



METALFORMING SOLUTIONS LITOSTROJ RAVNE



We shape your quality.

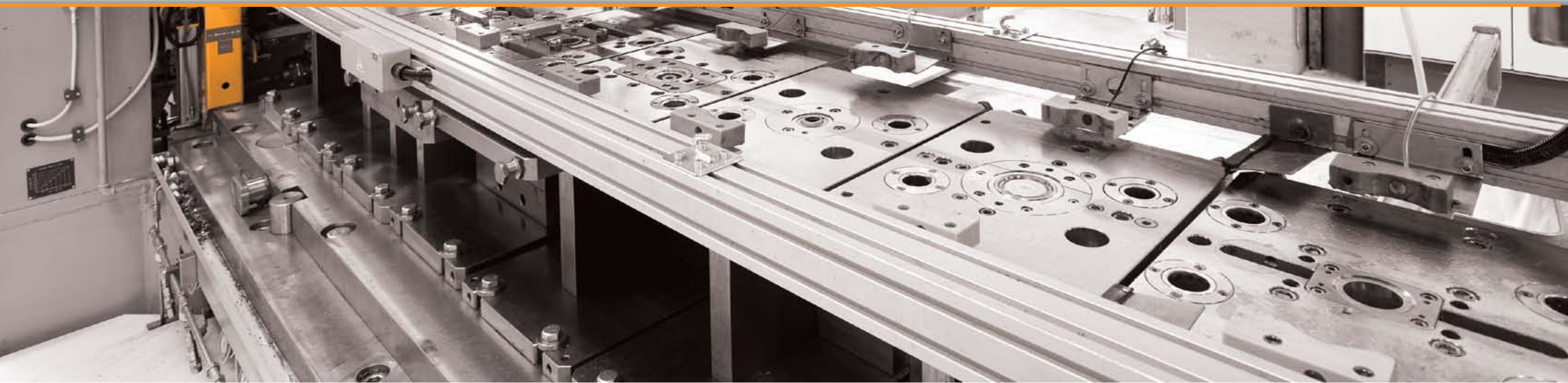
Automotive/truck industry

Home appliance industry

Tool and die industry

Electro industry

Aviation industry



About

Litostroj Ravne

Litostroj Ravne provides solutions for metalforming industry. It manufactures high quality custom-made metal forming presses with nominal force from 400 to 40,000 kN. In its 45 years long history the company has established a worldwide brand RAVNE that stands for innovation, reliability and durability of custom-made presses. Tradition, incorporated in experience, sets a base for a core advantage of Litostroj Ravne: innovative custom-made solutions. The company switched perspective from a production oriented company to a market oriented player when it became a member of Litostroj Group in 2008. Being part of a strong capital group has brought many advantages to the company, due to the fact that Litostroj is a strong brand with a rich tradition in iron casting and heavy industry. Capitalizing from the benefits of the group has set the company on sound grounds, oriented towards the customer. Customer satisfaction is integrated in the company's mission that is why all the products are engineered in close cooperation with the client. Today, Ravne is a synonym for innovation and Ravne press line machinery is integrated in production facilities of many renowned suppliers and producers in automotive, appliance and die industry. Up to date, in Litostroj Ravne alone more than 1,500 projects have been successfully implemented all over the world.

Products

Litostroj Ravne develops, designs, manufactures and installs technologically advanced press units. Ravne presses come in a variety of types such as precise cutting, forging, blanking, deep-draw forming, or progressive and transfer tool processing. With entire in-house production, Litostroj Ravne is able to launch a complete production line for metal processing, including decoilers, feeders, straighteners and other auxiliary press equipment of certified quality. At Litostroj Ravne, we do not focus on a press type but rather listen to customers' specific needs and choose the best combination of press drive or function

in order to increase the quality of pressing. In this way Litostroj Ravne provides solutions for technological growth of its customers.

Services

Apart from launching new products, Litostroj Ravne delivers a full scope of services for metal forming industry. Years of experience allow our skilled professionals to offer expert press-planning consulting. We advise our partners on press line improvement, automation and modernisation, component wear reduction and productivity optimisation on existing presses.

Litostroj Ravne also performs refurbishment of used machines and equipment of any brand, and can relocate and maintain stamping presses all over the world. As a value added activity Litostroj Ravne performs a range of services to keep customers' presses in shape. It involves maintenance, regular check-ups, preventive suggestions, repairs, spare parts accessibility as well as trainings and assistance at start-ups. By means of Ravne services the customers are able to press their products more accurately, economically and at record speed.



1,500 references | Presses up to 40,000 kN | Custom-made press units | Innovative solutions | Brands of Litostroj Group are all over the world | Rich tradition in metal industry

Litostroj Ravne History

- 1620:** Beginning of steelmaking in Ravne, Slovenia.
- 1969:** Construction of the first press.
- 1970-1971:** Cooperation with German enterprise Weingarten.
- 1971:** Construction of the first press for exports, for Germany.
- 1992:** The Ravne Steelworks split into several independent production and service companies. STROJI Ltd. took possession of presses production.
- 2008:** STROJI Ltd. became a member of Litostroj Group.
- 2009:** New company name – Litostroj Ravne Ltd.
- 2010:** New worldwide projects. New corporate identity.

Litostroj Group History

- 1947:** The first iron is poured – a new plant opened by Josip Broz Tito.
- 1951:** The start of steel casting production, in weights up to 8 T/pc.
- 1983:** Significant investment in heavy steel foundry, melting, heat treatment and inspection equipment – the heaviest castings are about 35 T/pc.
- 1991:** New company – Litostroj Tovarna Uliťkov.
- 1999:** IHC Holland acquired major share of the capital. Large investments in foundry equipment. Change of name to Litostroj Uliťki.
- 2005:** Acquisition of the company by ACMG – further investments in expanding casting and machining capacities.
- 2007:** New company name: Litostroj Steel.
- 2008:** Acquisition of the company Stroji Ltd. Litostroj became a group of seven companies.

From conception to maintenance

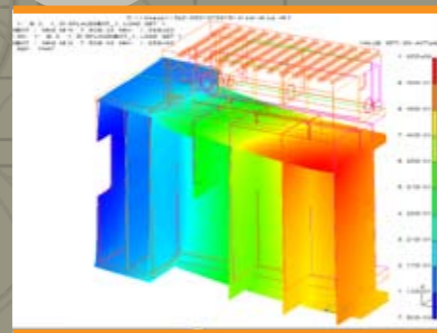
1 Customer orientation



Requirement analysis
Optimal solutions for customer's needs
Integrating customer's demands



Time and process studies
Standardized procedures in project management to optimize delivery time



Engineering
Up-to-date design calculation to optimize machine design
Latest commercial and own developed software

4 Quality



Design
3-D modelling
Electro design
Design in any customers' standards
Application of latest drives and automation systems



Quality material purchase
From verified suppliers



Production
Experienced workers guarantee high quality of welded parts

7 Precision



Assembly
Precise installing guarantees low deflection rate



Test run
Each press machinery is initially tested in house



Installation
At your facilities

10 Experience



Automation
Complete turnkey integration of automation



Start-ups and education
Assistance at start-ups for optimal productivity



Spare parts and services
Quick response in maintaining presses of any brands

Accumulated innovation and...

The continuous dedication to improving our competence, technologies and efficiency and being innovative is what allows us to make a distinctive product.

1. Competence and Innovation

Litostroj Ravne is proud of acquired knowledge of motivated engineers and service technicians, who always provide optimal solutions for the customers. The company can commend with low fluctuation rate among engineering and technical personnel.

Improved engineering

- Continuous improvements in design
- Increased rigidity (rigidity factor $k = 1.6-2.5$)
- Frame optimization: kinematics and dynamics optimization
- Use of simple and effective solutions in design
- Development of new products
- Longer life span of vital parts
- Implementation of standard parts

Own Litostroj Ravne standards for vital parts

- Ensure short production time
- Allow interchangeability of parts
- Demonstrate verified solutions
- Prove in-house engineering

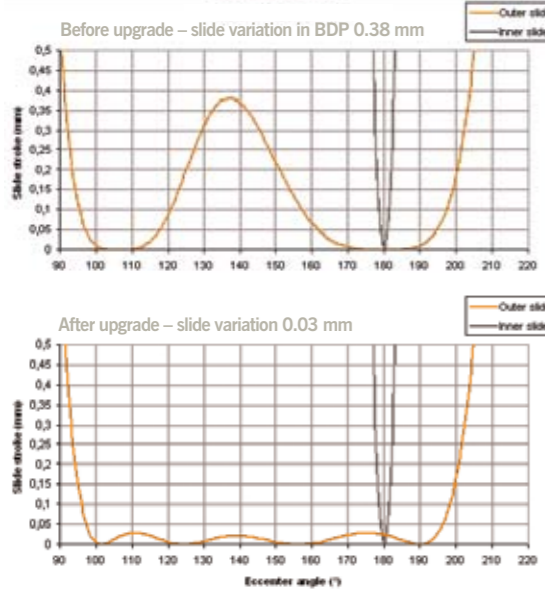
...never-ending improving tradition.

2. Quality Management

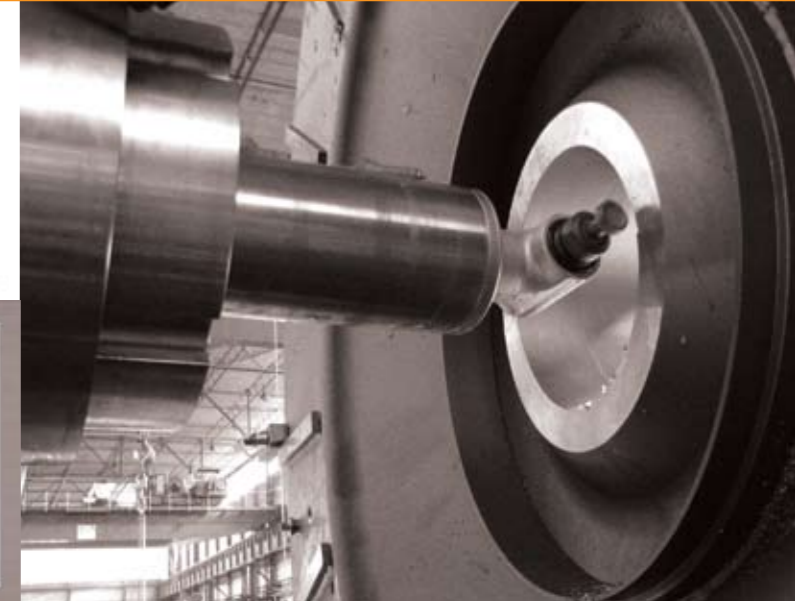
Litostroj Ravne takes great care in producing high quality presses and press equipment.

Each material and process is subject to particular control.

- Chemical analysis of material
- Tensile tests for all installed crucial parts
- Selection of optimal materials
- Noise reduction tests (BVQ certificate)
- Electromagnetic field tests (CE standards)
- Advanced casting, forging and heat treating eliminate stress in the material
- Final measurement of machinery
- SIST, EN, ISO, DIN and own quality standards
- Providing working efficiency by 20 keys method and 5S method
- Before delivery, each machine is firstly tested in house!



Standard component



Innovative safety control system

Litostroj Ravne, in cooperation with another company, developed an alternative safety control system that has recently become a standard in automation technology.

Such a system:

- Allows straightforward error detection
- Guarantees simple and cheaper system maintenance
- Provides longer module life span
- Omits complex connections
- Permits installing smaller electrical cabinets
- Reduces costs of electro installation

Machine condition monitoring and parts replacement prediction

Litostroj Ravne presses can come equipped with machine status sensors, which give details about the condition of the press. By means of such output, a customer can get precise information on expected repairs. Such information is appreciated in automotive industry and JIT delivery, given the fact that predicted line stops can be calculated in advance.

3. Machining and Equipment

With the use of dimensional control and CNC machines Litostroj Ravne accurately produces components for complex press units.

- Horizontal and vertical CNC milling machines (rotating table for components up to 100 t)
- CNC carousel lathe for workpieces more than 2 m diameter
- Gear fabrication for dimensions up to M24
- Grinding machines
- 100 t crane
- Production of high grade steels and on-site heat treatment

Custom-Made Press Units

Case 1 - Transfer Press

Turnkey Systems

Case 2 - Additional leveller



Problem: The customer needed a tandem press line of seven hydraulic presses. The required productivity was 7 ppm (pieces per minute).

Proposed solution: Instead of a tandem line of four presses, Litostroj Ravne proposed a transfer press with all operations included. Target productivity has increased up to 15 ppm.

Realized solution: Litostroj Ravne has delivered a 12,000 kN press, installed a transfer system, quick die change system, scrap removal system and automated it with a robot feeder.

Result: The executed solution takes remarkably less space, consumes less energy, demands less time to change dies, maintenance is easier, it is more cost effective and requires less operators.

Press characteristics: Transfer press, 12,000 kN nominal force, bed size 7 m, 7 stations, 25 strokes/min, 15 ppm.

Problem: The customer manufactured products of extremely hard material that required high level of evenness after levelling. Due to plastic deformation during blanking, they had to straighten the pressed product afterwards.

Proposed solution: Litostroj Ravne ensured a high level of evenness of material before it came to a press.

Realized solution: Litostroj Ravne installed a specially designed straightener with several rolls, combined with supplementary fine-leveller with extra small rolls. The achieved evenness of the material was at the required level and pressed products did not need additional levelling.

Result: The after-straightening procedure was not needed anymore. Productivity has increased from 70 strokes/min to more than 100 strokes/min. The customer has ordered four press lines with such solutions.

Press characteristics: Mechanical press, 6,000 kN nominal force, automatic transmission parts, 130 ppm.

Innovative Solutions

Case 3 - Completely Covered Line

- Problem:** The customer complained about dust in the air, which caused troubles in the process of painting car body parts.
- Proposed solution:** Completely dust protected press line.
- Realized solution:** Litostroj Ravne developed a press line construction that completely covered all exposed spaces. The construction prevented dust to enter inside the production line. Additionally, one compressor was installed, which generated overpressure inside the press line in order to remove dirty air from the system.
- Result:** Litostroj Ravne integrated automation system and installed a complete automatic die change system for changing dies within 8 minutes. Dust does not cause troubles anymore.
- Characteristics:** Tandem press line of five presses, with nominal forces of 15,000 kN, 10,000 kN and 3 x 8,000 kN, robot automation, 12 ppm.

Full-Service Provider

Litostroj Ravne maintains and repairs press units of any brand at customers' facilities on regular basis. Upon agreement, we keep vital spare parts on stock in order to provide short time delivery. We understand the demanding 24/7 production environment that the majority of the metal forming companies operate in and have put much effort into providing the critical service and maintenance support. That is why Litostroj Ravne has established a worldwide network of partners and tele-service support that help provide quick emergency response.

Case 5 - Restoration of Worn-out Slide Gibs



Case 4 - Extremely Rigid Housing

- Problem:** The customer manufactured evaporators for refrigerators, where only extremely low deflection rate of a press was tolerated. To assure low level of deflection on a rather big table the customer demanded an extremely rigid press.
- Proposed solution:** Litostroj Ravne established that the requirements could not be met with a standard construction solution and therefore proposed two additional central uprights with tie-rods.
- Realized solution:** Litostroj Ravne has applied the solution with six uprights and adjusted a construction of a bed and a slide to reach minimal deflection on 2.6 m long table.
- Result:** Achieved deflection rate was 0.046 mm/m, even lower than required.
- Press characteristics:** Hydraulic press, 16,000 kN nominal force, 2,600 mm table, 6 ppm.

Problem: Our customer faced a problem with deformed and worn-out slide gibs, which had lost initial perpendicular characteristic to a press table. The gibs condition did not fit within a tolerant acceptance; consequently it was impossible to adjust the slide for a normal press operation.

Proposed solution: Litostroj Ravne proposed a manual renovation of the gibs in the customer's premises. We promised tolerated gib evenness to at least 0.1 mm.

Realized solution: The manual renovation was far more suitable for the customer, because it was not needed to dismantle the press and bring it to machining. Contrary, the renovation work was done manually by scratching, smoothing and grinding. By means of persistent, reliable work and accurate measurements the process was finished within 14 days.

Result: The final evenness has greatly exceeded the required level. The work was over in 14 days; by means of machining it would have taken more than 3 to 4 weeks. The realized solution was far less costly and less complicated for the customer. There was no need for any press dismantle or manipulation.

Characteristics: Constant laser measurements were done to one thousandth accuracy.



Our advantages

- Proven durable and reliable presses
- Long industrial tradition
- Installation at your facilities
- Expert service, on-line diagnostics
- Spare parts service
- Long warranty period

Our advantages

Your benefits

- Increased productivity
- Quality products
- Decreased energy consumption per product
- Superior technology
- Short production stops
- One point of contact
- Lower responsibility for regular maintenance
- The most suitable cost-effective solutions

Your Benefits

Our advantages

- Fully customized press units
- Turnkey delivery
- Innovative solutions
- Pre- and after-sale activities
- Low deflection design
- Experience, knowledge, own engineering



Portfolio

Litostroj Ravne portfolio

Mechanical presses



Single point crank shaft press
(800-4.000 kN)

Force: 800 kN
Table size: 750 mm
Strokes/min: 250



Double crank shaft press
(1.000 – 16.000 kN)

Force: 8.000 kN
Table size: 991 mm
Strokes/min: 80



Single point eccentric presses
(1.000 – 15.000 kN)

Force: 1.00 kN
Table size: 650 mm
Strokes/min: 100



Two point eccentric presses
(1.000 -20.000 kN)

Force: 8.000 kN
Table size: 4.000 mm
Strokes/min: 40
Die tryout press



Four point eccentric presses
(1.000 – 40.000 kN)

Force: 20.000 kN
Table size: 6.000 mm
Strokes/min: 25



Link drive presses
(3.000 – 30.000 kN)

Force: 3.000 kN
Table size: 900 mm
Strokes/min: 40



Double action presses
(5.000 – 25.000 kN)

Force: 6.300/4.000 kN
Table size: 3.600 mm
Strokes/min: 16

Transfer presses



Force: 10.000 kN
Table size: 3.657 mm
Strokes/min: 45
Automation: 3 axis servo transfer



Force: 12.000 kN
Table size: 6.706 mm
Strokes/min: 25
Automation: 3 axis servo transfer



Force: 20.000 kN
Table size: 6.000 mm
Strokes/min: 25
Automation: 3 axis servo transfer



Force: 30.000 kN
Table size: 6.500 mm
Strokes/min: 20
Automation: HMS servo transfer



Force: 40.000 kN
Table size: 8.000 mm
Strokes/min: 16
Automation: 3 axis servo transfer

Servo hybrid presses

Servo press (1.000 – 10.000 kN)

Force: 1.400 kN
Table size: up to 3.000 mm
Strokes/min: Programmable speed

Progressive die presses



Force: 5.000 kN
Table size: 2.000 mm
Strokes/min: 80
Automation: Feeding line



Force: 16.000 kN
Table size: 6.100 mm
Strokes/min: 44

Precize blanking presses



(4.000 – 10.000 kN)
Force: 4.000 kN
Table size: 1.050 mm
Strokes/min: 40

Tandem/complete press lines



Five press lines
Forces: 10.000, 5.000, 4.000,
4.000, 8.000 kN
Automation: robot feeding
Strokes/min: 24
Pieces/min: 15



Eight press lines
Forces: 4x 1.250, 1x 2.500, 3x
3.150 kN
Table sizes: 1.000 mm
Strokes/min: 103
Automation: transfer system



Four press line - double action
presses
Forces: 8.000/6.300 kN
Table sizes: 2.740 mm
Strokes/min: 24



Complete press line

Hydraulic presses



Hydraulic press (1.000 – 40.000 kN)

Force: 16.000 kN
Table size: 2.600 mm
mm/s: 250

Presses for cold, warm or hot forging



Hydraulic forging press
Free forging
Force: 25.000 kN forging/30.000
kN upsetting
Ingot weight: 25 t
mm/s: 300



Mechanical forging press
Close die forging (5.000 – 30.000 kN)

Force: 16.000 kN
Table size: 1.700 mm
Strokes/min: 30

Feeder line equipment



Decoiler
200 – 25.000 kg coil weight



Straightener
0,6 – 16 mm coil thickness,
30 – 2.000 mm width



Feeder
30 – 2.000 mm plate width



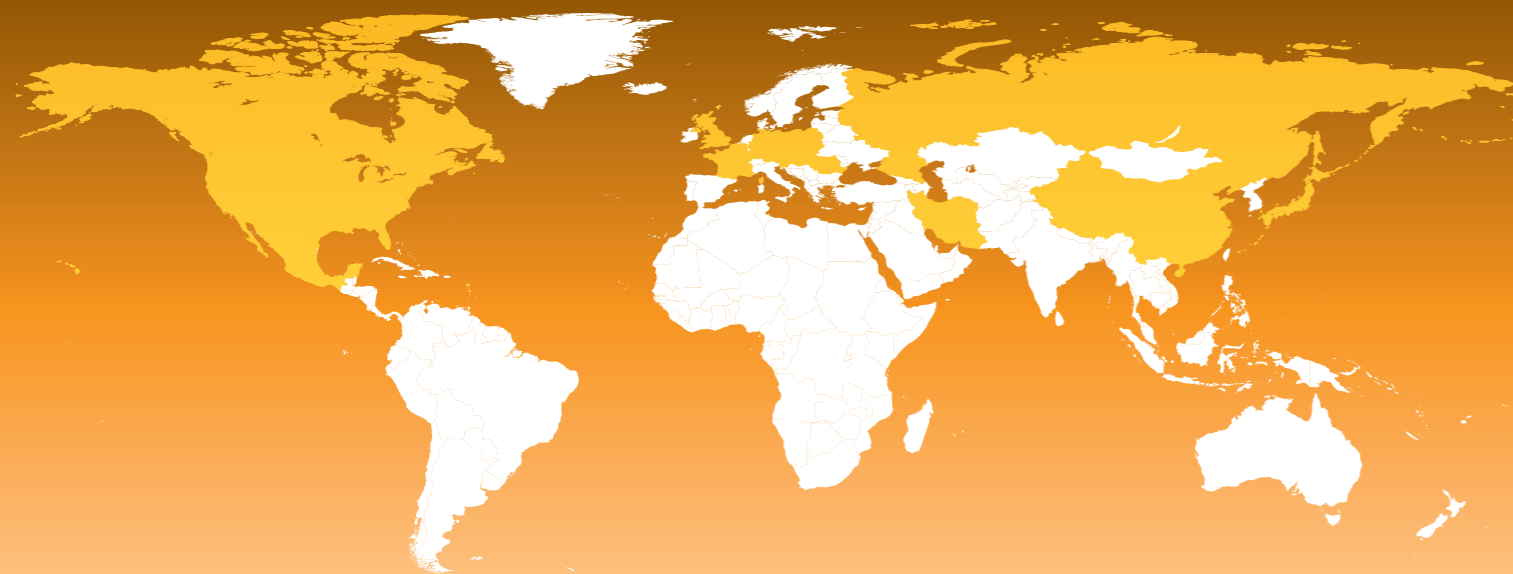
Shears
60 – 2.000 kN



References

Commercial Network Around The World

- USA
- China
- Japan
- France, Benelux
- Iran
- Czech republic



Canada & USA

Dana Coroporation
Dynax America Corp.
Riverside
Shiloh
Worlinghton Steel
Steel Technology
Precision Die & Stamping
Flexngate
Pacific Sales
Douglas & Lomson
Hawthorne
Midwest
Carrier Corporation
H. S. Automotive Inc.
Art Technologies, Inc.
Thysen Krupp Fabco
Mabe – Montreal
Faurecia Vipond
Dana Transform Automotive
Amsted Group

Mexico

Volkswagen de Mexico
Estampados Magna
Danfoss Mexico
Faurecia

Europe

France: Faurecia, PSA, Scoder, Delzenne
Germany: Schmittberg-Wuppertal, Johann Hay, ITT, Cordt
UK: Punch Precision
Austria: Mahle Filtersysteme, Knecht, Pucher
Czech republic: Bonatrans
Slovakia: Dong Hee-Žilina
Romania: Dacia
Poland: Faurecia, Arcelor, Schmittberg
Hungary: Wild, Pridgeon & Clay
Belgium: LVD, Radson

Slovenia

Gorenje
Revoz
Lama
Kovinoplastika Lož
Liv
TPV
Metal Ravne
Lama
Titan
Talum

Russia

VAZ
MAZ

Iran

Iran Khodro
Kherman Khodro
IKID
Iran forging
Saipa

Japan

Dynax Japan

China

Dynax China
Faurecia Wuxi



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