

### Low Temperature PD (Pre-Desolventizer) & Vacuumed Desolventizer Technology

With over 60 years of engineering, manufacturing, and project execution expertise, HUM delivers advanced process solutions tailored to the evolving needs of the oilseed and protein industries. Since 1960, HUM has continuously developed and optimized its technologies, combining field experience with customer-driven innovation.

Today, this accumulated know-how is successfully applied to Soybean White Flake production, offering a high-value, low-temperature desolventizing solution designed to preserve maximum protein functionality (PDI) while ensuring safe and efficient solvent removal.

#### WHAT IS SOYBEAN WHITE FLAKE?

Soybean white flakes are a premium intermediate product obtained after solvent extraction and gentle, low-temperature desolventizing. Unlike conventional meal production, the process is specifically designed to:

- Preserve native protein structure
- Maintain light color and neutral flavor
- Enable high end food and feed applications

#### PROCESS OVERVIEW

HUM's system is based on a two-stage desolventizing concept:

##### Pre-Desolventizer (PD) under Low Temperature

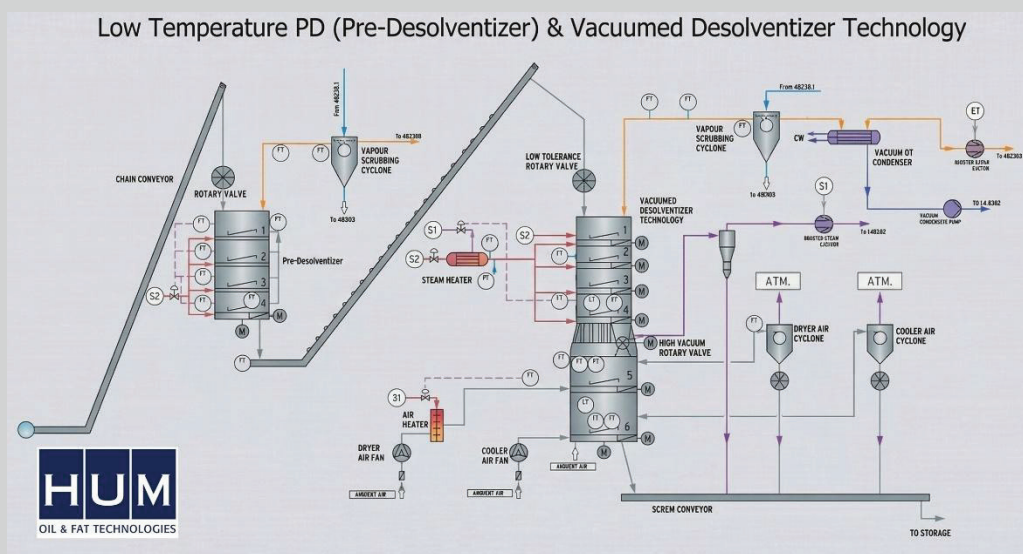
Indirect heating at controlled temperatures  
Efficient bulk solvent removal  
Uniform product handling without overheating

##### Vacuumed Desolventizer Stripper (VDS)

Deep desolventizing under controlled vacuum  
Gentle stripping with low-pressure steam  
Maximum protection of protein quality

##### Dryer & Cooler

Rapid cooling to preserve color and functionality  
Final conditioning for storage or further processing



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# SPECIFICATIONS



## Energy-Efficient Design

Optimized heat transfer and residence time result in:

- Reduced steam consumption
- Lower operational costs

## Industrial Reliability

Built on decades of experience, HUM systems offer:

- Robust mechanical design
- Long service life
- Easy maintenance

## Consistent Product Quality

Uniform residence time and controlled flow guarantee:

- Homogeneous output
- Reliable downstream performance.

## FEED MATERIAL CHARACTERISTICS

The system is designed to handle flakes directly from the extractor with:

- Hexane content: 25–35%
- Uniform flake structure
- Controlled particle size distribution

HUM's process ensures stable and homogeneous feeding, which is critical for consistent product quality.

## FINAL PRODUCT SPECIFICATIONS

The resulting Soybean White Flake meets the highest industry expectations:

- High PDI (Protein Dispersibility Index) 80-90%
- Low Residual hexane: < 250 ppm
- Moisture: < 12%
- Light color, low denaturation
- Excellent processability for downstream applications

## KEY ADVANTAGES OF HUM TECHNOLOGY

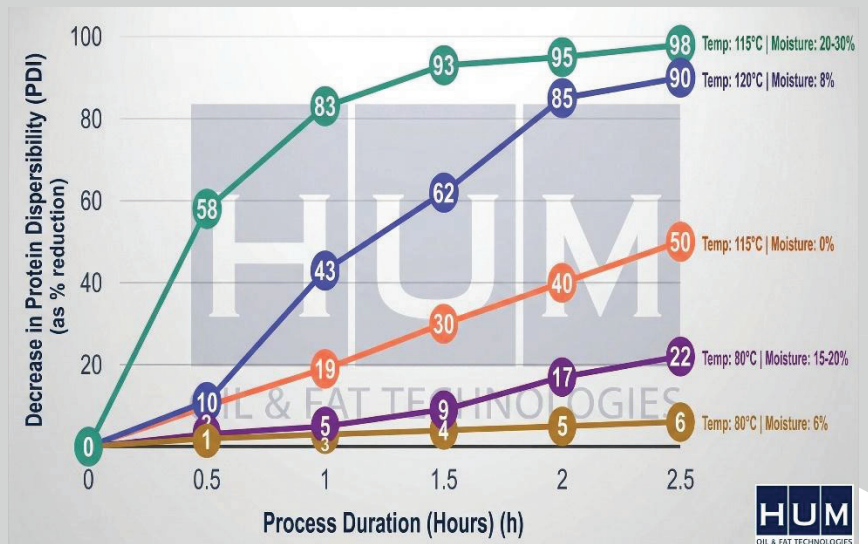
### Maximum Protein Preservation

Low-temperature processing ensures minimal denaturation and high functional protein value, ideal for premium applications.

### Controlled Vacuum Technology

Precise vacuum operation allows:

- Lower boiling temperatures
- Safe solvent removal
- Stable and repeatable performance



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# VALUE CREATION & MARKET ADVANTAGE

Soybean white flakes are not just an intermediate product — they are a high-value gateway material. By preserving protein quality, producers gain access to premium markets with significantly higher margins compared to conventional soybean meal.

## **Key Value Drivers:**

- Higher product pricing potential
- Access to food-grade and specialty feed markets
- Flexibility for further processing

## **Downstream Applications**

Soybean white flakes are the primary raw material for:

- Soy Protein Concentrate (SPC)
- Soy Protein Isolate (SPI)
- Textured Vegetable Protein (TVP)

## **These products are widely used in:**

- Aquafeed industry
- Pet food production
- Infant and specialty nutrition
- Plant-based food applications
- Functional food ingredients

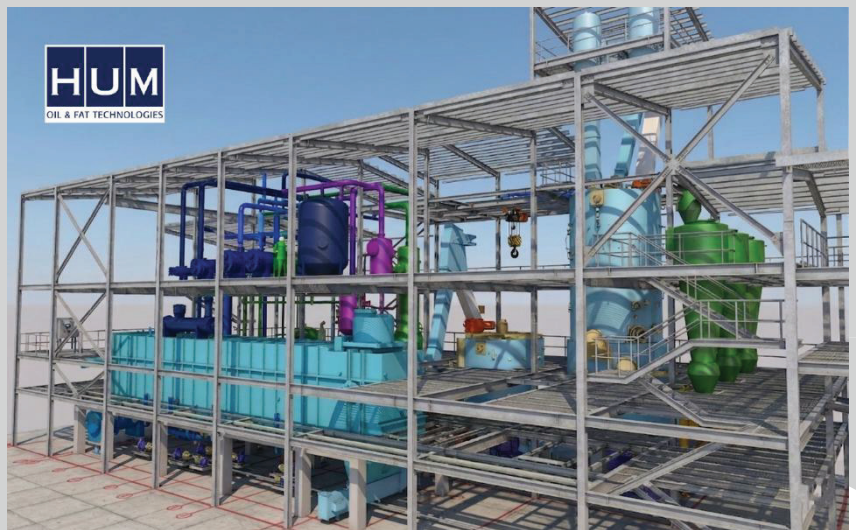


## **A PLATFORM FOR FUTURE PROCESSING**

HUM's White Flake System is designed not only as a standalone solution but also as a strategic entry point into high-value protein processing.

It integrates seamlessly with:

- Protein extraction plants
- Functional protein production lines
- Advanced food-grade processing systems



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01/2025

# HUM - ENGINEERING VALUE SINCE 1960

## From concept to commissioning, HUM provides:

- Process design & engineering
- Equipment manufacturing
- Turnkey plant solutions
- After-sales technical support

With a strong foundation built over decades, HUM transforms experience into performance, delivering solutions that meet today's requirements while preparing customers for tomorrow's markets.

## HUM ADVANTAGES

At HUM, we don't just supply equipment; we provide turn-key engineering solutions. With our PLC/SCADA controlled automation, we guarantee minimum energy consumption and maximum solvent recovery.

- 60+ years of process know-how
- Customized plant design (not standard package)
- Integration with existing hexane plants
- Low OPEX design (energy + solvent savings)
- Advanced automation:
- Recipe-based operation
- Remote monitoring / troubleshooting
- Commissioning & training support
- Performance guarantees

## UNLOCK THE FULL POTENTIAL OF YOUR SOYBEAN PROCESSING

With HUM's PD & Vacuumed Desolventizer Technology, you don't just produce flakes - you produce value, quality, and opportunity.



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