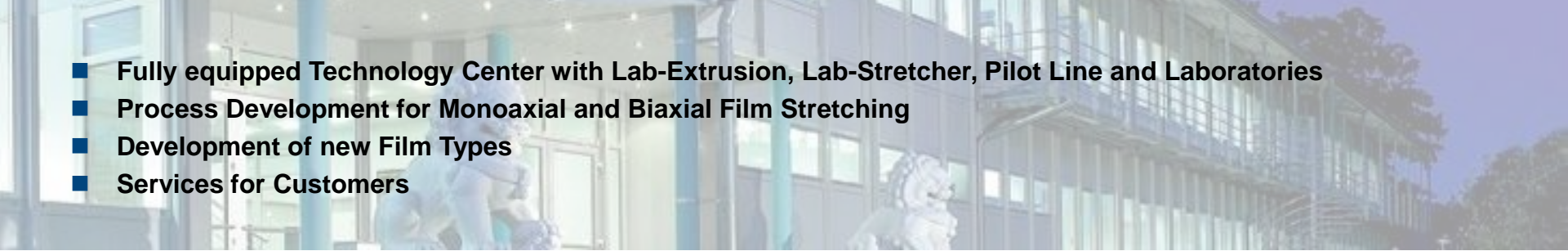




- Fully equipped Technology Center with Lab-Extrusion, Lab-Stretcher, Pilot Line and Laboratories
- Process Development for Monoaxial and Biaxial Film Stretching
- Development of new Film Types
- Services for Customers



Brückner Maschinenbau Technology Center

Technology Center

Platform for BO-Film Development



Laboratory Extruder



Lab Stretcher



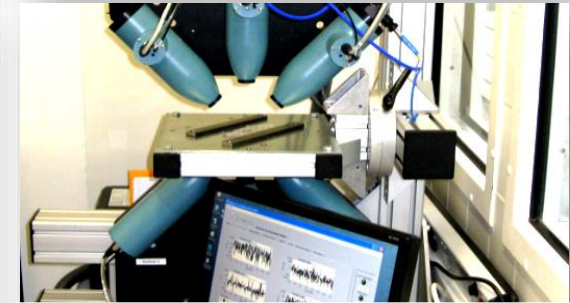
Pilot Line



Film Testing Lab



Chemical Laboratory



Measurement Laboratory

Upscaling Process

From Laboratory to Production

Method

- Evaluation of Process Window
- Optimization of Film Properties
- Production of Sample Rolls for Pre-Marketing
- Upscaling to production scale

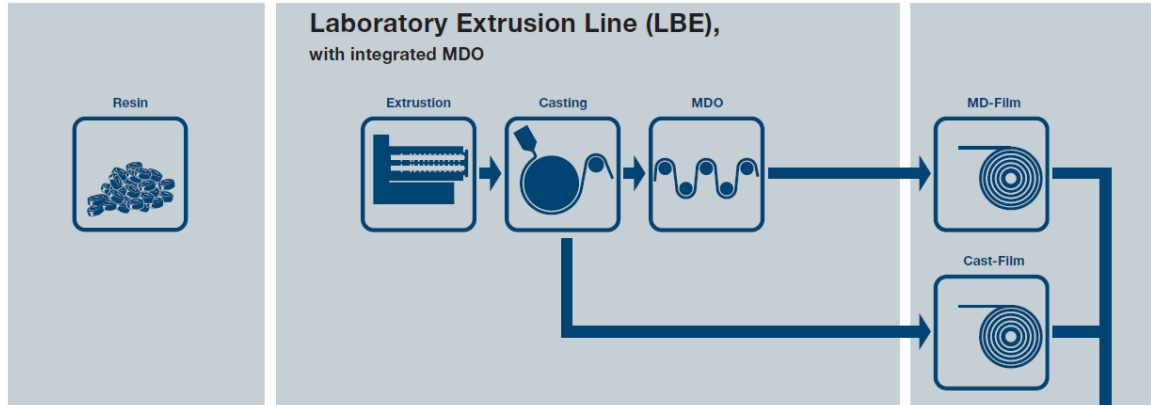
Advantages

- Basic R & D for Film Stretching
- Development of new Film types
- Demonstration of the LISIM® - Technology
- Introduction of new Technologies in Production Scale

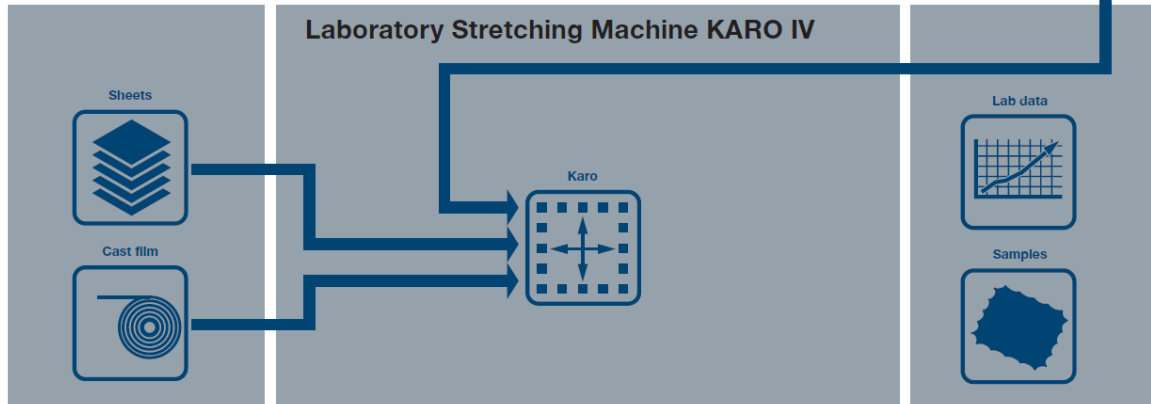


BO - Film Development in 3 Steps

1

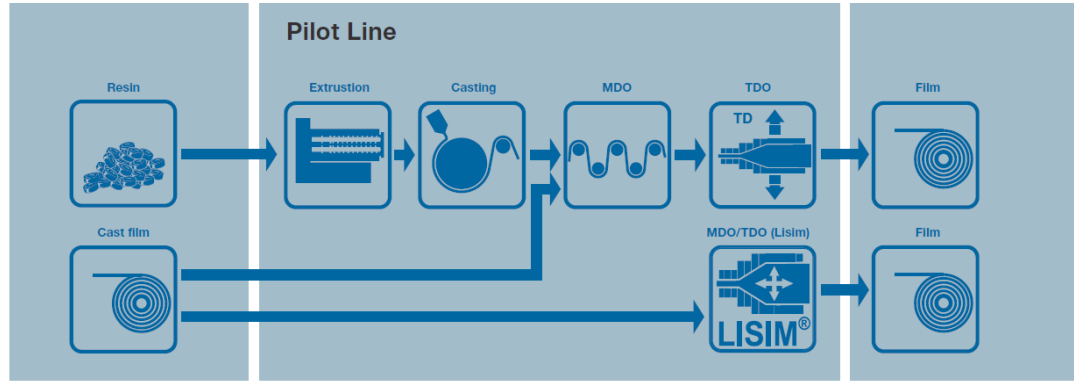


2

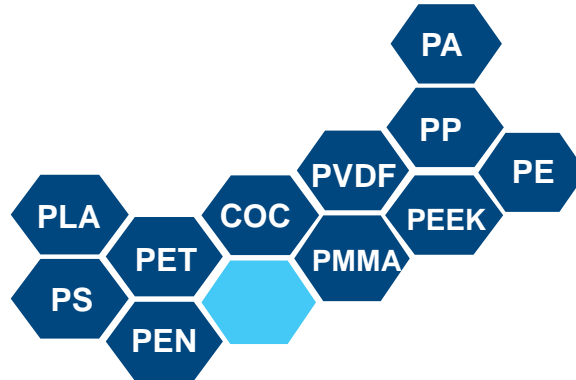


Film Development in 3 Steps

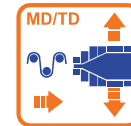
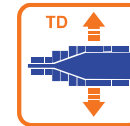
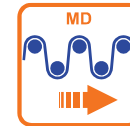
3



Processing of
all major
polymers



All stretching modes



Laboratory Extrusion Line

Target

- Process development
- Production of film rolls for stretching evaluations
- New materials and film structures

Principle

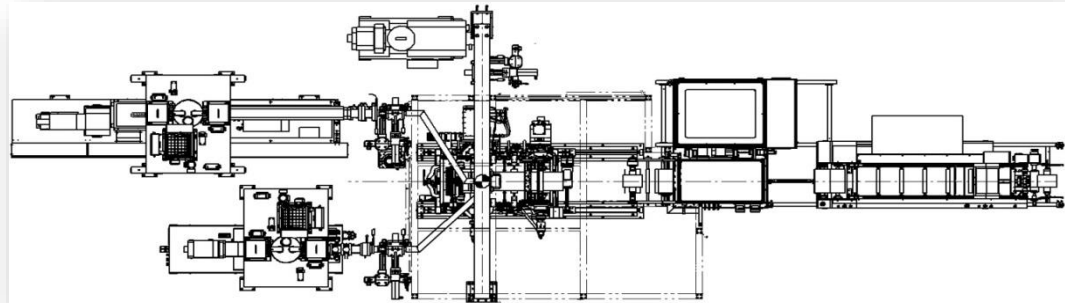
- 3-layer extrusion: 2 x twin-screw, 1x single-screw
- Pellets, powder and liquid dosing
- Ex-protected equipment
- MDO (single gap with IR heater)

Result

- Evaluation of process conditions:
 - Extrusion temperatures and settings
 - Chill-Roll / water-bath temperatures
 - Rolls for KARO IV and pilot line trials

Specification

Materials:	PP, PE, PA, PET, PEN, PS, COC, PLA,...
Output:	1-30 kg/h
Die width:	270 mm
Castfilm thickness:	100-1500 µm
Line speed:	0,1-30 m/min
MD-Ratio:	1-10
Special equipment:	Explosion Protection



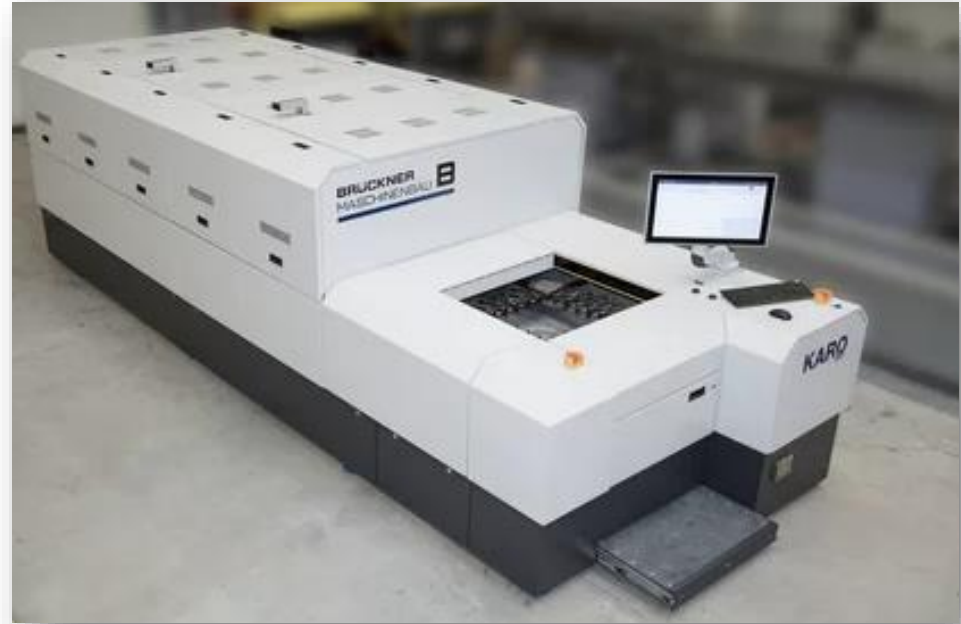
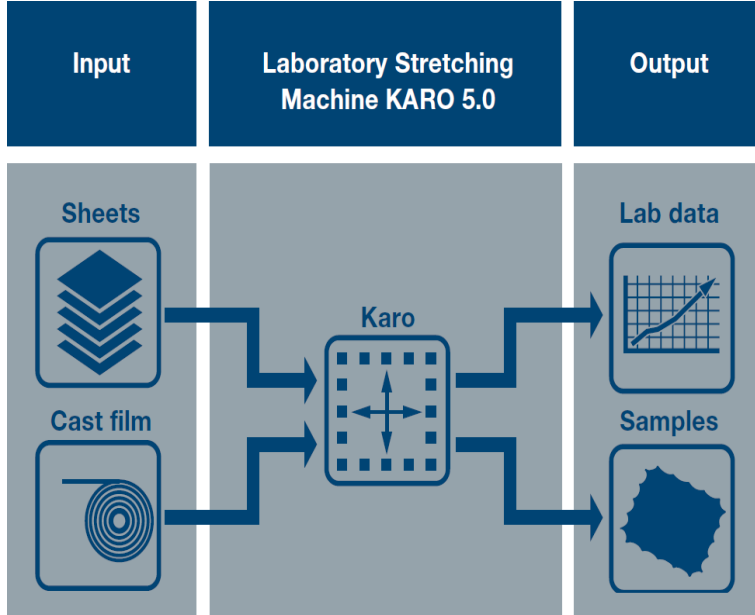
Laboratory Extruder

Cast film / MD-film production for the laboratory stretcher



Lab-Stretcher

Karo V



Lab-Stretcher

Karo V Specifications

Technical data

Recommended initial sample size

- 5 clip configuration
- 7 clip configuration

Recommended sample size:

90 x 90 mm
115 x 115 mm

Resulting stretching ratios:

10.4 : 10.4
7.7 : 7.7

Max. stretched sample size

750 x 750 mm (inclusive clamping area)

Max. sample thickness

20 - 4,000 µm

Stretching speed

1 - 700 %/sec. (5 - 500 mm/sec.)

Max. operating temperature

300°C (HT: 400°C)

Stretching force per axis

2,000 N

Machine dimensions:

- two oven design
- three oven design

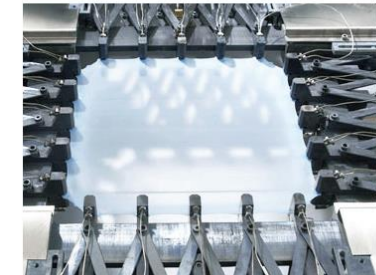
L x W x H [m]
5.9 x 2.0 x 1.8
7.5 x 2.0 x 1.8

Weight [kg]
4,700
5,900

Sample loading

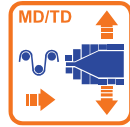
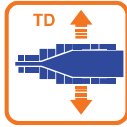


Sample unloading

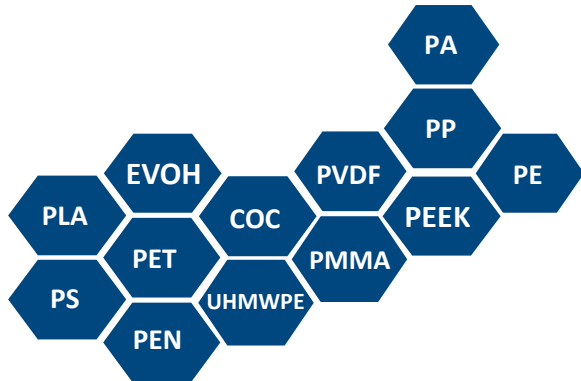


Pilot Line

All Stretching Modes



Processing of all major polymers

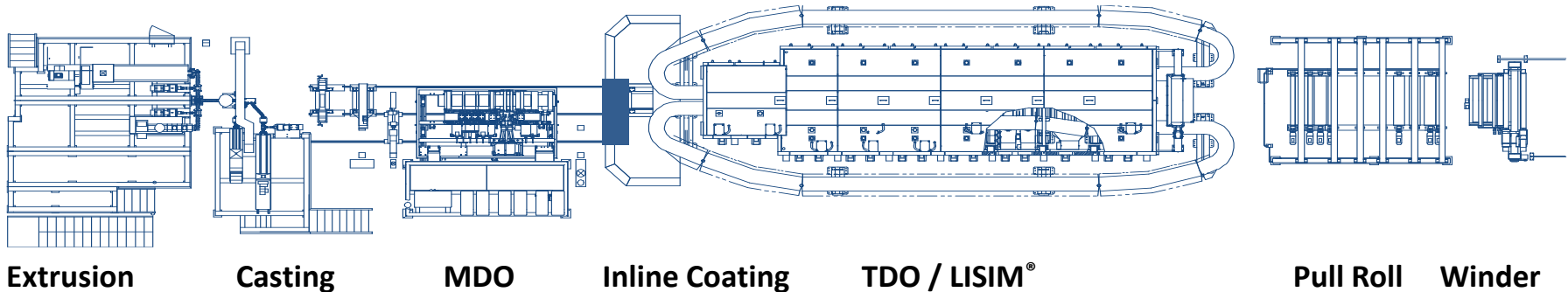


Pilot Line

Layout Data	BOPET	BOPP	BOPA
Thickness Range [μm]	1 – 350	3 – 60	5 – 30
Stretching Ratio MD	3 – 6	6 – 15	3 – 5
Stretching Ratio TD	3 – 5	5 – 10	3 – 5
Speed (max.) [m/min]	150	150	50
Output net (max.) [kg/h]	250	200	70

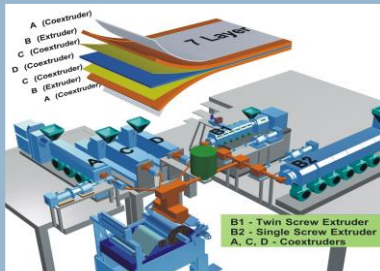
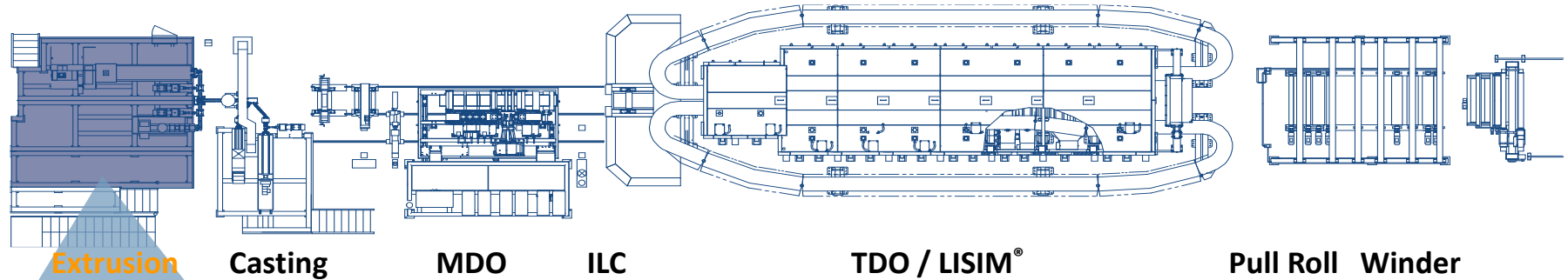
Other Filmtypes

- BOPLA / MOPLA
- BOPS / MOPS
- BOCOC
- BOPVDF
- BOPEN
- BOPE
- MOPET-G
- BSF



LISIM® Pilot Line

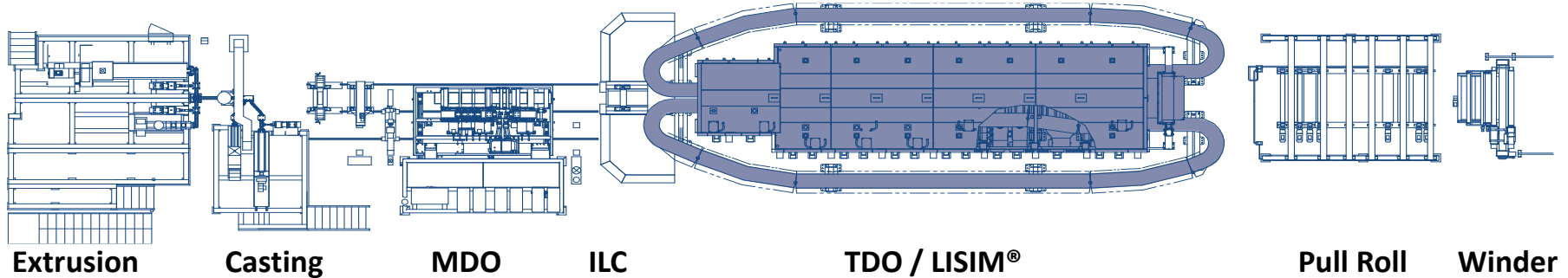
Extrusion



- Gravimetric Dosing 4 Components
- Extrusion
 - 3 Twin Screw
 - 3 Single Screw
- Die
 - Multiflow-Chanel Coathanger Type
 - 1- / 3- / 5- / 7- Layer

LISIM[®] Pilot Line

TDO / LISIM[®]



- Linear Motor Driven Clips
- Full Flexibility in MD and TD
 - Stretching Ratios / Curves
 - Relaxation Ratios / Curves
- Fast Product Change
- High Accurate Oven Temperatures



Film Laboratory

Evaluation of Film Properties

- Mechanical
- Optical
- Electrical tests
- Surface Analysis
- 3D Laser-Scanning-Microscopy
- SEM
- Chemical analysis
- Examination during trials
- Long-term examinations
- Database of film examinations



Key for your

NEW PRODUCT DEVELOPMENT

enabled by

Brückner Maschinenbau

and supported by

BO-Film Consulting