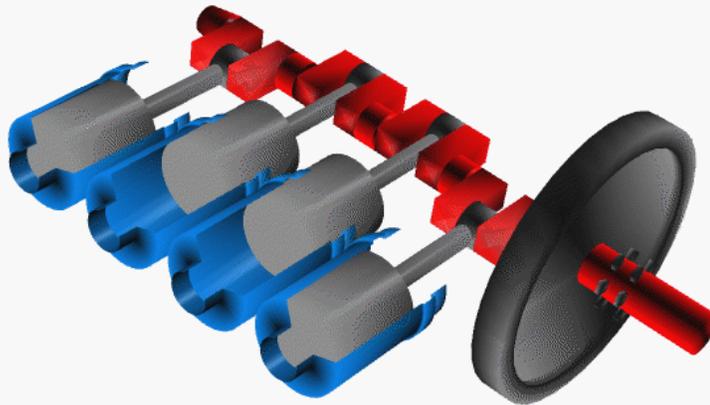


# CLUSTER PROFILE

## CRANKSHAFT

### SARGODHA



*Turn Potential into Profits*

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Ministry of Industries, Production & Special Initiatives  
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## **1 Introduction – Sargodha**

Sargodha District is an agricultural district of Punjab province, Pakistan. The district has an area of 5,864 km. According to the 1998 census of Pakistan the district had a population of 2,665,979 of which 27.96% lived in urban settlements.

The District is playing a leading role in agricultural production. It contributes about 95% to annual Citrus Fruit production in the country. Even with agricultural goods being the major income generator for the city as well as the district, the economy and industry has been diversifying itself to generate more demand for other goods which can be manufactured and produced in the city. Other industries include foundries (Crankshaft), Bakelite, Footwear, Oil mills and Pulses (Daal) mills.

## **2 DESCRIPTION OF CLUSTER**

### **2.1 HISTORY & BACKGROUND OF CLUSTER**

The crankshaft usually abbreviated to crank is an important part of an engine. Crankshaft manufacturing in Sargodha has been growing steadily in the last decade. The Crankshaft manufacturing Industries are predominantly located in Sargodha with large and medium scale Enterprises. The Estimated monthly crankshaft production is nearly 36000 units/pieces of various crankshaft products. Due to purely agri-base area, the crankshaft industry is being popular with the passage of time. The presence of large number of tractors in agrarian fields and stone crushing units enable the crankshaft industry to boost at large in the region. Moreover the presence of Asia's largest old tractor parts markets also spurred the establishments of crankshafts in the region.

### **2.2 DESCRIPTION & IMPORTANCE OF CRANKSHAFT**

The crank is the most important single mechanical device after the wheel. It transforms continuous rotary motion into a reciprocating one. Hand operated cranks were known for centuries. First crankshaft was developed in the 15th century that was cranked by hand. Rods were later incorporated into the crank to make the process easier. The successfully built crankshaft led the way to for the invention of the steam engine.

The crank and connecting rod mechanism was first used in Roman water mills of late antiquity, in which the mechanism converted the rotary motion of the waterwheel into the linear movement of the saw blades. In 1206, Al-Jazari described an early crankshaft, with a crank-connecting rod mechanism in twin-cylinder pump - mechanism consisted of a wheel setting several crank pins into motion. However it was a Dutch "farmer" Cornelis Corneliszoon van Uitgeest in 1592 with his wind-powered saw mill used a crankshaft to convert a windmill's circular motion into a back-and-forward motion powering the saw that was granted a patent for the crankshaft in 1597.

### **2.3 DEFINING THE PRODUCT**

The Crankshaft product range generally includes:

- a) Tractor (Messe 240, 265, 375)
- b) Tractor (Fiat 480,640)

- c) Tractor (Ford 3000,4000)
- d) Tractor (Belarus 50,55)
- e) Car (Suzuki 800cc to 1000 cc)
- f) Mini-trucks Mazda T 3000, T 3500
- g) Hino FB 4 Cylinder
- h) Bed Ford J4, J6

Production of Crankshaft for Tractors is constituted 90 % of the total production whereas the crankshaft for LTV and HTV only constitute 10% of the total production.

## 2.4 GEOGRAPHICAL LOCATION

Sargodha is the major Crankshaft manufacturing city in Pakistan. The 90% of Pakistan's Crankshaft products are being produced in Sargodha (according to Crankshaft Manufacturers Association Sargodha). The major supply of Crankshaft is also being supplied from this region.

**Table 2.1: Major Crankshaft Units and their production**

Name of Company	Production (pieces)/month
Sun Steel Industry (Sooraj Marka)	2000
Nadeem Agri Engineering (Five Star)	500
Al-Ghazi Crankshaft	500

## 2.5 CORE CLUSTER ACTORS

### 2.5.1 Industry Structure

Following table indicates the industry size in various categories:

**Table 2.2: Industry Structure**

Large	Medium
3	12

**Large:** The units manufacturing mainly Crankshaft of Tractors and LTV & HTV

**Medium:** The units which manufacture only Tractor Crankshaft.

### 2.5.2 Employment

Currently there are 500 employees working in this cluster. The education level of workers/labor working in this cluster is very low. The industry is technical labor oriented and mostly concentrated in medium size units.

### 2.5.3 Total Production

Majority of the Crankshaft manufacturing units are located in the vicinity of Sargodha. The Estimated annually crankshaft production is nearly 36,000 units/pieces of various crankshaft products. The major supply of Crankshaft to other cities like Karachi, Lahore, and Faisalabad is also from Sargodha. Due to purely agri base area, the crankshaft has become popular with the passage of time. The presence of large number of agriculture

machinery (tractors) and implements have enabled the crankshaft industry to boost at large in the region.

#### **2.5.4 Capacity Utilization**

At present installed capacity and production of Crankshaft is assumed sufficient to fulfill the demand. However, a sufficient gap is still exists particularly for LTV and HTV's crankshaft which are mainly imported or manufactured by the vehicle assemblers by their own. The manufacturing of LTV's Cranks shaft has a bright future in Pakistan as well as for export.

#### **2.5.5 Crankshaft Manufacturers**

As the trend of setting up casting/ foundry units is relatively new in this region hence there are only three major players engaged in the manufacturing of crankshafts. The manufacturers have also stepped into exports. The major cluster players are:

- Sun Steels Industry (Sooraj Marka)  
6-km, Lahore Road, Sargodha  
Tel: 048-3221683 Fax: 048-3221783  
E-mail: [info@sunsteelpk.com](mailto:info@sunsteelpk.com)  
Contact Person: Sheikh Naveed Iqbal
- Nadeem Agri Engineering  
77-University Road, Near Railway Crossing, Sargodha  
Tel: 0483-727922 Cell: 0333-6802565, 0300-8602565  
E-mail: [fivestarcranks@yahoo.com](mailto:fivestarcranks@yahoo.com)  
Contact Person: Mian Nadeem Anwar
- Al-Ghazi Crankshaft  
Bhalwal Road, Sargodha.  
Cell: 0321-6017586  
Contact Person: Muhammad Azam Qureshi

#### **2.5.6 Raw Material Suppliers**

Due to small scale of industry there are only two major raw material suppliers available in the market and their contact details are as follows:

- Hi Tech Foundry Pvt. Ltd.  
15-km, Sheikhpura Road, Lahore  
Tel: 042-7970248
- Mushtaq Foundry  
Gujranwala.  
Tel: 0300-8643548

#### **2.5.7 Machinery Suppliers**

There are only two major machinery suppliers available in the market. The details are as follows:

- Daska Engineering Works  
Lahore Road, Sargodha.

Cell : 0300-9601552

- Tahir Engineering Works  
Qainchi More, Sargodha.  
Cell : 0300-6009368

## **2.6 OTHER CLUSTER ACTORS**

There is a continuous growth of support firms in the cluster. These support firms have developed a niche in their relevant area/service. Details are given below:

### **2.6.1 Agriculture Implements Industry**

Casting of items like Bearing Brackets, V Shape Pulli, Round Circle weight, Wheel Hub, Bush, Bracket Tikki, and Conveyer Star etc used in production of wheat thrashers. Crushing Plates used in stone crushing and tip for loaders jaws are also made of casting material. So there is an ample opportunity to cast these items on commercial bases. Currently the said items are sourcing from the firm situated at Faisalabad and Gujranwala.

### **2.6.2 Packaging Suppliers**

Plastic/Polythene bags and wooden cases are used in wrapping and packaging of the finished products. The local suppliers of these items are available in the market.

### **2.6.3 Chemical Suppliers**

Chemical (Cutting Oil) Mobil Oil and other alloys like Molyb Denim, Magnesium, Silicate etc. are used in casting process. There are number of suppliers of these chemicals in the local market.

## **2.7 CURRENT CLUSTER SCENARIO**

Crankshaft Industry of Sargodha has a huge potential. The industry faces numerous problems, including difficulties in introducing diverse range of crankshaft for LTV and HTV and the conflicts between the manufacturers and raw material suppliers upon non standardized casting which has constrained their ability to take full advantage of their products and processes.

As industry is still working on conventional lines and they do not have the basic facility for casting. There is an urgent need to move the industry to compete with rapidly changing environment of world in technology and regulatory framework. Simultaneously, there is also need of the time to comply with the international environmental, management, safety standards. To enhance the productivity and to improve the quality of products as per the demand of international standards, manufacturer needs the provision of establishing Casting unit/Melting Furnace at Sargodha.

## **3 ANALYSIS OF BUSINESS OPERATIONS**

### **3.1 PRODUCTION OPERATION (PROCESS FLOW)**

Crankshaft manufacturing requires technical skills and highly precision. The production process can be divided into three major steps:

### **3.1.1 Casting of SG Iron**

SG Iron is molded into desired moulds to obtain the raw crankshaft in desired shape and length which is sent for further processing like surfacing, machining etc.

### **3.1.2 Machining**

The casted product needs to be cleaned and machined for its finishing.

### **3.1.3 Finishing & Packing**

After machining, the product is ready to pack in wooden cases. Crankshafts are dipped in rust preventive oil, wrapped with a polythene bag and packed in plywood case.

## **3.2 RAW MATERIAL AVAILABILITY**

SG Iron is the major component in Crankshaft manufacturing which is mainly sourced from Faisalabad and Gujranwala. Manufacturers do not have any customized facility of making raw material.

## **3.3 TECHNOLOGY STATUS**

Crankshaft Industry is using semi-skilled labor and technology. There is no arrangement for checking/examine the physical characteristics and chemical composition of crankshaft material i-e SG Iron. The use of low skilled labor and technology is also hindering the production capacity.

## **3.4 QUALITY STANDARDS AND CERTIFICATIONS**

The Crankshaft Industry is not yet provided with any institutional infrastructure support in the areas of Technological Development, Design & Product Development and Human Resource Development. Currently there is no facility available at local level to check or verify the Casting Material composition which is impediment to export the product.

## **3.5 MARKET MECHANISM**

The production is being distributed through distribution/dealer set up. The direct sale method is also used by the manufacturers.

## **3.6 FINANCING/ BANKS AND FINANCIAL INSTITUTIONS**

Almost all of enterprises are working as sole proprietorship. All of the businesses are being mostly financed by equity. At present, no financial institution has developed/offered any customize lending scheme for the development of this industry. The financial products available in the market are not geared to cater the requirements of this sector. Moreover the informal credit system is unable to fulfill the financing demand to establish crankshaft manufacturing unit.

## **3.7 HUMAN RESOURCES**

The crankshaft industry is labor intensive. The unavailability of skilled labor is a major hindrance in adopting new tools/techniques. Synergies between practical industry demand and vocational training are also very minimal. Hence the industry is forced to work on conventional lines.

## **4 INSTITUTIONAL SETUP**

### **4.1 ENTREPRENEURS ASSOCIATIONS/ CHAMBERS**

There is no formal association of the crankshaft manufacturers. There is an urgent need to develop such a platform for this industry however the small and medium size industries do not share same concerns/ issues. The manufacturers however are members of the local chamber i.e. Sargodha Chamber of Commerce and Industry (SCCI).

### **4.2 GOVT. /SEMI GOVT. SUPPORT INSTITUTIONS**

There is no any government, semi-government organization working in cluster. However in order to develop this industry the linkages with technical organizations should be established i.e. PITAC, MIRDC (TSC), TEVTA and EDB etc.

### **4.3 PRIVATE BDS PROVIDERS/ OTHER SUPPORT INSTITUTES**

There are currently no business development service providers (BDSPs) offering their services for development and uplift of this cluster.

## **5 SWOT Analysis**

### **5.1 STRENGTHS**

- Availability of cheap labor.
- Permanent demand being an essential part in Agriculture Implements and other HTV and LTV.
- Affordable price as compared to imported crankshaft.
- Geographically situated in ideal place as Sargodha Region is well known for Stone Crushing, Wheat Thrasher manufacturing and Agriculture implements.
- Strong Product Mix (LTV & HTV)

### **5.2 WEAKNESSES**

- Unskilled labor
- Old dated/Conventional technology for machining.
- Lack of Quality Control in small manufacturers
- Lack of marketing awareness (brand labeling, packaging etc).
- Limited access/know how about Government incentives, loans schemes.

### **5.3 OPPORTUNITIES**

- Can easily penetrate the export market.
- Marketing and promotion of local quality products in international market may lead to enhanced exports and lower imports of crankshaft in domestic market.
- Institutional infrastructure support in the areas of technological, design, product and human resource development would definitely pave way for development.

## **5.4 THREATS**

- Non-existence of research and development.
- Smuggling of crankshaft is causing severe threat to this industry and also the national interest in terms to fetch foreign exchange.
- Monopolistic behavior of raw materials suppliers.

## **6 INVESTMENT OPPORTUNITIES**

- Introduction of Melting Furnace: Crankshaft Industry is still working on conventional lines and they do not have the basic facility for casting. To enhance the productivity and to improve the quality of products as per the demand of international standards, melting furnace has a huge potential for investment.
- Raw Material Supply: Supply/trading of different chemicals and alloys used in crankshaft can be the other potential sector for investment in the sector. These chemicals can be sourced from locally as well as import from China.
- Casting of other related product: Due to the current spread of agricultural land there is a constant demand of other related products like Bearing Brackets, V Shape Pulli, Round Circle weight, Wheel Hub, Bush, Bracket Tikki, and Conveyer Star etc used in production of wheat thrashers.