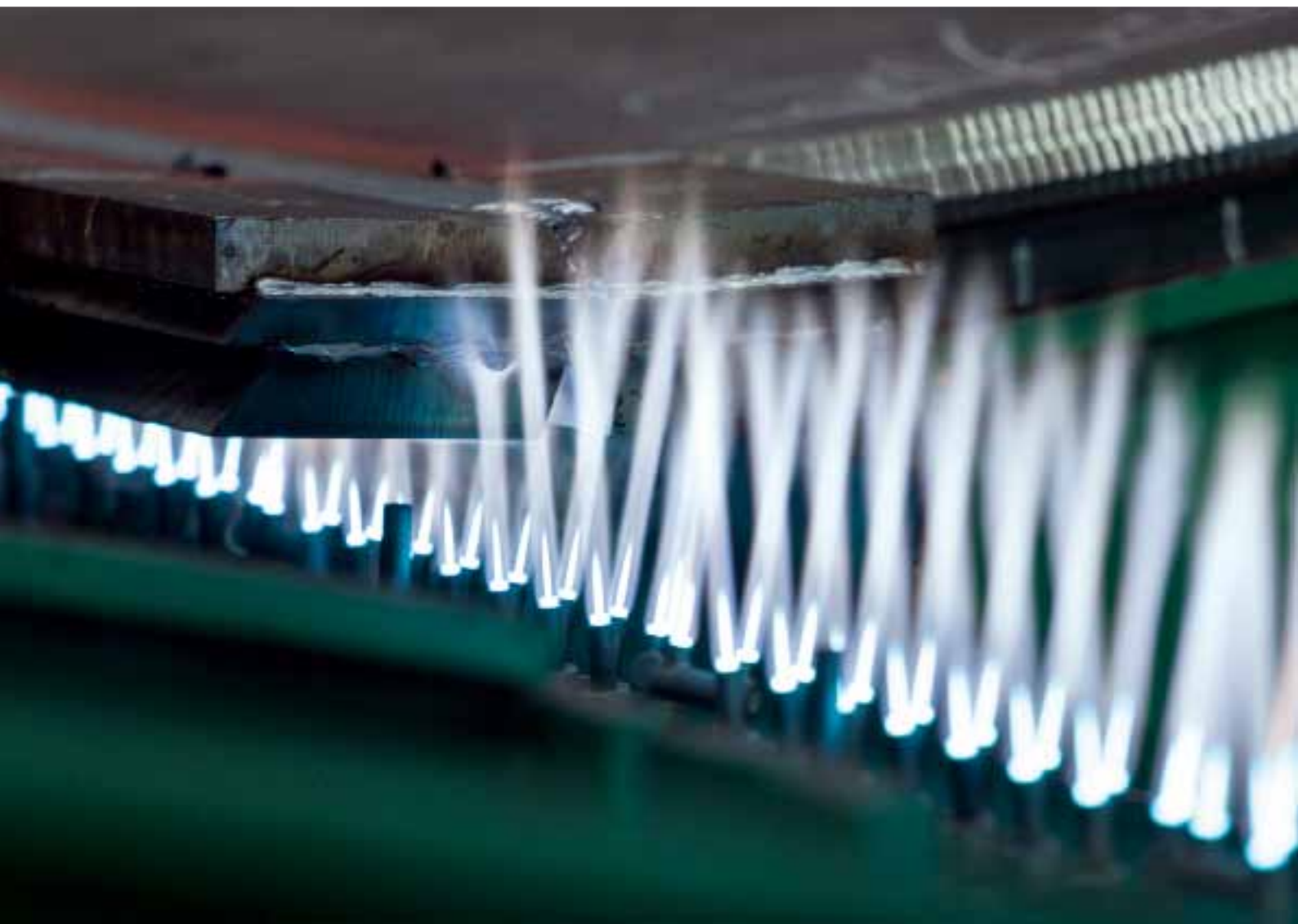


Preheating and postheating.

The perfect treatment for high-strength materials.



Make your material a hard nut to crack. With preheating and postheating solutions from Linde.

The use of high-strength steels is becoming increasingly popular as they offer an increased component performance at reduced weight and cost. However, these materials require special treatment during cutting and welding operations to maintain their material integrity.

Effective methods to avoid defects such as cracking are preheating and postheating, which are recommended and specified by many standards and codes of practice. Preheating is usually applied immediately prior to cutting operations while both preheating and postheating are used for welding.

Preheating is also used for other materials, especially when working with thicker sections. In cutting, for instance, preheating provides additional energy, allowing thicker sections to be cut with better quality.

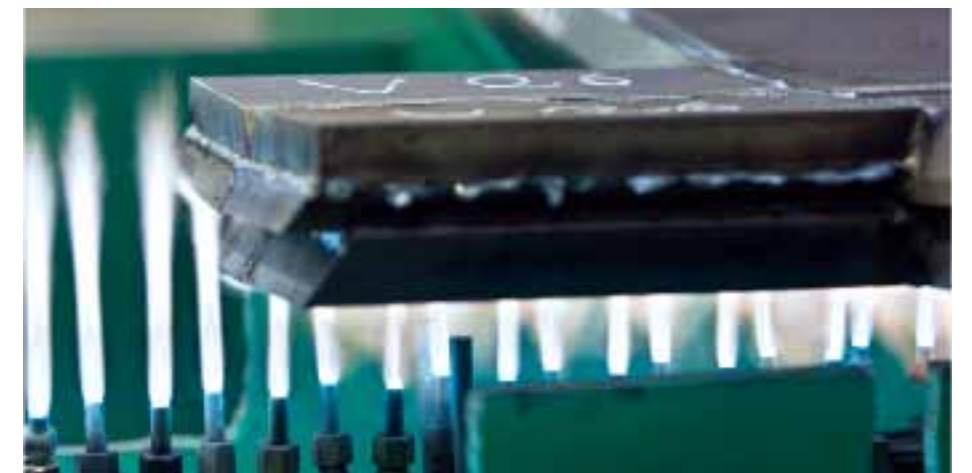
Successful preheating is achieved through precise temperature control and uniform heat distribution throughout the thickness of the material. The preheating temperature depends on the type and thickness of the material, and the subsequent process. Its correct measurement is essential and requires special care.

However, with the wrong gas, equipment or setup, valuable time and money is wasted. It is therefore important to have an experienced and reliable partner who can provide a comprehensive range of products, best-in-class technology and full support from beginning to end.

The complete package. Our full service offer.

If you work with materials that require preheating and/or postheating, Linde can provide you with a solution that perfectly suits your individual specifications.

Furthermore, you can profit from our wide range of services, which will lead you from design to implementation. As our preheating and postheating solutions are part of the extensive LINDOFLAMM® programme, we can offer you anything from manual to fully automated systems, meeting both your cost and performance needs.



Services at a glance

Process solutions

- Gas solutions
- Burner technology
- Automation systems
- Temperature measurement
- Complete design service
- Integration management

Quality and safety services

- Optimisation of burner setup
- Burner maintenance
- Safety audits
- Safety training
- Installation and inspection services
- Dedicated support

Supply solutions

- Supply reliability
- High-quality equipment and installations
- Express and emergency deliveries
- Automatic gas supply

Process know-how

- Application training
- Customer R&D
- Process consulting
- Development of future technologies

Getting into the thick of it. Our programme for high-strength materials.

Gas solutions

The preheating system, both gas and equipment, must be tailored to achieve the desired result for each individual application. For our LINDOFLAMM® solutions, acetylene is used as the fuel gas because it offers many advantages for preheating applications:

- Highest possible oxyfuel temperature
- Fastest heat transfer
- Maximum flexibility – oxygen source can be adjusted to achieve different flame temperatures
- Precise heat distribution
- Low moisture production – no hydrogen cracking
- Reduced oxygen consumption – air (compressed or aspirated) can be used for most preheating applications

Burners

Our LINDOFLAMM® burners are customised to your application, providing you with the optimal setup and consequently minimising your gas consumption, while still achieving the optimal heating performance. For some applications, it is possible to heat in line with the cutting or welding operation. In these cases, the system is designed to heat the workpiece to the desired temperature at a speed matched to that of the corresponding process.

When it comes to automation, you can choose from a broad range of levels, extending from mechanised torches with standard gas control equipment to fully automated torch systems with workpiece temperature control and automated ignition. The appropriate level of automation depends upon the application at hand.



Customer case study: Preheating of special pipes prior to SAW welding

		LPG	Natural gas	Acetylene
Processing duration	min	75	75	30
Fuel gas demand	m ³ /h	9.2	19.4	6.7
Compressed air demand	m ³ /h	–	–	46.9
Total fuel gas consumption	m ³	11.50	24.25	3.36
Total compressed air consumption	m ³	0 (aspirated air)	0 (aspirated air)	23.46
Total gas cost reduction	%	–	60	32
Workplace cost reduction	%	–	0	60
Total cost reduction	%	–	7.54	32
Specifications		Material: S 690, diameter: 3.5 m, thickness: up to 55 mm, length: up to 90 m; rotation speed: 1 m/min; preheating temperature: 150 °C		

Time to get it right. Precise temperature measurement.



The measurement of the actual preheating temperature immediately prior to cutting or welding can be problematic and therefore requires a great deal of care by the operator. Linde offers a number of techniques to optimise temperature measurement including temperature-sensitive crayons and paints, mechanical contact thermometers, thermocouple elements and infrared pyrometers. With the exception of the crayons and paints, all devices give the opportunity to document the measured temperatures for quality control purposes. In order to automate temperature control, LINDOFLAMM® control systems can be integrated with temperature measurement devices.

Through thick and thin. Total support from start to finish.

When working with Linde, you benefit from the process know-how, experience and commitment of our highly qualified experts. Whatever your application, our engineers will work closely with you to come up with a solution that meets your cost and performance needs, and will support you in every phase of a project. Finally, the optimum setup is ensured through correct nozzle selection as well as standoff and flame adjustment, resulting in a uniform and rapid heat transfer.

If you currently use preheating or are considering it for future production, please get in touch with our experts. They will demonstrate to you how the LINDOFLAMM® programme can help you improve productivity and quality with reduced costs.



Getting ahead through innovation.

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages, and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardised as well as customised solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimisation, and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – ideas become solutions.

Für Sie einheitlich erreichbar – bundesweit in Ihrer Nähe.

Vertriebszentren/Kundenservice allgemein

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