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- 地区性服务中心——印度、土耳其、美国
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- 研究中心——东莞
R&D Centre -Dongguan



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德科摩橡塑科技(东莞)有限公司

DEKUMA RUBBER AND PLASTIC TECHNOLOGY(DONGGUAN)LTD.
(大同机械企业有限公司成员 Member of Cosmos Machinery Enterprises Ltd.)

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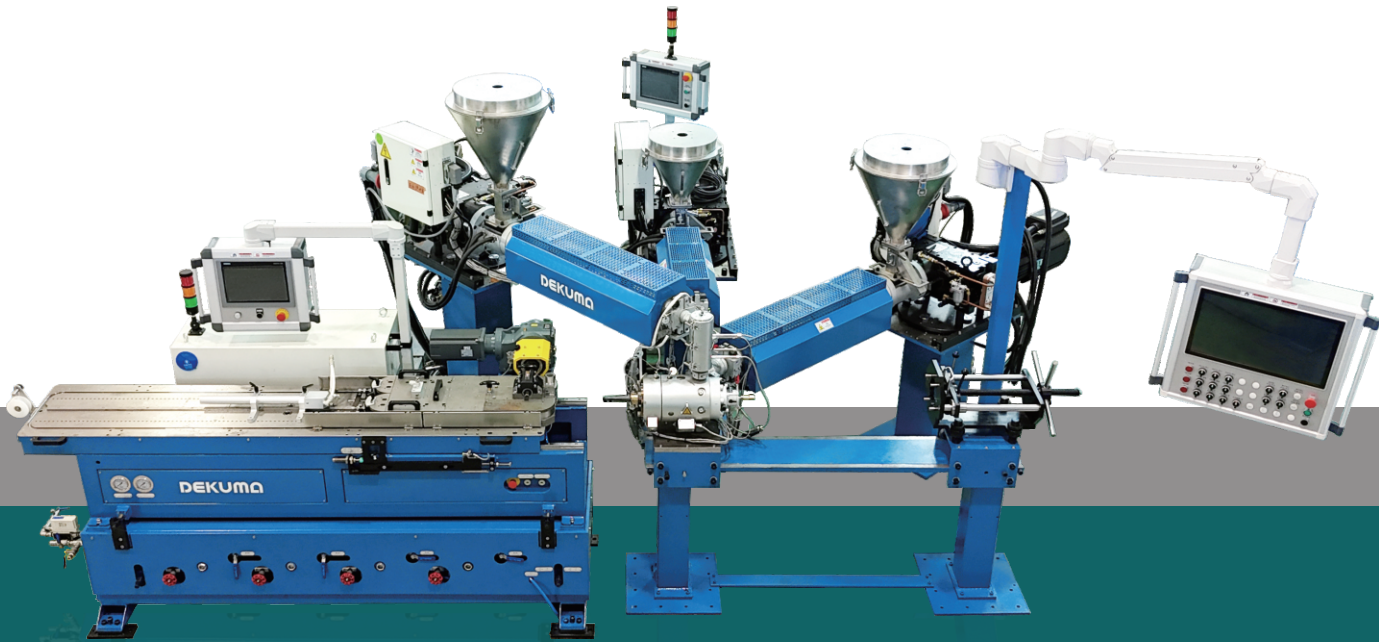
DEKUMA
中国高端橡塑机械行业领导者



汽车多层复合管， 波纹管高速挤出技术

EXTRUSION TECHNOLOGY OF AUTOMOBILE
MULTILAYER COMPOSITE PIPE

符合国六标准的汽车油管生产线
Applicable to Euro VI vehicle



Extrusion Technology of Automobile Multilayer Composite Pipe 202504

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关于德科摩

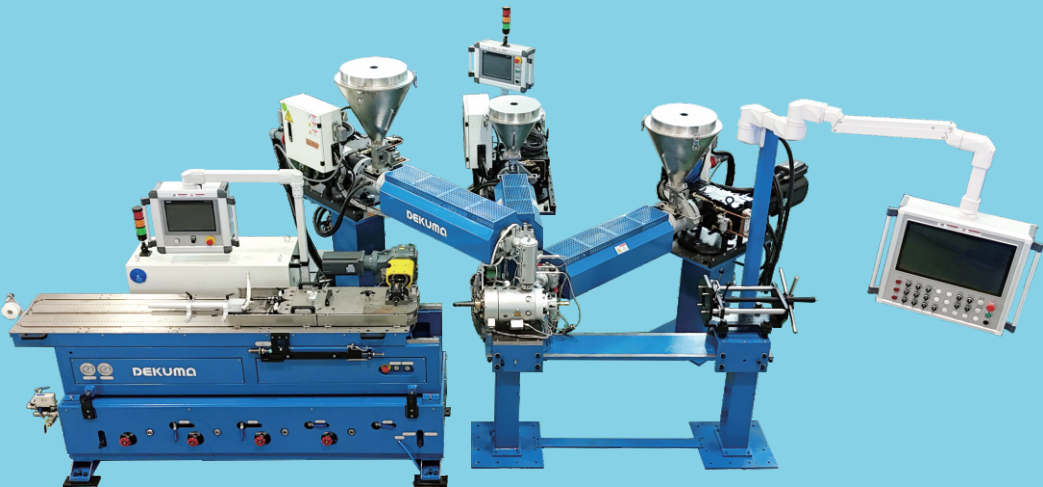
德科摩成立于2004年，由大同机械有限公司（香港上市企业大同机械企业有限公司全资子公司）和德国Dekuma GmbH 合资成立。

德科摩于2011年与世界知名汽车管路供应企业合作，研发生产出中国制造第一套五层汽车尼龙复合直管生产线，并成功交付客户投产使用。经过多年和汽车管路供应厂家合作，德科摩不断完善汽车尼龙复合管路挤出生产线技术方案，已为国内知名汽车管路厂家提供单层、双层、三层、五层汽车尼龙复合直管和波纹管生产线。

About Dekuma

Dekuma, founded in 2004, was a joint venture between Cosmos Machinery Ltd. (a Hong Kong public-listed company) and German Dekuma GmbH., specializing in the research, development, manufacturing, sales and after-sales of plastic pipe extrusion lines and rubber injection moulding machines.

In 2011, by cooperating with a well-known multinational enterprises, Dekuma developed and manufactured China's first multi-layer nylon composite pipe extrusion line. After continuous improvement, Dekuma has developed a mature turn-key solution, with stable production speed at 40-80m/min, Production efficiency and stability are competitive to those of German and Swiss equipment. This technology reaches and international leading level and wins the National Science and Technology Progress Award in China. Now Dekuma mono/multi-layer nylon pipe extrusion lines have been successfully running in end-users at home and abroad.



德科摩多层挤出主机和模头
Dekuma Multi-layer extruder and die head

汽车多层复合管 Automobile multilayer composite pipe

汽车燃油系统的多层复合管，是传统燃油系统对汽车轻量化、高集成化、低渗透性的管路产品，主要应用于汽车燃油输送。根据汽车燃油管使用的要求，选择不同阻隔材料，可生产不同的多层汽车燃油管结构，满足严苛的汽车燃油排放法规和标准。

It is used in the automobile pipeline system that satisfies the lightweight, highly integrated and low permeability for automobiles fuel systems. Mainly used in automobile fuel systems. Different barrier materials or different structures can be selected to meet stringent vehicle emission standards, such as Euro 6.

汽车多层复合波纹管 Automobile multilayer composite corrugated pipe

汽车多层复合波纹管不仅运用于燃油系统，随着国家节能减排新政，新能源汽车大批量投放市场，汽车管路对新能源汽车的冷却系统要求也不断提升。在新能源汽车轻量化、高集成化、低渗透性对波纹管的需求一路攀升，集中运用于新能源车电机、电控、电池的冷却液介质循环输送，以保证汽车系统长期稳定运行。

Not only for the fuel system, but also for cooling system of the motor, electronic control, and battery of new energy vehicles. It's also meetthe new vehicle emission standards, such as Euro 6.

TPV 针织增强管 TPV knitted reinforced hose

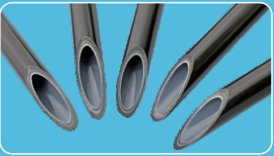
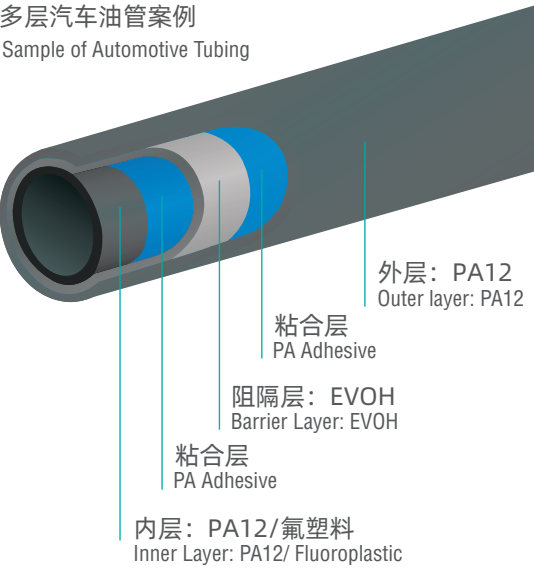
TPV是一种热塑性弹性体，通过将高度硫化的三元乙丙橡胶EPDM微粒分散在连续聚丙烯PP相中组成的高分子颗粒材料。

TPV针织增强管，中间层使用纤维织物增强爆破压力。相对于传统的EPDM针织增强管，TPV针织增强管在环保、轻量化及简化生产工艺上具有明显的优势，在新能源汽车电池系统的冷却管路应用上受到高度关注。

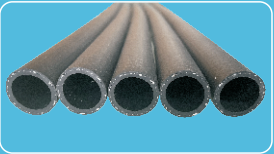
TPV is a thermoplastic elastomer composed of highly sulfurized ternary ethylene propylene rubber (EPDM) particles dispersed in continuous polypropylene (PP) phases to form polymer particles.

TPV knitted reinforced hose uses fiber fabric to reinforce the burst pressure in the middle layer. Compared with traditional EPDM knitted reinforced pipe, TPV knitted reinforced hose has obvious advantages in environmental protection, lightweight and simplified production process, and has received high attention in the application of cooling pipelines in new energy vehicle battery systems.

多层汽车油管案例
Sample of Automotive Tubing



多层复合管
Multilayer composite pipe

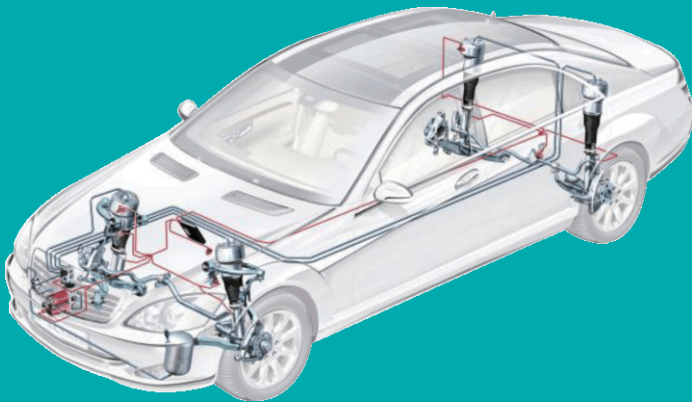


TPV针织增强管
TPV knitted reinforced hose



多层复合波纹管
Multilayer composite corrugated pipe

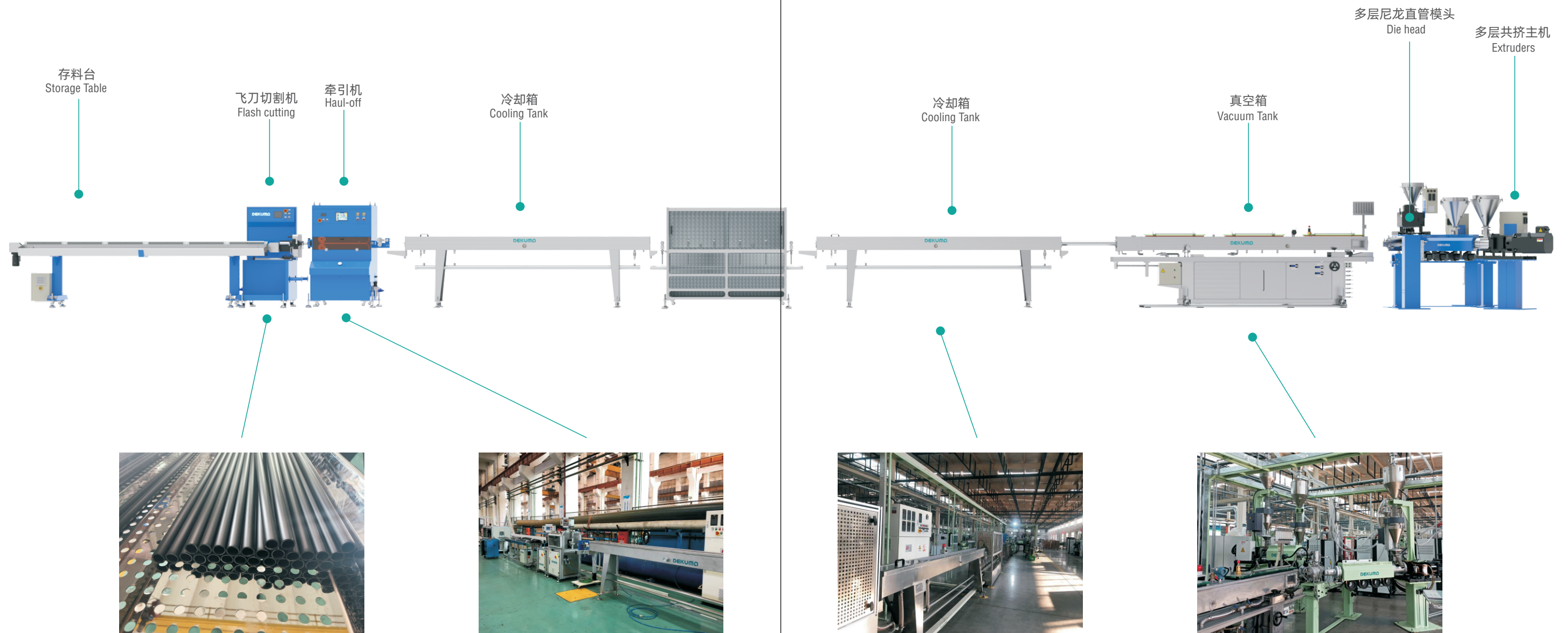
各种汽车复合管
Different automobile tubings



汽车管路示例
Low-emission vehicles (LEVs) fuel system

多层尼龙直管挤出生产线

自2011年德科摩为世界知名汽车管路供应商交付五层尼龙复合挤出汽车燃油管生产线，经过德科摩团队对五层复合挤出技术的迭代更新，国内主流汽车燃油管路厂家已高度认可德科摩多层复合挤出生产线。德科摩提供包含两层、三层、四层和五层的尼龙复合全套挤出技术解决方案，能为用户提供持续的设备和软件迭代更新。



Multilayer Nylon Composite Pipe Extrusion Line

Since 2011, Dekuma has delivered a five-layer nylon composite automotive fuel pipe extrusion line to a world-renowned automotive pipe supplier. After the Dekuma team iteratively updated the five-layer composite extrusion technology, Chinese mainstream automotive fuel pipe manufacturers have highly recognized Dekuma's multi-layer composite extrusion line.

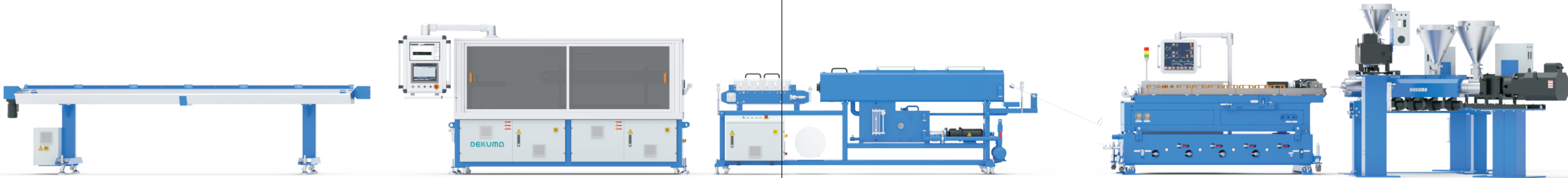
Dekuma provides a full set of nylon composite extrusion technology solutions including two-layer, three-layer, four-layer and five-layer, which can provide users with continuous equipment and software iteration updates.

多层尼龙波纹管挤出生产线

2018年，德科摩技术团队为用户交付应用于多层尼龙波纹管成型挤出生产线。挤出稳定、分层精准、成型饱满的波纹管成型机和波纹管精确影像裁切机是生产线稳定生产的保证。
德科摩多层复合挤出线可以通过更换下游实现波纹管 and 直管的生产切换。

Multi-layer Nylon Corrugated Pipe Extrusion Line

In 2018, the Dekuma technology team delivered an extrusion line for multi-layer nylon corrugated pipe. The stable extrusion, precise layering, and well performed corrugated pipe forming machine and the precise image cutting machine are the guarantee for stable production.
Dekuma multi-layer composite extrusion line can switch the production of corrugated pipe and straight pipe by changing the downstream.



存料台
Storage Table

波纹管牵引裁断一体机
3D Imaging Positioning Cutting Machine with Hual-off unit

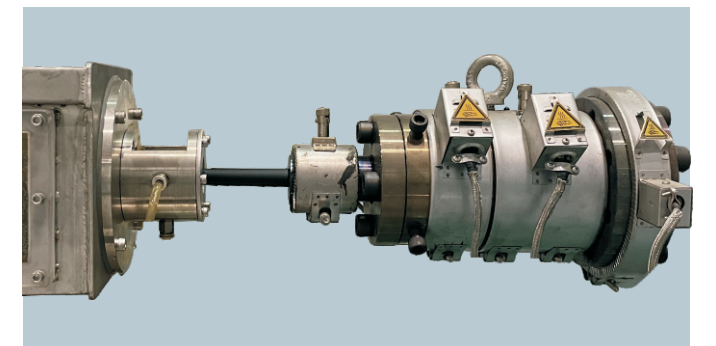
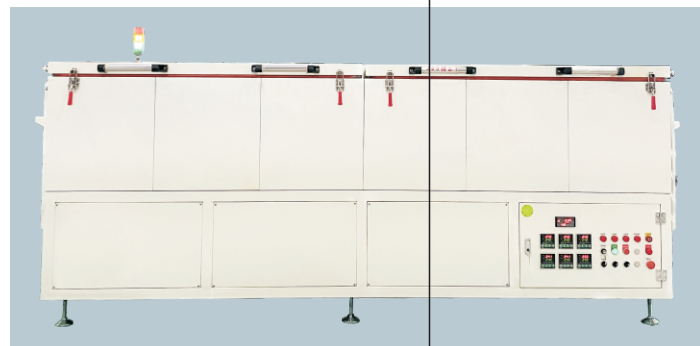
冷却箱和牵引机
Cooling tank with Haul-off Unit

波纹管成型机
Calibration Table for Bellows

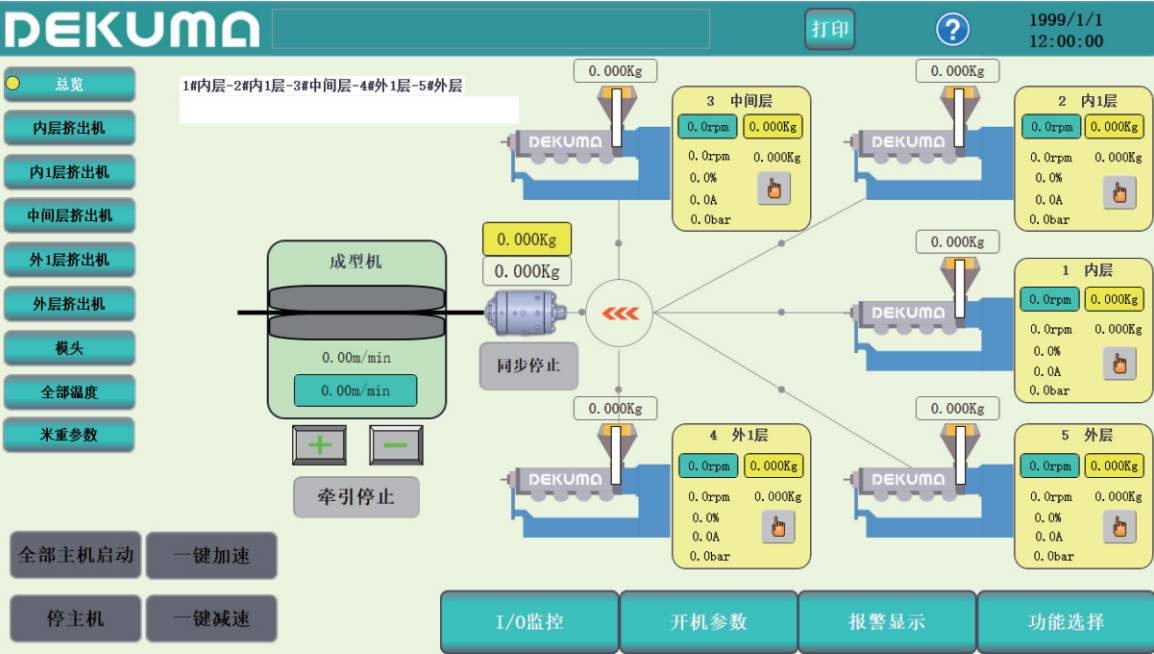
多层共挤主机和波纹管模头
Extruders & Die Head for Multi-layer Bellows

TPV针织增强管生产线布置

TPV Knitted Reinforced Hose Extrusion Line



整线控制系统
Control system

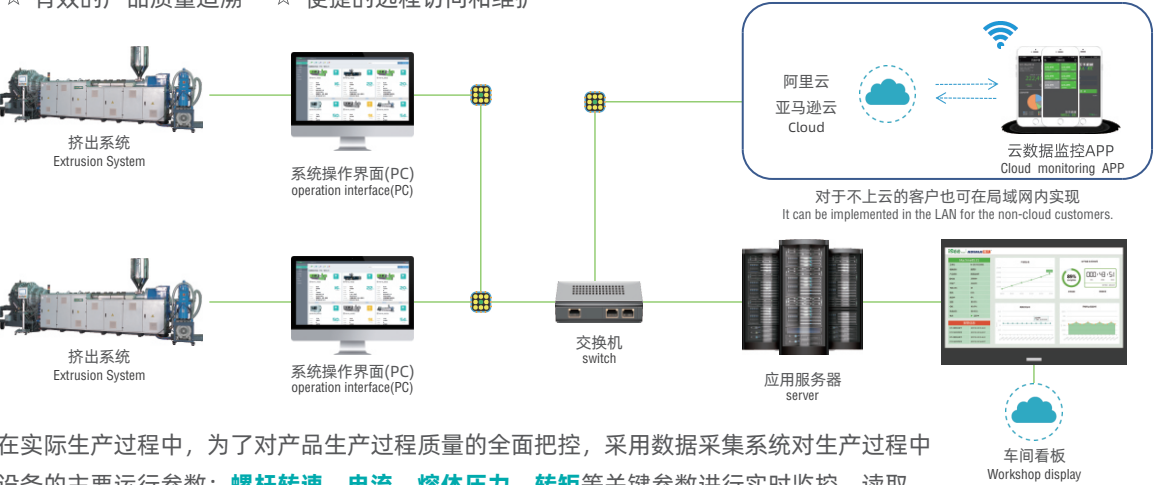


数据采集系统

智慧工厂对制造型企业生产过程中每一个数据有可能创造价值：无论对设备管理，产品品质管理、库存管理，产能利用及绩效评估等进行全面有效管理。过程数据同时能对生产管理决策及市场供应判断起至关重要的作用。

德科摩丰富经验的信息化部门对智慧工厂数据采集系统可：

- ☆ 生产运行状况监测
- ☆ 完整的数据报表导出
- ☆ 相关生产数据获取
- ☆ 精确的生产绩效评估
- ☆ 有效的产品质量追溯
- ☆ 便捷的远程访问和维护



在实际生产过程中，为了对产品生产过程质量的全面把控，采用数据采集系统对生产过程中设备的主要运行参数：**螺杆转速、电流、熔体压力、转矩**等关键参数进行实时监控、读取、存储、打印；有助于监控设备在生产过程中产品质量的稳定性；

In order to fully control the quality of the product production process, the main operating parameters of the equipment: **screw speed, current, melt pressure, torque, etc.**, are monitored, read, stored, and output in real time during the production process.

Data collection systems

The iSee system is a digital factory management system based on Industry 4.0, which uses production process data to support production management decision making.

Main functions include:

- ☆ Production monitoring
- ☆ Effectiveness evaluation
- ☆ Data collection
- ☆ Quality traceability
- ☆ Data report
- ☆ Remote access and monitoring

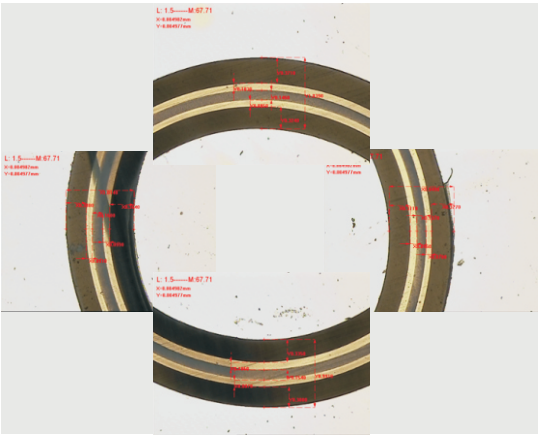


测试报告
Test Reports

试车拉伸性能测试
Commissioning tensile performance test results

检测项目 Test Item	技术标准要求 Technical standard requirements	检测结果 Testing result
纵向拉伸 Vertical stretching	断裂伸长率: $\geq 170\%$ Elongation at break: $\geq 170\%$	285%, 301%, 280%
	断裂强度: $\geq 24\text{N/mm}^2$ Break strength: $\geq 24\text{N/mm}^2$	25.63N/mm ² , 25.72N/mm ² , 25.45N/mm ²
横向拉伸 Lateral stretching	断裂伸长率: $\geq 170\%$ Elongation at break: $\geq 170\%$	425%, 417%, 429%
	断裂强度: $\geq 25\text{N/mm}^2$ Break strength: $\geq 25\text{N/mm}^2$	25.82N/mm ² , 25.23N/mm ² , 26.59N/mm ²

样片分析
Sample Slice Analysis



产品名称 Item	Nylon tube	产品型号 Item Model	PB550A/B 8mm
生产日期 Date of manufacture	2012.11.30	挤出速度 Extrusion speed	60M/min
量测工具 Measuring tool	Quick vision	产品颜色 Item color	white

标准厚度 Standard	角度0 Point0	角度90 Point90	角度180 Point180	角度270 Point270
0.45 ±0.03	0.468	0.436	0.433	0.465
0.15 ±0.02	0.147	0.152	0.145	0.144
0.05 ±0.02	0.053	0.050	0.049	0.053
0.05 ±0.02	0.049	0.046	0.055	0.063
0.30 ±0.03	0.302	0.320	0.330	0.282

(mm)