Independent services: Reducing the risk of procuring low-cost refractories

P. Carlo Ratto* outlines the perils associated with the low-cost procurement of refractories and discusses how glassmakers can overcome these challenges.

The developed economies of the western world have faced an economic crisis of an unprecedented span, the associated social costs of which have proved to be comparable only with the outcome of the major global wars of the last century.

The consequence of this crisis, however, has been unaccompanied by the material devastation of war, which resulted in a huge reconstruction effort and almost full employment for years after, revamping the economy. The current crisis, though resulting in similar economic devastation, has left behind it a large level of unemployment.

In the western world, the US is possibly at the end of a long stagnation, while Europe is still struggling between recession and stagnation. Meanwhile, the large eastern economies, led by China, have suffered blows to their role as a global production hub due to the crisis of their western customer, and has observed a fall to single-digit increase in GDP (Fig. 1).

The Chinese economy has focused on low-cost leverage, leaving areas such as refractories for glass underdeveloped in terms of products and services. It has expanded its domestic markets and in doing so had to accept double-digit annual inflation to its labour cost, impacting heavily on its global competitiveness.

The western and global glass industry has reacted to the distress of the crisis using all the levers of the classic capitalist system, such as reducing fixed cost structures (particularly at the level of staff in corporate offices and technical offices) and in marketing and sales. The best organisations have only partially reduced their R&D functions, focusing their activities on cost reduction and the rapid engineering of products and services in their areas of expertise.

The consolidation process has gone and we are at a point where in the near future a few mega-industries will control the global containers market. In float glass, global players have already reduced in number.

The refractories industry for glass, viewed as a minor segment by the major firms (in which the steel, foundry and cement segments dominate), has followed strategies deriving from its core business, with the exception of the fused-cast refractory specialist segment for which, traditionally, there are devoted companies beside a few generalist.

With reference to fused cast producers, it has been noticeable in the past two decades that there are a large number of independent Chinese players compared to a limited amount of ‘historical’ western suppliers (less than five, including the Japanese).

With the exception of one, all these western producers have manufacturing capability in China (and India), while all independent eastern manufacturers have focused on their low-cost feature, not investing enough in the development of products and services. Hence, they are currently facing rapidly increasing labour costs and a product that still has to point grossly on price leverage to be successfully marketed.

The result of the changes in the overall market structure of glass and that of refractory manufacturers (particularly electrofused) has increased the need, real or perceived, to procure low-cost refractory materials when planning major reconstruction of glass melting furnaces.

The glass industry has found itself challenged by the reduced capacity of managing refractory orders (as a consequence of the glassworks’ fixed costs reduction) and by the increased level of technical risk associated with low-cost procurement (due to a different level of reliability of products and services provided by the supplier).

In other words, glassmakers face a dilemma between the need to technically control the process of procurement of critical refractory (now more at risk) and the ability to do so by its own means, now significantly reduced.

While the economic benefit related to buying low-cost, even if financially...
significant, does not justify the higher risk of technical accident or even failure (whose consequences can be catastrophic), there is a need to reduce the risk associated with the procurement of low-cost, thereby making the associated financial benefits more acceptable.

Due to limited resources in the glass industry, there is no alternative other than to defer to structures outside the industry capable of providing professional specialist support on the basis of an ‘on demand’ service.

So what are these sensitive points?

Pre-order criticalities

A low-cost procurement requires technical knowledge of the project much deeper than when buying from a traditional western supplier.

Some ‘details’ that are otherwise considered trivial and taken for granted, such as the positioning of casting scars or bottom skirt grinding of sidewall blocks, must be spelled-out to a low-cost manufacturer. This will prevent unpleasant surprises and disputes during the acceptance inspection.

Communication with the supplier is critical due to the language and cultural barriers. Sometimes the deal is conducted through a commercial middleman (representative, retailer, promoter) that can facilitate communication. This absorbs a substantial share of the economic benefit related to the low-cost purchase though.

There are many types of so-called middlemen. These range from purely commercial intermediaries acting as cross-cultural translators but without technical competence, to traditional refractory suppliers already known in the glass market but who do not produce their own fused cast and are capable of providing technical support, but in a conflict of interests.

Then there are preliminary operations of the project normally carried out by traditional suppliers, such as, for example, the subdivision in tiles of a paving and the calculation/distribution of thermal expansion joints which, in case of dealing with alternative suppliers, must be cautiously managed by the glassmaker or by the intermediary, only when specifically competent.

During-order criticalities

There are now more than 20 independent producers in China alone, including at least six companies with export capacity, and a variable level of capabilities. Leaving out the process of selecting the particular supplier, a crucial fact is the negotiation or at least the common understanding of technical specifications, for the refractories to be ordered.

While traditional western suppliers operate on the basis of commonly agreed quality standards, to the point that rarely inspector and supplier check the materials with technical specification books in hand, in the case of procuring low-cost it is recommended that the parameters of quality acceptance (especially for attributes such as cracking, spalls and dimensional tolerances) are made clear not only before the inspection time, but before the order, since these parameters involve evaluations of cost/value of the supply.

This aspect cannot be handled by the buyer alone or with the commercial intermediary, as it requires a specific competence from an entity that operates in the primary interests of the buyer, without conflicts of competence, using knowledge aspects that are typical of the supplier and its process capabilities.

Post-order criticalities

Once a low-cost provider has been chosen, following commercial and technical negotiations on the basis of detailed requests and agreed-upon technical specifications, the order is issued with a technical attachment containing details about what the supplier must provide together with the supply of materials. This generally concerns documentation to be provided before or at the time of inspection of pre-assemblies at the supplier’s premises.

The scope of these requests, as it is for the agreed-upon specifications, is to clarify what the client expects from a supplier, in preparation for technical inspection, thus preventing discrepancies in the inspection process. This is necessary because the emergence of important critical issues can cause long delays in the shipping process, caused by the required corrective actions.

A knowledge of the strengths and weaknesses of specific low-cost suppliers at this stage, acquired through previous experience, is important to continue the process.

The final step of the procurement process is, of course, the technical

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inspection of acceptance ending in a detailed report including a list of the blocks rejected, the list of amendment operations agreed and the relevant timing, for a complete definition of the supply.

This phase is of course highly critical because the materials, once formally accepted by the inspector and inserted in the delivery process, are hardly contestable for qualitative aspects by the purchaser.

All possible qualitative issues, especially those that affect refractory performance, must be reasonably detected and included in the correction process. The capability to discriminate between defects mostly ‘cosmetic’ and mainly ‘functional’ allows a customer to bring the list of rejections and corrections to a reasonably manageable size.

The understanding of the particular low-cost supplier and its specific technical/technological weaknesses allows the inspector to manage the entire testing process (time, cost and effectiveness) in the best way.

The use of specialised inspectors (instead of or as well as the glassmaker’s technical staff) enables access to the necessary know-how, particularly when finalising a low-cost procurement.

Fortunately, professional services are now available for the management of the three critical phases mentioned above, on the basis of ‘on demand’ services that are not going to affect the fixed costs of the glassmaker, and that may be provided for the overall handling of the supply, or for the specific management of individual aspects, such as the technical inspection of the refractories at the supplier’s premises (e.g. in China).

The overall cost of such outsourced services is relatively low compared to the mark-up of a typical commercial intermediary that, when involved in the process of acceptance inspection, cannot do anything but operate in a situation of conflict of interests.

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Reducing the risks

Obviously, each case must be addressed specifically, but, while a commercial intermediary absorbs approximately not less than 5% of the cost of supply, the management of the aspects mentioned above on the basis of the provision of independent services (for the exclusive interest of the client), and in alternative to the use of a commercial intermediary, for a supply of the value of $1 million can represent a cost of about 1% (for inspection only) or about 2% when all critical aspects mentioned above are managed, leaving the glassmaker to predominantly focus on the commercial aspects of the acquisition.

In conclusion, due to the streamlining of the technical overheads of many glassworks due to the prolonged economic crisis, and the frequent recourse to the low-cost procurement of refractories, a conflict has been generated, where new and increased technical skills are required to address a low-cost procurement.

Today ‘on-demand’ resources are available, capable of reducing the level of risk associated with imperfect supplies in terms of products and services, but attractive in economic terms.

Since, in most cases, the assumption of a badly defined level of technical risk in the refractory procurement is not acceptable, the availability of these services provides an injection of know-how necessary to make the low-cost procurement of strategic refractories conveniently accessible.

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