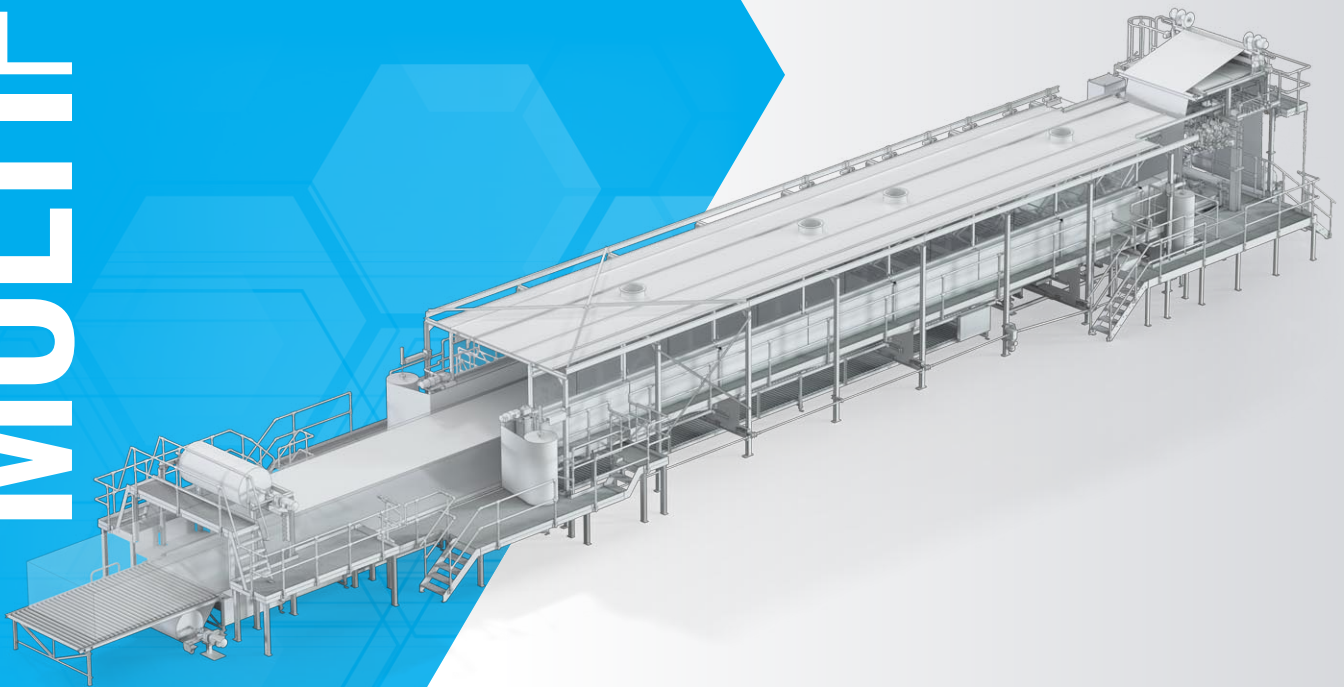




# MULTIFLEX



>> **Modular production lines for the continuous and efficient manufacture of high-quality slabstock foams**

>> 模块化生产线，用于连续高效地生产高品质聚氨酯软泡海绵

## MULTIFLEX – SLABSTOCK PRODUCTION WITH MAXIMUM EFFICIENCY

For almost eight decades Hennecke has developed and produced high-quality plants for polyurethane processing. Hennecke is considered the market leader in the field of slabstock machinery and equipment. This know-how is reflected in the MULTIFLEX systems. The latest generation of one of the world's most renowned slabstock lines impresses processors with its attractive price-performance ratio, which – thanks to a highly efficient raw material yield, outstanding foam qualities and the state-of-the-art FOAMWARE system control – ensures a fast return on investment.

## MULTIFLEX – 高效的聚氨酯软泡生产线

近80年来，亨内基一直致力于开发并生产高品质聚氨酯加工设备。在聚氨酯软泡设备领域，亨内基是公认的市场领导者。MULTIFLEX设备是我们丰富经验的又一结晶。作为世界上著名的聚氨酯软泡生产线之一，新一代的聚氨酯软泡生产线通过高效的原料利用、优秀的泡沫品质和先进的FOAMWARE系统控制，从而获得卓越的性价比，给客户下了深刻的印象，为用户确保了生产的超高经济效益。

### POUR PLATE WITH DOWNSTREAM FALL-PLATE SYSTEM

Homogeneous distribution of the reaction mixture on the application plate for defined block formation in the software-controlled segment section.

浇注板配有下游跌落板系统  
反应混合物在浇注板上均匀分布，得到有软件控制预先设定的配方下的泡体。

### HIGH-PRESSURE METERING FOR ALL COMPONENTS

Optimised pre-mixing through high-pressure injection of up to 120 bar (up to 60 bar for additives) in the manifold and enhanced efficiency due to pneumatically controlled injectors.

所有原料采用高压计量  
通过在系统中进行高达120 bar(添加剂高达60 bar)的高压喷射来优化预混合，并通过气动控制喷嘴来提高效率。

### LIQUID-LAYDOWN TECHNOLOGY

Significantly enhanced production quality with fewer pinholes, more efficient use of raw materials and eliminated cleaning, when compared to trough systems.

#### LIQUID-LAYDOWN 技术

与溢流槽发泡相比，显著提高了生产质量，减少了针孔，原材料利用率更高，并省去了清洗的步骤。

### TOTAL OUTPUT

总流量

**400** kg / min

### MACHINE FOOTPRINT

机器占地面积

**336** m<sup>2</sup>

Plant length  
设备长度 **42,000** mm

Plant width  
设备宽度 **8,000** mm

Plant height  
设备高度 **6,000** mm  
approx. / 大约为

### PRODUCTION SPEED

生产速度

approx.  
大约为 **2.5 - 10** m / min

### FOAMING HEIGHT

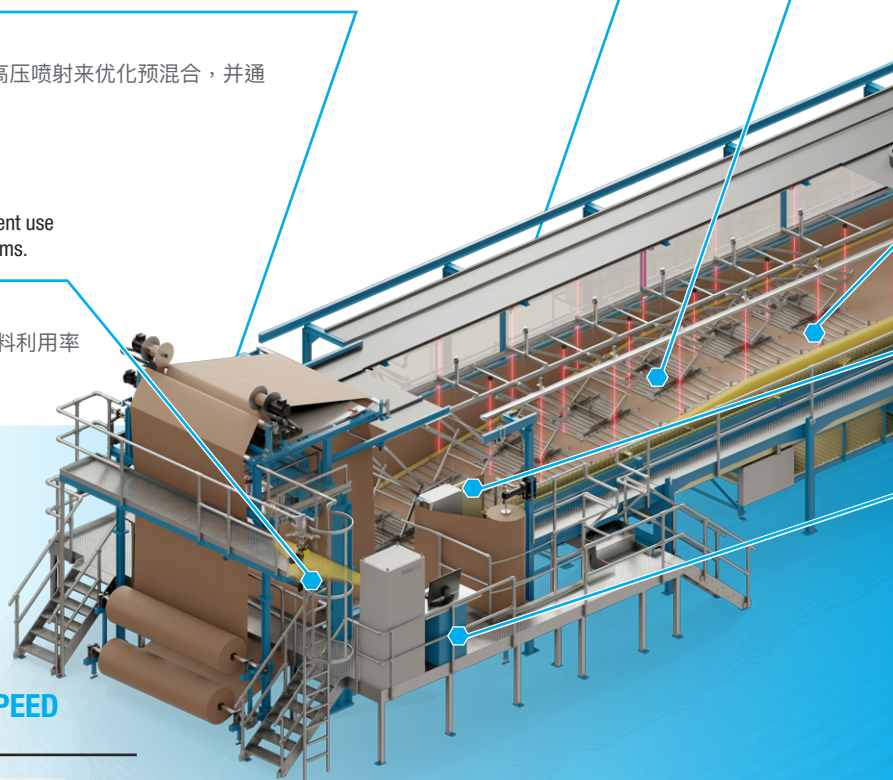
发泡高度

up to  
至 **1,550** mm

### FOAMING WIDTH

发泡宽度

**1,400 - 2,500** mm



# FEATURES

## AUTO-FLAT (OPTIONAL)

Benefit from the fully automated evolution to the FLAT-TOP system with a faster production start, greater production stability, and even better reproducibility.

## AUTO-FLAT (选配)

得益于FLAT TOP压顶系统的全自动升级，生产启动速度更快，生产稳定性更高，甚至可重复性更好。

## RISE PROFILE MEASUREMENT (OPTIONAL)

Set the highest standards for consistent quality with a combination of laser distance sensors and a FOAMWARE plug-in to continuously compare the rise profile with defined reference curves.

## RISE PROFILE MEASUREMENT (选配)

通过激光距离传感器和FOAMWARE插件的组合，不断将上升剖面与定义的参考曲线进行比较，从而达到高质量标准。

## TILTABLE SIDEWALLS (OPTIONAL)

Actively setting the tilt angles with FOAMWARE ensures optimal block shape, even for high-density and high-resilience foams.

## 可倾斜侧板 (选配)

使用FOAMWARE主动设置倾斜角度，确保最佳块体形状，即使是高密度和高回弹的海绵也是如此

## FOAMWARE

The intelligent automation for slabstock lines with impressive features including high-performance hardware, intuitive user navigation, many standard tools, useful plug-ins, and additional options.

## FOAMWARE

智能自动化的聚氨酯软泡生产线具有令人印象深刻的功能，包括高性能硬件、直观的用户导航、许多标准工具、功能性的插件和其他选项。

## RANGE OF APPLICATION

- >> Standard foams
- >> High resilient foams (HR)
- >> Hypersoft foams (HS)
- >> High load foams (HL)
- >> Viscoelastic foams
- >> CMHR + CME foams

## 应用范围

- >> 标准泡沫
- >> 高回弹泡沫 (HR)
- >> 超柔软泡沫 (HS)
- >> 高承载型泡沫 (HL)
- >> 粘弹性泡沫
- >> CMHR + CME泡沫

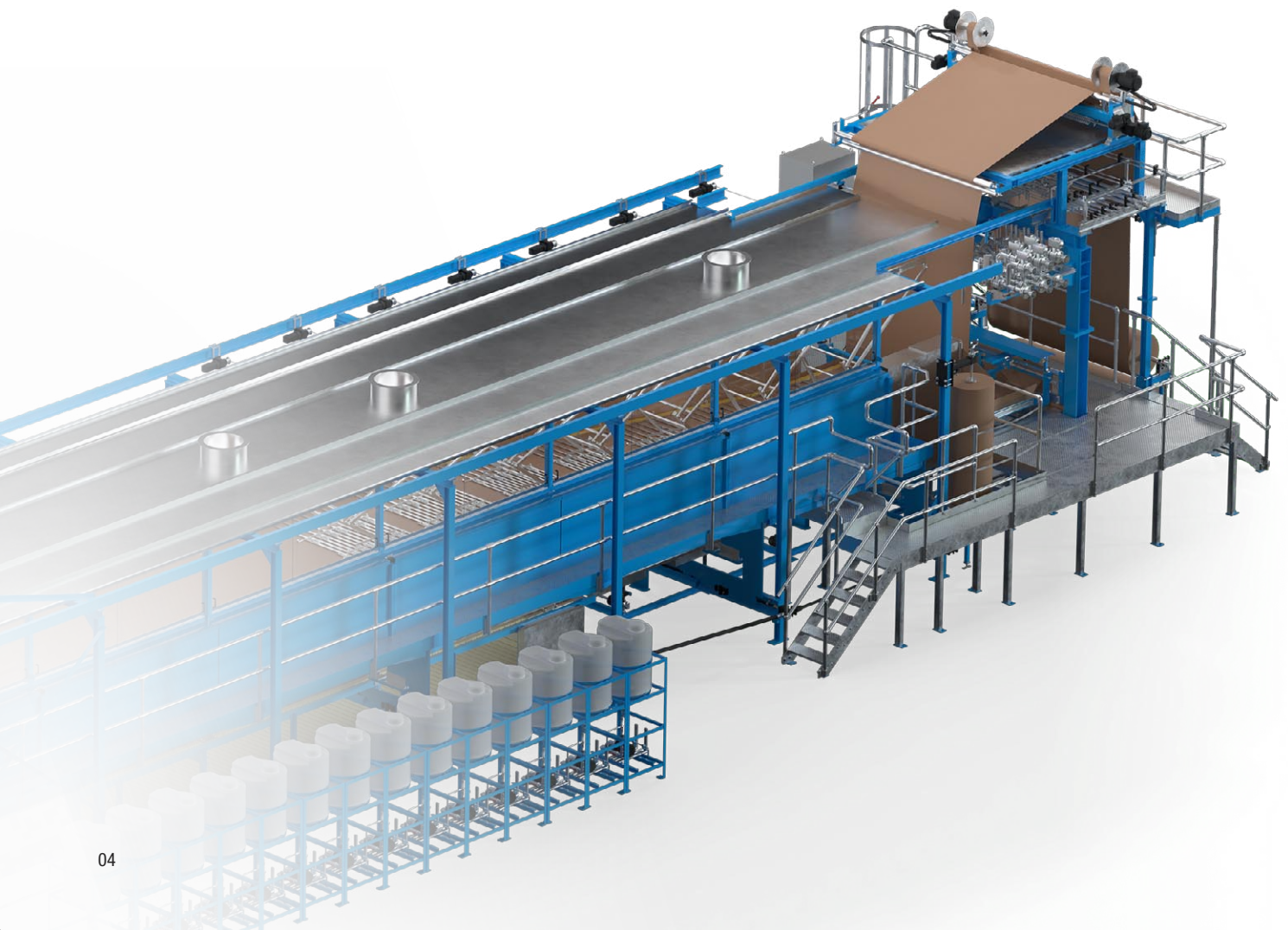


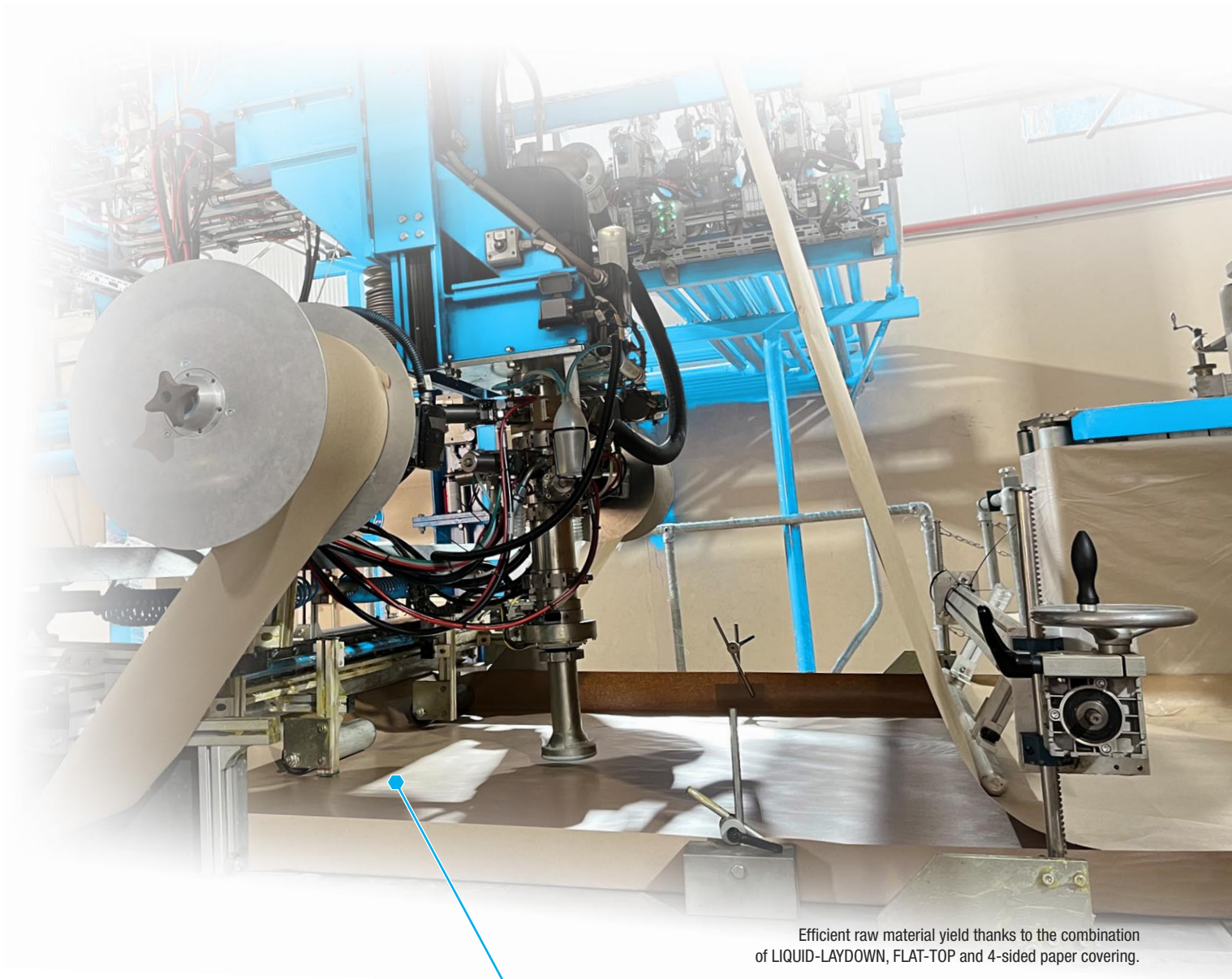
## THE HIGH-PRESSURE PATH TO PROFITS

Based on analyses and statements by leading slabstock foam producers and raw material manufacturers, the use of Hennecke high-pressure technology saves up to 5 percent isocyanate compared to low-pressure slabstock machines. With an annual slabstock foam production of 5,000 tonnes and an isocyanate price of EUR 3.00/kg, this corresponds to a saving of around EUR 200,000 per year. A further considerable cost saving results from the use of the proven LIQUID-LAYDOWN system together with the Hennecke rectangular process (FLAT-TOP system). 4-sided paper covering over the produced foam block – where the top rind is converted into usable foam – allows slabstock foam producers to achieve up to 5 percent higher foam yields compared to production without cover paper. And not forgetting: physical properties in terms of hardness and bulk density distribution are significantly optimized. This ensures the user a highly efficient raw material yield and the best foam quality. What is more, production can be further optimized by automating the FLAT-TOP-Systems (patented AUTO-FLAT system).

## 高压系统的盈利之路

根据领先的聚氨酯软泡生产商和原材料制造商的分析和声明，与聚氨酯低压机相比，使用亨内基的高压技术可节省高达5%的异氰酸酯。按照每年5000吨的聚氨酯软泡产量和3.00欧元/公斤的异氰酸酯价格，这相当于每年节省约20万欧元。与久经验证的LIQUID-LAYDOWN及亨内基压顶工艺（FLAT TOP系统）共同使用，可进一步节约大量成本。四面纸覆盖在生产泡沫块上，其中顶部被转化为可用的泡沫，与没有封面纸的生产相比，聚氨酯软泡塑料生产商可以获得额外高达5%的高泡沫产量。请注意：硬度和堆积密度分布方面的物理性能都得到了显著优化，可确保了用户获得高效的原材料产量和优秀的泡沫质量。更重要的是，可以通过压顶系统（获得专利的AUTO-FLAT系统）进一步优化生产。





Efficient raw material yield thanks to the combination of LIQUID-LAYDOWN, FLAT-TOP and 4-sided paper covering.

高效的原料产量得益于跌落板浇注技术、压顶系统和四面纸覆盖的组合。

### **SAFELY INTO THE (PRODUCTION) FUTURE THROUGH CONTINUOUS FURTHER DEVELOPMENT: THE MACHINE FEATURES**

MULTIFLEX lines are equipped with high-quality standard components. High-quality and robust system components are part and parcel of MULTIFLEX plants. Especially in the field of metering technology in particular, Hennecke has significant know-how and a high proportion of in-house production of all relevant components. For users, this translates into increased plant availability and lower maintenance and spare parts costs.

### **通过不断的进一步发展，安全地进入（生产） 未来： 机器特点**

MULTIFLEX生产线配备高品质、标准化的设备组件。高质量和稳健的系统部件是MULTIFLEX设备的重要组成部分，特别是在发泡技术领域。亨内基拥有丰富的专业技术，并在所有相关部件的内部生产中占很大比例。对用户而言，这也就意味着高的设备可用性兼具低的维护成本和备件成本。



## THE BASIS FOR HIGH-GRADE FOAM: THE DYNAMIC MSL STIRRER MIXER

One key factor that ensures high-quality and efficient processing of polyurethane is mixhead technology. Hennecke has outstanding expertise in this area and makes its mixheads (apart from a few standard parts) in its own manufacturing halls. This guarantees the highest quality and performance. The height-adjustable mixer unit of the MULTIFLEX series is the heart of the system. This powerhouse combines injection and stirrer principles with precise laminar liquid distribution through our calibration unit. The result? Exceptional foam quality — virtually void-free, striation-free, and with a uniform cell structure.

## 高品质泡沫的基础： 动态搅拌混合头

混合头工艺是保证聚氨酯加工质量和效率的关键因素之一。亨内基在这一领域拥有卓越的专业知识，并在自己的制造车间生产混合头（除了一些标准零件），这保证了高质量和高性能。MULTIFLEX系列的高度可调混合头单元是该系统的核心。该混合室将注射原理和搅拌器原理两相结合，并通过校准装置实现精确的层流浇注，从而实现几乎无豆孔、无条纹的高泡沫质量和均匀的孔隙结构。



## ADVANCED CELL CONTROL 先进的泡孔控制技术

### HIGH PRESSURE ISOCYANATE INJECTION

A micro-fine spray effect in the mixing chamber leads to a significantly improved chemical reaction and better control over the cell size. In addition, isocyanate consumption is reduced by up to 5 %.

高压异氰酸酯喷射混合室中的微细喷雾效应显著改善了化学反应，更好地控制了泡孔大小。此外，异氰酸酯的消耗量减少了5%。

### SPOUT-EX (OPTIONAL)

Effective extension for MSL agitator heads, which is based on extensive flow simulations and enables a significant reduction in pinholes, especially with fine-cell foams.

### SPOUT-EX (选配)

MSL混合头可有效扩展，基于大量的流动模拟，能够显著减少针孔，尤其是对于细孔海绵而言。

### MOTORIZED THROTTLE

Targeted adjustment of the mixing chamber pressure to influence the cell size in a controlled manner.

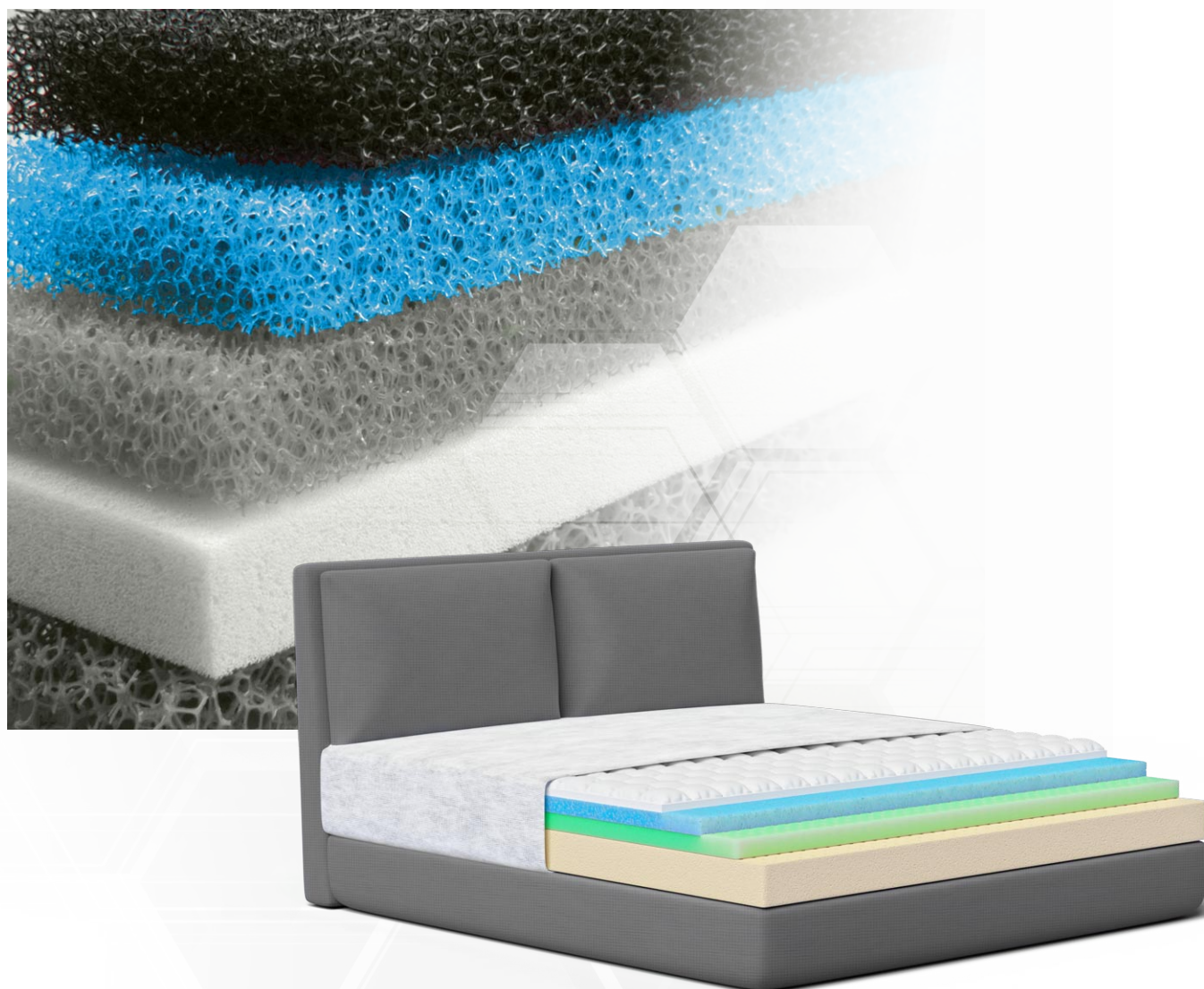
电动节流阀有针对性地调节混合室压力，以可控的方式影响泡孔大小。

## THE RANGE OF APPLICATION

Depending on the plant configuration, the MULTIFLEX series can be used to produce a wide variety of polyether-based slabstock foams with uniform hardness and density distribution. Besides the commercial foam types for the upholstery and mattress industry, MULTIFLEX slabstock is ideally suitable for technical items and for cutting into sheeting of any desired thickness. Patented NOVAFLEX® technology, utilizing the blowing agent CO<sub>2</sub> makes it possible to manufacture foams with low densities of up to 14 kg/m<sup>3</sup>. This process does not only fulfill qualitative and economic criteria, it also meets ecological requirements because CFC or methylene emissions are avoided.

## 应用范围

根据设备配置，MULTIFLEX系列可用于生产各种硬度和密度分布均匀的聚醚型软泡海绵。除了用于家私和床垫行业的商用泡沫类型外，MULTIFLEX聚氨酯软泡非常适合用于技术海绵和切割任何厚度的片材。NOVAFLEX®专利技术，利用二氧化碳发泡剂，可以制造低密度泡沫，低至14kg/m<sup>3</sup>。这一工艺不仅符合质量和经济标准，而且由于避免了氟氯碳化合物或二氯甲烷的排放，因此也符合生态要求。





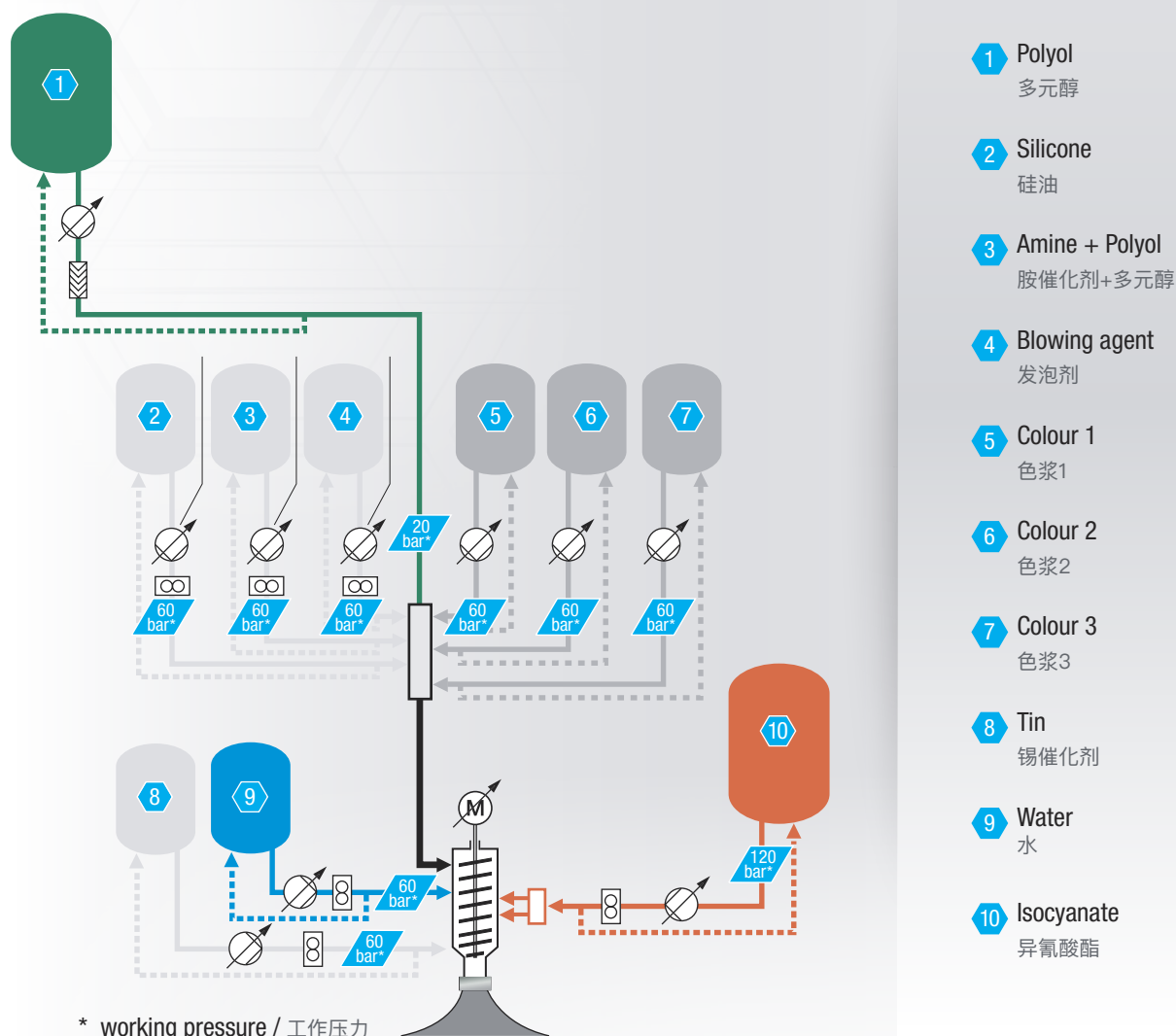
## HIGH PRECISION AND RELIABILITY: THE HENNECKE HIGH-PRESSURE METERING SYSTEM

The MULTIFLEX uses precision high-pressure pumps with large adjustment ranges to produce high-grade slabstock. All metering lines are equipped with recirculation systems for preliminary adjustments and formulation changes. Exactly reproducible metering outputs of the pumps and computer-controlled volume flow measurement ensure additional production stability. The number of metering units and the metering outputs in the standard configuration can be extended and adjusted at any time to suit individual requirements.

精确可靠：  
亨内基高压发泡系统

为生产高质量的软泡，MULTIFLEX 使用具有大调节范围的精密高压泵。所有计量单元都配备了用于进行预调节和更改配方的循环系统。泵计量效率精确可重复，且体积流量测量由计算机监控，进一步提高了生产可靠性。基本配置可以随时增加计量单元的数量和提高流量范围，以满足定制化要求。

### SCHEMATIC DIAGRAM OF A MULTIFLEX STANDARD METERING UNIT / MULTIFLEX 标准计量单元流程图



EVERYTHING IN SIGHT: AUTOMATED PROCESS CONTROL

The FOAMWARE is specially tailored to requirements of slabstock foamers. We have enhanced the proven functions of the previous generation PDE with a number of new features. Even in the standard version, the FOAMWARE includes visualized flow charts, process charts and calibration history, as well as further software tools for analyzing the actual and setpoint values. The FOAMWARE's "magic eye" function also makes it easier to identify any irregularities by displaying the pressure data in a graph. Nothing now stands in the way of perfect production results. At the customer's request, the plant can be equipped with additional functions, such as sensors that visualize current information on the rise curve of the slabstock foam produced and enables a real-time comparison of the gradient profile with defined reference curves.

Intuitive and clearly structured thanks to the powerful hardware platform and 32" UHD monitor.

凭借强大的硬件平台和32英寸超高清显示器，直观且结构清晰。

触手可及：自动化工艺控制

FOAMWARE是专门针对聚氨酯软泡生产厂家的要求而定制的。我们通过一些新功能增强了上一代PDE的已验证功能。即使在标准版本中，FOAMWARE也包括可视化的流程图、工艺图和校准历史，以及用于分析实际值和设定值的其他软件工具。FOAMWARE的“魔眼”功能可以在图形中显示压力数据，从而更容易识别任何异常情况。现在没有什么能阻挡完美的生产结果。根据客户的要求，该设备还可以配备额外的功能，例如传感器，可以将泡沫的上升曲线的当前信息可视化，并能够将梯度曲线与定义的参考曲线进行实时比较。





## SYSTEM ADVANTAGES

### >> Highly efficient raw material yield and cost savings through:

- Hennecke high-pressure technology for all components
- 4-page paper system (including FLAT-TOP-System)
- Recirculation for all metering lines
- Availability of additional functions such as tilting side walls and pneumatic nozzles for all metering lines

### >> High foam quality and cell control

- Application of high-pressure technology also for additives
- Height-adjustable mixer with direct LIQUID-LAYDOWN output
- Uniform hardness and density distribution

### >> Manufacture of low-density foams thanks to the patented NOVAFLEX® technology

### >> Modular design to ensure a cost-effective operation and an optimum adaptation to market requirements

### >> User-friendly and easy handling thanks to highly modern and intuitive FOAMWARE process control system

## 系统优势

### >> 通过以下技术实现高效的原料利用和成本节约：

- 所有部件适用亨内基高压技术
- 4面纸系统（包括FLAT-TOP压顶系统）
- 所有计量单元的循环系统
- 可提供额外功能，如用于所有发泡生产线的倾斜侧壁和气动喷嘴

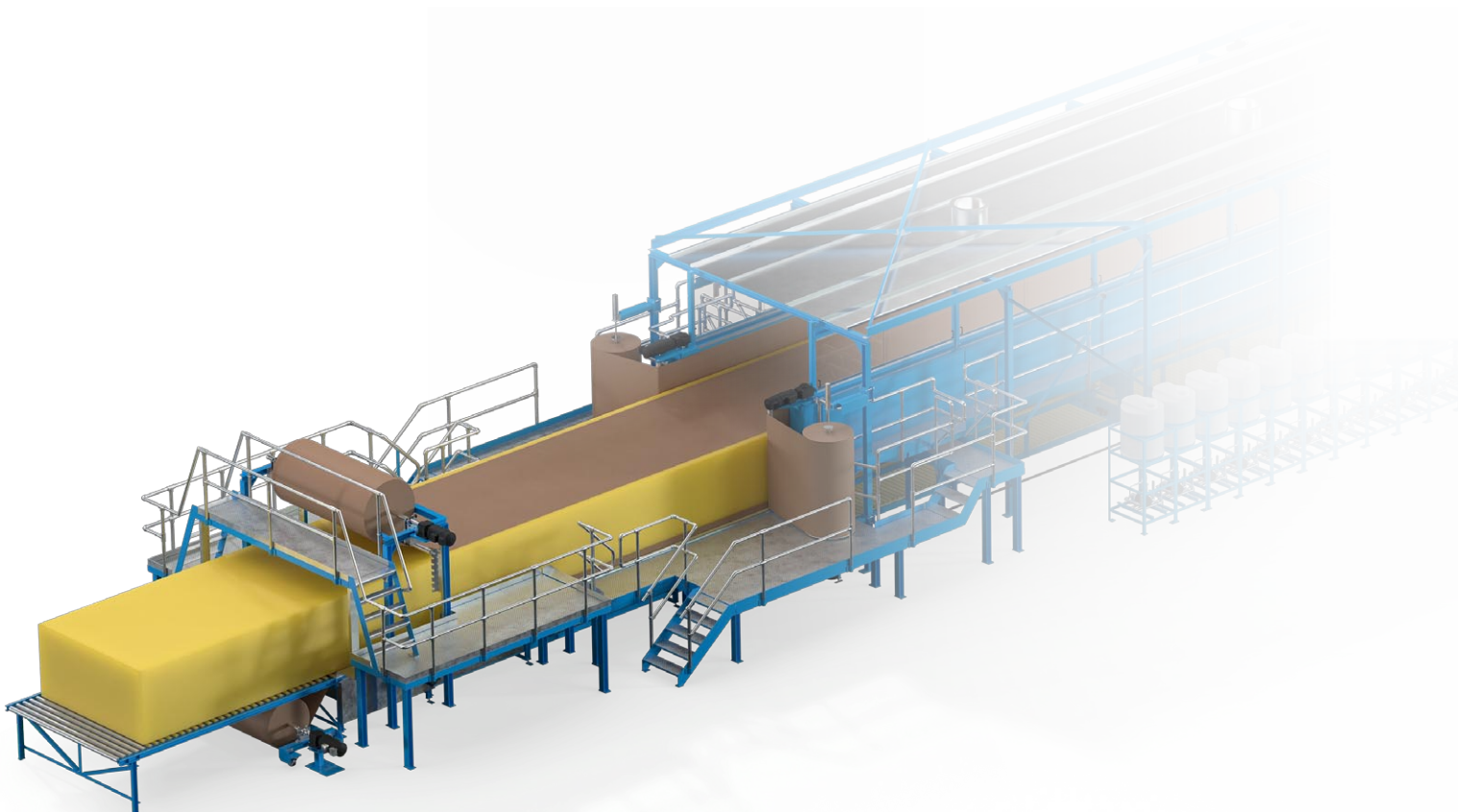
### >> 高质量泡沫和泡孔控制

- 高压技术还可应用于添加剂
- 高度可调混合头，LIQUID-LAYDOWN
- 硬度和密度分布均匀

### >> 采用获得专利的NOVAFLEX®技术生产低密度泡沫

### >> 模块化结构，节约运行成本且能最佳地适应市场需求

### >> 凭借高度现代化和直观的FOAMWARE工艺控制系统，用户友好且易于操作





**Further information and expert contact.**  
更多信息和专家联系方式。