



# Berndorf Band Engineering

## 百德福工程有限公司

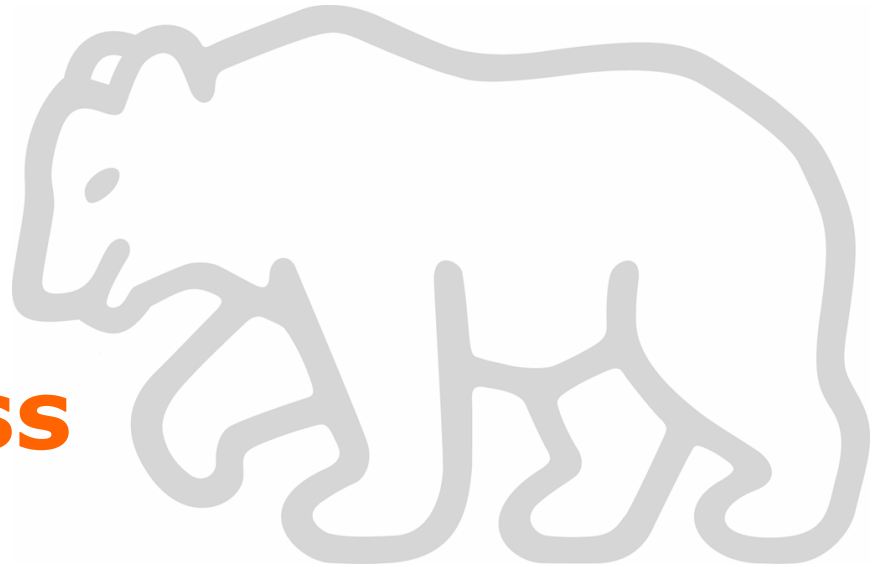
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Belt Systems

# Double Belt Press

双钢带压机



# Products of Various Industries

## 多种行业的产品



**Many materials 各种材料- versatile solutions 通用解决方案**

- Automotive 汽车
- Aerospace 航天航空
- Flooring 地板
- Ski and snowboard laminate 滑雪板贴面
- Electrical 电子
- Building construction 建筑



## Manufactured products on double belt presses 双钢带压机生产的产品

### Composite materials 复合材料

- Single and multi layer composites
- 单层/多层复合材料
- Thermoplastic prepregs 热塑预浸材料
- Fibre-reinforced thermoplastics (FRTP - CFRP/GFRP) 增强纤维热塑材料
- Thermoplastic composites with natural and/or artificial fibres
- 天然/人工纤维热塑复合材料
- Organoplates etc. 有机金属材料

### Laminates 贴面

- Low pressure laminate 低压贴面
- Plastic laminates 塑料贴面
- Wood-plastic-composite materials etc. 木材塑料复合材料

### Others 其他

- Raw panels for floors 地板
- Insulation boards (thermal and acoustic) 绝缘板 (消音隔热)



## New ideas for products to be produced on a double belt press

要用双钢带压机生产的创新产品-新思路

- Panels for duckboards (composite of particle boards with cellulose fibres) 遮泥板（纤维和刨花板的复合材料）
- PVC-recycled acoustic insulation boards 用来消音绝缘的再生PVC板
- Pork chips 零食猪皮片
- Foamed plates (PU based) 聚氨酯泡沫板
- Cover boards for wall panels for low cost building construction (thermoplastic composites with natural fibres)  
低价建筑墙板的覆层板（天然纤维的热塑复合材料）

# Manufacturing on Double Belt Presses

## 在双钢带压机上的生产



### General requirements for double belt presses

#### 对双钢带压机的一般要求

- Pressing, heating and cooling process in a single production step  
▪ 在一个生产过程中进行加压，加热，冷却
- Double-sided warming/cooling for optimum product manufacturing  
▪ 为优化生产，双面加热/冷却
- Uniform pressure transfer onto the product for high thickness accuracy  
▪ 均匀的施压保证产品厚度精准均匀
- Uniform and efficient heat transfer 热传导均匀高效
- Customer-specific design according to product requirement 为客户量身定制设备
- Production flexibility 生产高度灵活

Belt Systems

# Modular Double Belt Press

模块式双钢带压机



# Modular Double Belt Press (MDBP)

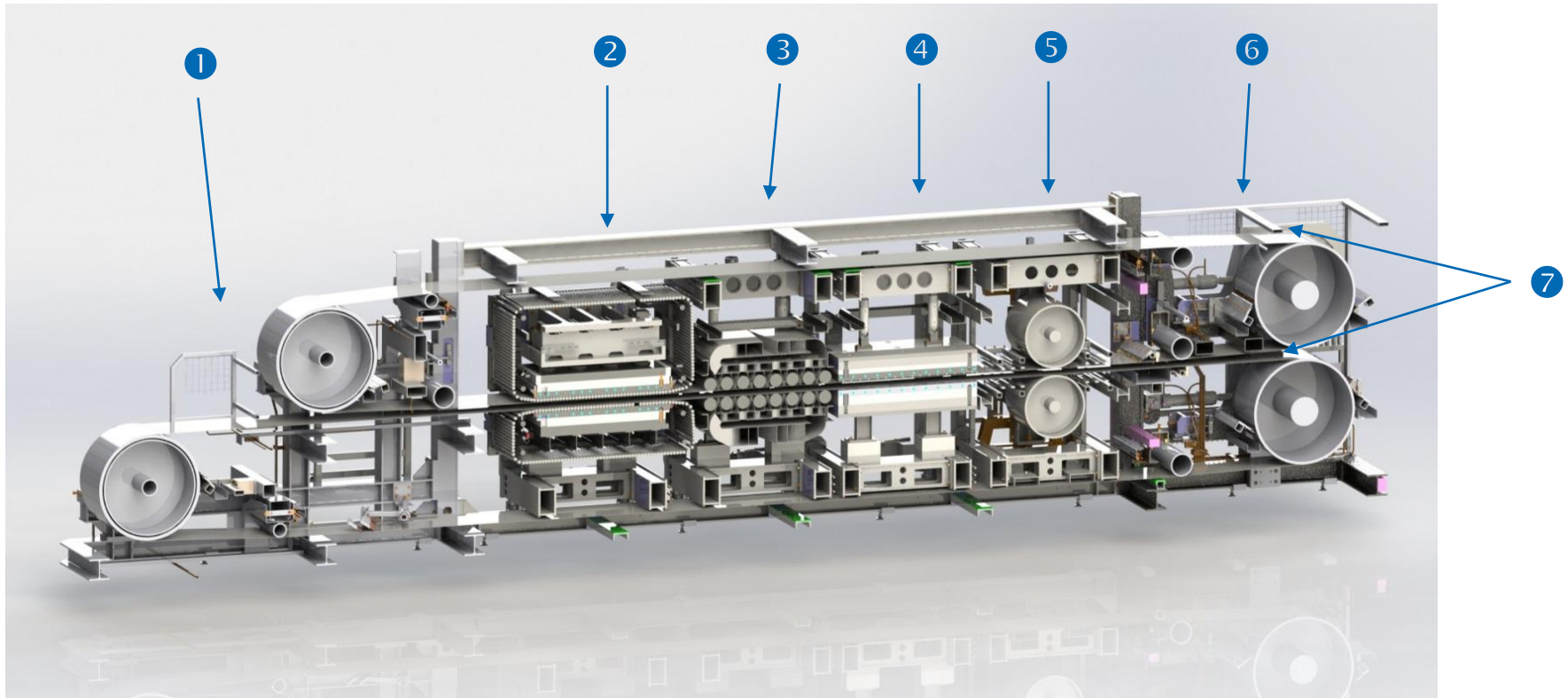
## 模块式双钢带压机（简称MDBP）



### Key facts 主要特色

- Modular system 模块式系统
- Temperatures up to 400°C 生产温度可达400°C
- Pressure up to 20 bar 生产压力可达20 bar
- Speeds up to 30 m/min 生产速度可达30 m/分钟
- Standard belt widths from 800 mm - 2100 mm
- 标准钢带宽度800 mm - 2100 mm

- Four standardised heating and cooling modules
- 四种标准的加热冷却模块
  - Sliding Plate Module (SPM) 滑块式模块（简称SPM）
  - Fixed Roller Module (FRM) 固定辊式模块（简称FRM）
  - Roller Carpet Module (RCM) 链毯式模块（简称RCM）
  - Calender Module (CAM) 转鼓式模块（简称CAM）
- Customer-specific configuration 客户具体配置
- Flexible production options through exchange and/or movements of individual module types
- 单个模块更换和组合使生产更加灵活高效
- Easy expansion and configuration of the machine 容易实现设备高配置和扩大生产



**1 Infeed terminal** 进料端

**2 Roller Carpet Module**  
链毯模块

**3 Fixed Roller Module**  
固定辊式模块

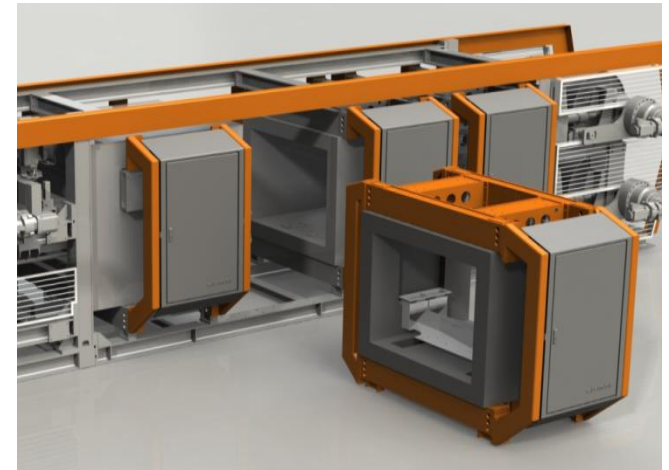
**4 Sliding Plate Module**  
滑块式模块

**5 Calander module**  
转鼓式模块

**6 Outfeed terminal** 出料端

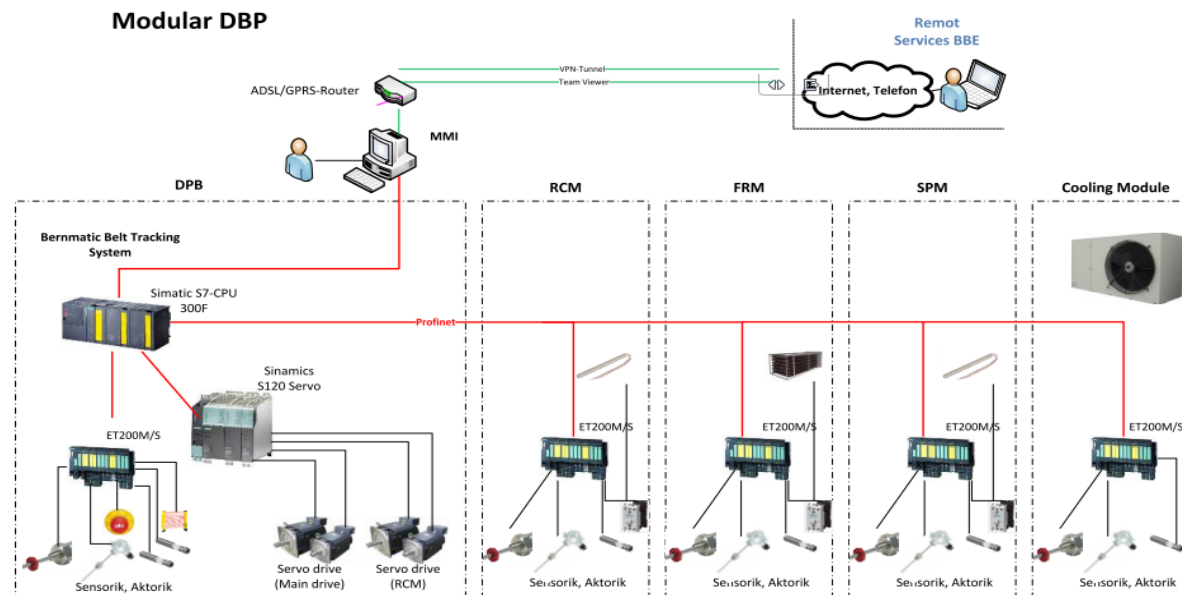
**7 Belts** 钢带

- Module change with installed belt
- 钢带安装后的模块更换

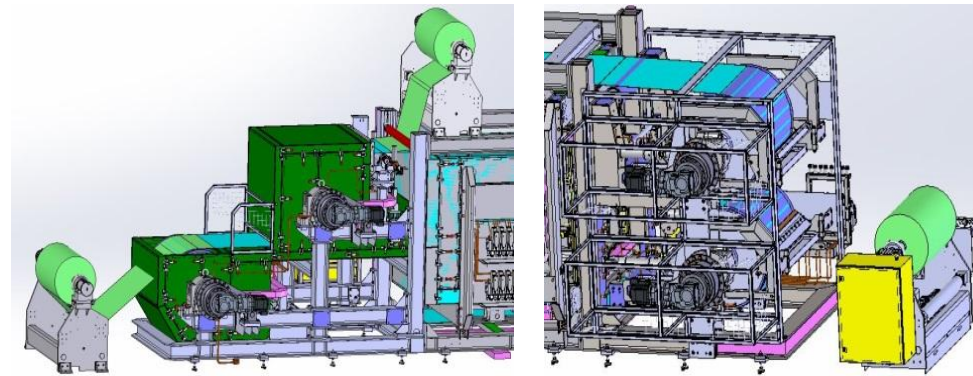


- Isobaric operation → constant pressure
- 等压操作 → 恒压
  
- Isochoric operation → constant press gap
- 等容积操作 → 恒定的施压间距
  
- Patented mixed operation → Isobaric – Isochoric
- 有专利的混合操作 → 恒压-等容积
  - Line load control within defined gap 约定好的间距下线性施压
  - Gap control within defined line load 约定好的线性施压下间距控制

- Siemens Simatic S7-300F PLC with integrated safety equipment
- 配有安全设备的西门子S7-300F PLC
- Customer support via remote access possible 协助客户的远程控制
- Connection to a primary PLS possible 和主PLS连接
- Allen Bradley as alternative to Siemens possible
- Allen Bradley系统 和西门子系统任选其一



- Up and downstream 上下游
  - Un- and rewind stations
    - 开卷和收卷端
    - Scattering units 分散单元
- Tempering units 加热冷却装置
- Measuring systems 测量系统
- Complete installation 完成安装



Schematic presentation of the roll-on and roll-off devices, R&D-Centre Berndorf

- Modular system ensures production flexibility and quick reaction to changing market requirements
- 模块系统使得生产更灵活地适应市场的变化
- Energy efficiency at temperatures up to 400°C
- 温度高达400°C时高的能源效率
- Module changes with installed belt 即便钢带安装好后，也可方便更换模块
- “Easy installation” due to pre-mounted and tested modules and terminals
- 由于预安装并测试了模块和各个终端，可实现最终客户处的快速高质量安装
- “Proof of concept” – Test thanks to available test facility in Berndorf
- 方案得以证实 - 感谢百德福的测试设备

→ **Machine and belt from one source** 设备和钢带来自同一个公司，更有保障性

Belt Systems

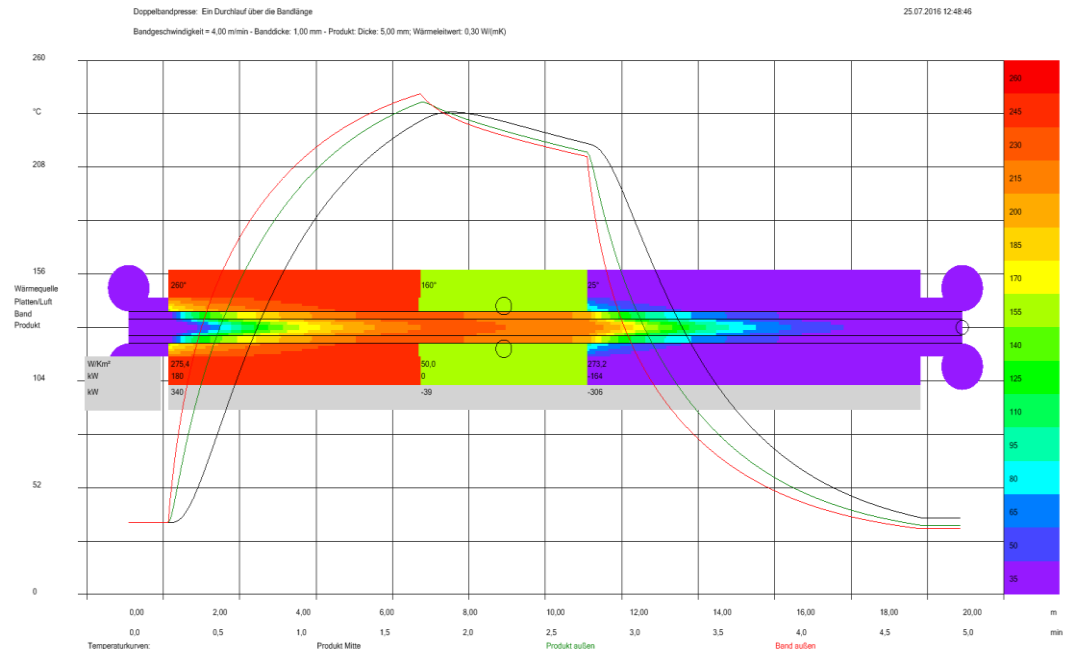
## Machine Concept 设备设计理念



- Theoretical process simulation on the basis of known product characteristics 基于产品特性建立工艺控制模拟
- Necessary data for process simulation → Questionnaire
- 必要的数据 → 客户填写问卷调查表

## Example simulation 例子

		Vorgabe	Änderg.
<b>Band</b>			
Trommelabst.	[m]	25,5	25,5
Geschw.	[m/min]	4	4
Pressendruck	[bar]	siehe	Zone
Dicke Band	[mm]	1	1
Wärmeleitzahl	[W/(mK)]	16,00	16,00
sp.Cth (* 10+6)	[J/(m²K)]	3.870	3.870
<b>Produkt</b>			
Breite	[mm]	600	600
Dicke	[mm]	2,00	2,00
Wärmeleitzahl	[W/(mK)]	0,500	0,500
sp.Cth (* 10+6)	[J/(m²K)]	2.000	2.000
<b>Heizung</b>			
Produkteinlauf	[°C]	35	35
vord. Trommel	[°C]	35	35
Heiz-Zonen	Anzahl	8	8
Positionen			wählen
Werte zeigen	Zone Nr.:	1	1
Temp. Ugb.	[°C]	35	35

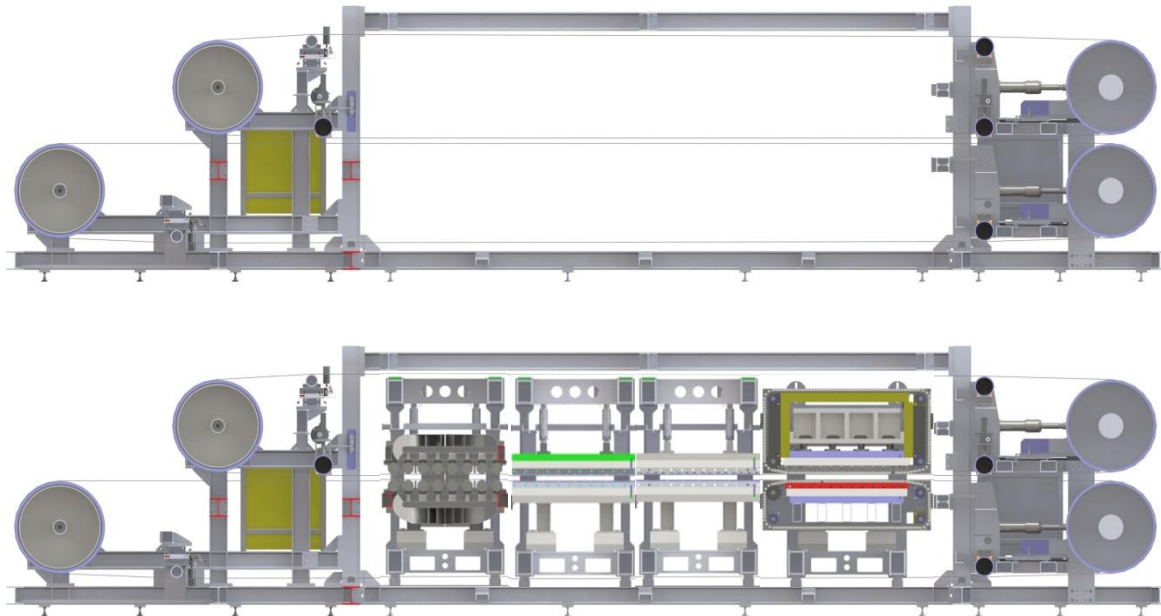




### R&D Center for product tests 研发中心-进行产品试验

- Steel belt width 钢带宽度: 800 mm
- Facility can be individually configured with all module types 配备所有类型的模块
- Variable testing procedures 各种不同的测试
  - Scattering unit for granulate 为粒状物配备的分散装置
  - Un- and rewind devices for endless flat products 为平面产品配备的开卷收卷装置

- Design/configuration of the facility based on theoretical calculation and practical tests 设备的设计和配置是基于理论计算和实际的检测



# Berndorf – Your Continuous Solution Worldwide - 百德福 全球连续解决方案

