



Process Technology for Alternative Proteins

Products and Solutions for Wet- and Dry Processing

INTRODUCTION

Alternative sources of protein are of utmost need to meet the growing population as well as the demand for sustainable and protein rich food products. With alternative proteins such as plant based, cell-based as well as insect based proteins taking the lead, processing techniques that are efficient, economical while delivering high quality are crucial.








Within the Business Field "Food & Pharma", we focus on milling, mixing and classification technology for a wide range of future-proof applications including protein shifting of legumes , cell disruption of yeast/ bacterial cells as well as fine milling of insects.

NETZSCH combines the most advanced production systems with process engineering expertise and guarantees efficient process solutions. We find an economical solution that suit your requirements. Our innovative dry and wet-processing technologies for the food and confectionery industry meet our extremely high standards for quality, hygiene and safety.

MACHINE & PROCESS SOLUTIONS FOR...



Application Matrix

		PROTEIN SHIFTING	CELL DISRUPTION	INSECT PROTEINS
DRY GRINDING	CONDUX® COMPACT Fine Impact Mill 		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	CSM Classifier Mill 	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	CFS/HD-S High-efficiency Fine Classifier 	<input checked="" type="checkbox"/>		
	CONJET® High Density Bed Jet Mill 		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
WET GRINDING	MASTERREFINER Horizontal Disk Mill 		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	MASTERCREAM Pre-cutting-system 			<input checked="" type="checkbox"/>
	OMEGA® High Pressure Homogenizer 		<input checked="" type="checkbox"/>	



PROTEIN SHIFTING

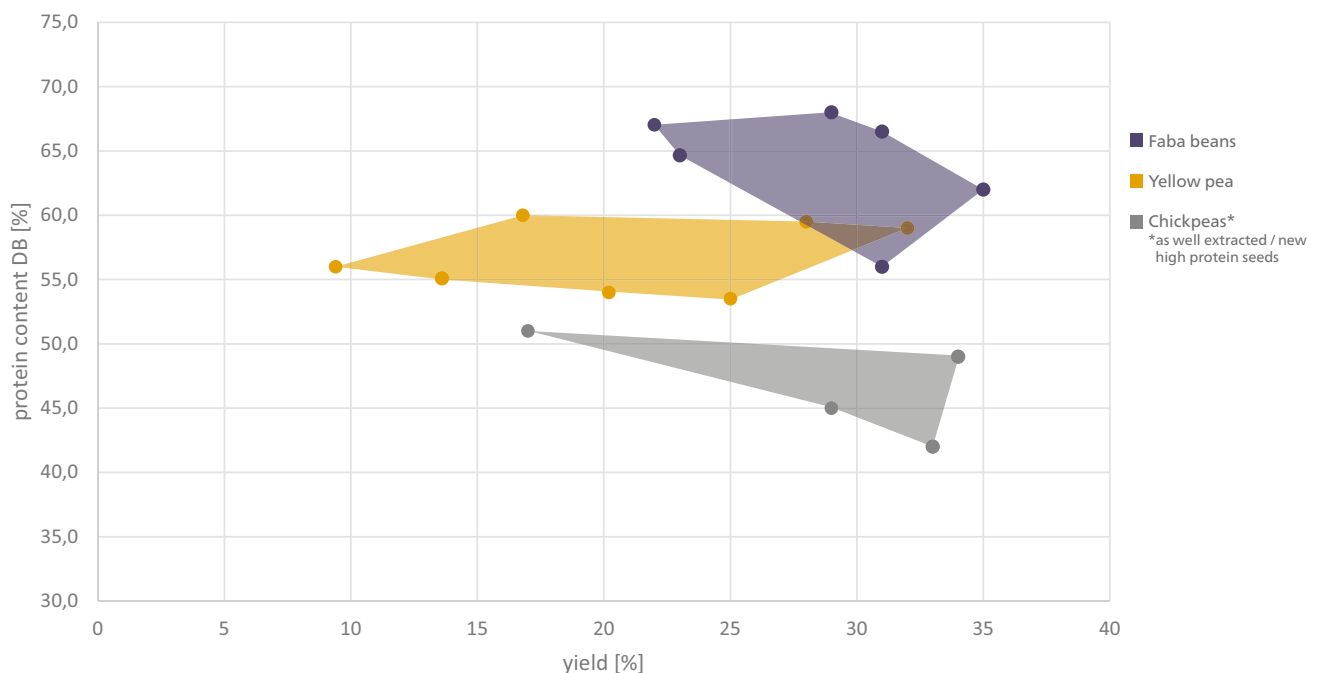
PROTEIN SHIFTING via Dry Grinding & Classifying

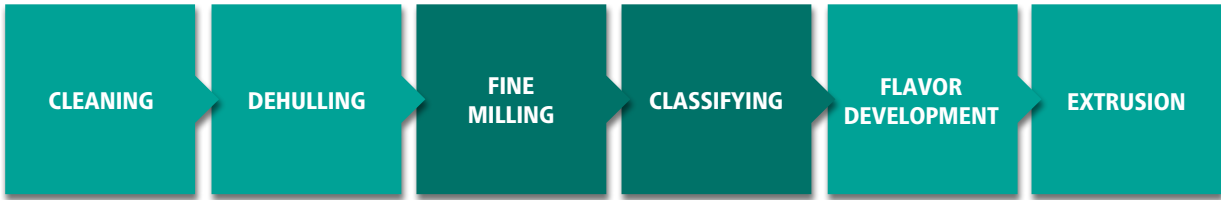
Application for Legumes & Derivatives*

*e.g. from press or extraction processes

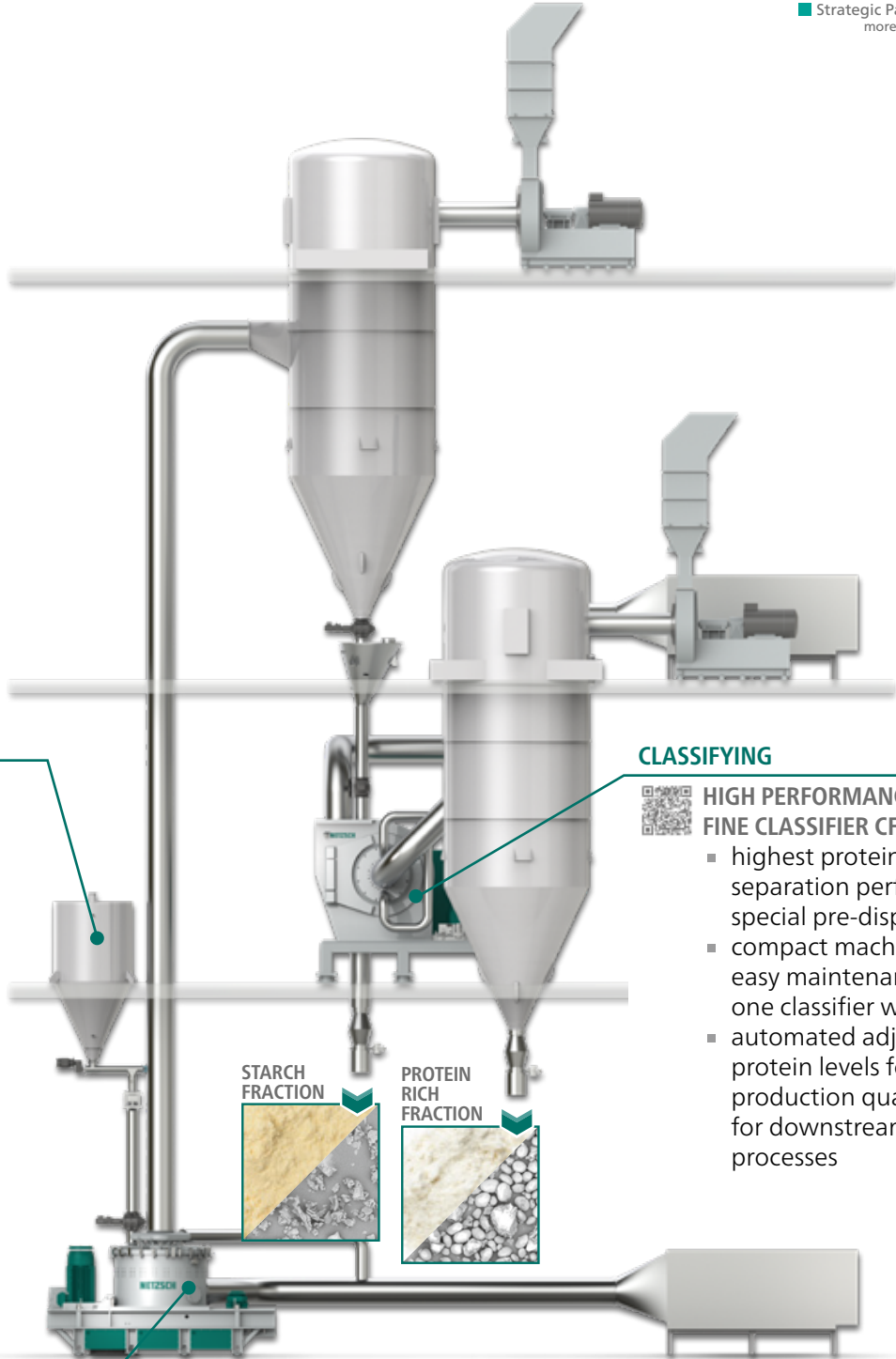
- Yield of protein fraction between 25 % - 50 %
- Protein concentration in 50 % - 75 %*
- Throughput up to 5 t/h

* Dependent on the feed product parameters
(i.e. moisture content, initial protein content, legume variety, etc.)





■ NETZSCH Equipment
 ■ Strategic Partnership
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FEEDING

DEHULLED LEGUMES



CLASSIFYING



HIGH PERFORMANCE FINE CLASSIFIER CFS/HD-S

- highest protein and starch separation performance, with special pre-dispersion unit
- compact machine design and easy maintenance with only one classifier wheel
- automated adjustment of protein levels for constant production quality, e.g. for downstream extrusion processes

STARCH FRACTION

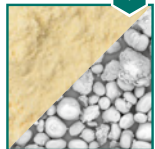


PROTEIN RICH FRACTION



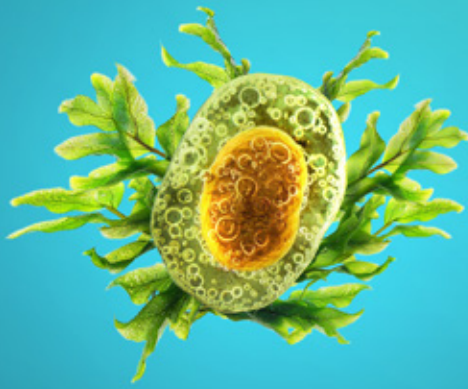
FINE MILLING

FINE FLOUR



CLASSIFIER MILL CSM

- axial orientation of classifier wheel and grinding disc allows equal and efficient milling properties
- automated hull release applicable for wear-reduced running operation

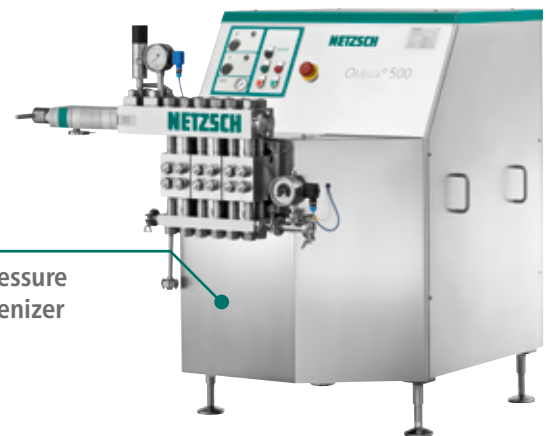


CELL DISRUPTION

CELL DISRUPTION

Product & Process Solutions for Algae & Yeast Cells

Wet Grinding Process



DISPERSING

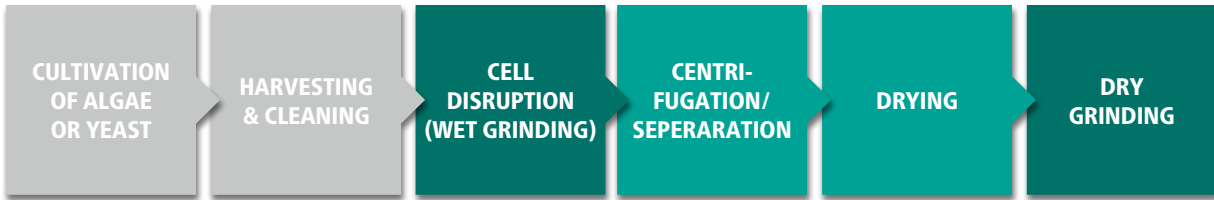


High Pressure
Homogenizer
OMEGA®

FINE GRINDING

Horizontal Disk
Mill MASTERREFINER

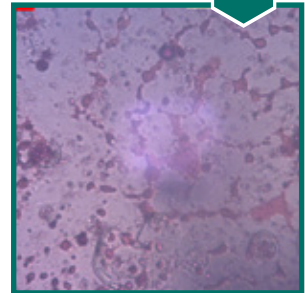
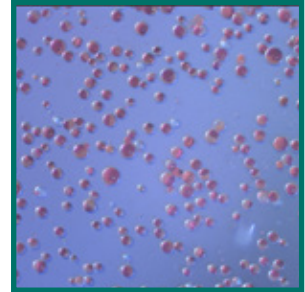




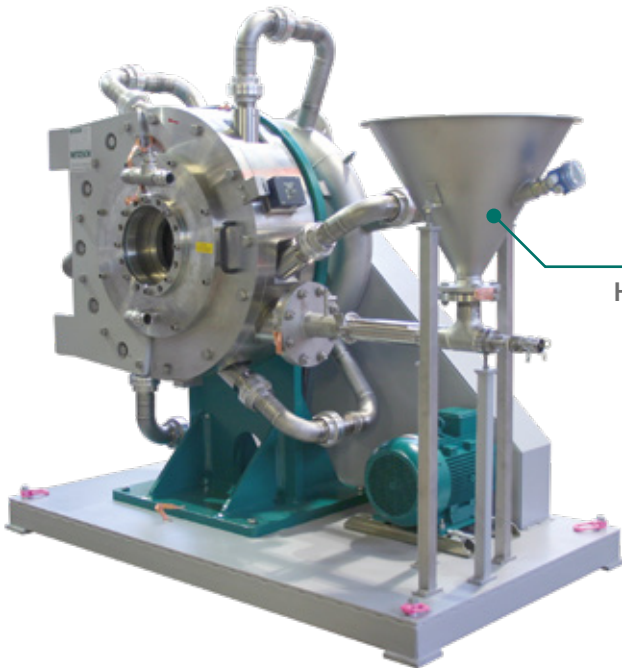
■ NETZSCH Equipment
■ Strategic Partnership
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NETZSCH Advantages in Cell Disruption Process

- No product damage or denaturation
- High degree of cell wall disruption / protein release, but allowing good separation conditions in following processes
- Scalability for high throughput rates > 10 000 l/h
- Cleanability (compromise of wear-resistant materials and hygienic design)
- Efficiency
- Low processing temperatures preserves the proteins



Dry Grinding Process



DRY GRINDING
 High Density Bed
 Jet Mill *CONJET*®



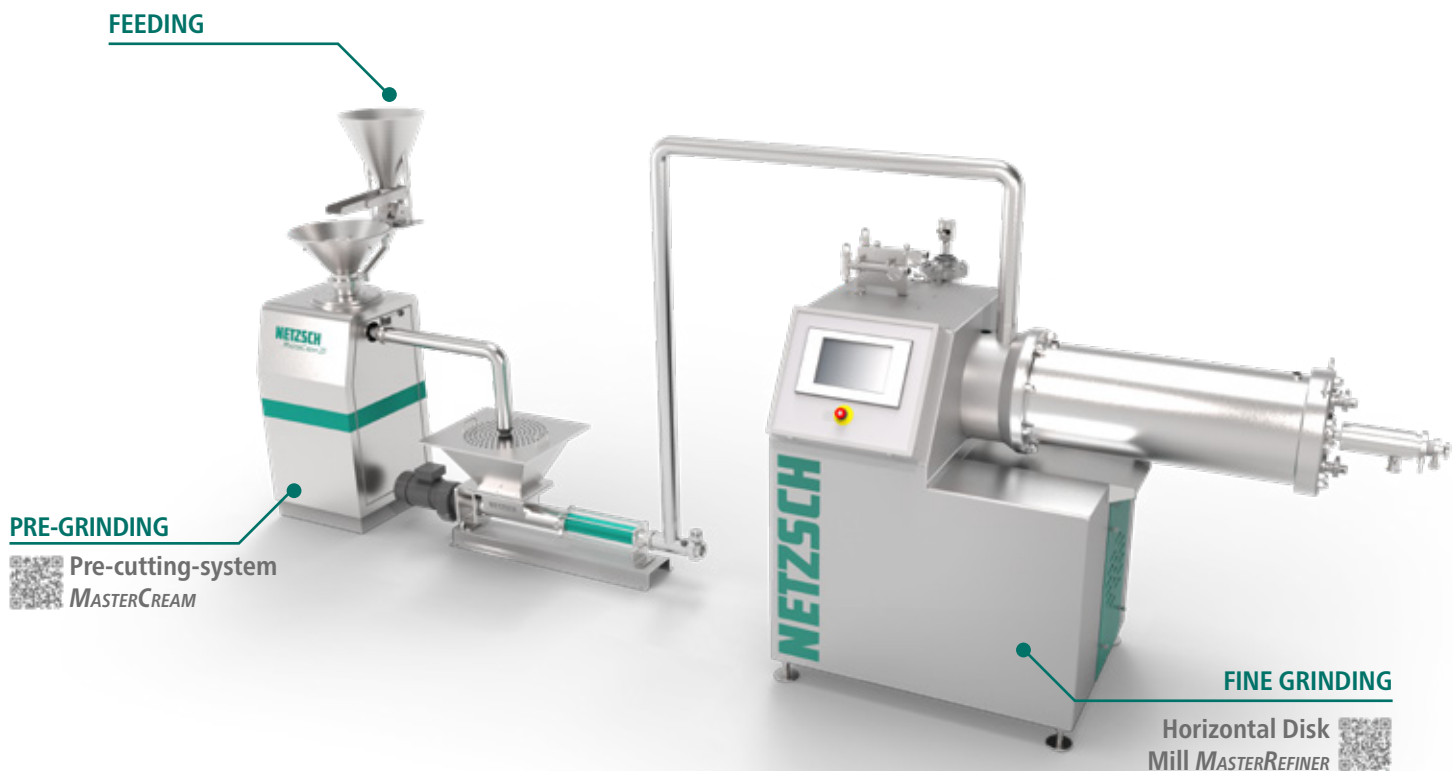
INSECT PROTEINS

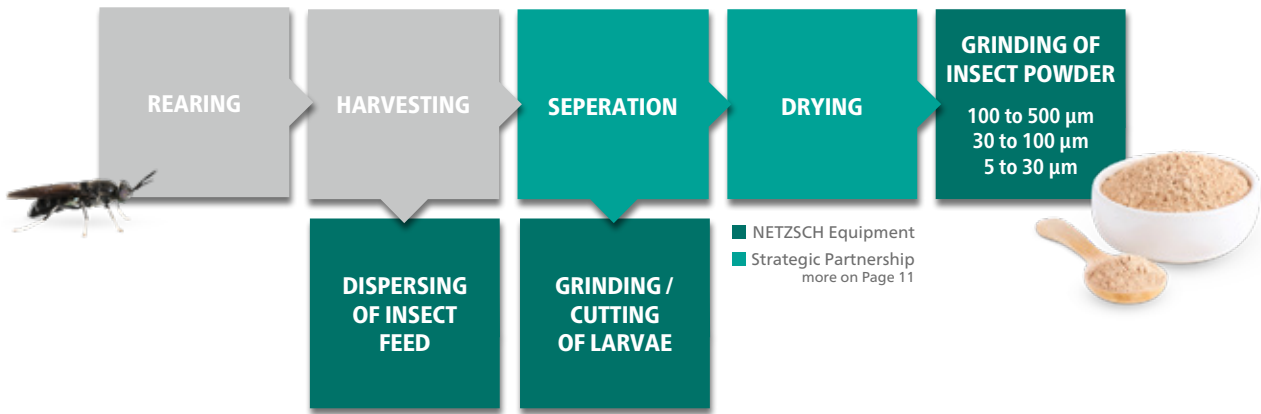
PROCESSING OF INSECT PROTEINS

Product & Process Solutions for Your Production

Wet Grinding Process

- Start with blanched or frozen larvae
- Feeding of whole insects or insect frass
- Low processing temperature below 40°C
- High throughput rates up to 8 t/h





Dry Grinding Process

- Starting from insect powder
- Inlet fineness between 1 mm - 5 mm
- Moisture content up to 10 %
- Fineness between 10 μm - 500 μm possible



DRY GRINDING



Fine Impact Mill
CONDUX® COMPACT



NETZSCH

APPLICATION LABORATORIES

The NETZSCH application laboratories in Hanau and Selb equipped with the state-of-the-art technology form an integral part of our comprehensive service offer.

After clarification of technical details you can give free reign to your creativity regarding recipe. Our teams at both locations are fully committed to ensuring that the tests are carried out to give the expected results.

NETZSCH Service

- Product development
- Process support
- Scale-up to your production requirements
- Project planning and -management, commissioning, customer service, local service
- Training at NETZSCH and locally

*WHITE*LAB for Testing Products from the Confectionery Branch

Our laboratory in Selb/Bavaria includes a separate area specifically set up and equipped for testing for the food industry. The results obtained in our labs form the basis for the design of plants for the production of confectionery masses and cocoa products which NETZSCH delivers to its customers all over the world.

Dry-Processing in *FOOD*LAB

Our *FOOD*LAB at NETZSCH Trockenmahltechnik in Hanau is available to you for tests which conform to food grade standards. There are two new test rooms in the *FOOD*LAB. Testing in each can be observed from the meeting room through a large glass panel and access to each test room from the meeting room for visitors and employees is only possible via a hygiene sluice.



NETZSCH Trockenmahltechnik GmbH
and NETZSCH-Feinmahltechnik GmbH
are company members of EHDG



TRUSTED PARTNERSHIPS

Realizing Visions Together

At NETZSCH, the value of trusted strategic partnerships cannot be overstated. Working hand in hand with our partners, we dedicate ourselves to enhancing both processes and product quality. This collaboration becomes particularly vital as we confront global challenges, venture into new markets, and present comprehensive projects as “integrated solutions.”

In our strategic partnerships, we focus on the development and implementation of future technologies, including functional coatings, innovative materials, advanced pharmaceutical active ingredients, alternative foods, and high-performance battery technologies.



Find out more
about our strategic
partnerships here:



The owner-managed NETZSCH Group is a leading global technology company specializing in mechanical, plant and instrument engineering.

Under the management of Erich NETZSCH B.V. & Co. Holding KG, the company consists of the three business units Analyzing & Testing, Grinding & Dispersing and Pumps & Systems, which are geared towards specific industries and products. A worldwide sales and service network has guaranteed customer proximity and competent service since 1873.

Proven Excellence.

Business Unit Grinding & Dispersing – The World’s Leading Grinding Technology

NETZSCH-Feinmahltechnik | Germany
NETZSCH Trockenmahltechnik | Germany
NETZSCH Vakumix | Germany
NETZSCH Lohnmahltechnik | Germany
NETZSCH Feinmahltechnik Polska | Poland
NETZSCH Mastermix | Great Britain
NETZSCH Broyage | France
NETZSCH Macinazione & Dispersione | Italy

NETZSCH España | Spain
NETZSCH Machinery and Instruments | China
NETZSCH India Grinding & Dispersing | India
NETZSCH Tula | Russia
NETZSCH Makine Sanayi ve Ticaret | Turkey
NETZSCH Premier Technologies | USA
NETZSCH Equipamentos de Moagem | Brazil

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