

# Metal Processing Industry (Automotive components industry)

## Introduction

The manufacturing of basic metals and fabricated metal goods has a long tradition in Croatia. Much of the basic metals industry is owned by state funds and banks, whereas private ownership dominates in the manufacture of fabricated metal products. Domestic companies' financial potential in this branch is limited, increased foreign investment of all types is both needed and expected. There are four machine engineering and three electrical engineering faculties in Croatia which are (colleges) annually producing some 1.000 graduates in the fields of engineering and information technology. Supported by the technology centres of the engineering faculties at the Universities of Zagreb, Rijeka and Split, these experts have the opportunity to develop attractive, entrepreneurial focused manufacturing programmes. The number



of companies possessing ISO 9000 certificates is growing, which is one of the conditions for co-operation and export to industrially developed countries, and also for establishing subcontractor and strategic partnership, especially with domestic manufacturers of machines and equipment. Companies, which produce machines, appliances and vehicles, actively participate every year in many specialized fairs within Zagreb Fair. The Croatian Chamber of Economics organises national joint attendance of their members on both domestic and international fairs depending on the interest of their members. Prior to Croatian independence Zadar with its companies SAS and

BAGAT stood out in this sector on the level of former Yugoslavia. These companies employed a large number of people and operated with customers from Germany to Russia. |

## Key success factors for automotive component suppliers

The relationship between OEMs (Original equipment manufacturers) and suppliers has undergone a fundamental change since the 1980s. As carmakers expect their suppliers to take on significant responsibility for the design, development and manufacture of entire modules and systems, the ability to increase the sales and profitability of component manufacturers crucially depends on the following key success factors: quality levels, innovation, product design and production engineering capabilities, management of their own supply chain, and the ability to deliver on time.

### a. Higher quality levels

With the increasing importance of just-in-time production and delivery systems, assemblers have embraced the principle of “quality at source”. They therefore impose strict quality requirements on their suppliers. Besides carrying out firm-specific audits, carmakers expect their suppliers (especially first and second tier suppliers) to be certified for at least the general ISO 9001 standard, and increasingly the industry specific ISO/TS 16949 standard. In addition, the increasingly more stringent environmental regulations being imposed on the automotive industry foster the importance of ISO 14001, the environmental management system (EMS) standard. Implementing the latter also allows component suppliers (especially SMEs) to reap substantial benefits in terms of cost reduction, stemming from savings in consumption of energy and materials and lower distribution costs, among others.

### **b. Upgraded innovation and design and development capabilities**

Early involvement of the suppliers in new product design is the current predominant model for OEM-supplier relations in terms of product development and vehicle innovation. This model originated in the Japanese automotive industry and was then widely adopted by US and European carmakers. It allows reducing stocks and achieving more on-time deliveries. OEMs and first tier suppliers carry out detailed enquiries to assess the design and development capabilities of their potential suppliers, including: number and qualifications of employees involved in design and development; number of CAD (computed aided design) stations at the supplier’s premises; use of testing, calibration and prototyping tools, such as FMEA technology; adoption and knowledge of design software specific to the automotive industry, such as CATIA. Another criterion on which part suppliers are evaluated by potential customers is their collaboration with organisations active in research and innovation, such as universities and research institutes. Often the number of designs and patents registered is also taken into account.

### **c. More robust supply chain management and ability to deliver on time**

The traditional customer-supplier relationship was based on a division of tasks, whereby the OEM would fully develop the product and then ask suppliers identified through an auction to manufacture a certain number of components at a negotiated price. Suppliers’ involvement in the development of components has fundamentally changed this relationship, which has evolved from being based on purely commercial terms to a potential long-term partnership involving the exchange of projects and designs, demand planning and forecasting, on-line cataloguing and data integration. This results in the following additional requirements for suppliers:

1. Implementation of electronic data interchange (EDI) systems (e.g. Odette, the standard most widely used in the automotive industry);
2. Adoption of enterprise resource planning (ERP) systems, which results in shortened cycle times through the optimisation of joint production planning and delivery processes;
3. Increased participation in on-line procurement initiatives through specialised B2B portals: E-business activities include requests for bids/proposals, reverse auctions, sending/receiving of interoperable CAD files, joint product design, and maintenance of a common database.

## **Reasons for investing in the automotive components industry of Zadar County**

### **1. Vicinity of EU countries**

Significant advantage Croatia, and Zadar County is the vicinity of the EU market, especially compared to Asian countries. Relative vicinity to the automotive factories in the EU-15 countries, good geographic position and intensive investments in modernisation of infrastructure offers domestic producers a great initial advantage. Apart from lower transportation costs, vicinity to the customers lately became increasingly important, because of the focus on synchronous delivery of parts to customers, according to their daily needs in order to decrease, as much as possible, the storage costs before vehicle assembly.

### **2. Quality of domestic suppliers is on the level of European Standards**

Majority of domestic suppliers hold all necessary certificates, primarily ISO 9001, but also, more and more the TS16949 certificate. Quality of the products meets high standards set in the automotive industry, which is proven by the fact that most part of the production is exported to the European Union markets. Quality is on the European level, and at the same time labour costs are lower than in countries of Western Europe, which creates a significant comparative advantage for Croatia.

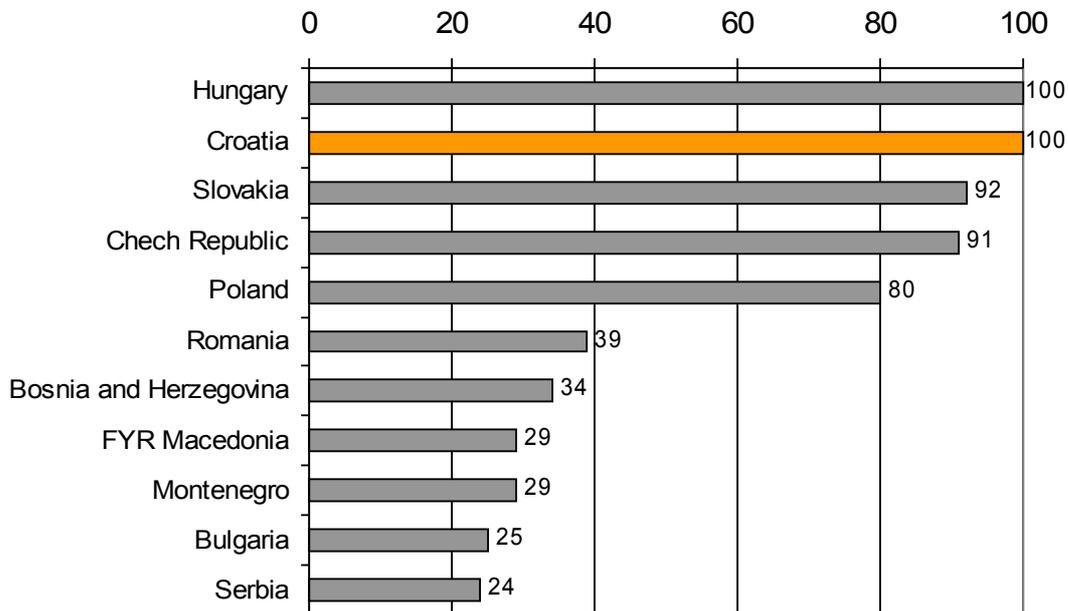
### **3. Strong cooperation of Croatian producers with clients in the area of research, design and planning of new products**

Numerous Croatian companies have successfully developed new product lines or services, or upgraded existing ones in past years. Use of AutoCAD and other software for design and development of components is relatively spread in comparison to the situation in other countries of the region. According to an OECD study, numerous Croatian suppliers in part already cooperate with their clients in areas which demand deep, stable and medium to long term business relations, such as product development, product design and production planning. They did it on the level which is almost without competition in other parts of the region. In addition, majority of the companies use web sites for communication with their clients and regularly participate in on-line public procurement. All these elements indicate existence of relatively deep and strong relationships between local suppliers and international clients.

### **4. Competitive costs and workforce productivity**

Republic of Croatia is still a country with competitive costs compared to EU countries, on the other hand the workforce productivity in Croatia is higher than in most countries of Middle and Eastern Europe, which is presented in the following graph.

Table1: Labour productivity in the manufacturing industry, 2004 (indexed on Hungary's productivity level)



Source: OECD analysis based on Eurostat, National offices of statistics

## 5. Skilled workforce

Important advantage is the quality and availability of highly skilled workforce, or engineers.

Table 2: Students who graduated at engineering faculties' 2005.-2009.

	2005.	2006.	2007.	2008.	2009.
Faculty of Mechanical Engineering, Slavonski Brod	31	31	43	33	66
Faculty of Mechanical Engineering and Naval Architecture, Zagreb	93	106	157	317	377
Faculty of Engineering, Rijeka	59	81	88	139	198
Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Split	145	131	182	304	362
Faculty of Electrical Engineering, Osijek	51	83	77	218	257
Faculty of Electrical Engineering and Computing, Zagreb	413	466	456	875	1137

Source: Central Bureau of Statistics, Higher education, 2009.

## 6. State support to the development of automotive industry

Although state subsidies are time limited, since it is the case of direct sectoral state subsidies to producers, they largely contribute to technological modernisation and competitiveness of companies operating in Republic of Croatia. CBRD (Croatian Bank for Reconstruction and Development) loans, also improve availability of funds intended for acquiring working capital at favourable terms. RC has a proactive approach to realisation of FDI in automotive industry, which include not only fiscal incentives, but, also, access to industrial zones and speeding up the procedure of acquiring necessary licenses.

## 7. Possibilities for connections with producers in other countries

Good geographic position and globalisation of the automotive production opens for producers in Croatia possibilities to connect with companies in surrounding countries

which have significant capacities for production of automotive parts, especially Austria, Hungary, Italy, Slovenia and Romania. Examples of cross border cooperation already exist, and further possibilities exist for creation of international clusters with producers in Member states and candidate countries. In spite of a high level of industrial rivalry on the international level, current trends in automotive industry force producers to intensify mutual cooperation.

### **8. Strong tradition**

Historically speaking the automotive industry was always strongly present in the area of ex Yugoslavia. One of the main heritages from the industry of automotive parts in this area is the high level of automotive specific training and strong base of skills, including skills which are tightly connected with the production of automotive parts, for example metal processing industry, welding, plastic products production, electric equipment production, machine engineering, production of high precision components. Zadar has a rich and long tradition in the metal processing industry. Before Croatian independence, Zadar companies SAS and BAGAT stood out especially, employing a large number of people and dealing with clients from Germany to Russia. Foreign investors who are already present in the region covered by the OECD study pointed out that the presence of quality skills connected to the automotive industry, in comparison with the situation in other emerging markets, was decisive when they decided for the region.

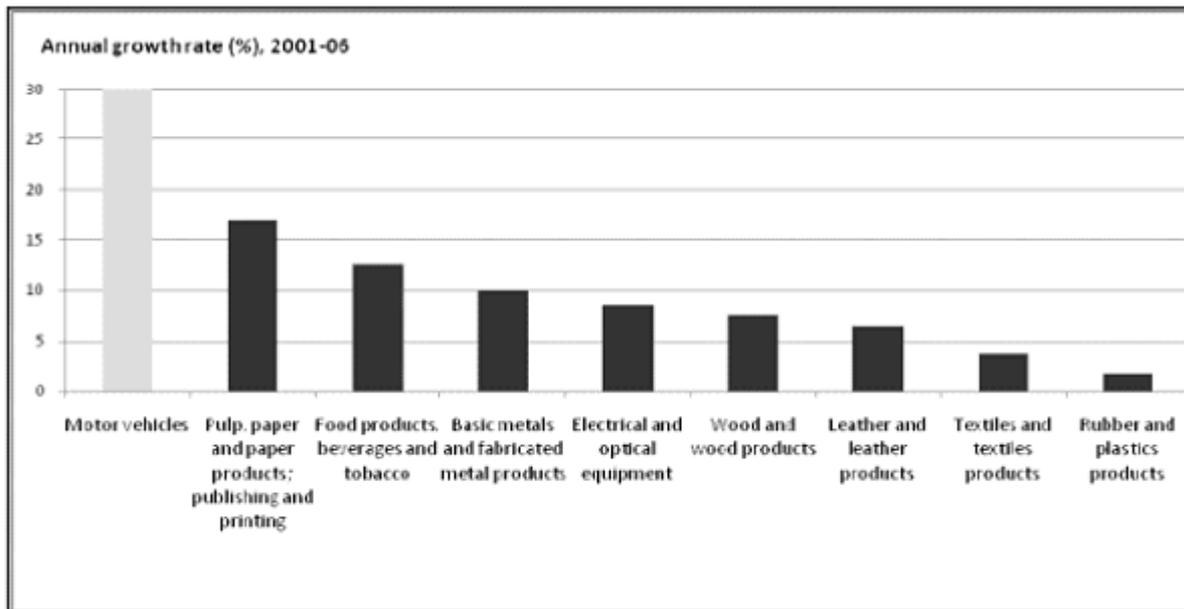
### **Organisation for Economic Co-operation and Development (OECD) on competitiveness of Croatia in the automotive parts industry**

According to the OECD study «Sector Specific Sources of Competitiveness in the Western Balkans» operative costs of the automotive parts industry in the countries of the Western Balkans are 60% of the level of same costs in Poland and Hungary. Sector of automotive parts in average grew by 13% in the period 2004-05 in the entire region. Suppliers of automotive parts in countries of the Western Balkans stand relatively well, even when compared to the countries of Middle and Eastern Europe.

Production of automotive parts in Croatia generates growth of added values. Annual growth rate was 30% for the period 2001 - 2006, and it surpassed the growth of any other sector of production for several percent (graph below). Sector is greatly export oriented: 62% of revenue from sales in 2006. was realised through export. From 2002 to 2007. export of automotive parts grew by annual rate of 16%.

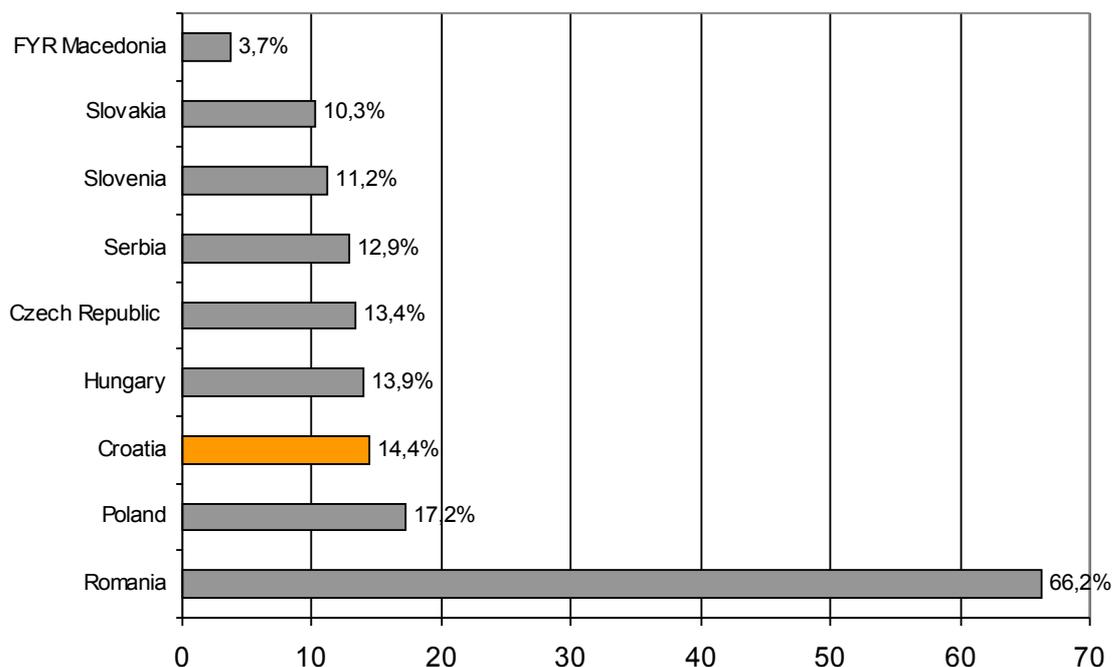


Table 3: Annual value-added growth in the manufacturing sector, 2001-06



Source: OECD analysis based on data from the Central Bureau of Statistics of the Republic of Croatia (2007)

Table 4: Growth in sales by automotive suppliers per country (2004-05)



Source: Roland Berger (2007)

### Salaries in processing industry

Amount of the average monthly salary in the industry sector of the Zadar County for first nine months in 2010 was on the level of the entire sector - 532 EUR, and in processing industry 537 EUR, which is approximately on the level or slightly above the average of the economy (533 EUR).

## The Zadar automotive cluster

Upon the initiative of Zadra Ltd., Development Agency of the Zadar County, the Zadar automotive cluster was established (ZAK) with a goal of improving the position on the market and achieve competitive advantage through networking and contacts. The aim is to establish a firm basis of quality producers that will by connecting with numerous subcontractors become the backbone of development of our County. The final goal is to create a technology park in the business zone Crno which covers over 4,000,000 m<sup>2</sup> and is ideally geo-strategically positioned. Twenty new companies will be subcontractors in the cluster. They will develop following the mentorship principle based on mentor company competences. ZAK will function as:

- Horizontal cluster: founders on the same level in the chain of creating added value
- Regional cluster: partners in the economic sector of the County;
- Professional cluster: specialised field of activities - automotive industry and accessories for automotive industry.



Founders of the Zadar automotive cluster:

LTH Metal Cast L.t.d. Benkovac  
SAS - STROJOGRADNJA L.t.d. Zadar  
HSTEC p.l.c.  
Zadra l.t.d.



## AD klaster - Cluster of automotive parts manufacturers

Cluster of automotive parts manufacturers is a voluntary, non-profit, professional association of producers of parts, accessories, tools and equipment for the automotive industry. The founders of the Cluster are members of the Croatian Association of Automotive Parts Manufacturers at the Industry sector of the Croatian chamber of economy. The Association works in close collaboration with the Government bodies of the Republic of Croatia as well as scientific and professional institutions.

# ADKLASTER



The Association works in close collaboration with the Government bodies of the Republic of Croatia as well as scientific and professional institutions.

AD Klaster members are leading Croatian companies in the manufacture of parts for accessories and equipment for the automobile industry as well as scientific and professional institutions. Member companies manufacture for renowned world automobile suppliers (Renault, Peugeot, Mercedes, Volkswagen, BMW, etc.). Apart from the manufacturers the members of the Cluster are the Croatian Chamber of Economy,

the Faculty of Mechanical Engineering and Naval Architecture, the Faculty of Chemical Engineering and Technology.

The mission of AD Klaster is sustainable support to its members in business and development in the field of auto industry. The Cluster will constantly work on the raising of value-added products of the members. The Cluster's work will be directed towards the use of know-how in the development of new products, new services and new systematic solutions for existing and new markets. The vision of AD Klaster in the next three years is assembling all relevant companies in auto industry in order to increase innovation and competitiveness.

#### Members:

AD Plastik d.d., Solin  
LTH Metal Cast d.o.o., Benkovac  
HSTEC d.d., Zadar  
Feroimpex automobilska tehnika d.o.o., Zagreb  
CIMOS - P.P.C. Buzet, Buzet  
IVANAL d.o.o., Šibenik  
SAINT JEAN INDUSTRIES d.o.o., Slavonski Brod  
TM d.o.o., Čakovec  
Croatian chamber of economy, Zagreb  
Faculty of mechanical engineering and naval architecture, Zagreb  
Faculty of chemical engineering and technology, Zagreb

#### AD klaster

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#### Key Companies

##### LTH Metal Cast L.t.d.

LTH Metal Cast in Croatia was founded in 1980 and joined the LTH Castings Group in 1999. After resuming the production in the early 90s, the company focus was predominantly raw part production. Today, using the advantages of a traditional industrial environment and the Group's synergies LTH Metal cast offers a wide range

of machining and is the LTH Castings's group most "lean" site. Using fully automated casting machines, machining centres and dedicated machines the facility typically manufactures aluminium anti-vibration and breaking system components as well as water and vacuum pump housings for the automotive industry. Using lean structures, the site can be particularly cost efficient with high volume production

LTH Metal Cast L.t.d.

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Web: <http://www.utlth-ol.si/>

### **SAS Strojogradnja Ltd.**

SAS Machine Tools Company was founded in 1961. Today it is a very successful member of the RIKO group. Production programme of SAS Machine Tools Company:

- Special machine tools
- Machining centres
- Flexible manufacturing systems and lines
- Transport and manipulating equipment

Application area: high series production in automotive industries, precision mechanics industry, house appliances industry, agricultural machines industry, aircraft industry, etc.

Market and references: Germany, USA, Belgium, China, Mexico, ex-USSR, ex-Czechoslovakia, Poland, Romania, etc. In total 1500 different special machine tools and lines have been designed and produced up to now (2002).

Property: a factory with total area of 29.000 m<sup>2</sup>, 75% of which is air-conditioned. SAS facilities cover all kinds of machining (more than 150 machine tools, 55 of which CNC), heat-treatment, coating, painting.

The internal organization of the company is based on the principles of minimum mediators to the executor- worker/machine. Design and production processes include the application of CAD-CAM systems and company's own production is based on high productivity of CNC machine tools and production systems.

SAS Strojogradnja d.o.o.

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### **HSTEC p.l.c.**

Hstec (formerly SAS-HSTEC d.d.) was founded in the year 1997 for development, design and production of high speed precision motor spindles, direct drives and other high speed technology, as well as for



engineering, design and automation of special machine tools and systems. The project of establishing such new company was realized in cooperation with the company SAS Zadar, well-known in the field of production of special machine tools and the German company INDRAMAT, a world famous company in the production of electric drives and control systems. Since founding the company HSTEC has developed a wide range of motor spindles and electric drives for direct application in machining centres and machine tools. A flexible team

of highly skilled mechanical and electrical engineers with great working experience in



development, design and production of special machine tools, and implementation of industrial robots offers optimum solutions in industrial automation. HSTEC's R&D team is focused on individualized production offering development, design, calculations and optimization, production and assembly of machine tool components according to customer requirements. High standard of product quality control continues after the product has been sold, managing the product's life-cycle.

HSTEC p.l.c.

High speed Technique

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### **Aluflexpack L.t.d.**

ALUFLEXPACK is a Croatian company founded in June 2001 as successor of former Folijaplast founded in October 1981, with head office in Zadar, 23000, Murvica bb. AFP has two production plants Umag and Zadar

and employs 400 people and they are using the most modern technologies for printing, lacquering, extruding and laminating. Our main activity is flexible packaging and conversion of aluminium foil and flexible films. The plant in Zadar is specialized for the aluminium program – UV flexo, conventional flexo and is orientated towards dairy and pharmaceutical industry. We are ISO 9001:2000 certified. The laboratories of Aluflexpack are equipped with most sophisticated devices and instruments and we are working in four shifts as well as the production in order to guarantee a 24 hours quality control. All our suppliers are certified. Quality control is divided in quality control of raw material, process of quality control and quality control of the final products. HACCP – Certification process were completed by end of 2006. About 60 % of the final products we are exporting to EU and Eastern Europe countries and all countries of former Yugoslavia. The other 40 % pertain to local market. Our biggest clients are companies as FERRERO GROUP, BAVARIA, BAUER, STORK etc. On domestic market as reference we can mention FRANK, KRAŠ, PODRAVKA, LURA, LEDO, PLIVA etc.

Purchase Department

(under Management Board authority)

Aluflexpack d.o.o.

Murvica bb, 23000 ZADAR

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e-mail: [afp@afp.hr](mailto:afp@afp.hr)

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### **Nauta Lamjana p.l.c.**

Nauta Lamjana shipyard offers an extensive service to mariners and owners of all types of yachts and sail or motor boats as well as commercial vessels. Our company joins together our tradition (since 1898), existing infrastructure, equipment and know-how in ship repair with the global trends of sustainable development, ecological consciousness and responsibility to our ideal geographic position and beautiful untouched natural surroundings. We aim to provide a full service, to become your base and home port where you will be able to solve all matters related to the logistics and maintenance of your vessel at a convenient price, the services done in a quality and professional way so that your vessel is at all times safe and trustworthy at sea. Nauta Lamjana d.d. is a company that disposes of complete technology and manpower for the repair of ships up to 300 GRT and other vessels. The shipyard extends on the area of 190,000 m<sup>2</sup>, a half has been used for the ship repair works. Our long time partners know us as reliable ship repairers in all situations where urgent or scheduled works were required, capable to perform various fittings and services and works of maintenance and conversions, and to organize dry-docking for their ships.



Nauta Lamjana d.d.

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### **Salaries in processing industry**

The average monthly payroll in the industry sector in Zadar County for first nine months in 2010 amounts to 3,935 HRK, and in processing industry 3,976 HRK, which is approximately equal or slightly higher than the average salary in Croatia (3,945 HRK).

### **High education institutions in the sector of metal processing industry**

Zagreb University

Faculty of Electrical Engineering and Computing

Unska 3, 10000 Zagreb

Tel: +385 (0)1 612 9999

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Web: <http://www.fer.hr>

Faculty of mechanical engineering and naval architecture

Ivana Lučića 5, 10000 Zagreb

tel: +385 (0)1 6168 222

e-mail: [dekanat@fsb.hr](mailto:dekanat@fsb.hr)

Web: <http://www.fsb.hr>

University of Split

Faculty of electrical engineering, mechanical engineering and naval architecture

R. Boškovića 32, 21000 Split  
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University of Rijeka

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## Manufacturing and industrial business zones in Zadar County

No.	City Municipality	Name and location of the zone	Area (ha)	Use	BUSINESS ZONES										
					INFRASTRUCTURE										
					TO THE ZONE					IN THE ZONE					
					Road	Electricity	Water	Sewer	Telecom.	Road	Electricity	Water	Sewer	Telecom	
1.	BENKOVAC	Business-industrial zone Benkovačko selo	37	Business-manufacturing	no	no	yes	no	yes	no	no	no	no	no	no
		Business-industrial zone Veljani, Biljane Donje	44,53	Business-manufacturing	yes	no	yes	no	no	no	no	no	no	no	no
		Business-industrial zone Šopot, Šopot	62,79	Business-manufacturing	no	no	yes	yes	no	yes	yes	yes	yes	yes	yes
2.	BIOGRAD	Industrial zone Biograd	20,2	Manufacturing-service	yes	yes	yes	no	yes	yes		yes	no	yes	
3.	NIN	Entrepreneurial zone Poljica brig, Poljica	3,1	Manufacturing-trade	yes	yes	yes	no	yes	yes	yes	yes	no	yes	
		Entrepreneurial zone Mirila, Nin	6,65	Manufacturing-trade	yes	yes	yes	no	yes	no	yes	yes	no	no	

		<i>Prvi brig, Zaton</i>	12	Manufacturing-trade-service	no											
<b>4.</b>	<b>OBROVAC</b>	<i>Karlovac, Kruševo</i>	7,5	Business-manufacturing	yes	yes	yes	no		no	no	no	no	no		
		<i>Brčić, Kruševo</i>	28	Business-manufacturing	yes	no	no	no	yes	no	no	no	no	no	no	
<b>5.</b>	<b>PAG</b>	<i>Business zone Pag 1, Pag</i>	112,4	Manufacturing-service	yes	yes	yes	yes	yes	no	no	no	no	no		
		<i>Business zone Pag 2, Pag</i>	24,78	Manufacturing-service	no											
<b>6.</b>	<b>ZADAR</b>	<i>Enterprise zone Crno, Crno</i>	397,85	Business-sports&recreation	no											
<b>7</b>	<b>BIBINJE</b>	<i>Business zone Lonići, Bibinje</i>	50	Business-manufacturing	yes	yes	yes	no	yes	no	no	no	no	no		
		<i>Business zone Gromica, Bibinje</i>	250	Business-manufacturing	yes	no										
<b>8</b>	<b>GRAČAC</b>	<i>Stražbenica, Deringaj</i>	24	industrial	no	yes	no									
		<i>Kupirovo, Runovac Kupirovački</i>	24,69		yes	yes	no									
		<i>Tintori, Gračac</i>	25	industrial	yes	yes	no	no	yes	no	no	no	no	no	no	
		<i>Gračac, Gračac</i>	18,54	industrial	yes											
		<i>Srb, Srb</i>	1,62	industrial	yes	yes	yes	no	no	yes	yes	yes	yes	no	no	
		<i>Donji Srb, Srb</i>	1,59	industrial	yes	no										
		<i>Mrkonjić, Srb</i>	9,13	industrial	yes	no										
<b>12</b>	<b>LIŠANE OSTROVIČ</b>	<i>Trolokve, ostrovica</i>	11,13	Business-manufacturing	yes	yes	no	no	no	yes	yes	no	no	no		
<b>13</b>	<b>NOVIGRAD</b>	<i>Pridraga 1, Pridraga</i>	15,27	Manufacturing-service	yes	yes	yes	no	yes	no	no	no	no	no		
		<i>Novigrad 1, Novigrad</i>	1,82	Manufacturing-service	yes	yes	yes	yes	yes	no	no	no	no	no		
		<i>Novigrad 2, Novigrad</i>	4	Manufacturing-service	yes	yes	yes	yes	yes	no	no	no	no	no		
<b>16</b>	<b>POLAČA</b>	<i>Industrial zone Brig, Polača</i>	28,5	industrial	no	no	no	no	yes	no	no	no	no	no		
		<i>Industrial zone Kamenolomi,</i>	122	industrial	no	yes	yes	no								

Jagodnja Gornja													
17	POLIČNIK	Grabi, Poličnik	40	Business-manufacturing	yes	yes	yes	no	yes	yes	yes	yes	yes
		Murvica jug, Murvica	42,53	Business-manufacturing	yes	yes	yes	no	yes	no	no	no	no
		Murvica IK, Murvica Murvica	25	Business-manufacturing	yes	yes	yes	no	yes	yes	yes	yes	yes
		Murvica zapad, Murvica Donja		Business-manufacturing	yes	yes	yes	no	yes	no	no	no	no
		Business zone Dračevac Ninski-Visočano	47,21	Manufacturing	no	no	no	no	no	no	no	no	no
20	PRIVLAKA	Kurtiči, Privlaka	10	industrial.	yes	yes	yes	no	yes	no	no	no	no
25	SUKOŠAN	Drinjino, Gorica	53,5	Manufacturing	yes	no	no	no	no	no	no	no	no
27	ŠKABRNJA	Business-industrial zone Marinovac, Škabrnja	11,77	Manufacturing-service	yes	no	yes	no	yes	no	no	no	no
30	VRSI	Manufacturing zone Duševiča mlin, Poljica	49,64	Manufacturing	yes	no	no	no	no	no	no	no	no

## Contacts

### Professional networking

Within the Croatian Chamber of Economy there is an association of producers of machinos and appliances, motor vehicles, trailers and sidecars.

President: Vladimir Wagnor, DALIT-CORP d.d.  
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e-mail: [gribaric@hgk.hr](mailto:gribaric@hgk.hr) [industrija@hgk.hr](mailto:industrija@hgk.hr)

### Association of producers of parts and accessories for automotive industry

Within the Sector for Industry there is the Association of producers of parts and accessories for automotive industry.

President of the Association: Josip Boban  
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