

Supply Chain Challenges of the Ferrite Industry as a Result of the Pandemic

Mr. JC Sun, measuring specialist at Bs&T, and Mr. Rico Wachs, from German ferrite manufacturer Tridelta, reflect on the present crisis in the ferrite industry and its challenges amid the pandemic.

By Bodo Arlt, Publishing Editor, Bodo's Power Systems

Following the supply problems of chips and semiconductors, recently passive component supply is also in trouble, especially at the level of the ferrite material and cores. Is it purely a problem of supply or does it also have hidden technical aspects?

JCS: It is both, actually. The enhanced demand on high quality inductive components in Europe and shortage of ferrite supply chain in China is temporally causing a significant asymmetry of demand and supply. But it is much more complex than that, as there are other less obvious technical challenges in the power electronics game. As I always say: "If magnetics does not get done, nothing gets done!"

RW: China currently represents both the largest producer and consumer ferrite material and cores. There are many manufacturers registered in China, while there are only few in Europe. The high-end market requires specific local presence, while traditional commodity is served by a large number of distributors, who have to fight in different fields. Therefore, we believe that it is a supply bottleneck.

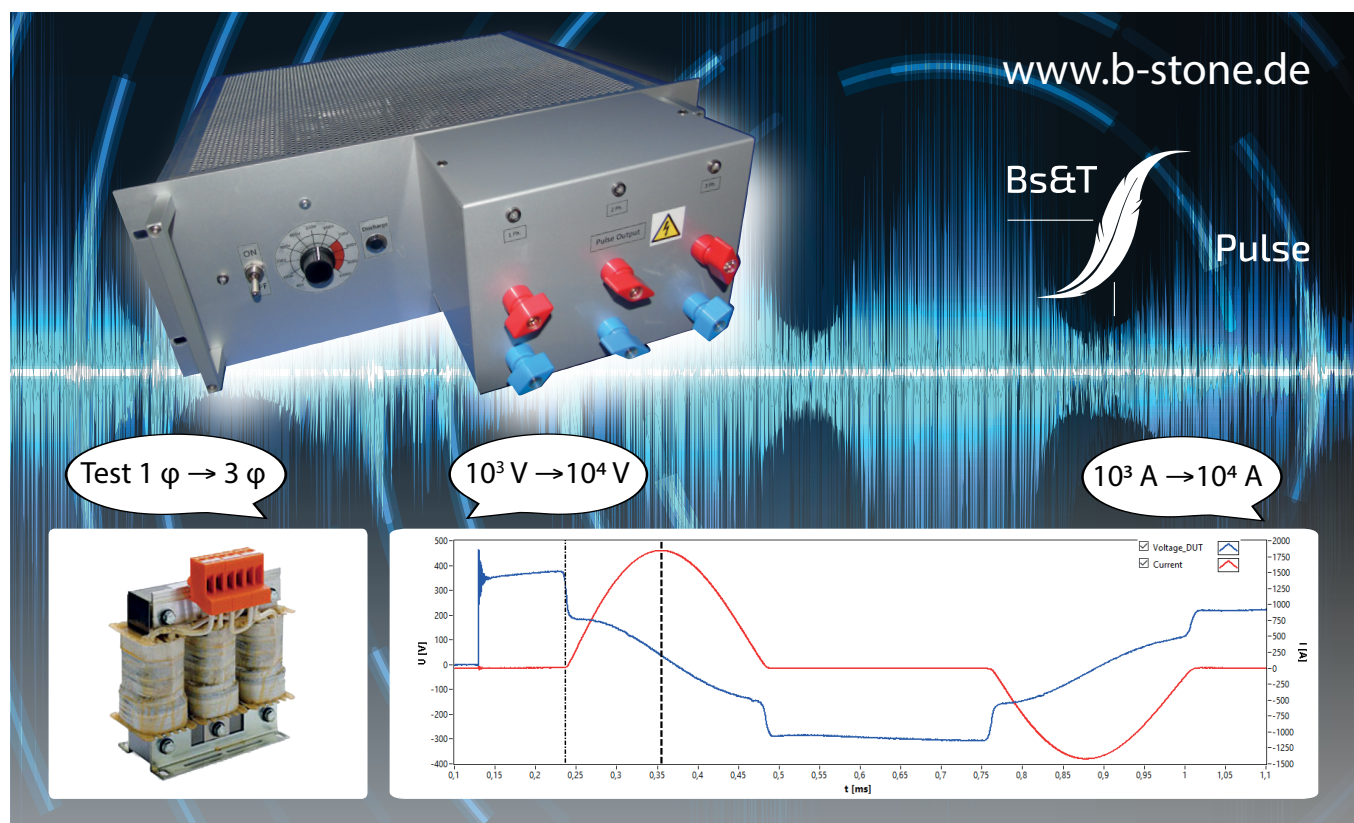
Can you give some example to describe market situation, price and lead time?

RW: We had moderate price increase of less than 5%, with a slightly increase in lead time due to consolidation of location in Hermsdorf and process optimization under one roof. In general, we are talking about 2 to 6 weeks depending on whether the ferrite cores are in stock. Custom designed ferrite cores and small batches from our machining center take 4 to 8 weeks depending on size, shape and quantity, prototypes even only a few working days

JCS: The price of ferrite in China has undergone several readjustments in the order of 25% to 50%, as the raw material price is now uniquely volatile, especially with regards to high purity iron oxide. This segment has almost tripled within half a year. Once the power ferrite is composed of 70% of iron oxide, it determines the price and quality. Manufacturers with material/core validation competence and specialized knowledge acknowledge it, but they represent still the minority.

Is the moderate price increase solely determined by raw material?

RW: Yes, TRIDELTA Weichferrite believes it is. However, we are not only seeing an increase in commodity prices, but also in energy costs. Our process is quite optimized and automatized, and our logistics have not been affected by pandemic, they are still efficient and satisfactory. On the other hand, it is not necessarily true for



distributors, who are more directly impacted by logistic uncertainty, such as sharp monthly increases in air and sea freight prices, not to mention the disaster in the Suez Canal. These global parameters have no impact on our core business... what about China Mr. Sun?

JCS: Well, about 40% ferrite manufacturers are buying the ready to press powder as their raw material. It means the ready to press powder is a market for itself; the large technological uncertainty is gradually outsourced to clients, the winding house. Hence, it is not particularly transparent how particularly price increase is allocated in market segments, applications.

The plan uncertainty in price and lead time will have important consequences in the passive component industry, like inductors and transformers, as well many ongoing technological developments - think of DC grid development, ultrafast speed charging, wireless charging and further automotive applications due to electrification - how do you communicate with your clients in this regard?

RW: Absolutely, this is a key issue; we see many developments particularly in magnetization technology. New materials are required to withstand higher temperature, higher Bs material for medium-frequency range, for solid-state-transformer, for infrastructure development. The vulnerability of ferrite industry does exist! Due to large scale offshore activity by larger enterprises, we, as specialist with over 70 years' experience, are looking for sustainable client relationship, focus on high demand products, and serve them with customized application.

JCS: Indeed, experience and competence in validation technique is of essential importance. Since there is no micro magnetic alternative model available for ferrite, measuring is indispensable. I see another consequence, namely on the supply side: the overcapacity will be diminished, and the dependence on China is migrating into the wire wound components industry. Those 1000 winding houses

in Europe are already seeing the challenge. I can only appeal to validate wire wound component compliant standard, IEC or IEEE, for the sake of sustainable business.

What is your analysis throughout the ferrite chain, and what is your outlook in competition with other soft magnetic materials?

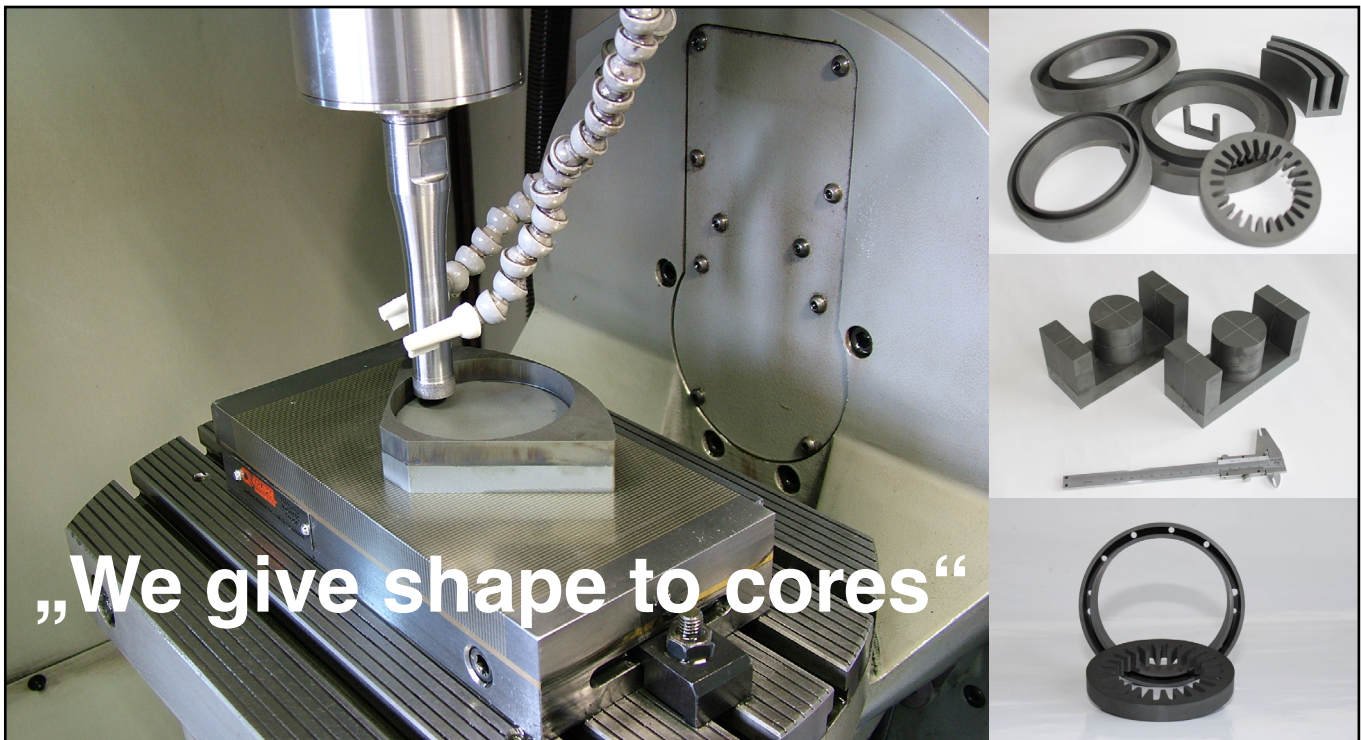
JCS: Ferrite, as artificial ceramic, is almost 100 years old, thanks to pioneer work from Takei and Snoek. This pioneering work was continued by Manifer® (TRIDELTA Weichferrite) and Ferroxcube® (Netherlands) after the WWII in Europe. Two major groups of Mn-Znferrite are of interest, power and signal applications, for which low loss and high permeability are mainly important. However, the application with high permeability is facing stiff competition from iron-based nanocrystalline tape wound core as "new kids on the block". Over long term, the technological advantage of inductive component cored with metallic alloy will win, as the price will decrease due to large economies of scale. A strategy for diversification of material is consolidating, as low-loss materials, withstanding high temperature, is increasingly required for high power/energy drive application. Therefore, material designers in Europe will in all likelihood need support from local manufacturers, to give a new shape and spirit towards the future ferrite material and core industry.

RW: If ferrite not gets done, nothing gets done, right, Jun? Our experience in material development and manufacturing of ferrite cores will provide added value to our customers now and in the future.

Thank you both very much for sharing your thoughts!

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„We give shape to cores“



TRIDELTA Weichferrite GmbH has over 75 years experience in the design, manufacture and processing of soft ferrites from samples to special design meeting the requirements of customers in a wide variety of applications and industries.

🌐 www.tridelta-weichferrite.de / ✉ info@tridelta-weichferrite.de / ☎ 036601 – 9152-200