State-owned Taiyuan Iron & Steel Co., Ltd. (TISCO), one of China’s largest stainless-steel mills, has developed the technology to produce the nib. A key component of the tip of a ballpoint pen, the nib will be produced through a partnership between TISCO and Ningbo’s Beifa Group, China’s leading stationery company and largest pen exporter. TISCO has begun producing nibs using only domestic components, enabling the production of 100% “Made in China” ballpoint pens. TISCO’s technological capability and China’s national pride benefit from this innovation, but for Chinese domestic pen makers overall, producing pens this way may not be economically smart, mainly because reduced component costs could be offset by increased production and logistical expenses.

The tip of a ballpoint pen consists of a tungsten carbide ball and the ‘nib’, a bullet-shaped component that secures the tungsten carbide ball at the tip of a pen. Ink flows from the 2.3-mm-wide metal socket to the half-mm ball at the nib tip. China produces and exports the tungsten carbide ball, while it imports more than 1,000 metric tons of special steel for nibs annually from Japan and Europe at the cost of over $17 million annually.
China is the world’s leading steel producer, but nib production uses high-precision stainless steel and advanced equipment that require exact proportions of special microelements. Most of China’s steel capacity is in ordinary and low quality steel.

China’s inability to produce the nib reflected its weakness in precision manufacturing, a recurrent source of anxiety for its leaders. In 2011, the Ministry of Science and Technology (MOST) launched the Pen-Making Industry Key Material and Technology Research and Industrialization Program. MOST asked companies to localize pen-production technology and provided RMB60 million for research and development (R&D) to each of three sub-projects: (1) ballpoint pen ink R&D and production; (2) pen wire and equipment technology R&D; and (3) nib/ink compatibility and other bottlenecks. For each sub-project, the participating enterprises were required to invest twice as much as MOST, bringing the total costs of the full project to RMB180 million.

MOST’s pen technology program catalyzed TISCO’s collaboration with Beifa to develop ballpoint pen nibs and by September 2016, they had created China’s first fully-domestic ballpoint pen. Beifa won the bid to design and produce the G20 Pen, provided to all heads of state who attended the September 2016 G20 summit in Hangzhou. Almost immediately, Beifa began mass-producing pens with domestically sourced nibs in January 2017 for its “China Good Pen” series. The company hopes to end nib imports altogether by 2019.

Beifa World Manufacturing Center in Ningbo, China. Source: Beifa Group Website

Not only did TISCO's stock increase more than 25% after the nib story went public, it also developed China’s first technical standard for nibs. All told, China eliminated the need for $17.5 million a year in nib imports, but only after spending $8.7 million in government funding and $17.4 million in matched corporate spending: $26.1 million total. These calculations also exclude unreported spending by either MOST or TISCO and Beifa and do not factor in the cost of supporting failed import substitution projects in the industry.

Domestic nib production has reduced nib costs from an import price of more than $17,000 per ton to $13,000 a ton, resulting in $4 million in annual savings for pen manufacturers. However, current data do not yet suggest a greater per-pen profit for domestic pen manufacturers. According to one pen retailer, the savings from component costs will likely not translate to overall savings because of increased production and logistics expenses. Additionally, TISCO’s nib industry standard may solidify a state-backed
monopoly that adversely affects other domestic pen producers. It still remains uncertain to what extent the state-driven effort can economically benefit the industry.

**Additional Resources**


Eric Ng. “Why cracking the secret of the ball-point pen is such a big deal for Taiyuan Steel.” *South China Morning Post*. February 1, 2017.


