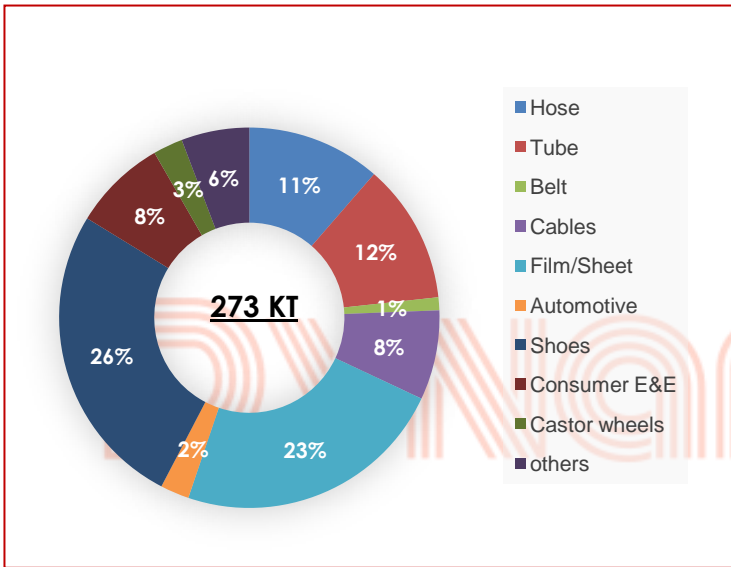


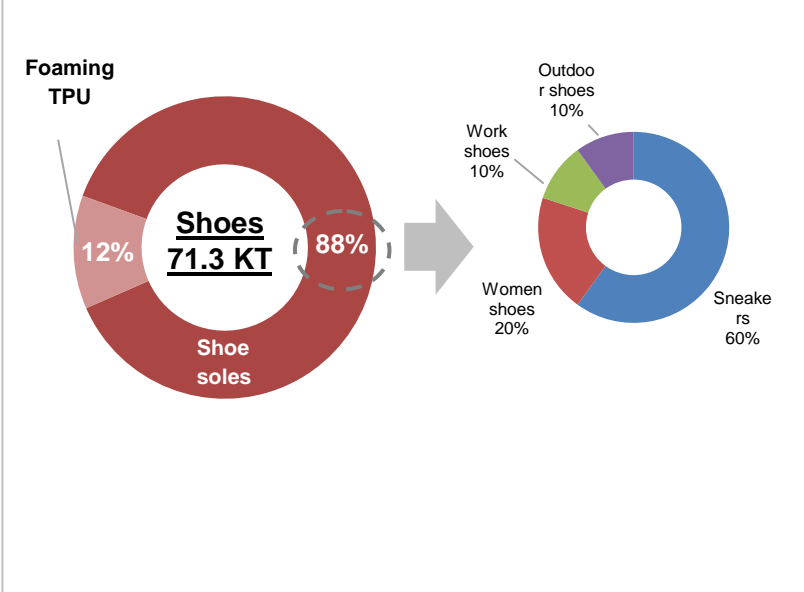


China's TPU demand by each segment in 2017



- TPU is widely used in many industries including hose, tube, belt, cables, automotive, shoes, sports, consumer E&E, caster wheels and so on.
- The TPU market in China is projected to grow from 273MT in 2017 to 337 MT by 2022, at a CAGR of 4.3% from 2017 to 2022
- The largest end-use segment in TPU market is shoes, followed by film/sheet

Leading sub-segments in the shoes segment, 2017



- There are over 1,000 manufacturers of TPU shoe materials in China, which are mainly distributed in Wenzhou, Zhejiang Province and Jinjiang, Fujian Province
- 60% TPU shoe soles are used for producing sneakers
- Acting as a new TPU materials, foaming TPU is mainly used for producing mid-soles for sports shoes which are co-developed by Adidas and BASF
 - Two local sneaker producers, 361° and XTEP, as followers, also launched 10,000 pairs of E-TPU sneakers in Chinese market in June 2017
- TPU suppliers: TPU used in shoe soles is mainly supplied by local companies such as Wanhua and Huafon, whereas foaming TPU is mainly supplied by BASF, Miracell(山东美瑞), GMF (宁波格林美孚) and Huafon

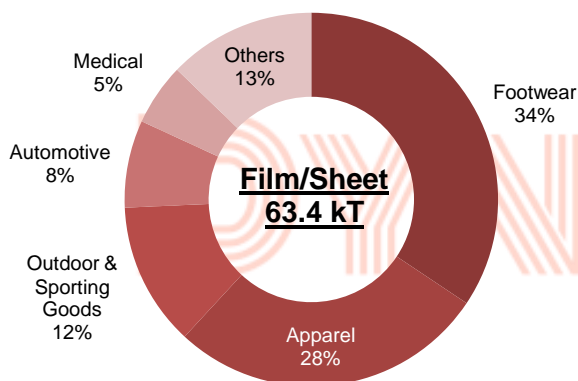
Industry trend

- The TPU demand in shoe soles is expected to grow at a CAGR of 3% in 2017-2021 and grow at 1.5 in 2021-2027, impacted by the production relocation of international shoemakers to the Southeastern Asian countries
- The foaming TPU is expected to grow at more than 10% CAGR in 2017-2027

TPU suppliers

- In shoes soles segment, MNCs make up around 25% of the market share, key players including BASF, Covestro and Lubrizol, and Local suppliers dominate the market, key players including Zhejiang Huafon, Wanhua chemical and Taiwan Sunko
- In foaming TPU, MNCs make up 65% of the market share, key players including BASF, Huntsman, and local players are also available in this market, key players including Shandong Miracell, GMF and Zhejiang Huafon

Leading sub-segments in the Film/sheet segment, 2017



- The TPU film/sheet industry is relatively concentrated with less than 100 players
 - The large TPU film manufacturers in China include Dongguan Xionglin, Zhejiang Jiayang and Breath Tex. These large players have around 4-5 kT TPU consumption every year
 - Some players specialized in hot melt adhesive film, most of which consume less than 1 tons TPU every year
- TPU films are mainly used in shoes, automotive and outdoor products
 - TPU hot melt adhesive films are mainly used for shoes and apparel in place of solvent-based adhesives as it saves the gluing task and is eco-friendlier than solvent-based products
- TPU used for film/sheet is mainly supplied by local suppliers, however, some high-end applications, such as automotive and healthcare, use TPU supplied mainly by MNCs producing in China, or it is even imported

Footwear (Film/Sheet)

- The TPU film/sheet consumption in shoes is expected to grow at a **CAGR of 3% in 2017-2021 and at 1.5% in 2021-2027**, impacted by the production relocation of international shoemakers to the SEA countries
- In this segment, MNC TPU suppliers only take less than 10% market share, and local TPU suppliers dominate this market, including Wanhua chemical, Zhejiang Huafon, Bangtai New Materials

Apparel (Film/Sheet)

- The demand for TPU films in apparel is expected to grow at a **CAGR of 6-7% (2017-2027)**, driven by rising incomes and the popularity of outdoor sports in China
- MNCs make up around 15% of the market share, and the TPU supplied by MNCs is mainly used for apparel that requires high moisture permeability
- Local products are dominant, the key players including Wanhua, Huafon, Shanghai Heind, Bangtai New Materials

Outdoor sporting goods

- The demand for TPU films in outdoor sporting goods is expected to grow at a **CAGR of 8% (2017-2027)**, driven by the growing domestic demand for sporting goods
- MNCs make up only 20% of the market share, key players including BASF and Covestro
- Local players dominate the market because they can meet the requirement of most outdoor sporting goods manufactures and brands with lower price, the key players including Wanhua, Huafon and Taiwan Coating

Automotive (Film/Sheet)

- The TPU demand in exterior protective film is expected to grow at a **CAGR of 7% during 2017-2027**, driven by the increasing sales of premium cars and popularity of protective films
- MNCs are dominant with around 80% of the market share because of their better performance such as anti-yellowing, good resilience, high quality consistency between batches, the key players including BASF and Covestro