Valk Welding Group

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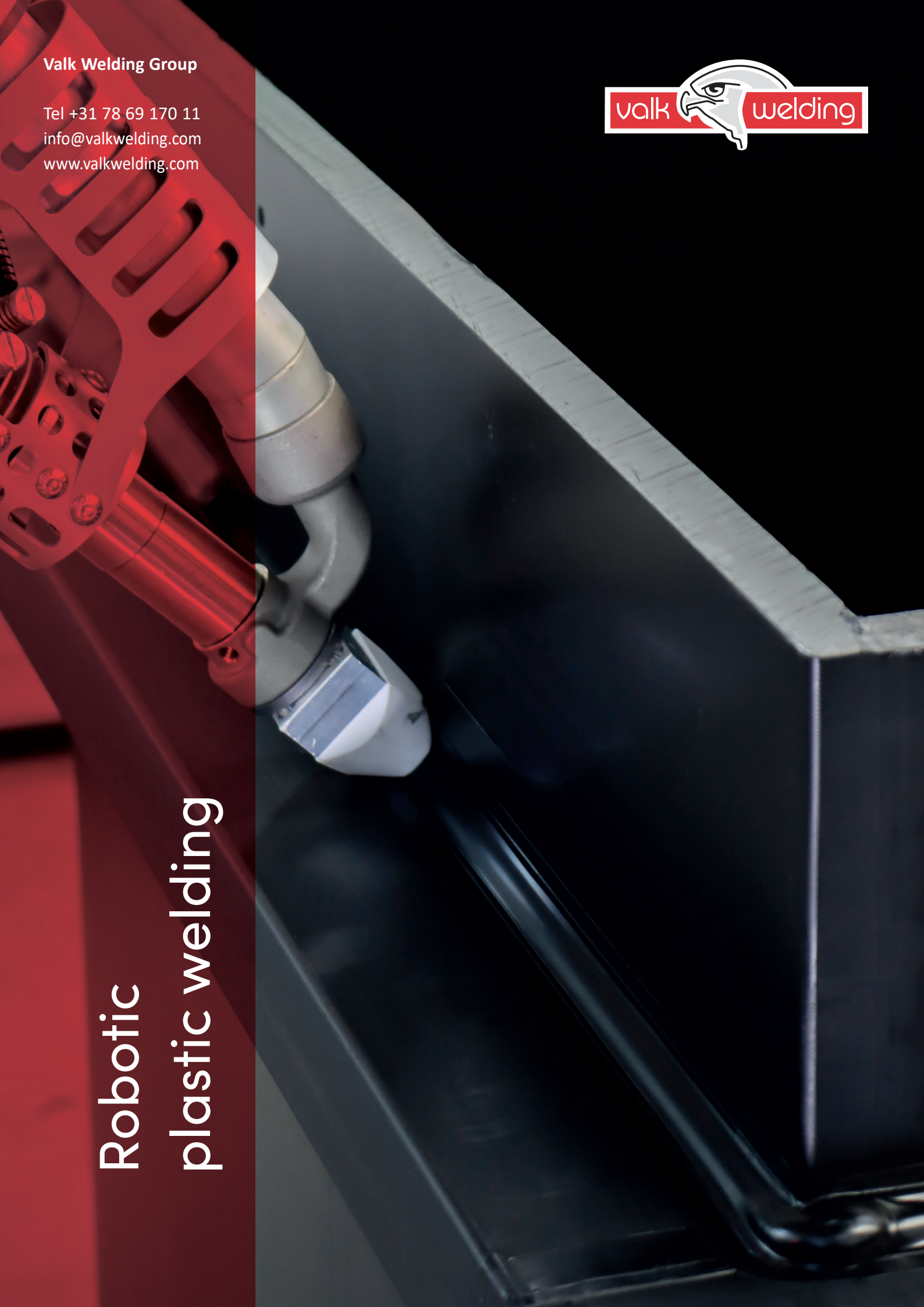
Robotic plastic welding



For many years we have specialized in automating the welding process for the metal industry, in recent years we have used this knowledge to offer a solution that makes automation in the plastic welding industry possible.

Robotic plastic welding

Valk Welding has designed a full-fledged automation solution for plastic welding. The robot is equipped with an industrial plastic welding application, this application speeds up the welding process and can weld with greater precision.

Valk Welding

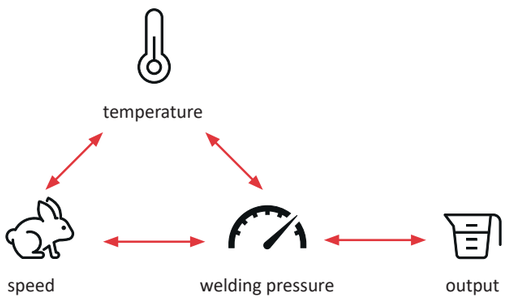
Valk Welding develops and builds turn-key welding robot systems for small to medium production requirements. With the sale and installation of industrial robots and the monthly supply of solid welding wire for the metal industry, we are among the largest independent suppliers in Europe. From our headquarters in the Netherlands and our own facilities in France, the Czech Republic, Germany and Denmark, we serve the entire European industry with local demonstrations, sales, distribution, training and service facilities. For many years we have specialized in automating the welding process for the metal industry, in recent years we have used this knowledge to offer a solution what makes automation in the plastic welding industry possible.

We think with you, so that together we can achieve the best result. We supply all-in-one welding robot systems, but above all we offer solutions! Everything from one source and the ideal total solution for your company.

Valk Welding makes use of the Panasonic welding robots. Panasonic is the only robot manufacturer that focuses entirely on welding robots and produces all components in-house. This ensures that the various components are optimally geared to each other. Think of the robot arm, robot controller, online and offline programming software, manipulators and peripherals. This also offers advantages for the welding of plastics.

Why automate?

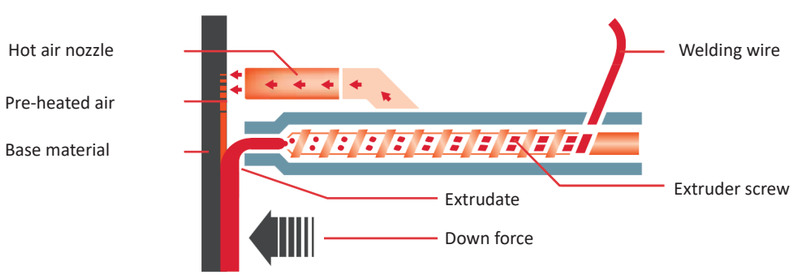
- Shortage of skilled workers
- Welding plastic manually is ergonomically demanding and stressful work
- The robot works accurately, quickly and continuously
- Easily deliver both large and small series of products with fewer deviations compared to manual welding
- Possibility of various options associated with welding with an industrial robot.

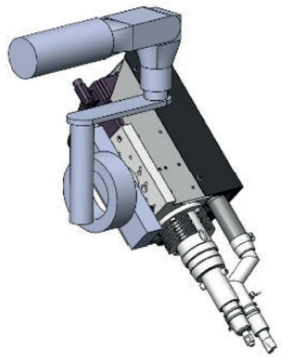


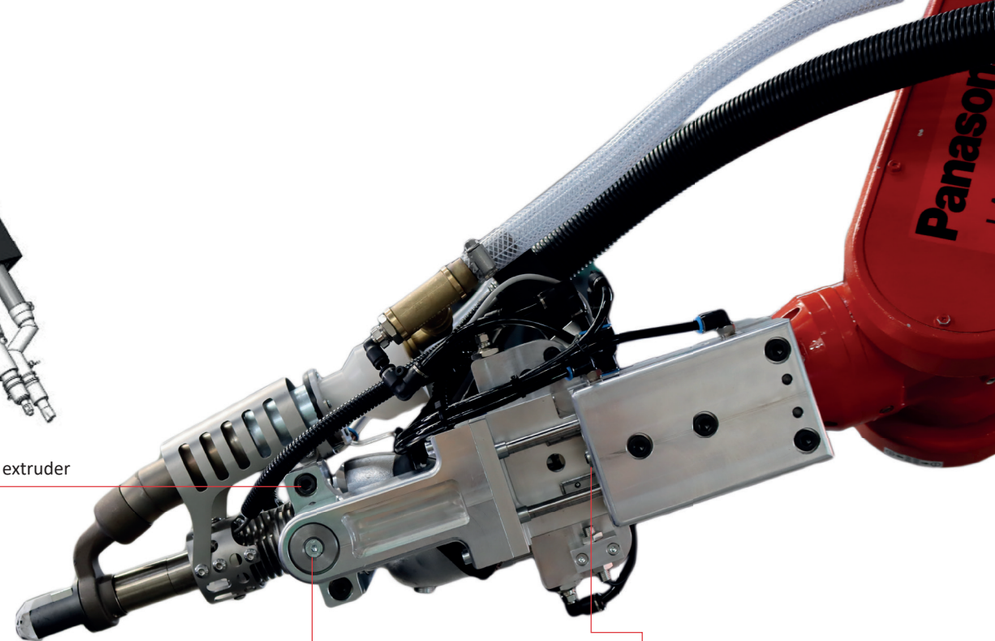
The process principle

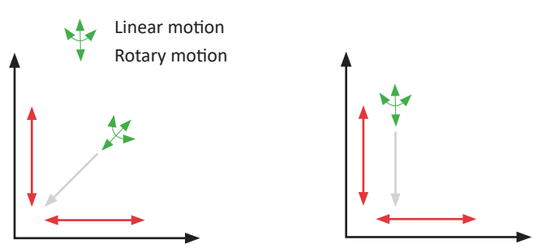
A good plastic weld depends on three variables: temperature, speed and welding pressure. Combined, these are the key factors for a thorough plastic welding.

Robotic plastic welding uses a brushless extrusion welding machine specifically designed for robotic use. In extrusion welding, the material is preheated with hot air and joined by adding the ground and plasticized welding wire.





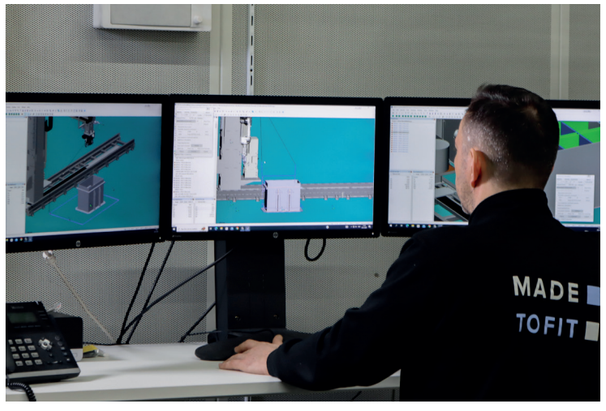




Toolholder

To create a good strong weld, both the base material and the extrudate must be at the right temperature. The speed at which the weld is applied and thus the robot arm moves is important. As is the correct pressure with which the weld is pressed against the base material. Especially with a changing welding direction, it used to be a challenge to maintain the correct welding pressure. With the Valk Welding tool holder, the welding robot can accommodate distance changes in two directions through a linear carriage and a pivot. These are both pneumatically controlled so that a constant welding pressure is realized. The hot air, amount of material and welding speed are independently adjustable, making it possible to weld corners without the risk of burning the base material or depositing to much material.

Valk Welding has worked out this concept in different tool holders. Each tool holder works according to the same concept, but the exact tool holder depends on your product, the welding work the robot will weld, your installation and the desired extruder. We will put together the right tool holder in consultation with you so that an optimal result is achieved.



Possibilities industrial robot

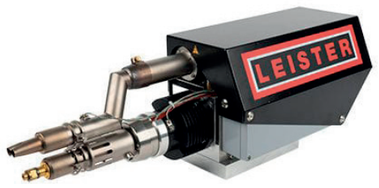
When using an industrial robot installation, there are more options and possibilities that make the process more efficient and precise. For example, it is possible to apply tactile sensing, also known as Touch Sensing. With Touch Sensing, the robotic system will perform a number of search movements before the welding process begins. This allows the robot to sense whether the product is in the right place and positioned correctly. The robot calculates any shift and/or rotation relative to the original reference point within the program. The robot can then execute the program perfectly, compensating for any shift and/or rotation. When welding an inside corner, it is possible to follow the seam by using the guides on the holder. The weld seam is followed mechanically with the welding shoe. Different welding shoes can be used for different welds.

It is also possible to program your products with the offline programming software DTPS (Desktop Programming and Simulation Software). DTPS is a full-fledged 3D CAD/CAM system for programming and simulating the welding path on Panasonic welding robots. The offline programming software replaces programming with a teach pendant directly to the robot. This eliminates the need to interrupt production for programming and maximizes the duty cycle of the welding robot systems.

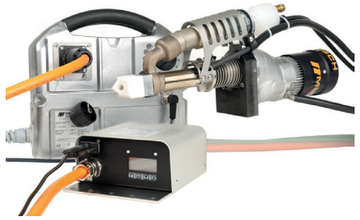
Extruders

Robotic plastic welding uses a carbon brushless extrusion welding machine specifically designed for robotic use. There are several suppliers of these extrusion welding machines on the market. Valk Welding has experience with three brands: Leister, Munsch and Dohle. We take into account your possible preferences for type of extruder, but we can also advise you on the most suitable extruder for your welding process.

Brand, type	Welding wire with maximum output	Extruder Weight	Air conduction	Preheat module	Air supply type
Leister 200-i	Ø 3 mm - 0,1-1,4 kg/h Ø 4 mm - 0,1-2,0 kg/h	15 kg	External	Internal	External - (compressed air)
Leister 600-i	Ø 4 mm - 0,1-4,0 kg/h Ø 5 mm - 0,1-6,0 kg/h	22 kg	External	Internal	External - (compressed air)
Leister 610-i	Ø 4 mm - 0,1-4,0 kg/h Ø 5 mm - 0,1-6,0 kg/h	22 kg	External	Internal	External - (compressed air)
Munsch MEK-25-ROB	Ø 3 mm - 1,7 kg/h Ø 4 mm - 2,5 kg/h	4,5 kg	Internal	Internal	External - (compressed air/ blower)
Munsch MEK-40 -B-ROB	Ø 4 mm - 3,1 kg/h Ø 5 mm - 4,0 kg/h	5,5 kg	Internal	Internal	External - (compressed air/ blower)
Munsch MEK-65-B-ROB	Ø 4 mm - 5,0 kg/h Ø 5 mm - 6,5 kg/h	6,9 kg	Internal	Internal	External - (compressed air/ blower)
Dohle Robot 0,4	Ø 4 mm - 0,1 - 0,4 kg/h	2,2 kg	Internal/ external	Internal	External - (blower)
Dohle Robot 0,8	Ø 4 mm - 0,1 - 0,8 kg/h	6,3 kg	Internal/ external	Internal	External - (blower)



Leister



Munsch

Dohle

See here several videos from practice

The strong connection

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