

# Suzhou Shincell New Material Co.,Ltd

Committed to sustainable foaming technology

# Company Profile

Established in March 2019, we focus on the research and development of polymer clean foaming technology and high-performance lightweight materials. At present, we have over 100 employees, 20000 square meters of plant area and 60 million RMB of actual capital utilized. We have built 9 polymer microporous foam production lines with a single machine capacity of 500 tons/year. The company's core equipment and key processes are independently developed and have completely independent intellectual property rights. We have applied for 12 invention patents and 7 utility model patents.

Shincell has a R&D center and an analysis and testing center, and has passed ISO 14001 environmental management system certification and ISO 9001 quality management system certification, and was certified as a "high-tech enterprise" in December 2021.

Shincell's main products are divided into two categories: light and high strength materials and soft and high elastic materials. The products serve Huawei, ATL, Adidas, Li Ning, Anta, HOKA, KEEP and other customers.





# Founder's profile

Founder: Dr. Xiulei, Jiang

2003.9-2009.5 East China University of Science & Technology, Ph.D

2015.10-2018.10 Zhejiang University, Postdoctor

- M.S./Ph.D. research topic: microporous foaming of polypropylene with application of supercritical CO<sub>2</sub>
- Postdoctoral research topic: thermoplastic polyurethane (TPU) microcellular foaming
- Published 6 relevant research papers (SCI indexed)
- In March 2009, the applicant put forward the technical idea of industrialization of polymer solid foaming for the first time in the world and built the first generation of MPP microcellular foaming production line, which has been upgraded and iterated continuously.
- Participated in the National Key R&D Program "Lightweight Technology of Polymer Materials".
- The research team won the first prize of Shanghai Science and Technology Progress Award in 2020
- Since 2003, we have been focusing on the research and application development of microcellular foaming



# Core Technologies

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## IP status

- FTO (Freedom To Operate) assessment obtained from the law firm without infringement, against the patent existed in the key regions globally.
- Various Patents (more than 20 patents), including PCT patent, applied across the foaming process, machinery and tooling.

# R&D Center

## Joint R&D Center with Universities.



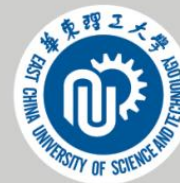
浙江大学

苏州工业技术研究院

Suzhou Industrial Technology Research Institute

聚合物轻量化材料联合研发中心

Joint R&D Center of Lightweight Polymer Materials



华东理工大学

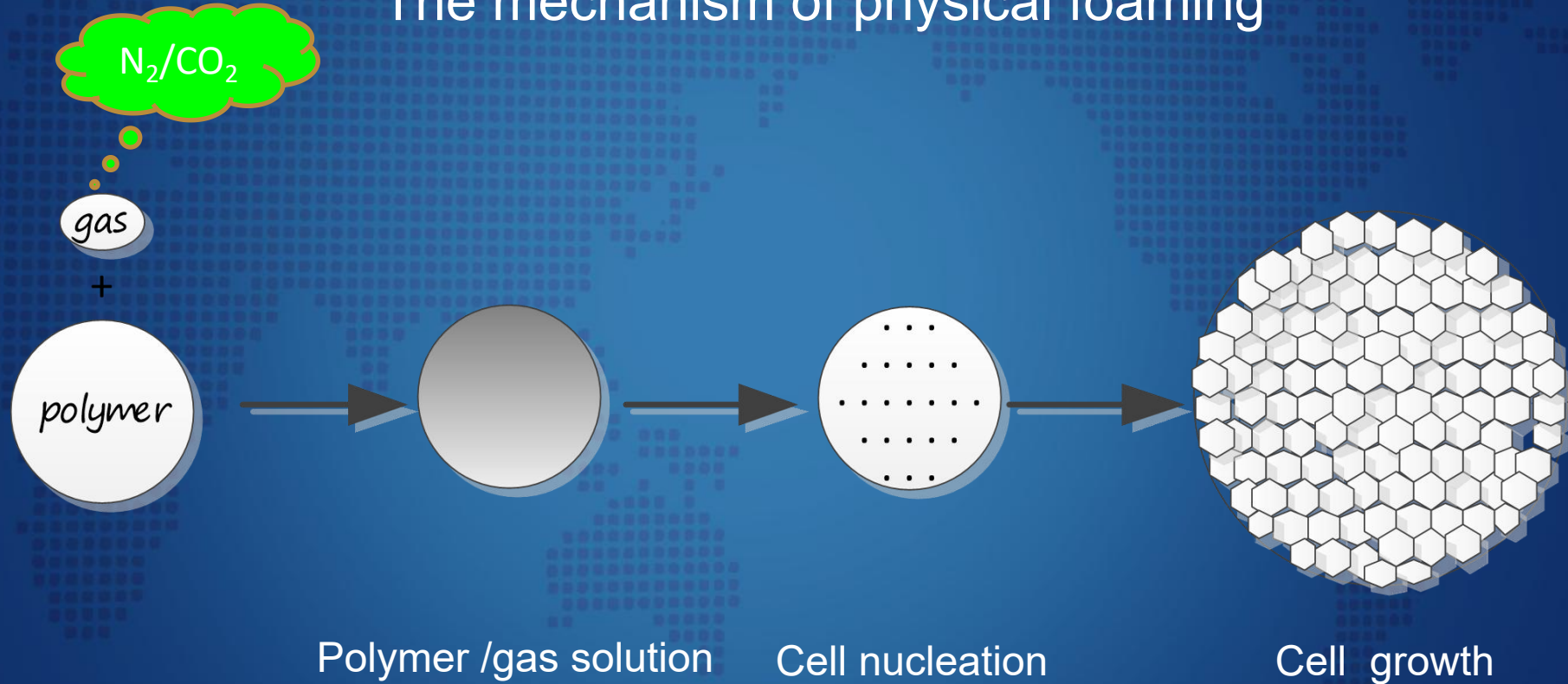
新材料开发及智能化应用技术研究中心

New material development and intelligent application technology Research Center

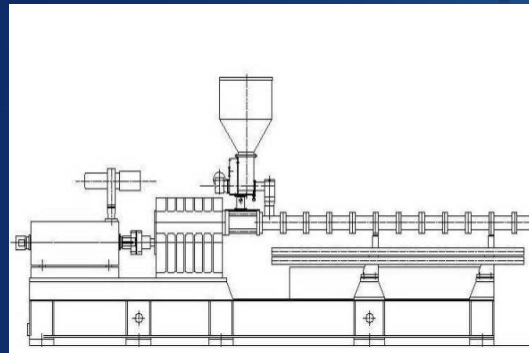


# What's supercritical physical foaming?

## The mechanism of physical foaming



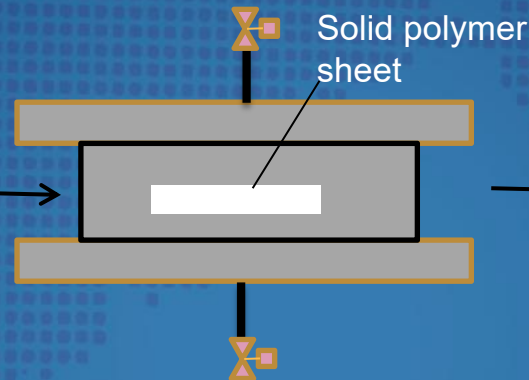
# Theory process



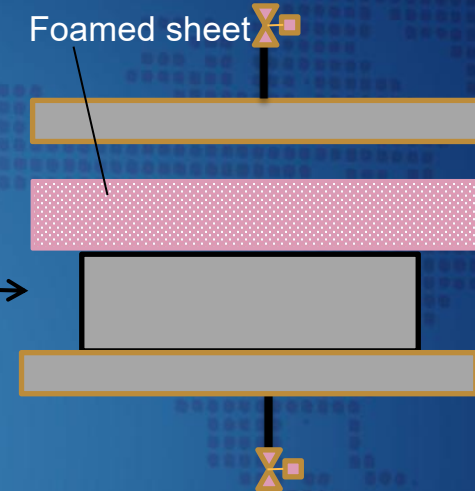
Extrusion



Solid polymer sheet



CO2 and N2 Saturation



Pressure Relief Foaming





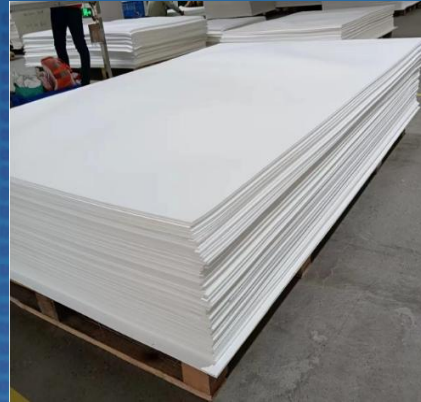
# PROCESS



Adding raw material



CO2/N2 Gas



Cutting to  
demanded  
thickness



Edge  
trimming



Extruder



Solid sheets



Molded foam  
machines



Foamed sheets



# Production Facilities



**CO2/N2 Gas station**



**Lab scale machine**



**Extrusion line**



**Sheet foaming machine**



**Particle foaming machine**



**Testing lab**



**Precise skiving machine**



**Digitized cutting machine**

# Capacity

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4 production lines now and will add 5 production lines in End of March 2023.  
Total 9 production lines.

190pcs foam sheets per one machine per day. For example, M-TPEE12 size 1400\*1050\*28MM can be produced 760pcs per day now and can be produced 1710pcs per day in March 2023.



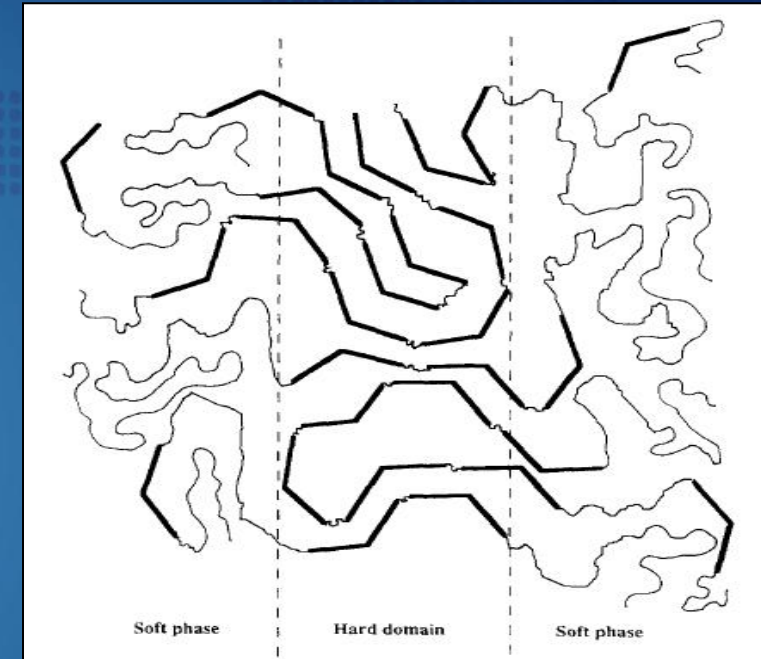
**Sheet foaming  
machine**



# Our Products:

M-TPU  
Aliphatic TPU (A-TPU)  
M-TPEE  
M-PEBAX(Bio-Based)

The micro-structural phase separation of hard segment and soft segment contributed to the high performance



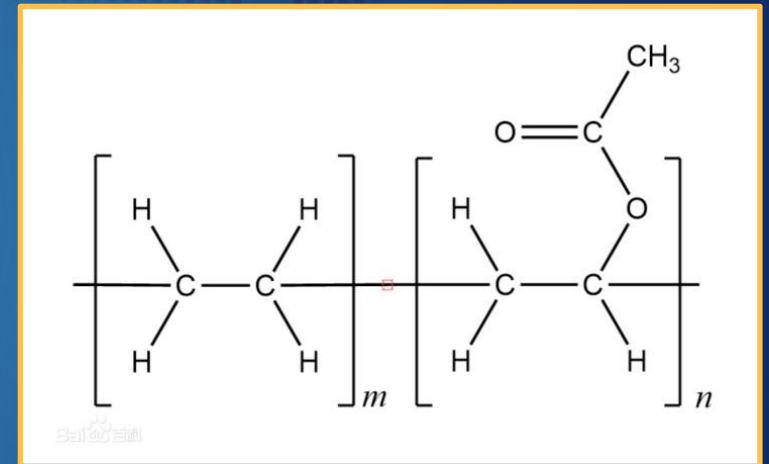
Hard segment (HS) domains dispersed in a soft segment (SS) matrix.





# What's the constraints of EVA based foam?

- EVA molecular structure & limited material options hinders the further improvement of performance.
- Short service life, foam get deformation & collapse.
- Unpleasant smell & restricted chemicals generated by chemical foaming agent
- Not recyclable, not eco-friendly



EVA Molecular structure

# What's the solution from Shincell?

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## Elastic thermoplastic + physical foaming (Supercritical fluid foaming)

- Superior performance in terms of extremely high energy return, lightweight and long-lasting cushioning.
- No smell, no additional chemicals, foamed by the gas exists in the air.
- No crosslinking enables recyclability
- Bio-based version is also available, Content up to 44%
- Recyclable ,low temperature resistant

# Cold Resistance of SCF Foam

Tg: Glass Transition Temperature

**The lower the Tg value, the better the cold resistance**

MATERIAL	Raw Material Supplier	Tg Value
PEBAX(Bio-Base)	Arkema	-35.8°C
TPU	BASF	-49°C
TPEE	DUPONT	-50°C



# What's the application?



# Physical property of MTPU foam sheets in single large pieces

检验项目 Test Item	测试方法 Test Method	单位 Unit	M-TPU12	M-TPU16	M-TPU20
密度density	ASTM D3574	g/cm3	0.12±0.02	0.16±0.02	0.20±0.02
硬度hardness	Shore C	C	23±4	27±4	36±4
拉伸 Tensile Strength	ISO 1798:2008	MPa	3.6	4.0	4.4
伸长率 Elongation at Break	ISO 1798:2008	%	280	320	360
撕裂强度（裤型） Method A Tear Trouser Test	ISO 8067:2008	N/cm	32	42	52
撕裂强度（直角） Method B Tear Angle Test	ISO 8067:2008	N/cm	82	96	110
落球回弹 Ball Resilience	ASTM D3574	%	63-69	62-68	60-66
压缩形变 Compression set	ASTM D395	%	29	27	25
耐黄变 Sun Test	ASTM D1148	/	4	4	4

# Physical property of Aliphatic TPU foam sheets in single large pieces

检验项目 Test Item	测试方法 Test Method	单位 Unit	Aliphatic TPU
密度 Density	ISO 845:2006	g/cm <sup>3</sup>	0.07 ± 0.02
硬度 Hardness	SATRA TM 205-16	Shore C	30 ± 5C
拉伸 Tensile Strength	ISO 1798:2008	MPa	2.27
伸长率 Elongation at Break	ISO 1798:2008	%	163.92
撕裂强度（裤型） Method A Tear Trouser Test	ISO 8067:2008	N/cm	18.27
撕裂强度（直角） Method B Tear Angle Test	ISO 8067:2008	N/cm	69.6
落球回弹 Ball Resilience	ASTM D3574	%	80
压缩形变 Compression Set	ASTM D395	%	24



## Physical property of MTPEE foam sheets in single large pieces

检验项目 Test Item	测试方法 Test Method	单位 Unit	M-TPEE12	M-TPEE14	M-TPEE16
密度 Density	ISO 845:2006	g/cm <sup>3</sup>	0.12±0.02	0.14±0.02	0.16±0.02
硬度 Hardness	SATRA TM 205-16	Shore C	34±4C	40±4C	45±4C
拉伸 Tensile Strength	ISO 1798:2008	MPa	2.8	3.6	4.0
伸长率 Elongation at Break	ISO 1798:2008	%	280	320	360
撕裂强度（裤型） Method A Tear Trouser Test	ISO 8067:2008	N/cm	35	45	55
撕裂强度（直角） Method B Tear Angle Test	ISO 8067:2008	N/cm	95	110	120
落球回弹 Ball Resilience	ASTM D3574	%	72	67	67
压缩形变 Compression Set	ASTM D395	%	23	19	19

# Physical property of M-Pebax foam sheets in single large pieces

检验项目 Test Item	测试方法 Test Method	单位 Unit	M-PEBAX07
密度 Density	ISO 845:2006	g/cm <sup>3</sup>	0.07±0.02
硬度 Hardness	SATRA TM 205-16	Shore C	35±4C
拉伸 Tensile Strength	ISO 1798:2008	MPa	2
伸长率 Elongation at Break	ISO 1798:2008	%	150
撕裂强度（裤型） Method A Tear Trousar Test	ISO 8067:2008	N/cm	15
撕裂强度（直角） Method B Tear Angle Test	ISO 8067:2008	N/cm	60
落球回弹 Ball Resilience	ASTM D3574	%	75
压缩形变 Compression Set	ASTM D395	%	38

# Close partners:

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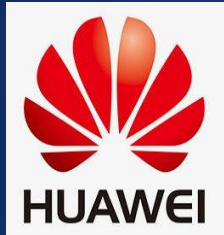




# Customers

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**SHINCELL**  
Committed To Sustainable Foaming Technology





# Do you have any question?

## Thank you

send email to: [contact@shincell.com](mailto:contact@shincell.com)