyde	38	83	2.2
Linalool	139	591	4.3
Phenylacetaldehyde	63	130	2.1
Methyl Salicylate	63	175	2.8
Geraniol	77	180	2.3

Black-tea extract from the IES has higher concentrations of compounds that contribute to the aroma of fresh-brewed tea.

ately after roasting) and maximise flavour extraction during the brewing process.

The Slurry Preparation module and Flavour Extraction module (see below as well as module inserts for details) are integral to the preservation and capture of varietal flavours, including elusive top notes, for subsequent incorporation into the concentrated extract.

With the IES, it is possible to produce extracts complete with fresh-roasted coffee characters or the light floral notes of Darjeeling tea: extracts that are absolutely superior to traditional products and often better than a fresh brew.



## THE IES MODULES, EXPLAINED

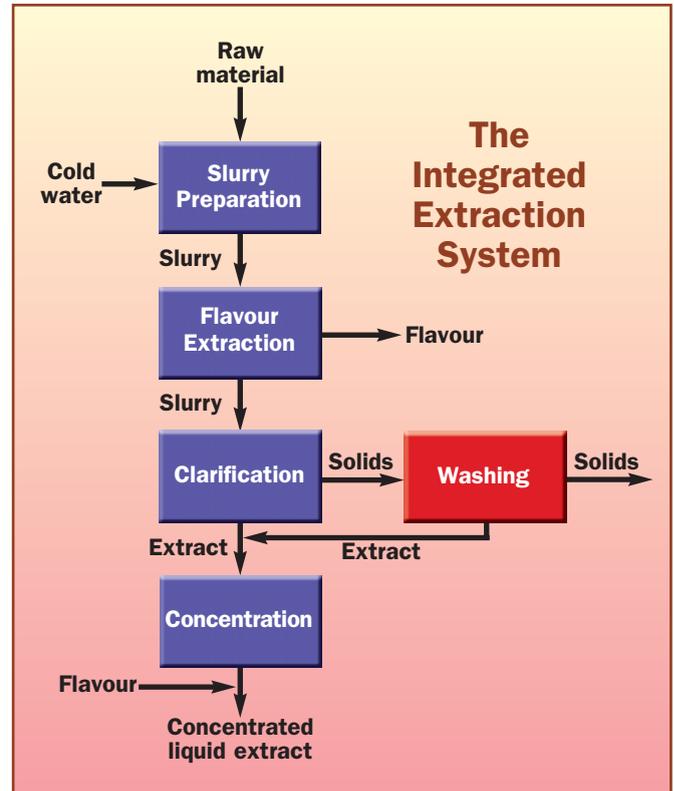
A standard system consists of the following:

**1. Slurry Preparation module:** This accepts roasted coffee beans, tea leaves or other plant material and employs specialised milling techniques to minimise flavour loss on comminution. It prepares and maintains a uniform slurry as the feed stream for the Flavour Extraction module.

**2. Flavour Extraction module:** This, the heart of the system, employs Flavourtech's patented Spinning Cone Column technology.



*The IES Slurry Preparation module and the Flavour Extraction module produce the world's finest green-tea extract.*



*A schematic of the Flavourtech Integrated Extraction System with the optional Washing module.*

The SCC, renowned for its ability to collect fragile volatile compounds without damage, captures the flavours unique to the raw material. This essence is separated and stored, avoiding the rigours of further processing. There are several options for flavour reincorporation including addition to the concentrate prior to packaging or, with greater effect, addition immediately prior to product consumption.

**3. Clarification module:** This consists of several stages. The first separates the liquid extract from the bulk solid material and the second removes any residual fines. A third filtration stage (optional) allows extract polishing.

**4. Washing module (optional):** The washing module is particularly useful when it is desirable to maximise the yield of soluble solids extracted from the coffee bean or tea leaf.

**5. Concentration module:** This module consists of the Flavourtech Centritherm: a unique spinning-cone evaporator that uses centrifugal force to ensure a very short residence time. This, coupled with low evaporation temperatures, results in extremely low thermal impact. The centritherm produces premium quality concentrates with high levels of soluble solids.

Brochures with more information on each module are available (contact Flavourtech).

## WHO IS FLAVOURTECH?

Flavourtech is an innovative Australian company specialising in the design of superior processing systems based on core flavour-management and evaporation technologies.

The SCC was developed by Flavourtech and is widely used as an aroma-recovery or flavour-management device. Many food and beverage processors around the world have adopted this technology to improve the aromatic qualities of their products, but none more so than in the coffee (especially the soluble-coffee) industry.

Spinning Cone Columns are now installed in over twenty countries (see the map below).

Flavourtech also owns Centritherm evaporator technology (previously of Tetra-Pak, Sweden). The Centritherm is recognised as the world's leading evaporator for premium products.



*Flavourtech's Spinning Cone Columns now circle the globe.*

Today there are more than 1,000 Centritherm installations in over 90 countries.

Flavourtech's commitment to quality and customer satisfaction has made it the supplier of the world's finest processing technology for the world's finest flavours and concentrates.

## INTEGRATED EXTRACTION SYSTEM: A CASE STUDY

Typical of many companies that are taking advantage of Flavourtech's expertise in the production of superior coffee and tea extracts is Sensus LLC, a Cincinnati-based enterprise supplying flavour components and extracts to the beverage industry.

Says Dr. Dan Wampler, President of Sensus: "The Spinning Cone Column gives us unprecedented control in capturing the distinctive flavour of coffee beans and tea leaves, and ensuring its inclusion in the final extract or concentrate.

"The Spinning Cone Column assures us of fresh-brewed flavor tonality, captured at its peak of quality, with maximum efficiency and with significantly reduced cost-use compared to conventional methods."

Flavourtech's Integrated Extraction System has enabled Sensus to capture the attention of, and generate sales to, globally respected beverage manufacturers. Rapid escalation in consumer demand for ready-to-drink coffee and tea beverages is creating growth opportunities for companies such as Sensus.

When combined with the additional IES modules, a flexible processing line is created. Every IES module is designed and built with a singular objective: to produce the highest-quality coffee and tea extracts possible.

If you'd like more information on the Integrated Extraction System, or its individual modules, please contact the Flavourtech office nearest you (see below).

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