



ADAMJEE ENGINEERING (PVT) LTD

POWDER METALLURGY DIVISION



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ABOUT THE COMPANY

ADAMJEE ENGINEERING (PVT) LTD

- **1963:** Guest, Keen and Nettlefolds (Pvt.) Ltd. (a subsidiary of GKN, PLC, UK) established a factory in Karachi to manufacture industrial fasteners.
- **1986:** Hanif Adamjee Group bought over majority shareholdings from GKN and the company became Adamjee Engineering (Pvt.) Ltd.
- The company today consists of three manufacturing divisions.
 - ▣ The Fasteners Division
 - ▣ **The Powder Metal Division**
 - ▣ The Machining Division.
- The Company employs over 500 employees comprising of qualified engineers, professionals & skilled workers.
- **ISO-9001-2015 Certified.**

VISION

It is the objective of Adamjee Engineering (Pvt) Ltd to maintain its leading position in the fastener and powder metal industry in Pakistan and to continuously strive to become a recognized name in the international market by maintaining and taking advantage of its competitive strengths.

MISSION

- ❑ To provide attractive returns to the shareholders on their investments.
- ❑ To maintain a healthy financial position at all times.
- ❑ To always strive to strengthen its reputation of being a company known for the quality of its products and services and for its constant innovation in production processes, marketing strategies, customer service, human resource development and supply chain management.
- ❑ To maintain its leading position in the domestic market and become a recognized name in the international market.
- ❑ To create and maintain a professional environment in the organization.
- ❑ To develop an encouraging, motivating and hard working culture and environment within the organization.
- ❑ To be a socially responsible company.

QUALITY POLICY

It is the policy of Adamjee Engineering (Pvt) Ltd to ensure:

- ❑ **Customer satisfaction by providing quality product, timely delivery at a competitive price.**
- ❑ **Safe and inspiring work environment for our employees.**
- ❑ **Compliance and Continual Improvement in the effectiveness of its Quality Management System.**

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THE “POWDER METAL DIVISION”

POWDER METALLURGY

POWDER METAL DIVISION

at Adamjee Engineering (Pvt) Ltd

The Powder Metal Division is involved in the manufacturing of Self-lubricating Bushes, Washers, Oil Pump Gears, Shock Absorber parts and other sintered parts for the Automotive, Fan and other Home Appliances industries.

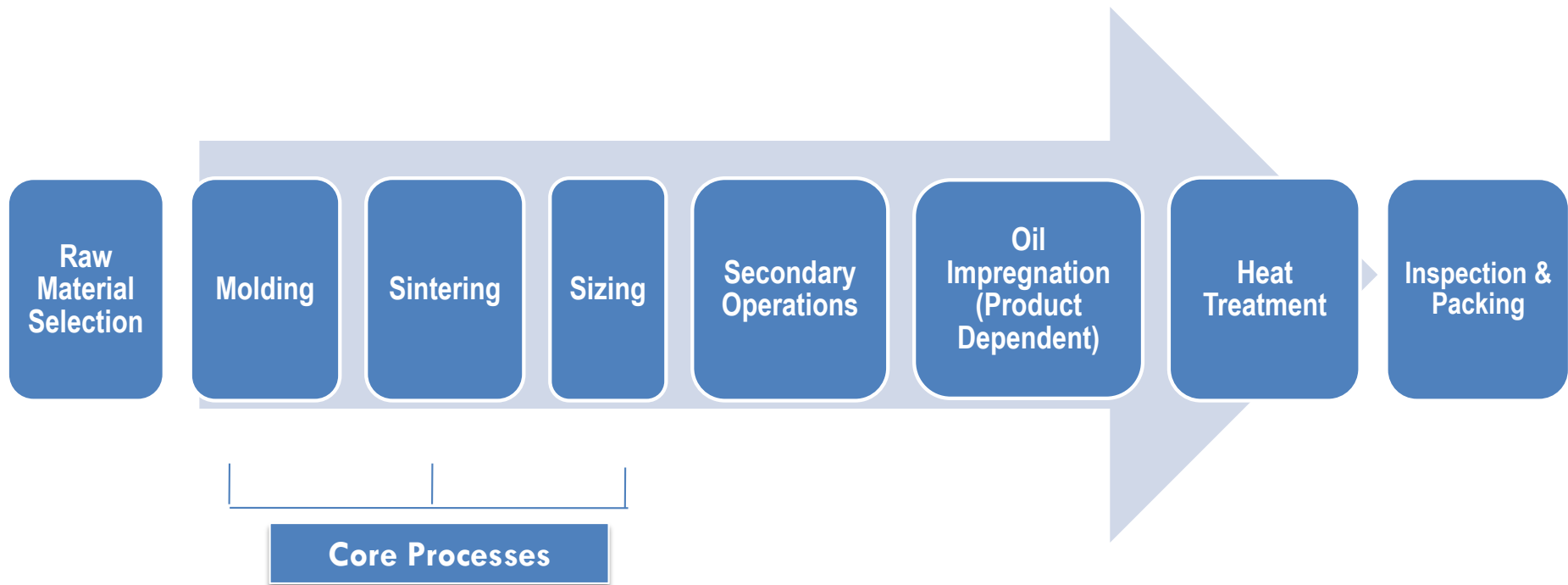
Powder metallurgy is a an efficient, practical and cost effective technology that lends itself to producing high quality mechanical parts. This process was developed and has been in use for over 100 years now. With successive advancements, it has kept on exploring new opportunities. With advantages of minimized machining, powder metallurgy brings about a more effective utilization of materials, performance and work when compared to the conventional casting or or forging processes.

ADVANTAGES OF POWDER METALLURGY

- ❑ Eliminates or minimizes machining.
- ❑ Eliminates or minimizes scrap (material utilization is normally 97%)
- ❑ Wide variety of Alloy mixtures.
- ❑ Excellent surface finishes.
- ❑ Provides porosity for self lubrication properties.
- ❑ Enables manufacturing of complex & unique shapes.
- ❑ Offers long-term performance reliability in critical applications
- ❑ PM is **cost effective**

POWDER METALLURGY PROCESS

At **Adamjee Engineering (Pvt) Ltd**, the powder metallurgy production process is carried out as follows.



Quality Control & Inspection carried out at each & every step.

QUALITY CONTROL AND ASSURANCE

Quality Control and Assurance has been the hallmark of Adamjee Engineering (Pvt) Ltd right from the beginning. Our leadership in the local market along with sound export volumes endorses this aspect of the company.

Quality Control is of key importance in our processes and it is critically monitored throughout the production process. Some of the key parameters checked during the production are as follows.

- ❑ Overall length (OAL), Mass, Density and Split Density at the Molding Stage.
- ❑ Internal & External Diameter, OAL, Hardness, Strength at the Sintering Stage.
- ❑ Internal & External Diameter and OAL at the sizing stage.
- ❑ In secondary processes all the parameters mentioned above (except density and split density) are tested again.

QUALITY CONTROL AND ASSURANCE

In order to maintain the same quality level while avoiding batch to batch variations, we follow a **Lean Manufacturing System by employing Quality Control Plans** for each and every product bearing the details of the processes to be followed during the production along-with the dimensional tolerances and testing specifications. This has helped us reducing waste and eliminated/reduced costly sizing processes.

In addition to all of the above we provide testing & other facilities to our customers. Some of the facilities we offer to our customers are as follows.

- Aid in Design for Manufacturability
- Precision Measuring
- Fully Calibrated Process Monitoring
- Hardness Testing
- Density Checking
- CAD Facilities

QUALITY CERTIFICATION



Current issue date: 7 October 2020
Expiry date: 18 August 2023
Certificate identity number: 10296785

Original approval(s):
ISO 9001 - 19 August 1999

Certificate of Approval

This is to certify that the Management System of:

Adamjee Engineering (Pvt) Ltd

Plot No 1 & 16 , Sector 20, Korangi Industrial Area Karachi, Karachi, 74900, Pakistan

has been approved by Lloyd's Register to the following standards:

ISO 9001:2015

Approval number(s): ISO 9001 – 0049954

The scope of this approval is applicable to:

Manufacturing of Fasteners and Powder metals parts.

Luis Cunha

Area Operations Manager - SAMEA

Issued by: Lloyd's Register Quality Assurance Limited



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PRODUCTION FACILITIES

MOLDING PRESSES

20 – 100 Ton Capacity



PRODUCTION FACILITIES

SINTERING FURNACES



PRODUCTION FACILITIES

SIZING AND SECONDARY PROCESSES

- **Sizing of Bushes and Auto-parts.**
- **Secondary Operations**
 - ▣ **Drilling & Burnishing.**
 - ▣ **Grinding Operations.**
 - Surface Grinding.
 - Cylindrical Grinding.
 - ▣ **Vibratory Finishing.**
 - ▣ **CNC & Conventional Machining.**
 - Turning (reducing diameter)
 - Facing (reducing length)
 - Tapering (making a conical shape)
 - Grooving (making a symmetrical indentation)
 - Chamfering (creating a radially symmetrical chamfer)
 - ▣ **Milling and Slotting.**
 - ▣ **Heat Treatment (Carburizing, Quenching & Tempering).**
 - ▣ **Oil Impregnation**

PRODUCTION FACILITIES – SECONDARY OPS



PRODUCTION CAPABILITIES

Following are some of the key design parameters for powdered metallurgy products produced at our production facility.

- ❑ **Mass of Product** – Max 450 grams
- ❑ **Height/Length of Product** – Max 50 mm (may vary)
- ❑ **Outer Diameter** – 70 mm (may vary)
- ❑ **Density** – Max 7.10-7.20 gm/cc (depending upon premix powders)
- ❑ **Hardness** – Max 85 HRB and up to 35 HRC with heat treatment process.

PRODUCT RANGE

AEL offers a wide variety of powder metal/sintered products. The products shown and mentioned in the slides below are not an exhaustive list but provide a fairly good idea about our capabilities. For a complete list of products please contact us on the details mentioned in the last slide.

SECTORS

Following are some of the industrial sectors Adamjee Engineering (Pvt) Ltd is catering to locally and internationally with its top of the quality powder metal product lines.

□ **Automotive Sector**

□ **Motorcycle Industry**

- Ge-rotors, Shock Absorber parts, Valve Guides etc.

□ **Car Industry**

- Shock Absorber parts

□ **Commercial Vehicle Industry**

- Ge-rotors, Oil Pump Gears and different kinds of bushes.

□ **Tractor Industry**

- Ge-rotors, Oil Pump Gears, Idler Gears and different kinds of bushes.

□ **Home Appliances Industry (Fan and Washing Machines)**

- Multiple self lubricating bushes in iron and bronze.

GEROTORS - AUTOMOTIVE

AEL provides a wide variety of Gerotors specifically designed for a large number of OEM models including,

- ❑ Massey Ferguson Tractors MF-135, MF-240 MF-375/385, MF-440.
- ❑ Ford Tractors 40/60, 6610/7000.
- ❑ Ford Transit Vans.
- ❑ Dry Sump Pumps for Motorsports Industry.
- ❑ Honda Motorcycles CD-70, CG-125.
- ❑ Pumps for Compressors of Buses.

.... and many more

OIL PUMP GEARS - AUTOMOTIVE

In addition to Gerotors the company specializes in the manufacturing of Oil Pump and Idler Gears for numerous models. Some of them are as follows.

- ❑ Bedford Trucks.
- ❑ Balancer Units for Massey Ferguson tractors.
- ❑ Idler Gears for Massey Ferguson tractors.
- ❑ Fiat Tractors (480 & 640).
- ❑ John Deere tractors.
- ❑ Ursus tractors.
- ❑ Peugeot Commercial Vans (Model No. J-9).
- ❑ Mercedes Benz trucks.
- ❑ Lombardini Engines, LDA 450-96.

For complete details of Oil Pump and Idler Gears please contact us on details mentioned in last slide.

SHOCK ABSORBER PARTS - AUTOMOTIVE

Adamjee Engineering (PVT) Ltd also offers a wide range of shock absorber parts for a large number of OEM models including the following.

- ❑ Shock Absorber parts for Suzuki Cars.
- ❑ Shock Absorber parts for Honda Motorcycle (CD-70 & CG-125).
- ❑ Shock Absorber parts for Yamaha Motorcycles.
- ❑ Rod Guides for European Trucks (including DAF, Scania, Mercedes and Volvo etc).

SELF LUBRICATING BUSHES

AEL started the production of its powder metallurgy plant with the production of oil retaining, self-lubricating bushes for the fan & domestic appliances industry in the country and with two decades in this business, the company has amassed an extensive range of sintered bushes in cylindrical, flanged and spherical shapes using iron, iron/copper, diluted bronze & 100 % bronze powders. We are familiar and are able to maintain MPIF, ISO, DIN & ASTM standards for both material & tolerances. Our standard bushes are impregnated with Shell Tellus 68 Hydraulic Oil.

Further details on our range of sintered bushes are covered in the slides that follow.

SELF LUBRICATING BUSHES

COMPOSITION & PROPERTIES OF POWDER MIXES USED FOR SELF LUBRICATING BUSHES

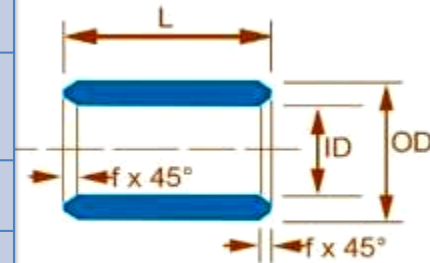
TYPES	PARTICULARS	POWDERS		
		Bronze	Iron/Copper	Diluted Bronze
NAME	Powder Mix No.	630	124	661
CHEMICAL ANALYSIS	Copper (%)	89 - 91	16-19	Balance
	Tin (%)	11 - 9	Nil	6.5 - 7.5
	Iron (%)	Nil	Balance	25 – 26
	Carbon (%)	-	-	-
	Others (%)	0.3 max	0.8 max	0.8 -1.35
MECHANICAL PROPERTIES	Density (grams/cc)	6.6	5.8 - 6.2	6.3
	Oil Content (% by volume)	22	20	20
	Radial Crushing Strength (N/mm ²)	140 min	200 min	160 min
CORRESPONDING STANDARDS	MPIF	CT-1000-K-26	FC-2000-K-30	-
	DIN	Sint A-50	Sint B-20	-
	ISO 5755 Grade	P4012Z	-	-
	ASTM	B 438 Grade 1 Type 2	B 439 Grade 4	-

Note: Other densities and strengths are also available upon request

SELF LUBRICATING BUSHES

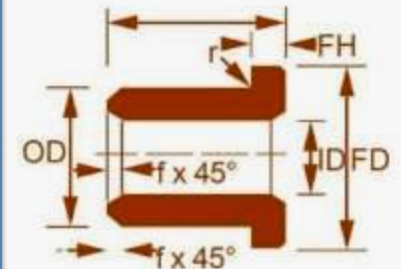
CYLINDRICAL SELF LUBRICATING BUSHES

INNER DIA (ID) – Range in mm		OUTER DIA (OD) – Range in mm		LENGTH(L) - Range in mm	
Min	Max	Min	Max	Min	Max
6	50	9	60	6	60



FLANGED SELF LUBRICATING BUSHES

INNER DIA (ID) - Range in mm		OUTER DIA (OD) - Range in mm		FLANGE DIA (FD) - Range in mm		FLANGE HEIGHT (FH) – Range in mm		LENGTH(L) – Range in mm	
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
6	40	12	50	14	60	2	5	6	50



For complete details of Self-Lubricating Bushes please contact us on details mentioned in last slide.

PRODUCT PICTURES

SINTERED PRODUCTS FOR TRACTORS



SINTERED OIL PUMP GEROTORS



SINTERED OIL PUMP GEARS



SINTERED PRODUCTS FOR MOTORCYCLES



SINTERED PRODUCTS FOR CARS (SHOCK ABSORBERS)



adamjee
ENGINEERING
ISO 9001 : 2015 CERTIFIED COMPANY

SINTERED PRODUCTS FOR COMMERCIAL VEHICLES



SINTERED, SELF LUBRICATING BUSHES



OUR PROMINENT CLIENTS



WHAT WE OFFER

- ❑ **Commitment to Quality**
- ❑ **Timely Deliveries**
- ❑ **Exceptional Product Performance**
- ❑ **Consistency & Repeatability (no batch to batch variations)**
- ❑ **Highly Competitive Pricing**
- ❑ **Highly engineered products that satisfy**
 - ❑ **Strength,**
 - ❑ **Hardness, and**
 - ❑ **Performance criteria.**

*In short, we strive to provide customers with **peace of mind** through our services.*

CONTACT DETAILS

Please feel free to contact us regarding the orders, quotations and list of products.

Adamjee Engineering (Pvt) Ltd

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