



# Is service a tradition of the past or has it an economic future?

## Customer service through the course of time

### Service is more than customer support

Service- an English word derived from the Latin "Servitium = (slave) service" is synonymous for an extended contribution to the customer. A service, that was provided in addition to the core object of the business relationship and that had a material value in addition to a perceived value. The milkman delivered the product, the milk, to the front door in the morning, the gas station attendant filled the tank, but also checked the oil and cleaned the windshield. This work was valued by customers, mostly paid for and with that, fed families. Some services are currently experiencing a renaissance, such as delivery services, but others have completely disappeared because they have become obsolete, automated, or no longer recognized as such. Others went "digital" and reappeared as "online helpdesk" (without this being a real digitization). Ultimately, it was always "economic" reasoning on the customer or the supplier side

to put an end to services. Holistic considerations beyond pure cash flow can lead to a completely different evaluation, as service in its extended definition is hardly directly quantifiable. In the relationship between the cement industry and the refractory industry, the exchange of experience and the transfer of knowledge plays a special role beyond the basics like engineering and analytical services. This is not about product marketing, but rather about sharing of tested and proven specialist knowledge and experience both internally and externally of a given organization. This has been the claim of the REFRA Academy for over 50 years. The service offerings of the REFRA Academy range from networking platforms to training courses with highly customizable content and delivered through various venues from on site to virtual.



### REFRA Academy – the evolution of a brand

In 1970, almost unnoticed, a small event took place with the objective to enable an open technical exchange between the decision-makers in our customer industries and Refratechnik. This event, later called the REFRA colloquium, quickly reached benchmark status as the meeting point for experts and decision-makers in the industry and adapted its scope and format over the years based on regular evaluations of the events. Spin-off formats were created from



these evaluations, such as REFRA Training International in the 1990s. Ever since, REFRA Training hosted 50 participants from up to 35 nations every year for 11 days at a time and provided them with in-depths insights into refractory technologies, installation technology, but also sustainable networking and deeper professional exchange. Smaller, sometimes very specific formats followed, and one of them, REFRA Training, even went on the road beginning in 2012. It took two 20-foot containers, a lot of ideas, practical solutions, lots of equipment and a team of dedicated supervisors to visit customers who could not manage to come to us. Every event, from the planning stage to the execution, is prepared by a growing team of dedicated employees to ensure that ultimate goal of sharing expert refractory knowledge is accomplished in a safe, efficient, and cooperative manner.

**New customer structures, new generations, new requirements, the same process**

Basic understanding of the value creation offered through a service or a product as prerequisite for negotiations or even decisions is a concept of the past. Globalization, outsourcing, delegation of responsibility in procurement, even outside the company's own corporate structure are the order of the day. Reducing the core value creation process, the production of clinker and cement in large industrial facilities to set of imaginary, economic and technical KPIs, is en vogue, yet very ambitious and success is not guaranteed.

This continuous process with large flows of mass and energy, operating pressures, temperature profiles and with its complex chemical-mineralogic interactions, only runs stable in a very small operating envelope which requires full attention of those

responsible for the production process. Every production unit is unique with its specific input materials and creates a thermal and chemical load profile, that must be fully understood at the time of decision making for the refractory system.

If this prerequisite step does not happen, the kiln operator takes a big chance that the whole thing may "go well". If it fails, not any contract, no matter how detailed, will compensate for the actual damage, not to mention the potential loss of trust and reputation on both ends.

Requested additional services are sometimes very extensive and very often combined with the pronounced desire to



delegate responsibility away from the process operator to refractory supplier. And here, too, additional to the basic requirements of cement technology, there is a clear hierarchy of priorities: Compliance with legal requirements is without alternative, performance-enhancing measures are generally dependent on the required

utilization level of the kiln and subject to the perception the decision maker. Conceptual design, detailed engineering, delivery, construction site logistics and occupational health and safety and IT application and security are largely undisputed. It goes without saying that further requirements like CO<sub>2</sub>-handling (presumably e. g. carbon capture and storage), circular economy, recycling (both for cement involved industries and refractory manufacturers) have to be respected. Everything else is called "hygiene factors" or "goodies" in consultant jargon. The extent and type of additional services is a permanent agenda item during the often lengthy contract negotiations. These additional services are typically supportive to enable a smooth and thus economical process but they are not critical. With the increasing number of lawyers involved, negotiations unfortunately are no longer focused on the offering itself, but on who to blame or who must settle the damage in the event of the failure of any element in the complex supply chain.

**Mutual trust is a prerequisite for successful concepts**

Optimizing a process that already achieved 90% thermal efficiency is very ambitious but improvements of energy efficiency,

carbon footprint or output are still possible and relevant concepts are already on the table.

The whole thing only works as a coordinated effort between the parties involved: rotary kiln operator, equipment supplier and refractory manufacturer. Powerful IT solutions rely on accurate parameters,



representative process data and without them, they cannot produce meaningful runtime or performance forecasts. However, this topic deserves its own consideration, which cannot be dealt with here.

It is indispensable for the success of an optimization project to have respect for the individual contributions of the partners involved, to be open in dealing with the conditions and limitations, and trust in a targeted and careful handling of sensitive information. Only then individual, technical, economic, and ecological solutions can be successfully developed and implemented. Predicting the future or only looking ahead is the expressed objective of operators and refractory manufacturers, and with that, understanding the past is without alternative. Approaches such as "post-mortem" analysis (investigations to determine the causes of wear with the aim of improving the process in the future) help the parties to understand the conditions during service life of a refractory lining from installation to removal. Chemical reaction products, the interplay of the mineral phases, and wear and tear in its various appearances paint a sometimes surprisingly precise picture of the completed kiln run. Anyone who has seriously dealt with clinker microscopy knows this effect when evaluating clinker samples. Raw mix preparation and composition, oxidizing / reducing kiln conditions, burner position, flame shape and pre-cooling zone up to the expected reactivity leave their fingerprint on the clinker morphology and phase formation. In combination with the associated process data and a correspond-

ing post-mortem evaluation, not only a detailed status analysis but also optimization potentials can be obtained.

#### **Digitization - meanwhile everyday life for refractories**

The desire for precise lifetime forecasts quickly emerges to further optimize the burning process and usable lifetime of the refractory lining. Industry 4.0 sends its regards: prompt, digital order processing considering the impact on production, logistics and the installation work directly taken from the lifetime forecast. And no one would welcome that more than the refractory industry. However, this is not yet realistic even in stable, fully transparent processes that are determined by a few parameters. Successful approaches in steel production with relatively precisely defined input materials have been reported for some time. In the more complex systems of the cement industry with fluctuating secondary raw materials and fuels, only a few steps have been made in this direction. But already these small steps towards a trustful cooperation help the operator and the refractory supplier to reach an operational optimum together. Increasingly powerful computing systems allow us to simulate, side by side with brick analysis and evaluation of process data, the development of new assemblies and designs in a virtual environment. Finite element analysis, which can also model complex constructions about their loads in the application, have significantly increased their ability to model realities. In the meantime, we can also offer

virtual tours in real time through complete kiln systems or go on kiln inspections together using data goggles, even if we are thousands of kilometers away from each other. This brings back the original concept of an extended service offering just about at the right time and proves the point, that a successful refractory offering is much more than the exchange of products and data sheets.

#### **Outlook**

Extended services in the refractory sector enables the optimized technical, economic, and ecological production of metallic and non-metallic materials that require high-temperature processes while complying with the comprehensive legal and social requirements.

Evaluations of the wear behavior in combination with new research and development approaches will not only improve the product performance but also help to meet the targets of climate policies. Up-to-date information technologies show a path to Industry 4.0, and possibly even beyond. Training courses tailored to customer needs are essential to meet these ever-increasing requirements. With the implementation of these (service) offers, we can make a future-oriented economic process technology a reality.

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