



Vsystem

COMPANY PROFILE





CONTENTS

- Company main features
- Integrated supply chain
- Technologies overview
- Additional services
- Client portfolio



COMPANY HISTORY

V System s.r.l. was founded in *2013* thanks to the commitment of *Veca S.p.A.*, who is the majority shareholder, with the intention to extend its long-term experience in manufacturing of machined components for motorsport also in the exhaust systems field.

The factory is situated in *Fiorano Modenese*, near the homonymous test circuit, and includes a covered area of 850 m² for the production site, 300 m² for offices and a climate-controlled inspection room. The wide spaces, dedicated to production and services, have been conceived in order to allow any possible future enlargements and rational handling of raw materials and finished products across the manufacturing site.





CORE BUSINESS

The core business of V System is the manufacture of *motorsport components* made of *Ni and Ti special alloys*. The parts are obtained by plastic forming (mainly tube bending and hydroforming) and assembled by welding.

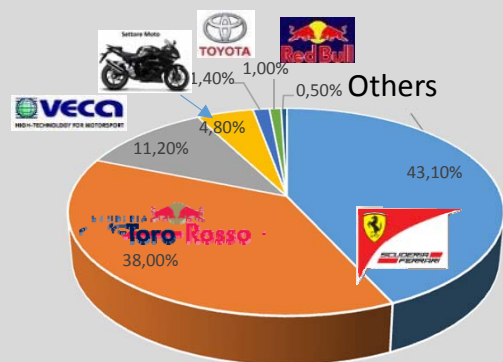
The type of products that are currently provided by the Company to its *F1 customers* are:

- Exhaust systems dyno testing
- Exhaust systems for race applications
- Titanium tail pipes
- Turbocharger assemblies
- Different components & prototypes for dyno testing
- Hydroformed pipes

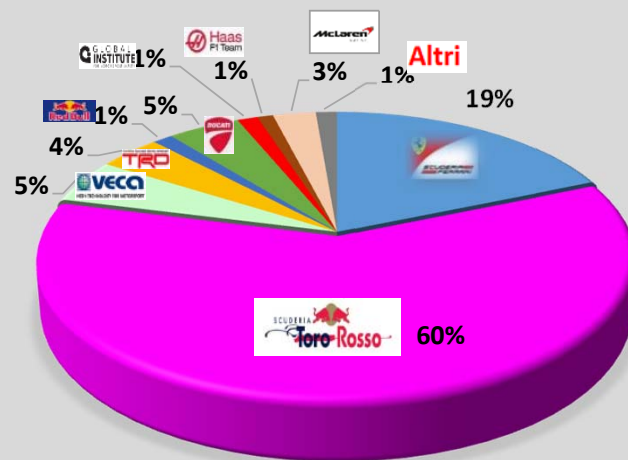




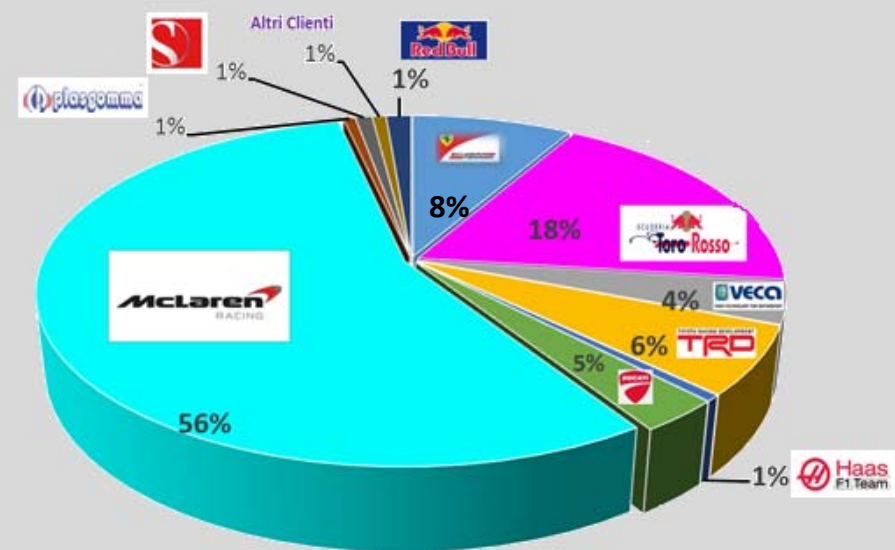
CLIENTS PORTFOLIO



Year 2016



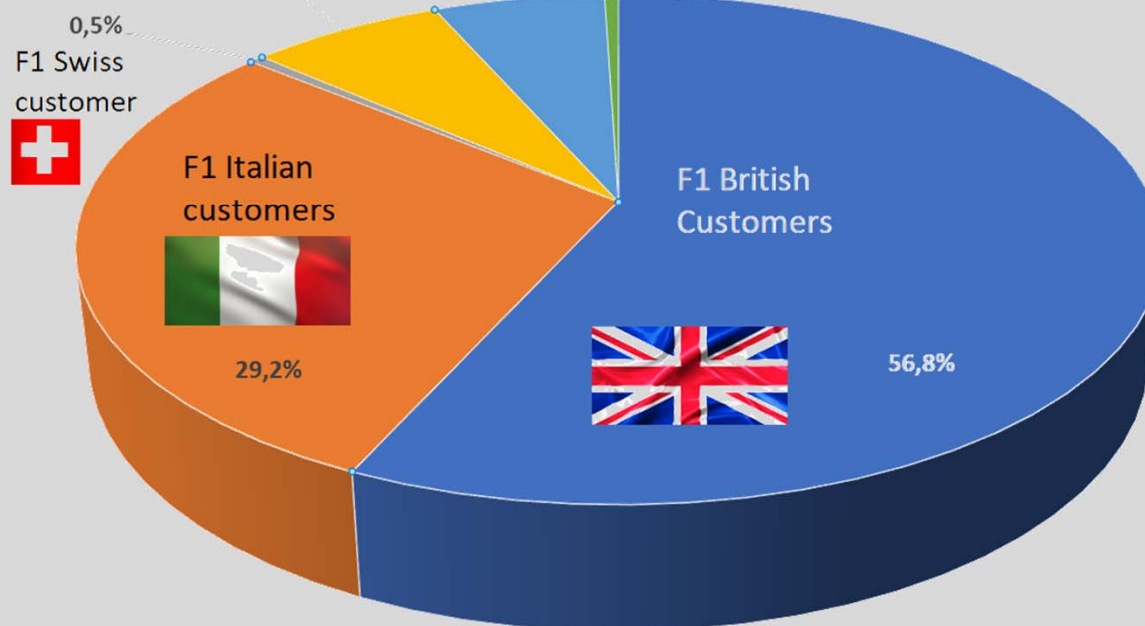
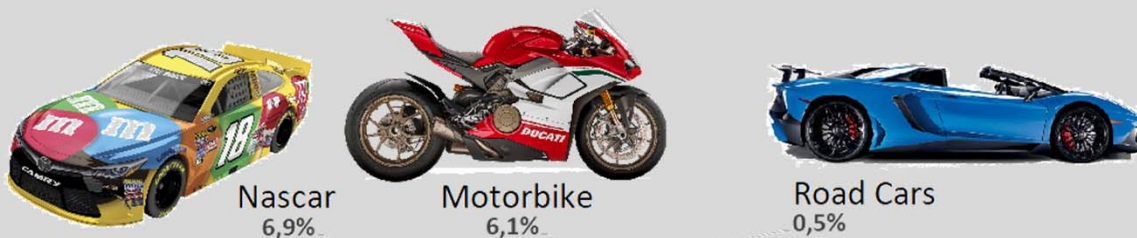
Year 2017



Year 2018



CLIENTS PORTFOLIO



Year 2018



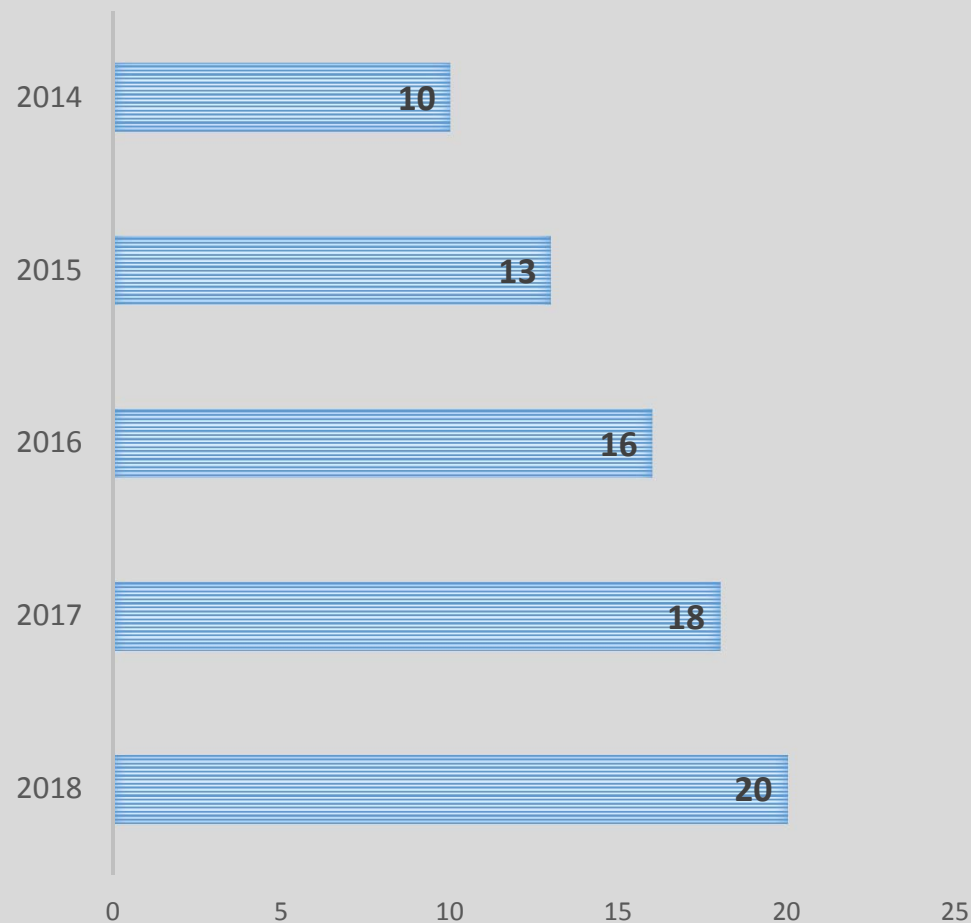
TURNOVER TREND



V System's turnover and profits are *increasing* every year, allowing the company to grow and constantly *expand its business*



WORKFORCE



Between 2014 and 2018, V System has effectively *doubled* the number of its employees. Since last year we have increased resources within the welding department and also in the field of quality control and dimensional testing.

Currently we employ *20 people* across the company.





INTEGRATED SUPPLY NETWORK

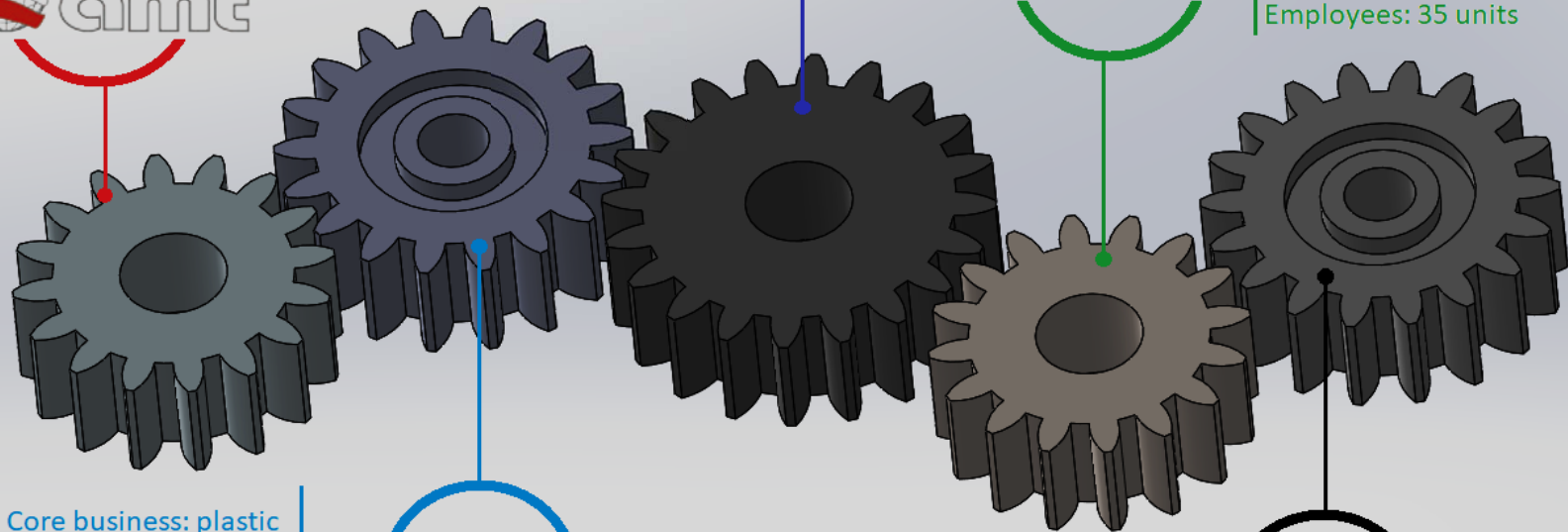
Core Business: additive
manufacturing & HT
Turnover: 2.000.000
Employees: 4 units



Business: CNC machining
Turnover: 30.000.000 €
Employees: 95 units



Business: CNC machining
Turnover: 8.500.000 €
Employees: 35 units



Core business: plastic
forming and welding
Turnover: 6.000.000 €
Employees: 20 units



Business: grinding
Turnover: 2.500.000 €
Employees: 15 units

*THE
STRENGTH
OF A TEAM
AT YOUR
DISPOSAL!*



OUR EXPERTISES

PARTS MANUFACTURING



Machining



Additive
manufacturing

METAL FORMING & WELDING



Tube bending



Hydroforming



Welding

DIMENSIONAL CHECKING



CMM
measurements



Optical
measurements &
Reverse engineering

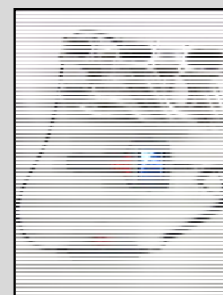
NDT



MT inspection



PT inspection



VT inspection

VACUUM HT & LABORATORY



Vacuum units



Laboratory
examinations



SHORT LEAD TIMES

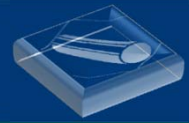
Our Company is flexible and skilled in *prototypes* manufacturing and tools development. On average, we are able to develop a functional proto exhaust system from approved CAD geometry with a lead time between *four and five weeks time*.





TECHNOLOGIES OVERVIEW



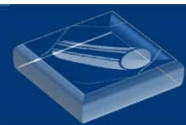


TUBE BENDING

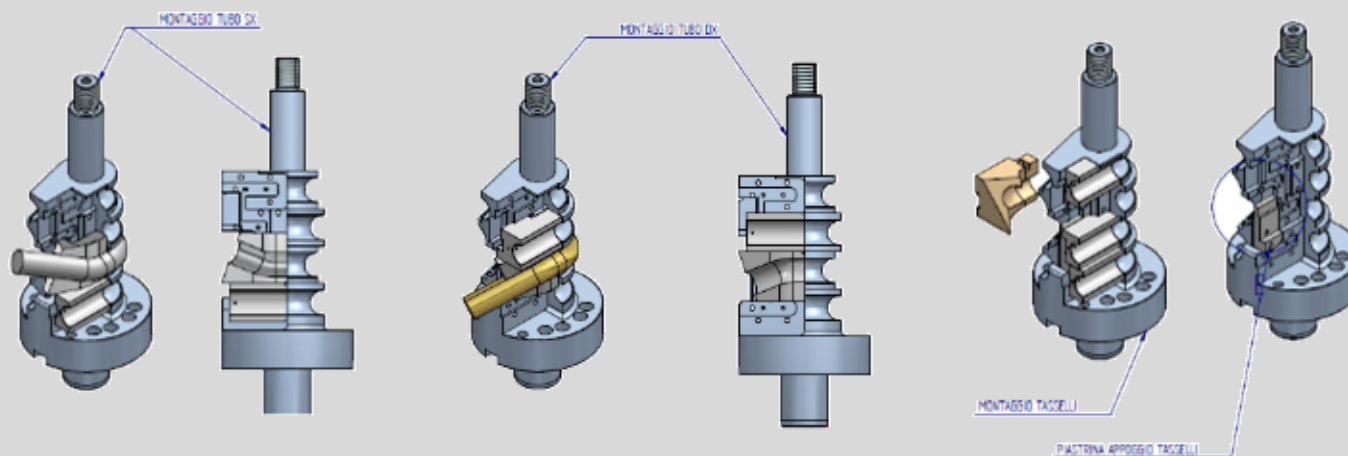


The company owns the equipment for the production of small and medium-sized batches of pipes by using *rolling technology*. We are also specialized in thin-walled pipe bending (0.7 to 1.2 mm) performed on exotic materials such as nickel and titanium alloys.

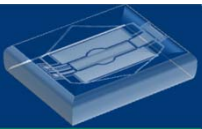
Pipe bending is carried out by using the latest *tube-bending* machinery with 9 electric axes CNC controlled. This machine, equipped with appropriate tools developed by our R&D department, allows manufacturing complex parts with a mean *radius/diameter ratio equal to 1:1* and no straight parts between the curves. The maximum bendable outer diameter is currently 97 mm.



BENDING TOOLS



- Bending tools with *customized shape* for production of curved *pipes without straight part* between two curves
- Wide range of universal bending tools in the *diameter range 22 – 97 mm* ($\approx 1'' - 3.75''$)
- Ability in bending thin wall pipes with ratio $Rm/D = 0,9 - 1,2$



HYDROFORMING

Hydroforming is a manufacturing technology which allows to obtain pipes shaping (at room temperature) by using *high-pressure water*. This method enables manufacturing of closed sections with *non-uniform cross-sectional areas* along the pipe axis by using a circular tube as input material.

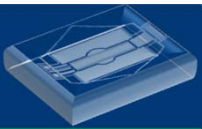
Hydroforming is a technological solution that can be widely applied for developing pipes requiring complex geometry, tight tolerances, and lightweight.

The hydroforming press installed at V system plant has the following features:

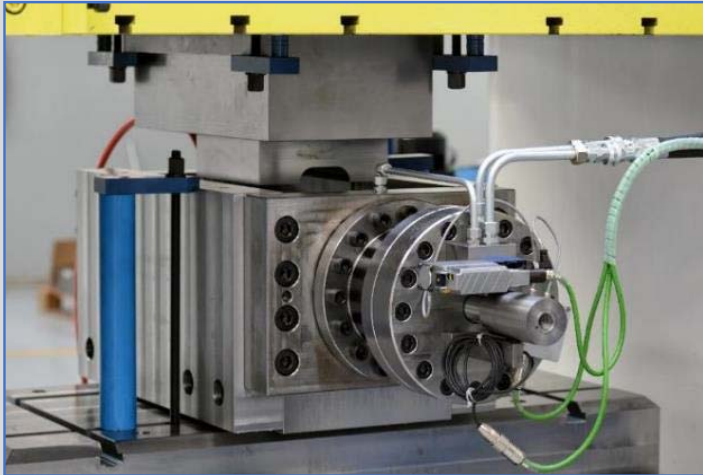
- Water injection pressure up to *2.300 bar*
- Maximum closing force equal to *1.000 tons*

We are also able to help our customer with the components co-design, as well as the development and manufacturing of the hydroforming tooling.





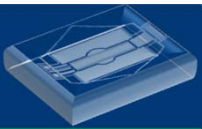
HYDROFORMING FEATURES



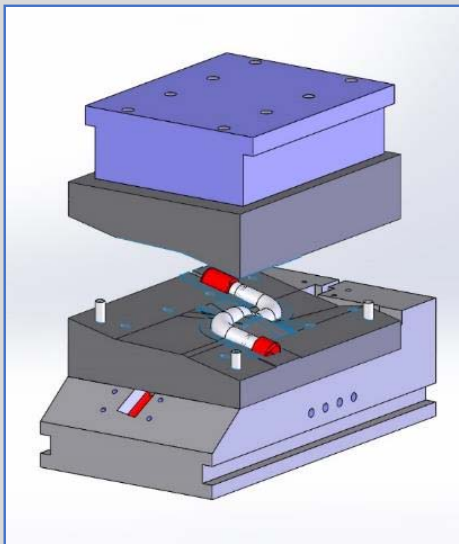
Basic *technical specifications* of our hydroforming press:

- Maximum closing load = 1.000 tons ($2,2 \times 10^6$ lb)
- Total height from the floor = 5.700 mm (225 inch)
- Tool base max. dimensions: 1.800 x 1.400 mm (71x55 inches)
- Tool max height: ~ 900 mm (35,5 inch)
- Hydraulic manifold with Rextroth gear pump
- Water injection system with two pressure levels (I1=500 bar, I2=2300 bar)





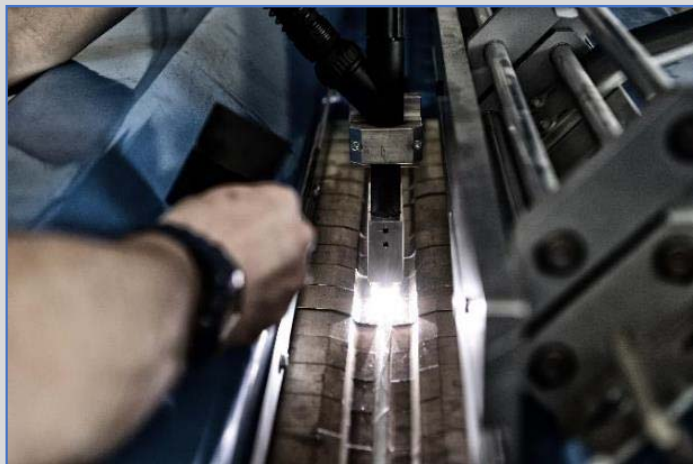
HYDROFORMING TOOLS



- Developing and manufacturing of *hydroforming tools* (with dedicated tool holders)
- Production of *hydroformed parts* in stainless steel, nickel and titanium alloys



GTAW WELDING



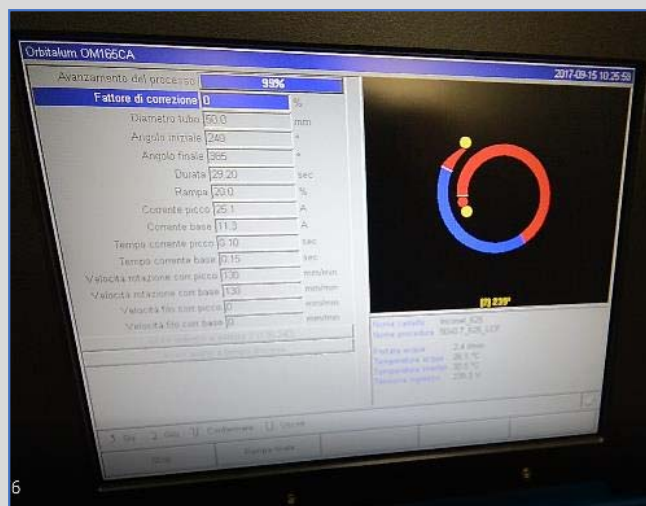
Our staff has many years of experience in welding by using *GTAW technology* and all the welders own the EN license for welding *Ti and Ni alloys*. We perform *manual and semi-automatic welding* of stainless steels, aluminum and magnesium alloys, titanium and nickel alloys. We are also experts in design and manufacturing of welding jigs and fixtures required for the component's assembly.



ORBITAL WELDING

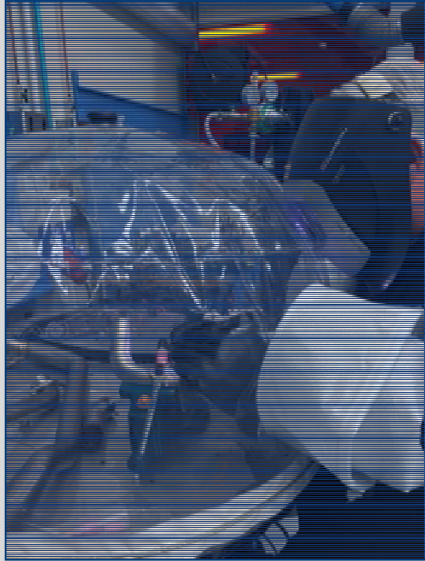
During 2017 V System acquired a new *automatic orbital welding system*. This equipment allows us to increase productivity and improve the quality level of the welded *butt joints*.

Orbital welding is a rapid technology, easily repeatable, all the welding parameters are recorded and can be provided to the customer, if required.





INERT ATMOSPHERE WELDING DEPT.



In the case of welding *highly-reactive alloys*, such as titanium, we are able to weld the joints using *inert atmosphere cabinets*, which prevent oxidation and discoloration in the welded area.

We have one metallic welding chamber with a fixed volume and one inflatable flexible chamber with variable volume, which can be used depending on the applications and dimensions of the parts.

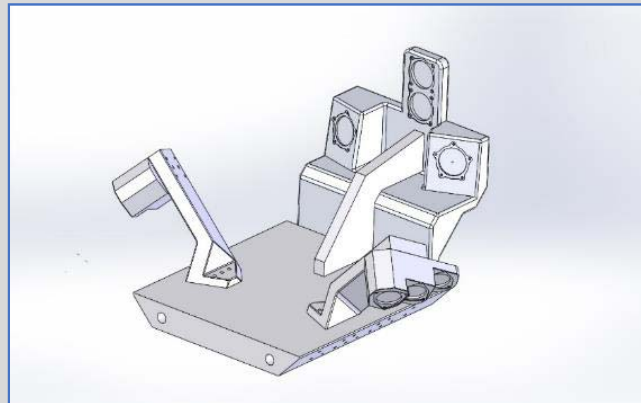
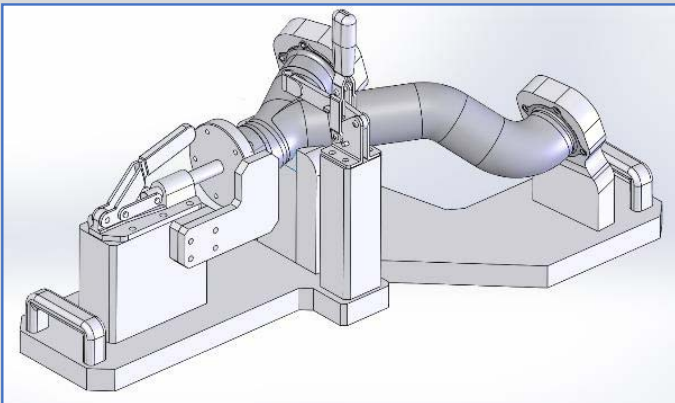
The controlled atmosphere used in the chambers can be pure argon or a mixture of argon/helium and we are able to control and certify the quality of the inert gases using an *oxygen analyzer*.

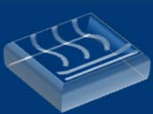




WELDING JIGS DEVELOPMENT

V System is committed to being an efficient and *reliable partner* to its Customers, taking part in the process development from the early stages of the projects, and also providing *ideas and solutions for jigs* and tools manufacturing.





THERMAL INSULATION DEVELOPMENT

Upon the Client's request, we are able to produce and apply different kind of thermal insulations to our components (wrapped to the parts or removable ones).

Our thermal protections are developed using *silica based ceramic papers* and tissues of different thicknesses.

The outer shells can be made of stainless steel, Inconel 625 or titanium alloys.

Should the usage of microporous material be requested, V System has a consolidated *partnership* with the company *Esterline Darchem* located in UK who is a specialist in providing these types of insulations.



HIGH PERFORMANCE MATERIALS



- Consolidated experience in *plastic forming* of different materials, like Ti and Ni based alloys
- Wide *stock* of coiled materials and thin tubes in:
 - * Inconel 625 LCF[®]
(Th. 0,5 – 0,6 - 0,7 – 0,8 – 0,9 – 1 – 1,2 – 1,27 – 1,5 – 2 mm)
 - * Inconel 718 (Th. 0,7 – 1 mm)
 - * Kobe Steel Ti 1,2 ASN-EX[®] (Th. 0,7 – 0,9 – 1 – 1,2 mm)
 - * Timetal Exhaust XT[®] (Th. 0,65 mm)
 - * Nippon Steel 10CuNb[®] (Th. 0,6 mm)
 - * CP Ti Grade 2 (Th. 0,5 mm)
- We can perform a wide variety of *heat treatments* in two vacuum units belonging to our partner AMT



RAW MATERIALS & PARTS TRACEABILITY

In 2017 we installed a fully automated *warehouse system*. The new warehouse, which is linked to our ERP software, tells us in real time the stock levels of raw materials. This allows us to forecast and program future purchases as well as guaranteeing our customers full *traceability* of the batches used for our production.

With regards to tracing components coming from external suppliers, as cnc/dmls parts belonging to our welded assemblies, we created a dedicated *storehouse* where we can upload-download all incoming part numbers, by using *barcode labels*.

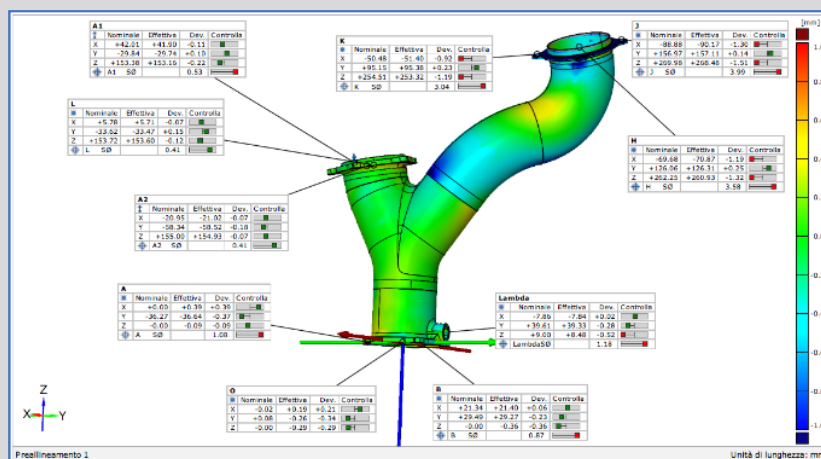




DIMENSIONAL CONTROLS



In order to ensure the highest quality and precision of our manufactured products, the Company has a *climate-controlled inspection room* where a 3D optical scanning system has been installed. This device, which works by using *interference fringes* technology, allows making dimensional inspections as well as *reverse engineering* activities for obtaining mathematical reference models.





HALO PROJECT DEVELOPMENT

In the second half of 2017, V System managed to become an official supplier for the F1 safety protection component *HALO III - B* in accordance with the *FIA standard 8869-2018*





NDT INSPECTIONS



In our factory a *penetrant liquid inspection* line is installed. The inspection technique used is *water washable fluorescent* PT and we inspect the welded junctions of our components with 100% frequency.

Nr. 3 V System employees own the certification for PT inspection according to EN ISO 9712 standard (II level)

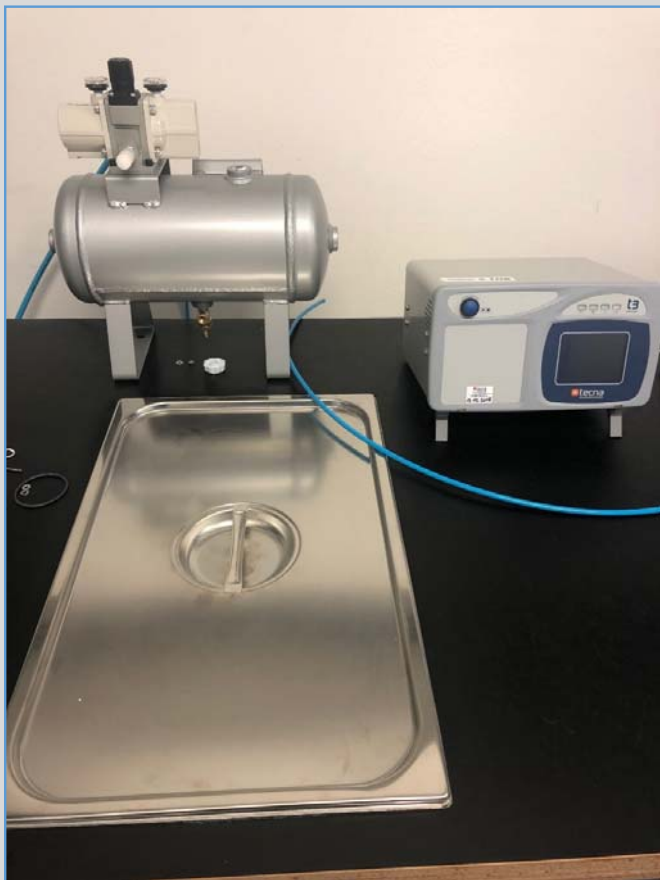


V System can also perform on its own products accurate *visual inspections*, with both direct and remote techniques. We can inspect welds and detect surface imperfections on inner and outer sides, also by using a *video endoscope*.

Nr. 2 V System employees own the certification for VT inspection according to EN ISO 9712 standard (II level).



PRESSURE TEST



We recently installed in the company a fully equipped *pressure test bench*. The equipment can perform pressure test up to 20 bar and determining the effective leakage rate of the components.

In our R&D office we also able to develop and manufacture the *sealing caps* needed for the trials.

METALLURGICAL LABORATORY



In V System a fully equipped *metallurgical laboratory* is available, where we can perform sample preparation for *micrographic & macrographic inspections* of our components.

In detail we own the following equipment:

- Precision cut-off machine
- Hot mounting press
- Automatic grinding/polishing machine
- Stereo Microscope
- Optical Microscope
- Micro hardness Vickers tester





WELDING PROCEDURE SPECIFICATIONS

Vsystem HYDROFORMING TECHNOLOGY		WELDING PROCEDURE SPECIFICATION (WPS)		WPS n°: NI_002
				Data: 10/07/2014
				Revisione: 00
Cliente:	Ferrari S.p.A.	Codice parte:	610-380924 (sistema HYD)	
Compilato:	Jonas Anzani	Approvato:	Giacini Silvia	
Saldatura:	TIG (141)	Tipologia saldatura:	X Manuale <input type="checkbox"/> Automatica	
CARATTERISTICHE DEL GIUNTO				
Tipologia giunzione:	Testa a testa			
N° passate:	1			
Distanza lembi:	0 (mm)			
Smusso:	Non presente			
Supporto rovescio:	<input type="checkbox"/> si <input checked="" type="checkbox"/> no			
Penetrazione 100%:	X si <input type="checkbox"/> no			
MATERIALE DI BASE (QW-403)				
Lembo n°1		Lembo n°2		
Tipologia materiale:	Inconel 625 LCF - Tubo (Gr. 43)	Tipologia materiale:	Inconel 625 LCF - Tubo (Gr. 43)	
Spessore:	0,8 (mm)	Spessore:	0,8 (mm)	
Stato fornitura:	Laminato a freddo	Stato fornitura:	Laminato a freddo	
METALLO DI APPORTO (QW-404)				
Tipologia materiale:	nessuno - sald. per fusione	Riferimento AWS:		
Dimensione filo:	(mm)	Produttore filo:		
FLUSSO DI PROTEZIONE (QW-408)				
Tipologia gas:	Argon 100%	Portata Gas:	12-14 (l/min)	
Riferimento EN 439:	1 (l/min)	Gas a rovescio:	<input checked="" type="checkbox"/> si <input type="checkbox"/> no	
PARAMETRI ELETTRICI DEL GENERATORE				
Corrente:	X CC <input type="checkbox"/> AC <input type="checkbox"/> Pulse	Programma:	Nessuno	
Intensità corrente:	15 ± 1,5 (A)	Tensione:	Sinergico (11,4 V) (V)	
Frequenza:	0 (Hz)	Brandamento:	Non presente (Hz)	
Dimensione elettrodo:	ø1,6 (mm)	Tipologia elettrodo:	Toriated WT20 (rosso)	
PARAMETRI AUTOMAZIONE				
Automazione lineare <input type="checkbox"/>		Automazione circolare <input type="checkbox"/>		
Velocità traslazione:	(mm/sec)	Velocità di rotazione:	(giri/min)	
Lunghezza:	(mm)	Dimensione in rotaz.:	(mm)	
PRERISCALDO (QW-406)		POST TRATTAMENTO (QW-407)		
Temperatura:	Nessuna (°C)	Temperatura:	Solubilizzazione 1300 (°C)	
Tempo:	(min)	Tempo:	40 (min)	

Thanks to our metallurgical laboratory and to the recording equipment connected to welding generators, we are able to provide Clients with the *Welding Procedure Standard (WPS)* for every welded joint.





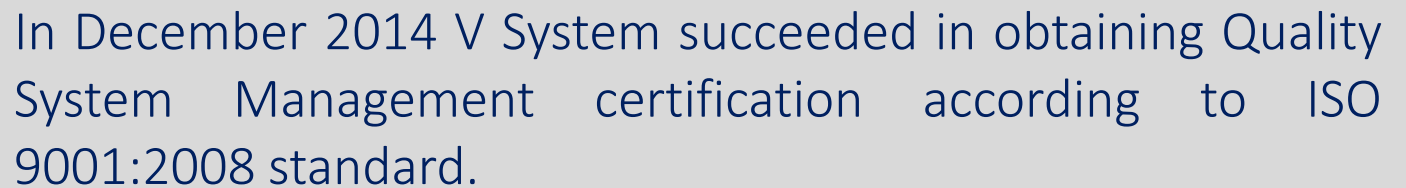
UK VAT POSITION



In order to manage all the transactions between V System and British clients, we have opened our own *VAT position in the UK* with the aim of dealing with customs procedures and VAT refunds as effectively as possible for both parties.

VAT IDENTIFICATION Nr. : GB 306743215





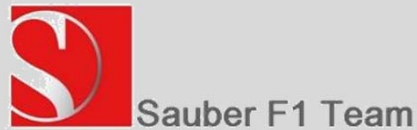
In November 2017 we updated our certification with the *new* Quality System Management standard *ISO 9001:2015*.

In both cases, the certification committee chosen as controller was «*Det Norske Veritas Italia s.r.l.*» (DNV).





OUR REFERENCES





V system

V System s.r.l.

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