شرکت دانش بنیان صنعتی تولید کننده ماشین آلات صنعتی و مقطع سازه ای تونالی

F O O L A D  M A C H I N E  N E K A
Manufacturer of Industrial Machinery and Hollow Structural Sections (HSS)
Foolad Machine Neka Company, one of the main producers of heavy structural profiles and pipes and one of the top exporters of the province, with over 20 years of experience works in different parts of industry and production.

The main activities of this company are:

1. **Machinery Manufacturing Plant:**
   Foolad Machine Company with the support of Research and Development (R&D) Department, has succeeded to design and manufacture HSS production lines and other industrial machinery in order to develop the company.

2. **Producing Hollow Structural Section (HSS) Plant:**
   This knowledge-based company with unique and innovative technology of producing Hollow Structural Section (HSS), is trying to develop the complex, increasing the capacity and diversity of its products.

3. **Designing and Manufacturing New Steel Structures (Modular) with HSS:**
   This company is trying to produce new products (pre-fabricated structural elements) which are in accordance with world standards synchronous with other global manufacturers of these products.

4. **Industrial Electric Company:**
   It is the complementary part of machinery manufacturing plant by means of producing electrical components such as electrical panel, PLC control system and...
Researchers and Development

Foolad machine Company as the first industrial knowledge-based company in Mazandaran, parallel with investigation and through investiment in researches, with greater use of its capacity and capabilities has focused on production-oriented activities. Some of them are as follows:

Concrete Filled Tube (CFT) design guide

One of the most important applications of HSS is in the structures with concrete filled steel columns. Lack of sufficient knowledge of engineers about design, construction and execution of steel structures CFT column is one of the main obstacles to develope the application of HSS. Therefore R&D department of Foolad Machine Company, in order to localization of knowledge, proceeded to formulate a design guide of Concrete Filled Tubes (CFT) with cooperation of a research team in Iranian society of steel structures and supervision of Dr. Abazar Aghaari. This book is in accordance of with the tenth issue of National Building Regulations and American Institution of Steel Construction bylaws and has been approved by eminent professors of this domain.

The Top Exporter of the province

Research and Development (R&D) department of Foolad Machine Company tries to match capabilities with environmental demands, obtains competitive advantages and chooses the target market through marketing communicative tools, and in parallel with producing high quality products, it has been selected as a top exporter of the province in compete with other activists of export in the field of industry.

www.fooladmachine.com
Research and Development

• Patents

The discovery of the new knowledge about academic and technological industrial titles in order to improve product quality, design new products to achieve the optimization solutions of the processes and energy consumption are the main goals which this department follows in company policy framework. Based on these objectives, this department was able to produce three of its own industrial patents which contain the following:

1. Rotary Cut-off Machine for Circular Steel Section With Rolling Blades and Differential Mechanism
2. Production Process of Steel Square and Rectangular Hollow Sections with Straight Method (without changing dies)
3. Overhead Crane with Truss Structure and Self-alignment Mechanism

One of the inchoptics of success of this company in the field of industry, is the direct link and cooperation of two units (R&D and Machine Manufacturing) simultaneously and it made the conversion of idea to technology, practical. Therefore through manufacturing these machines and innovative production lines and the use of innovative mechanism, the company has been able to increase the production speed, quality, efficiency, optimal performance of the products, in addition to significant optimization in the consumption of energy and material.

• Superior product of Research and Development (R&D) department:

All the activities of the company are concentrated on R&D. Therefore due to the importance of industrial researches and their basic roles in growth and development of the country, it produced Hollow Structural Sections which have special characteristic in terms of technology and based on new technology in production process.

Accordingly after the judgement and during a ceremony to commemorate the 17th week of Research and Technology which was held in Nooshrvani University, Foolad Machine Company was selected as top choice of research and technology achievements group and its products also was selected as superior product of R&D department in Mazandaran in 2016 (1395).

www.fooladmachine.com
### Company Products

- **ERW pipes**

One of the company's products is ERW steel pipe. Size and wall thicknesses of ERW steel pipes are given in the following table.

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<td>0.3</td>
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</table>

- **Full Scale Test of Steel Moment Connection under Cyclic Loading**

- **Test Frame**

  - **Specimen**
    - Two 20 mm thick plate elements connected by one dissimilar moment connection
  - **Test Frame**
    - 200 mm x 200 mm x 200 mm
  - **Loading**
    - Loading applied to the connection
  - **Results**
    - Evaluation of the connection's performance under cyclic loading

- **Equipment List**

  - **Frame**
    - 200 mm x 200 mm x 200 mm
  - **Load Cell**
    - 200 kN
  - **Data Acquisition System**
    - 20 ms sampling rate
  - **Data Storage**
    - 2 TB SSD

- **Conclusion**

  - The test results show that the connection is suitable for cyclic loading conditions.

- **References**

مقایسه قبیل سقفی با قبیل‌های معمول عبارت است از:

- امکان تولید بکار گیره سازه 
- عملکرد سیستم مکانیکی خود تطبیق شونده 
- کاهش وزن و انرژی راحت سازه 
- قابلیت تأمین شده با یکنوازنر 

Foolad Machine Company has taken a great step in machinery manufacturing industry and heavy equipment production through innovative design for overhead crane with easier manufacturing approach. The structure of this crane is made of Hollow Structural Sections with full-strength steel and truss model and with increasing number of the wheels on each end trucks (from 2 to 4), changing the rigid connection to pin and applying self-alignment system in each end truck and trolley. Foolad Machine Company has designed and manufactured high quality, optimum performance, also durable and cost-effective overhead crane.

Advantages of this crane compared to common ones consist of:

- Capability of producing integrated structure
- Self-alignment system
- Reduction of noise and vibration
- Easier control
- Reduced final cost

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Products:
Hollow Structural Sections

The term HSS is the abbreviation of Hollow Structural Section. HSS is a tubular section which is produced by cold rolling method (cold form) in square, rectangular and circular cross-sections. In recent years the use of hollow structural sections significantly increased due to their appearance and mechanical characteristics.
In Foolad Machine Company these sections are produced in 2 ways:

1) **straight method**, the flat strip straightly transforms to the box after forming and welding by ERW method. This line is capable to produce square and rectangular cross-sections profiles with 6 to 15 mm wall-thicknesses and various dimensions.

2) **Indirect method**, which the transformation of round tube to box in this method will be done by forming flat steel strip to produce a round tube, and welding the tube seam by ERW method. This line is capable to produce square and rectangular cross-section profiles with 4 to 8 mm and various dimensions.

Size and wall-thickness of produced sections are given in the following table.

**UT Online Testing System**, installed on the production line of the rectangular and square hollow sections in final step and before cutting in order to detect seam weld and HAZ zone defects.
In steel structures, the use of Hollow Structural Sections (HSS) brings several advantages. These sections are preferred for their superior strength-to-weight ratio, easier handling, and reduced labor costs.

**Reduced Final Cost**
- By using HSS in constructing steel structures, the overall cost of the project is significantly reduced.
- 30-50% of building material cost is saved.

**Increasing Structural Resistance**
- When using HSS, the structural resistance of the column section increases, allowing for a more efficient design.
- This leads to lower deflections, reducing the need for additional structural support.

**Increasing Production Capacity**
- In current projects, the use of HSS has increased production capacity by 3.5 times compared to reinforced concrete structures.
- The use of HSS in construction can significantly reduce the time required for construction, leading to higher productivity.

**Advantages of Produced Steel Structures with HSS**
- Increased stability and rigidity
- Reduced weight
- Lower deflections
- Easier handling and installation
- Lower labor costs

HSS is a versatile material that offers several advantages over traditional concrete structures. Its use is particularly beneficial in large-scale construction projects, where efficiency and cost savings are critical.
Machinery Manufacturing

With the progress of technology and due to the development and implementation of industrial machinery and key role of them in the production, Foolad Machine Co. not only increased speed, capacity, quality and precision by mechanizing production process, but it is entered in new phase in manufacturing industry by using new technologies, maximize the utilization of equipment and raise the productivity of its force.

Foolad Machine Company has designed and manufactured all of its innovative products and special machinery with high quality and safety, perfect and unique performance by reliance on its several year knowledge and experience.

Foolad Machine Co. with having hardware capacities consist of CNC machine tools and software knowledge in designing, is capable to fabricate precise, heavy and complex component for machine manufacturing. In order to achieve self-sufficiency and new technology in electrical and industrial machinery control (such as electrical panel, control system of PLC and...) added Industrial Electrical Co. as a complementary part of its machinery manufacturing plant.

The most important achievements of the company are as follows:

- Designing and manufacturing rolling line for Rectangular Hollow Structural Steel (200x200-400x400) without changing die.
- Designing and manufacturing rolling line of ERW pipes and profiles (12 in).
- Designing and manufacturing rolling line of ERW pipes and profiles (10-14 in) without changing die.
- Designing and manufacturing overhead cranes with Hollow Sections, truss model and self-alignment mechanism.
- Designing and manufacturing cyclic loading test machine for testing new connections.
- Designing and manufacturing slitter line with new and different operation mechanism.
- Design and manufacture size machine for transforming pipe to profile.
- Designing and manufacturing Rotary cut off machine for circular hollow sections (size: up to 14 in).

ماشین سازی

با پیشرفت تکنولوژی و هم چنین می توان به توسعه و پیشرفت دوران ماشین سازی آت هستی و نتیجه کلیدی این آثار تولید کرده، در فرآیندهای یکی از آثار ساختاری و تولیدی، سرعت و کیفیت فرآیند را با استفاده از فن آوری های جدید، با کاربردی کنروتری، به راه اندازی ساختار استثنایی طراحی شده توجه نمود. ویژه از آن دارای واریز جدیدی می توان به کاری که یکی از مخازن ساختاری، و محصولات مناسب خود را با کیفیت ارسال به مشتری عالی و خدمات بهتر، تولید کرده است.

شرکت فولاد مسکن با برآورده کردن فن آوری ماشین سازی ایزهایهای و مناسب CNC وارد شده است و با برآورده کردن فن آوری ساخت فلز، نیروی ساخت فلز و ابزارهای فلز طراحی شده است.

در این زمینه در یک واحد فلز ساخت گیرندگی و نیروی ساخت فلز را در زمینه ساخت ماشین آت عالی دارد. به عنوان مثال به وارداتی که در فلز گیرندگی و ساخت ابزار به استفاده از تکنولوژی های الکتریکال کاربردی و کنترل ماشین آت صنعتی (مانند: بالوری با ضریب سیستم کنترل و PLC و... که در اینجا اشاره نموده است.

بخت ماشین سازی به مجموعه خود اضافه توجه است.