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Opening photo: Stûv was established in 1983 in Bois-de-Villers (Belgium) and it has specialised in the design and manufacture of wood, gas, and pellet individual heating solutions.



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A new Pre-treatment System Helps Guarantee Perfect Paint Adhesion on Stûv's High Temperature Stoves

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The charm of a fireside is timeless. Although habits and technologies have evolved and, in many cases, fireplaces and stoves are no longer an actual need, their presence in our homes remains a source of charm, able to create a warm, cosy, and

relaxed atmosphere especially when it is rainy and cold outside. Of great aesthetic value and able to adapt to both rustic and modern-design homes, stoves and fireplaces also maintain a functional value that has evolved over time to embrace environmental

sustainability and superior performance goals. Indeed, they can integrate into already-existing heating systems, act as a source of energy for heating water, or even be used to cook, just like in the past. Stûv (Bois-de-Villers, Belgium) designs,

produces, and sells wood, gas, and pellet individual heating solutions (ref. **Opening photo**) by focussing on high quality, aesthetics, and functionality since 1983, when Benoît Lafontaine and Gérard Pitance established it. The latter was an industrial designer who found no acceptable solution on the market for his projects and, therefore, decided to design, build, and market a stove that still fully represents Stûv's philosophy: combining the pleasure of a fireside with a high-performance heating system, thanks to an enclosed fire device that can also work as an open fire one. In 2000s, they launched Stûv 30, a wood-burning stove with three modes of use, i.e. open fire, glass door, and solid door, which can be switched by simply pivoting the drum (Figs. 1 and 2).



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It represented a revolution for the market as well as the ultimate success of this company. Currently, Stûv has three plants in Belgium (Bois-de-Villers, Thuin, and Floreffe), branches in America, Switzerland, and the United Kingdom, and a global market presence. With the addition of new product types able to reach operating temperatures up to 580 Celsius degrees, however, the need arose for a pre-treatment system guaranteeing perfect paint adhesion. Therefore, Stûv installed a Prometheus nebulisation system supplied by DN Chemicals (Caleppio di Settala, Milan, Italy), a company specialising in the production and distribution of surface treatment chemicals. It uses Dollcoat SA 115, a silane-based nanotechnology solution, for the metal surface conversion phase prior to coating.



Figures 1 and 2: Stûv 30's glass door and solid door options.



Figure 3: DN Chemicals' Prometeus pre-treatment line for the application of nanotech products.

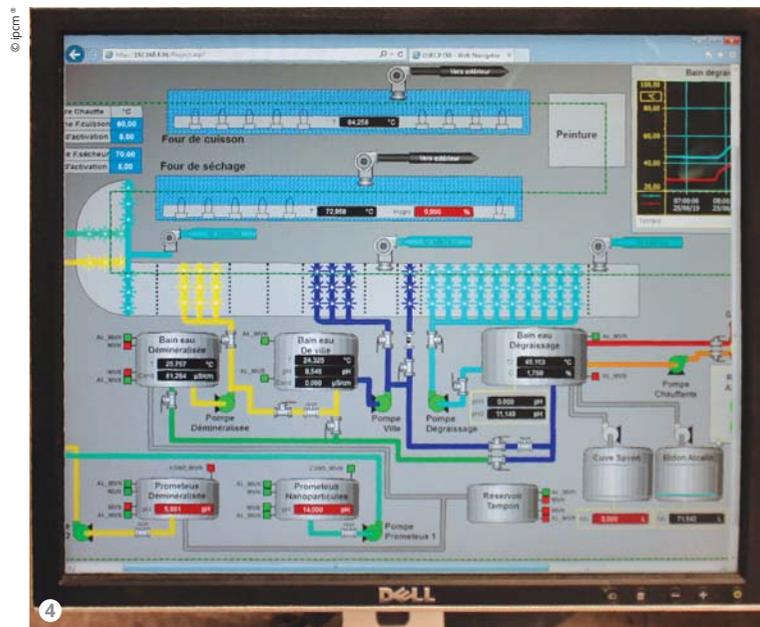


Figure 4: The Prometeus system guarantees continuous process control.

From design to delivery: all-round production to meet every need

“Stûv’s production flow starts with the design phase and it includes the whole metal sheet processing cycle,” explains Production Manager Michel Collignon. “Each plant specialises in a particular phase: the Thuin and Floreffe ones deal with machining, i.e. cutting, folding, and punching, and manufacture accessories. The Bois-de-Villers one, on the other hand, handles the pre-treatment, coating, pre-assembly, and assembly phases, as well as managing the warehouse and dealing with logistics and shipping operations.”

“With the launch of Stûv 30 on the market, our production volumes enjoyed significant growth. We went from producing 7,000 stoves per year to 14,000,” adds Collignon. “We now manufacture about 50 stove types following the make-to-stock method, preparing batches of about 15 products of the same type to guarantee prompt deliveries.”



Figure 5: Manual coating operations.

Problems linked to high operating temperatures

“Quality is Stûv’s priority: that is why we perform tests and checks in each process phase. With the creation of new stove types able to reach very high operating temperatures, however, we had to deal with the issue of paint adhesion. The phosphating product that we used for our pre-treatment process was no longer able to guarantee the necessary adhesion degree, which resulted in several problems in terms of quality and coating durability,” explains Collignon.

Stûv turned to DN chemicals to find the best solution for its new needs. “In collaboration with them, we performed various tests with an alkaline product, obtaining excellent results,” states Michel Collignon. The new pre-treatment process is a spray cycle exploiting the Prometeus system, which is composed of nebulisation modules that optimise the conversion product application (Fig. 3). The cycle includes the following steps: alkaline degreasing with Dollclean AS series products, rinsing with mains water,



Figure 6: The Stûv P-10 pellet stove won the 2016 Red Dot Design Award in the Product Design category.

rinsing with demineralised water, rinsing with osmotised water, and no-rinse conversion with the nebulisation of Dollcoat SA 115, nanotechnological surface conversion with synthetic oligomers obtained from silanes.

“The silane oligomers, which resist temperatures up to 600 °C without deteriorating, guarantee maximum paint adhesion. This treatment solved the coating quality problems we had with the old phosphating product and caused by the high operating temperatures of our stoves,” explains Collignon. “The Prometheus system also guarantees continuous process control (**Fig. 4**) and the possibility to evenly apply an always-fresh product on the whole workpieces’ surfaces, thus reducing consumption and operating costs.” After pre-treatment, the parts are liquid-coated in a manual booth, in order to ensure they are uniformly painted irrespective of their geometry (**Fig. 5**).



Figure 7: From left to right: Stûv Product Manager Michel Collignon and Communication Manager Serge Alhadeff.

A worldwide-recognised aesthetic and quality value

“Functionality, aesthetics, sustainability, and quality are very important factors for Stûv and they have characterised our products since the beginning. They have in fact enabled us to establish ourselves in the international market and even obtain prestigious awards, such as the 2016 Red Dot Design Award assigned to our pellet stove Stûv P-10 in the Product Design category (Fig. 6),” says Communication Manager Serge Alhadeff (Fig. 7). “Our production is controlled at every stage through a 4.0-oriented management system. We especially focus on innovating and providing our



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customers with a reliable service able to meet every need.”

“In our Bois-de-Villers plant, we paint parts for the whole Group. Our Floreffe factory is also equipped with a powder coating system, but this does not achieve the technical and quality degree required by our high-operating temperature stoves, yet. That is why it was crucial to make sure that our pre-treatment plant, and therefore our coating process, could meet all our production needs. We can safely say that our cooperation with DN Chemicals and the installation of the Prometheus line have enabled us to achieve this objective,” states Alhadeff. ○