

**Buss-SMS-Canzler**

## **High Viscosity Technology**



We live process engineering  
and special manufacturing

**SMS**



Buss-SMS-Canzler

# Buss-SMS-Canzler

## Core Competence High Viscosity Technology



*FILMTRUDER® rotor details*

Buss-SMS-Canzler is a leading international supplier of thermal separation solutions for difficult products and mixtures. We are the world's leading supplier of thin film evaporation technology. This is due to the long-standing experience and expertise of the four former companies Luwa, SMS, Buss and Canzler. This long experience and expertise is now incorporated into Buss-SMS-Canzler.

For our customers around the world we develop and manufacture machines and plants for evaporation, processing of highly viscous materials, membrane filtration and drying. Our experience and our test centre allow us to develop customer specific process solutions by applying tailor-made equipment and complete systems.



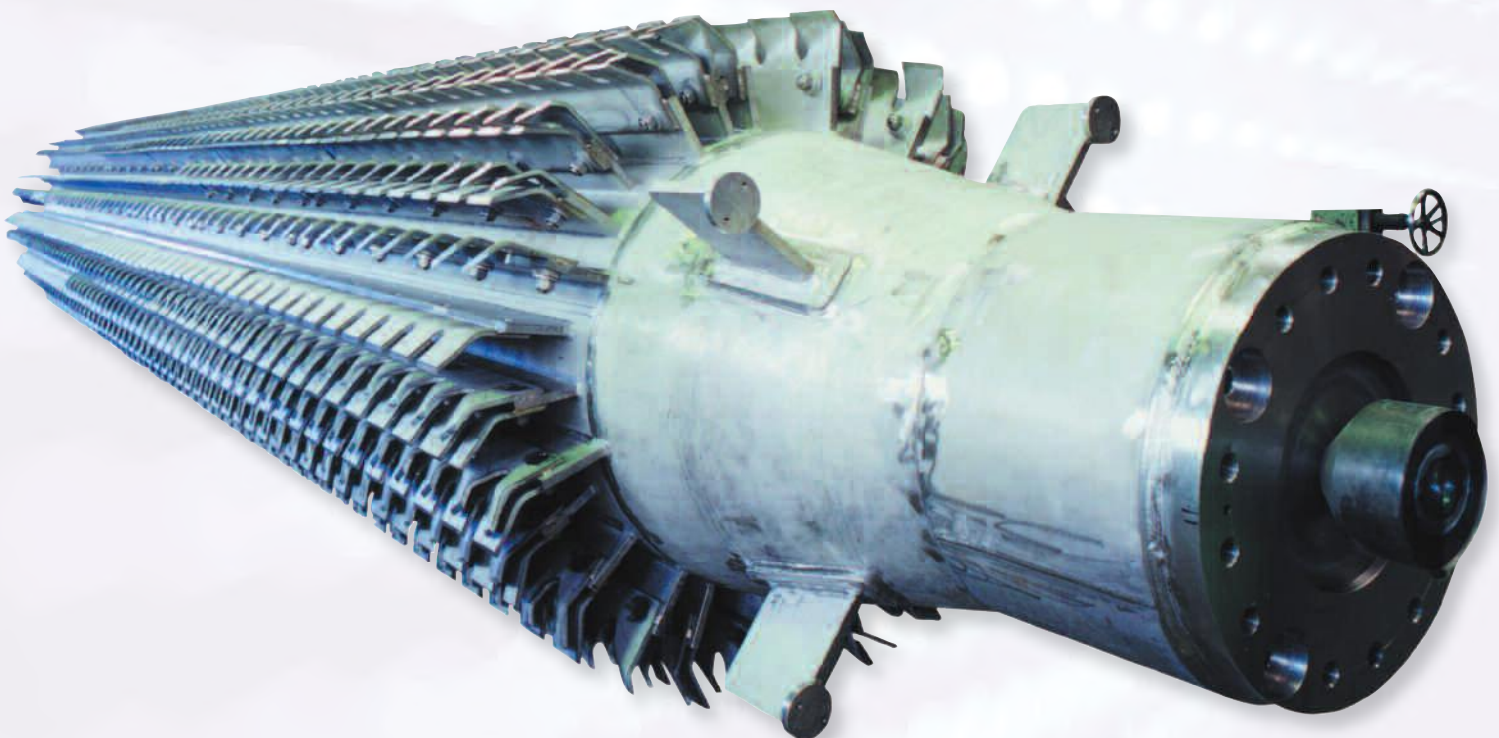
*Positive displacement discharge*

Buss-SMS-Canzler partners you as consultant, designer and manufacturer through all project stages: from the process layout, pilot tests, engineering, mechanical design, manufacturing and documentation, to installation, start up and after sales service.

### **High Viscosity Technology:**

#### **Joint success**

Buss-SMS-Canzler supplies Thin Film Processors and Large Volume Processors for your highly viscous products. As a special service, we offer our customers the joint development of complex applications with utilisation of our comprehensive resources, such as rental units, test centre, process engineering and design department.



# High Viscosity Technology at a Glance

Our High Viscosity Technology with Thin Film Processors and Large Volume Processors is utilised for the thermal treatment in polymer production and in post-reaction treatment.

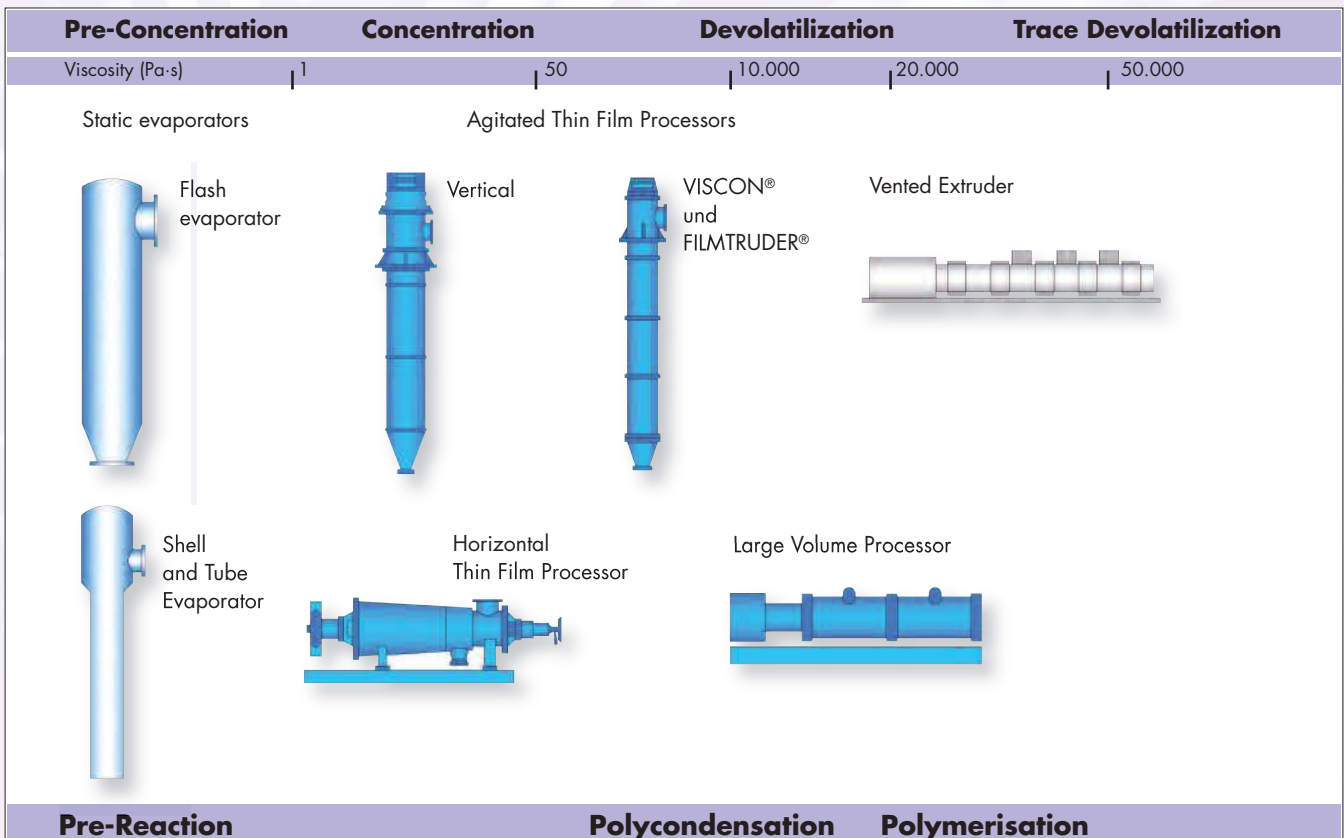
## Typical processes are

- Polymerisation
- Polycondensation
- Devolatilization, including the removal of monomers, solvents, and reactants from a variety of viscous products
- Compounding/Reactive compounding
- High viscosity mixing
- Crystallization
- Sublimation
- Combinations of the above

## Products included in these processes are

- Acrylic resins
- Adhesives
- Biopolymers
- Chemical intermediates
- Detergents
- Elastomers
- Engineered thermoplastics
- Fibres
- Foods including fruit purees, sugars and cheeses
- High performance polymers
- Phenolic resins
- Polyesters
- Resources recovery - waste volume reduction
- Silicones
- Styrene co-polymers

To achieve the best process solution, combinations with state-of-the-art technologies such as flash evaporation and extrusion are made. Our own technologies comprise key equipment with integrated application tailored product feed, discharge systems and drives.



# Thin Film Processors and Large Volume Processors: Economic Production for High Quality Products

## Thin Film Processors

The FILMTRUDER® and VISCON® Thin Film Processors produce a mechanically agitated thin product film which is distributed over the inner surface of a vertical heated cylinder by a rotor. The rotor continuously agitates the film, creating surface renewal and resulting in high heat flux and mass transfer. The rotor blades are designed to propel the product down the cylinder walls. Volatile components are rapidly evaporated. The large free vapour space in relation to the

low product hold-up allows the separation of large volatile rates in a single stage.

## Large Volume Processors

The Large Volume Processor program consists of horizontally arranged, heated reactors with either a single or twin (co- or counterrotating) shaft which provide intensive mixing and kneading.

The highly versatile Large Volume Processors are characterised by large process volumes and self-cleaning. They allow for the efficient treatment of difficult and/or phase changing products.

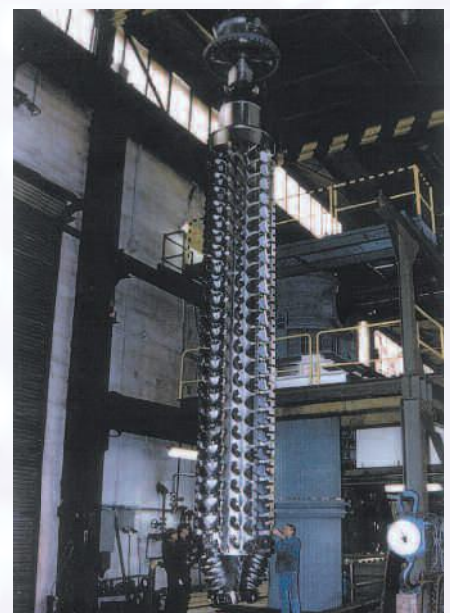
Large Volume Processors allow for the economic realisation of long residence times and the combination of various process steps in the same unit.

## Operation Window

	Thin Film Processors	Large Volume Processors
<b>Heating temperature</b>	20 - 400°C	20 - 350°C
<b>Product temperature</b>	20 - 380°C	20 - 350°C
<b>Pressure (heating side)</b>	Up to 70 bar	Up to 12 bar
<b>Pressure (process side)</b>	< 1 mbar - 30 bar	< 1 mbar - 5 bar
<b>Product viscosity</b>	20-10.000 Pa·s	20-15.000 Pa·s /solids
<b>Residence time</b>	Up to 15 min.	Up to 2 hours
<b>Product capacity</b>	20 -15.000 kg/h	2 -15.000 kg/h
<b>Operation mode</b>	Continuous	Batch or continuous



REACOM®



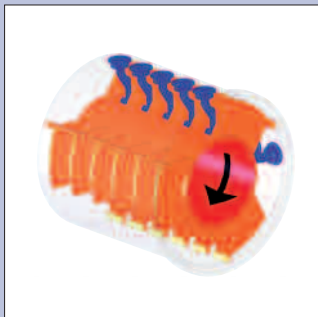
FILMTRUDER® rotor in test facility

REACTOTHERM® with high torque hydraulic drives used for rotor, side-feeder and discharge screws

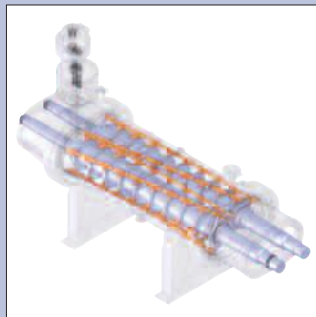


### Large Volume Processors

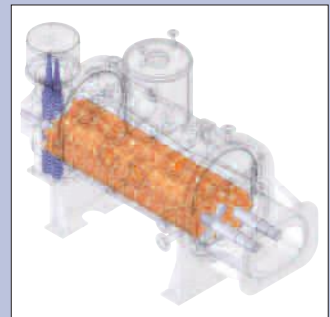
Based on new developments our recently developed program of high viscosity Large Volume Processors has been further improved.



**REACTOTHERM®**



**REACOM®**



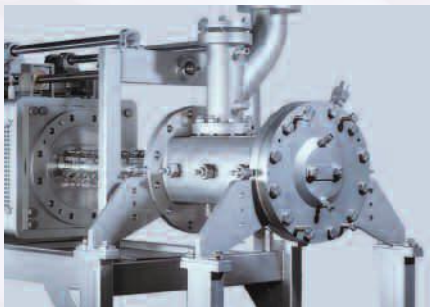
**REASIL**

<b>No. of shafts</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>Rotation direction</b>	<b>-</b>	<b>co-current</b>	<b>counter-current</b>
<b>Speed ratio</b>	<b>-</b>	<b>1:1</b>	<b>1:1</b>
<b>Plug flow</b>	<b>+</b>	<b>+++</b>	<b>+++</b>

# Development: Special Processes for Special Products

In close cooperation with our customers we identify the need and develop customised process solutions. We assist you as reliable development partner from the product idea through the entire process and technology development work to the optimised quality production.

Our test equipment can be scheduled for use in our test centre or rented for use in your facility.



Rental unit of Large Volume Processor used as batch reactor



REACTOTHERM® for pilot trials

## Identifying the Need - Developing the Solution

### Purpose

### Description

PES - Preliminary Evaluation Study

Evaluation of client specifications on product and process, cross-check with our comprehensive data base, review of product properties on laboratory scale equipment

Bench scale

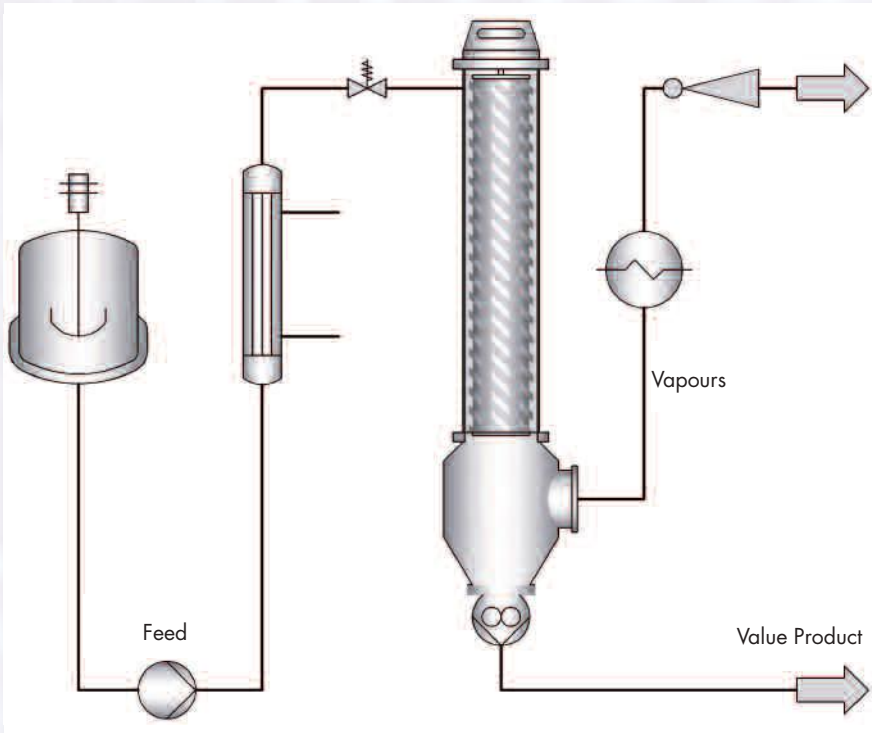
Feasibility tests at our test centre using pilot scale Thin Film Processors, single or twin-shaft batch or continuous Large Volume Processor

Design Study

Demonstration tests at our test centre or at customer's facility using Thin Film Processors or batch or continuous Large Volume Processors, for the commercial design

# Applications: Concentration, Reaction, Mixing and Devolatilization

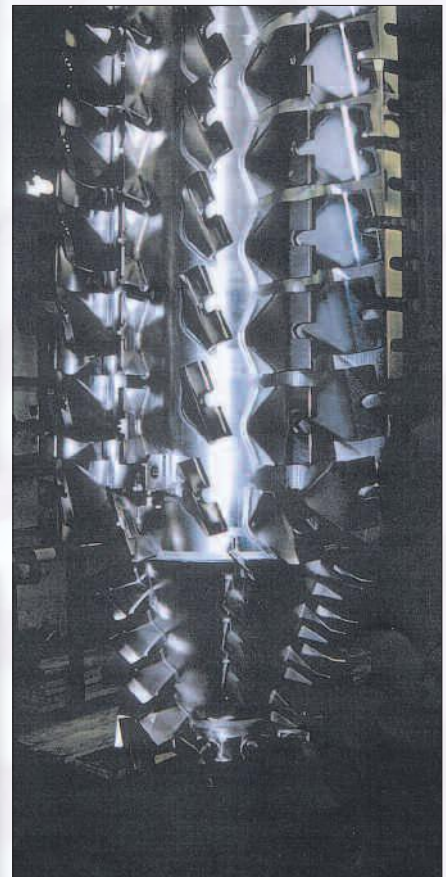
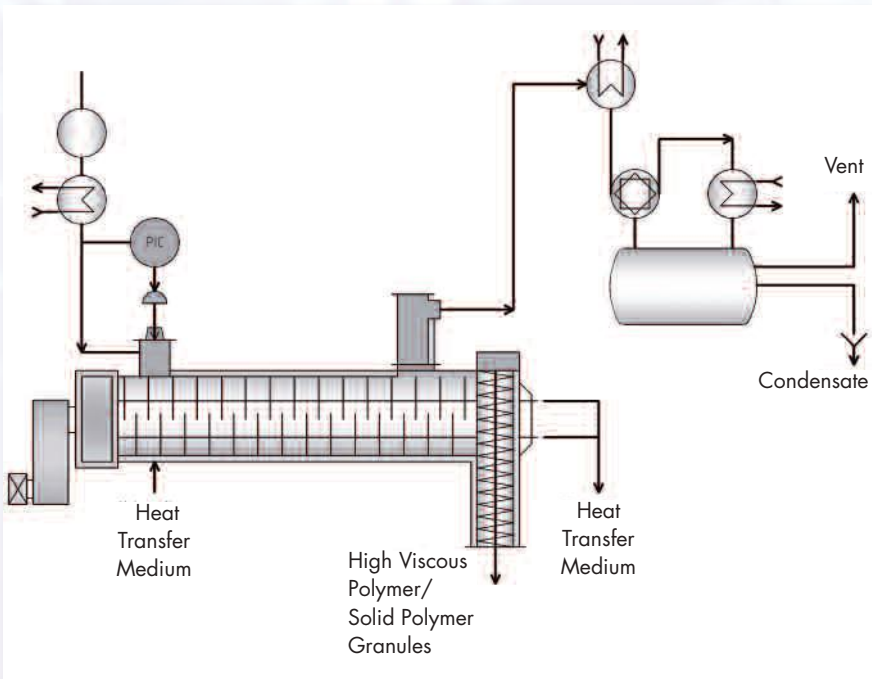
## Concentration of polymer solutions



## FILMTRUDER® co-current

- Concentration from 10% polymer up to 95% polymer in one single stage
- No product entrainment
- Ideally suited as pre-stage upstream to the final devolatilization

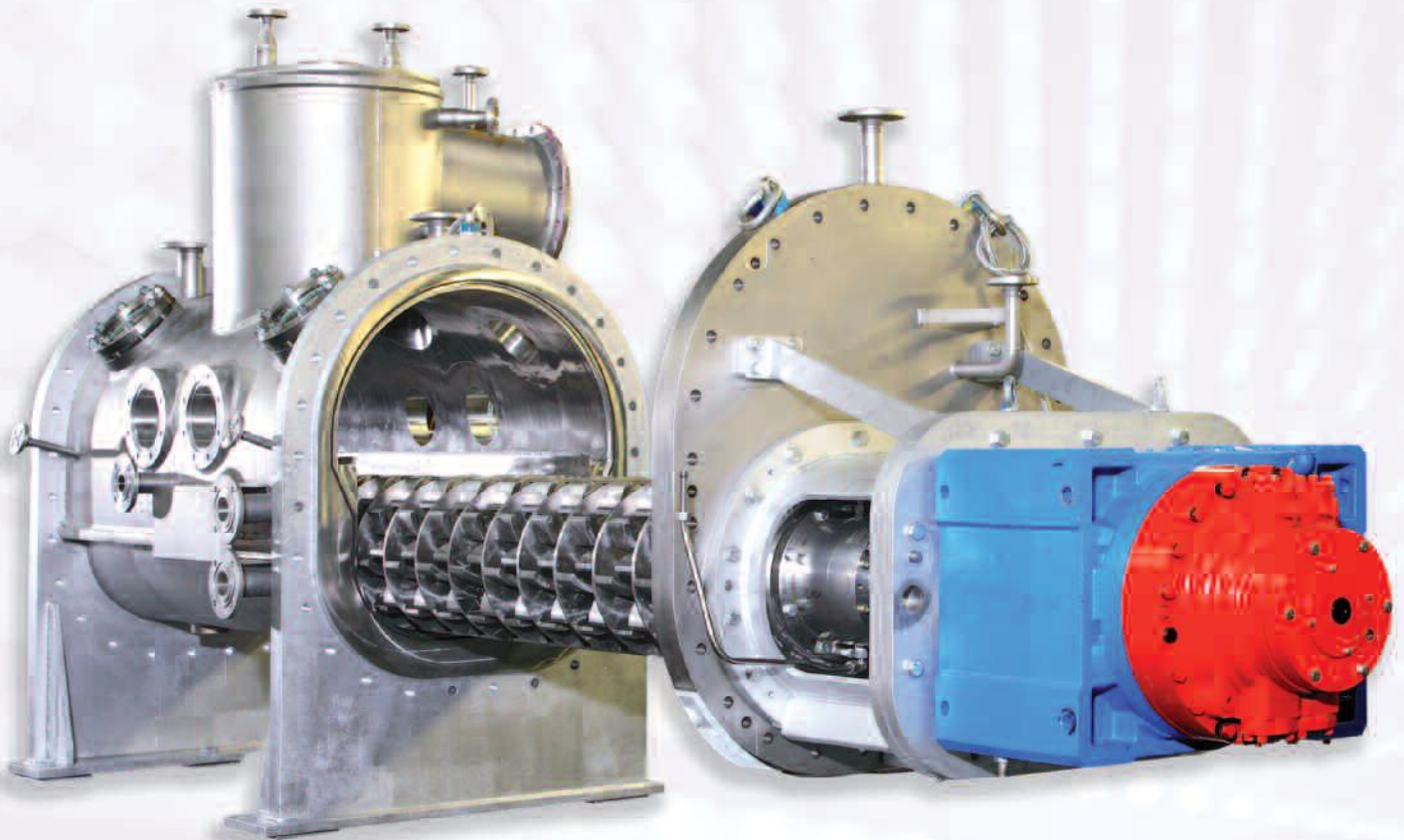
## Typical plant design of Large Volume Processors



Discharge section of FILMTRUDER®

## Large Volume Processor

- Polymerisation, single stage with high monomer yield
- Mixing/compounding, can handle wet powder
- Devolatilization of shear sensitive elastic products



#### Head Office & Workshop

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#### Branch Office & Test Center

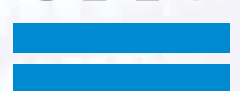
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and special manufacturing

# SMS



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