EFFICIENT SOYBEAN DEHULLING

SOPA – INTERNATIONAL SOY CONCLAVE

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BÜHLER

OILSEEDS COMPOSITION
SOYBEAN VS. SUNFLOWER AND CANOLA

SOYBEAN

Moisture:	11 %
Oil:	19 %
Fiber:	4.7 %
Protein:	37 %
Hulls:	**7.5 %**

DEHULLING DEGREE

Rest hull:	1 – 2 %
Protein:	49 %

SUNFLOWER

Moisture:	8 %
Oil:	45 %
Fiber:	17.5 %
Protein:	18 %
Hulls:	**25 %**

Rest hull:	10 – 12 %
Protein:	42 %

CANOLA / RAPESEED

Moisture:	8 %
Oil:	40 %
Fiber:	12 %
Protein:	20 %
Hulls:	**18 %**

Rest hull:	2 %
Protein:	43 %

OBJECTIVE OF DEHULLING

- Reduction of fiber content in finished meal by removal of hulls during seed preparation
- Less fiber content in seed leads to a higher protein content in the extr. meal.
- Fiber content in kernel or seed substance can’t be influenced by front end dehulling but by tail end dehulling in the deoiled meal.
- Protein content in finished meal depends on the protein content in raw material.
- Intensive dehulling requires an efficient control of oil loss in hulls.

DEHULLING PROCESS OVERVIEW

SOYBEAN

COLD DEHULLING
- Conventional Dehulling
- Soybean moisture: 9 – 10 %
- HP Meal: 46 – 48 % Protein
- Drying and Tempering for 36 hours

WARM or HOT DEHULLING
- Conditioning, Fluidization
- Soybean moisture: 12 – 13 %
- HP Meal: 48 – 50 % Protein
- Low Energy

SUNFLOWER

1- STAGE DEHULLING
- Conventional Dehulling
- One sifting Stage
- 12% Resthull
- Max. 41% Protein

2- STAGE DEHULLING
- Conventional Dehulling
- Two sifting Stage
- 10% Resthull
- Max. 44% Protein

CANOLA / RAPESEED

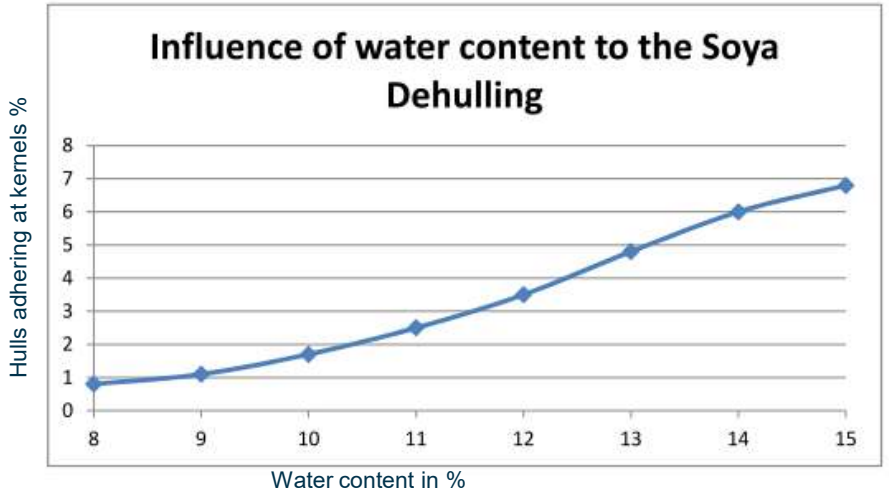
CLASSIFIYING / DEHULLING
- Classifying seed size
- Drying to 4 – 6% moisture
- HP Meal: 40-41% Protein
- High kernel loss in hulls

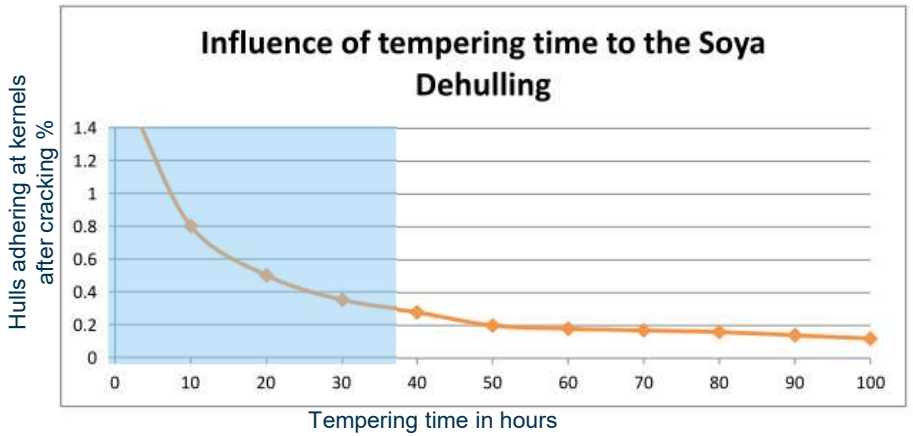
Protein Shifting

Shifting of Extraction Meal
- 50% HP fraction
- Intermediate fraction
- Crude fiber fraction

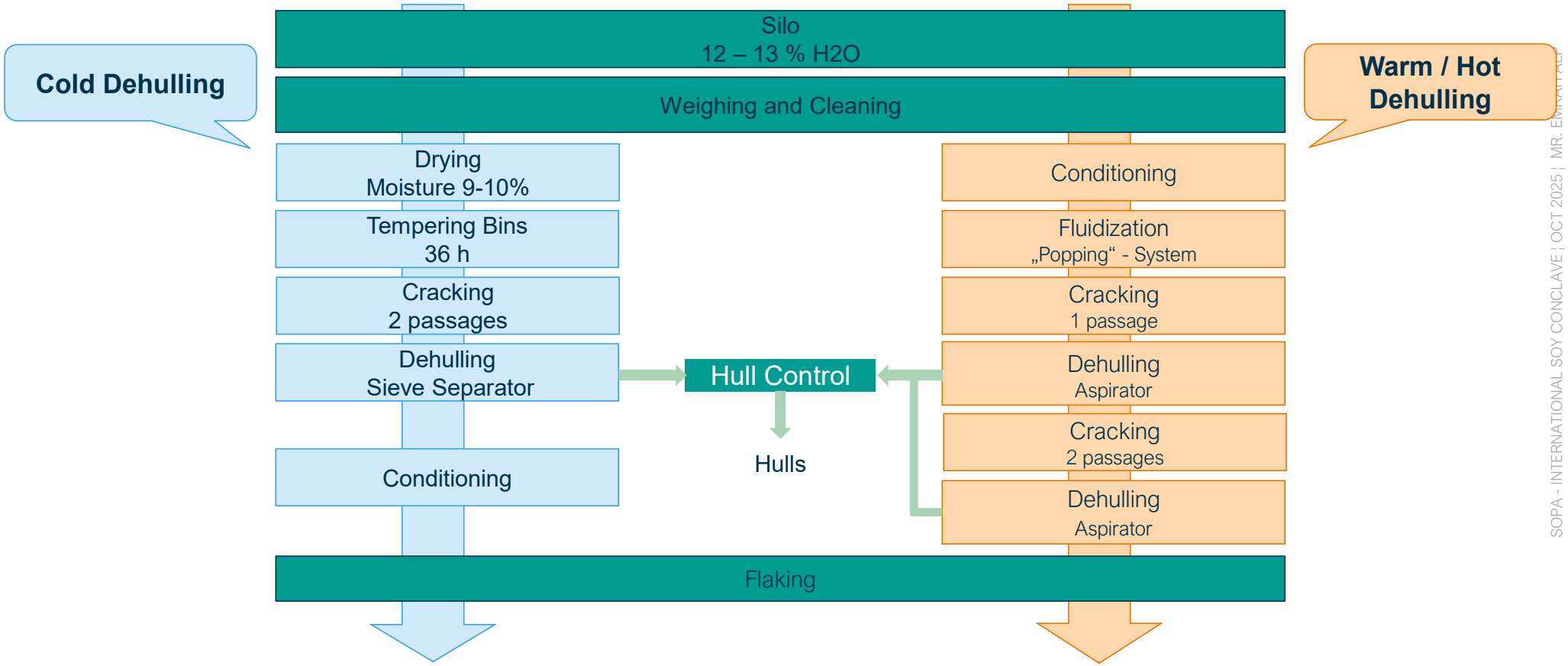
SOYBEAN DEHULLING

INFLUENCE OF MOISTURE & TEMPERING TIME



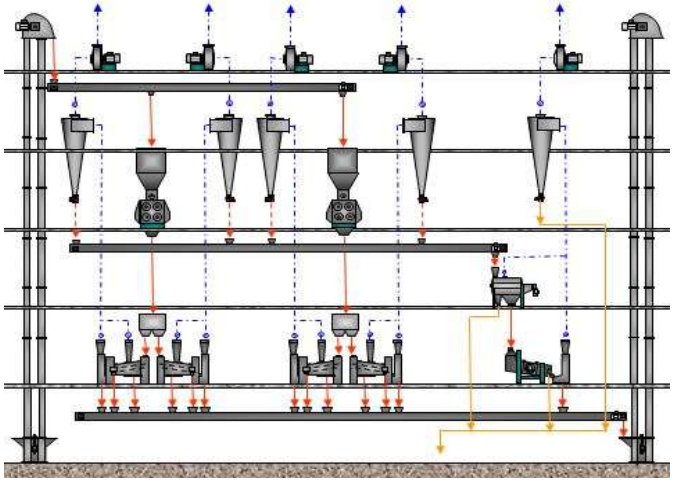


SOYBEAN DEHULLING
COLD DEHULLING VS. WARM/HOT DEHULLING

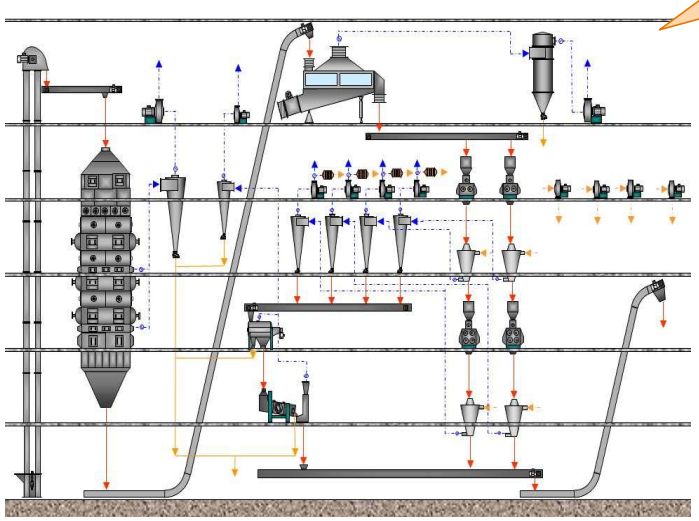


SOYBEAN DEHULLING
COLD DEHULLING VS. WARM/HOT DEHULLING

Cold Dehulling



Warm / Hot Dehulling



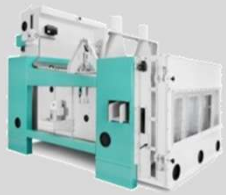
	Rest hull content	
< 2%		< 1,0%
< 1,0%	Loss of oil (based on hulls)	< 1,0%

SOYBEAN DEHULLING
KEY EQUIPMENTS

COLD DEHULLING

Cracking Mill OLCB

Hull Separator SMA



Conditioner OLKA

WARM / HOT DEHULLING

Conditioner OLKA

Fluid Bed Drier OLHA

Cracking Mill OLCB

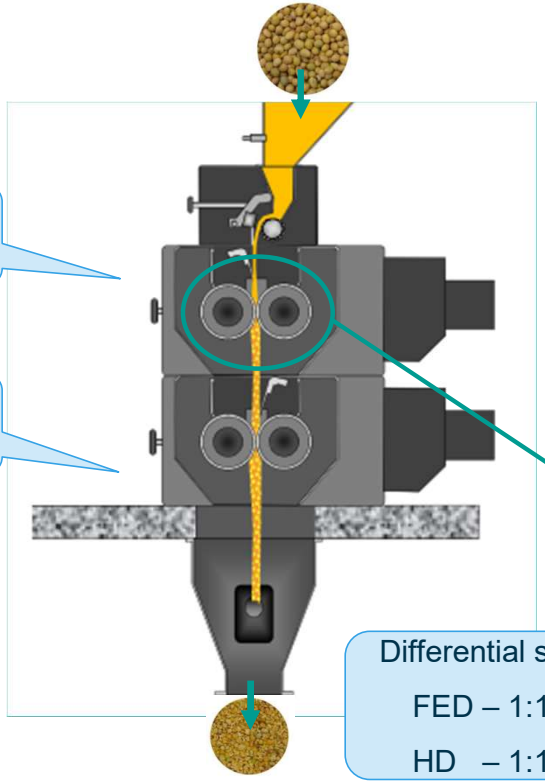
Aspirator OLSA

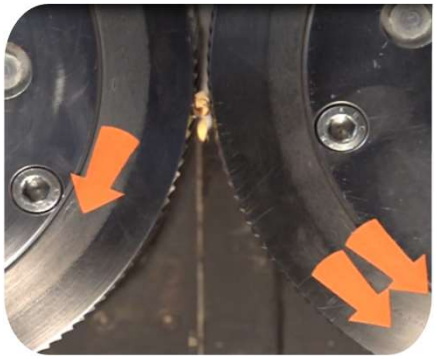
Flaking Mill OLFB

SOYBEAN DEHULLING
CRACKING MILL

Cracking – 1st passage
½ - ¼ size

Cracking – 2nd passage
1/4 - 1/8 size





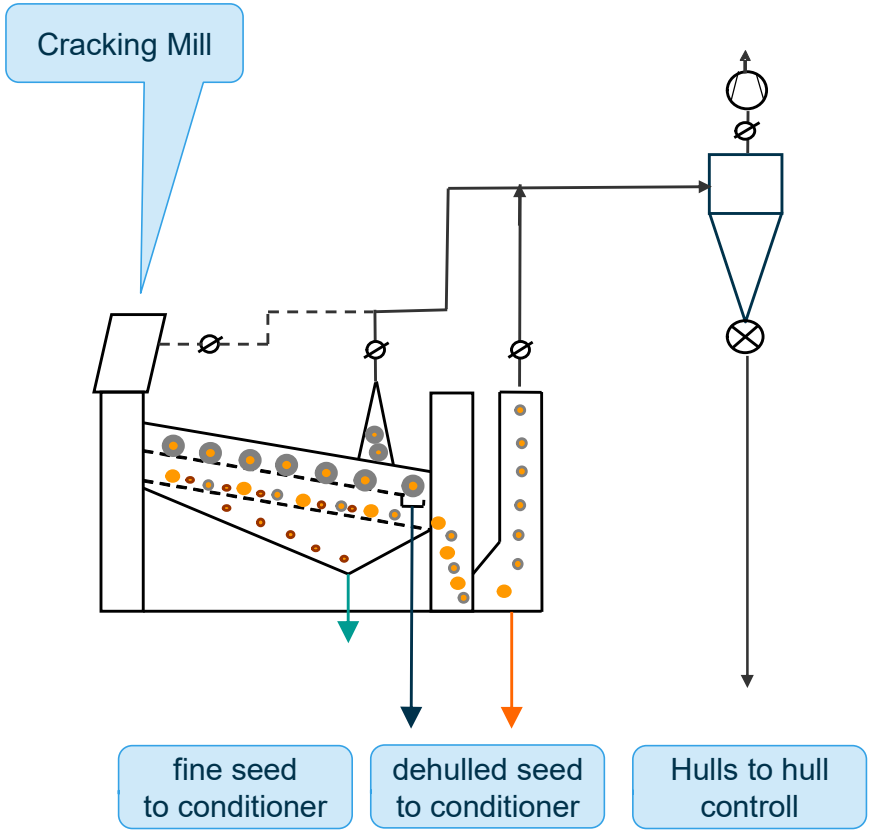
Corrugation:
FED – 275/250
HD – 225/250/250

Differential speed:
FED – 1:1,27
HD – 1:1,60

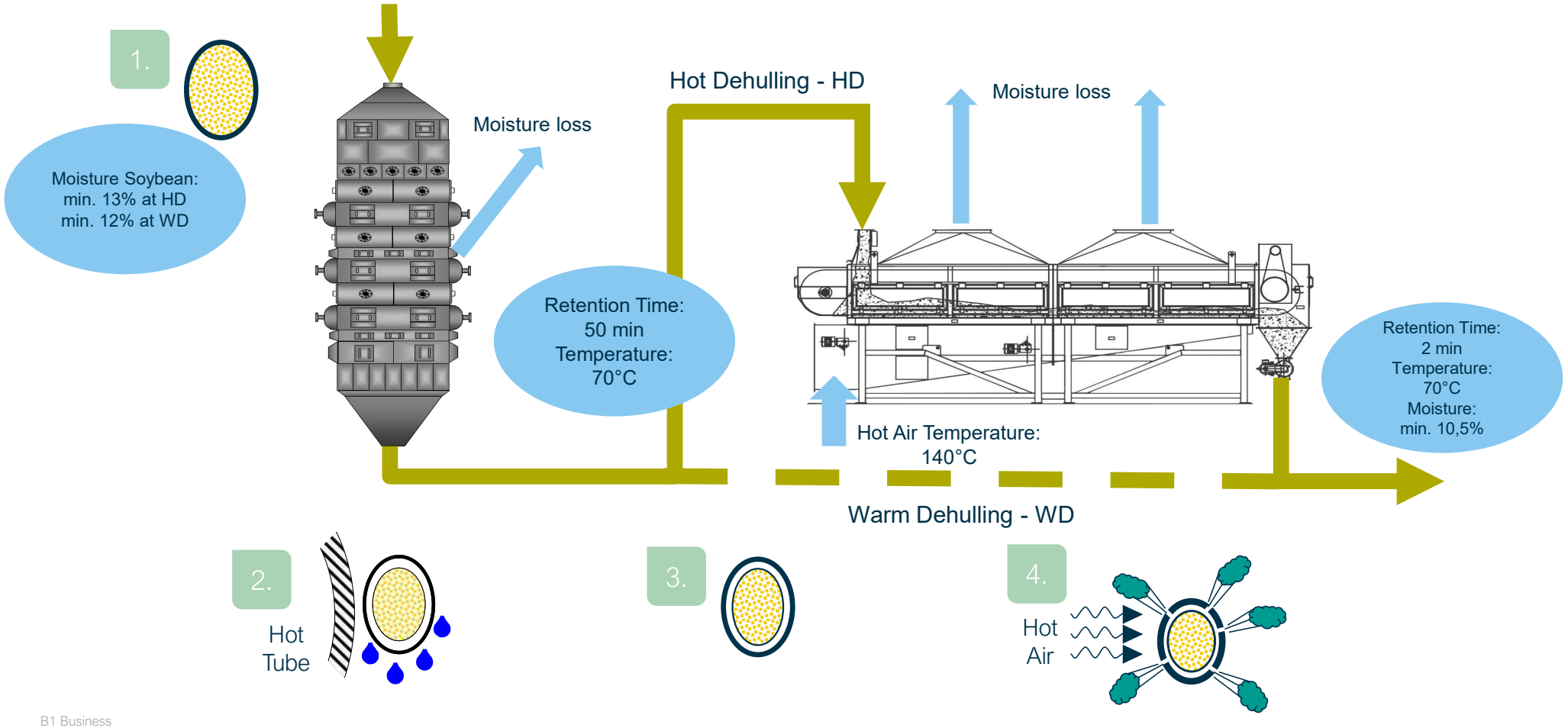
Differential speed and corrugation need to be adapted if processing cold or hot dehulling.

SOYBEAN DEHULLING
HULL SEPARATION – COLD DEHULLING


SMA-203-3 OL



SOYBEAN DEHULLING
CONDITIONER & FLUID BED DRIER FOR WARM / HOT DEHULLING

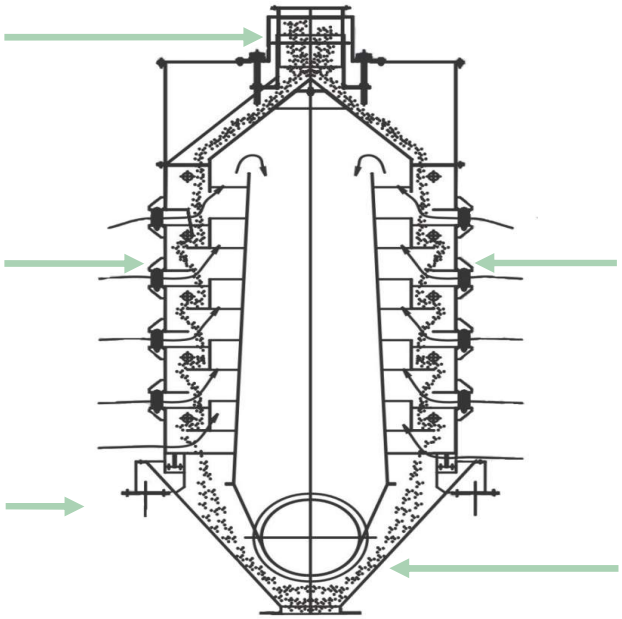


SOYBEAN DEHULLING
HULL ASPIRATOR FOR WARM / HOT DEHULLING

Product inlet
Even distribution over the entire inlet by means of the distribution cone.

Aspiration
By means of air, fine particles are separated from the product and conveyed to the two air discharge pipes.

Cover
The aspiration cover enables recirculation of warm air. This reduces the heat loss and saves energy.



Cascade rings
Vertically adjustable impact cylinders improve the dehulling effect.

Product outlet
Heavy particles, mainly kernels, are collected and discharged through the product outlet.

SOYBEAN DEHULLING
HULL CONTROL

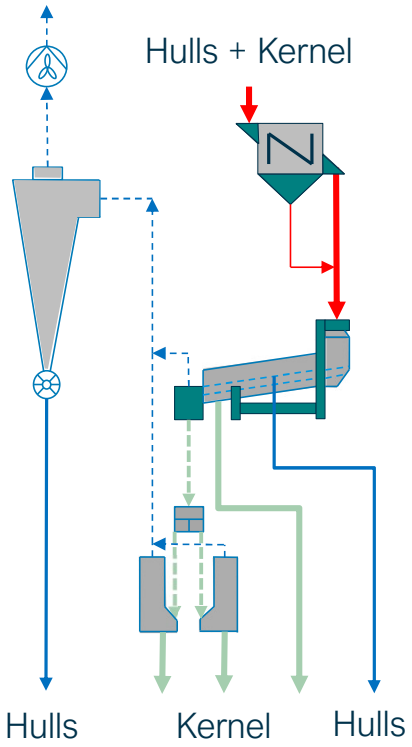
Hulls + Kernels

- Separation of sticking kernels at hulls by drum sieve (beater/brush type)
- Sifting of hulls and kernels
- Aspiration of remaining hulls via aspiration channel

Drum Sieve DMHX

Hull Separator SMA

Aspiration Channel MVSH



RESUME

- HP meal production ensures the highest benefits
- Knowing the exact type of soybean is important for a precise plant design
- Cold Dehulling has lowest investment costs but highest energy consumption, due to drying efforts
- Warm & Hot dehulling have highest investment costs – but lowest energy consumption and best yield
- Highest HP meal concentration can be achieved with Warm / Hot dehulling
- Low oil loss / kernel loss due to efficient hull control

YOUR PARTNER FOR OILSEED PREPARATION

INNOVATIONS FOR A BETTER WORLD