PITAC SUCCESS STORIES

A STORY OF PITAC'S SUUCESSFUL JOURNEY TOWARDS INDUSTRIAL DEVELOPMENT

PREFACE

The government of Pakistan established Pakistan Industrial Technical Assistance Centre (PITAC) in 1962 with the merger of Industrial Research and Development Centre (IRDC) and Industrial Productivity Centre (IPC) under the administrative control of Ministry of Industries with its headquarter in Lahore and regional offices in Karachi, Peshawar, Gilgit Baltatistan, Mirpur (AK) & Quetta. PITAC is rendering technical assistance to the industry by way of designing and manufacturing of production tooling equipment, prototyping, and rendering training services to engineers, supervisors and technicians from a variety of industries throughout the country. It has a track record of services and considered as the mother of several technologies. In 70's, PITAC provided it's services to Metal Advising Services "MAS" – a cell, which was developed within PITAC to provide technical assistance to Pakistan steel Mills (PSM) under the supervision of Egyptian Metallurgist Dr. Kamal Hussain. Further, the valuable customers of PITAC are Pakistan Ordinance Factory (POF), NDC, Millat Equipment Limited (MEL), Millat tractor Limited (MTL), Honda, Synthetic Product Enterprise Limited (SPEL) and many small and medium industries others. Glimpse

PITAC also facilitates import substitution by providing assistance to original equipment manufacturers and vendors. It also provides in-house training facilities to the new & existing industries to improve their production and technical capabilities.

This booklet takes you on a brief journey of how PITAC is helping its stakeholders in gaining technical trainings that how PITAC is contributing in the industry's development and the country's economy.

Where We Are Driving Industrial Progress

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DESIGN DEVELOPMENT AND MANUFACTURING OF 4 CAVITY AUTO MOLD OF JBL 50ML BOTTLE AND CAP for JOHNSON & JOHNSON

CUSTOMER INFO

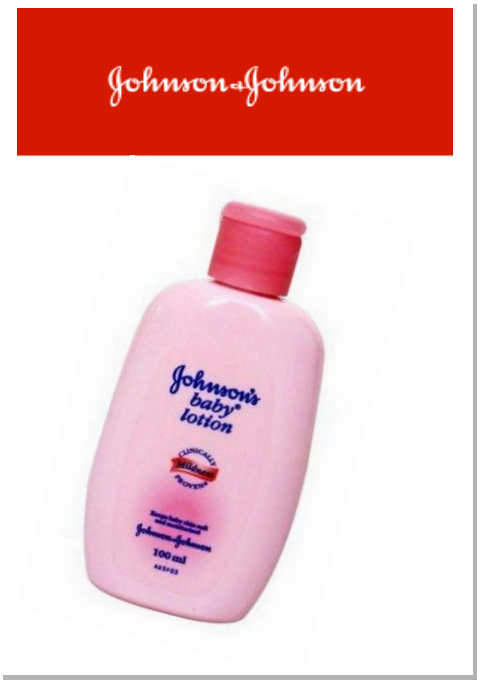
JOHNSON & JOHNSON PAKISTAN (PVT) LTD.
Plot No.10 & 25, Sector-20 Korangi Industrial Area, Karachi 75180, Sindh, Pakistan
Phone: 9221-111515515 / 5045564 / 5045560 / 5044253 / 5044254
Fax: 9221-5044283

DESIGN AND DEVELOPMENT OF PRODUCT

PITAC ensures reliably, efficiency and facilitates cost reduction to customers. We deal with a lot of different kinds of products. As an example Johnson & Johnson Pakistan (Pvt) Ltd, which offers one of the world's largest range of consumer healthcare products, gave PITAC a work order (no. 26928) of a four cavity mold for one of their Lotion bottle and cap.

After few modification cycles succeeding the trial shot, the mold was ready to be delivered to customer.

This type of mold design was completely novel to PITAC and we took great pleasure to design this type of mold which took a great deal of specificity and astuteness. The customer also appreciated PITAC's effort in making a successful product.



DESIGN PHASE

There were several intricacies that our design team had to face while designing and manufacturing the Bottle's cap because it had to have a screw as well as a lid opening mechanism which had to be carefully thought of. This design made us face significant challenges because we had to use double sealed bearings (needle bearings) in conjunction with rack and pinion in order to facilitate the extraction of thread forming core on the bottle cap. Further, the dexterous designers made the 2D and 3D drawing manually because at that time PITAC was not using any type of software. That was a fine achievement of PITAC at that time to design and fabricate the mold without any proper setup of machinery and soft wares.

MACHINING PROCESS

In 1998, PITAC has had not the facility of Computer Numerical Control (CNC) machines, and it was very difficult to work with few conventional machines like milling, lathe, shaper and grinding etc., but the PITAC team skilfully and successfully completed the mold facing a lot of intricacies and troubles. This achievement is a proud for the PITAC that without any advanced setup and facilities, it was able to come up with solution.

PRODUCTION DATA

The average production of the mold was 60,000 bottles per year.

COMPARISION

In contrast to the mold imported from the china, the PITAC manufactured mold was more reliable and efficient to work. Also, in the monetary terms, it was cost efficient with a max warranty in comparison to the other market molds.

DESIGN DEVELOPMENT AND MANUFACTURING OF 12 CAVITY SHARPENER MOLD FOR YAQOOB AND SONS STATIONERS

CUSTOMER INFO

YAQOOB AND SONS STATIONERS

Tipu Sultan Road New Mozang Road Lahore

DESIGN & DEVELOPMENT

A customer approached PITAC for the sake of designing and manufacturing mold of small pencil sharpener. The design was based on several complexities. The designing of a product requires a proper research and development strategy and during this every aspect, that can obstruct the developmental activity, is considered. Following this approach, the first point under discussion before the designing phase was the angle of the blade because a child's way of inserting a pencil into a sharpener is different as compared to that of an adult therefore it needed to be accounted for by altering geometry of the sharpener hole so that the sharped pencil tip does not break.

DESIGNING PHASE

PITAC, utilizing the in-depth knowledge & experience of designers, offers its clients the ever possible best designed product. On this project, the dedicated and well educated team of experienced designers as well as the machine shop experts analyzed the product keeping in mind the product user as well as reliability of the part. They carefully calibrated the angle and other design requirements necessary to achieve a successful product. And these experts proved their capabilities in the form of

successful trail shot.

MACHINING PROCESS

This was a 12 cavity mold. As the designing procedure was keenly followed by the designers likewise the team of engineers and foremen, the mold was manufactured in first go and ready for delivery after the trail shot. The machining process like milling, boring, drilling, grinding and lapping were performed in the machine shop which is the biggest shop of PITAC and the other operations like cavity and core making, wire cut operation, and assembly were performed in the Plastic Mold Design (PMD) – (the project of JICA). After the successful completion of one mold, the customer order the manufacturing of further two molds.

DESIGN DEVELOPMENT OF SHOE MOLD DESIGNING FOR ABC

CUSTOMER INFO

DESIGN AND DEVELOPMENT

After the setup of soft wares, it was very easy to design the complicate jobs and under the able designers. One and after getting intricate jobs, PITAC received a job regarding designing of a mold of shoe. PITAC designed the mold and the trail shot was successful in one go although the manufacturing and trial shot was to be outsourced as per customer's instructions but the after the trail shot the shoe sample was perfect.

DESIGNING PHASE

A shoe manufacturing company approached PITAC to design a Mold for a shoe. The client gave us a sample made of Plaster of Paris material which made it difficult for us to get accurate measurements. After discussion with the customer we decided to make the CAD model with the best possible sizes we could extract from the sample. It took a lot of time to make the design but with the help of our experienced and professional designing team we did it successfully by image tracing and some manual measurements.

The customer was extremely content with the new shoe design.

DESIGN DEVELOPMENT AND MANUFACTURING OF TRIGGER SPRAYER CAP MOLD FOR ABC

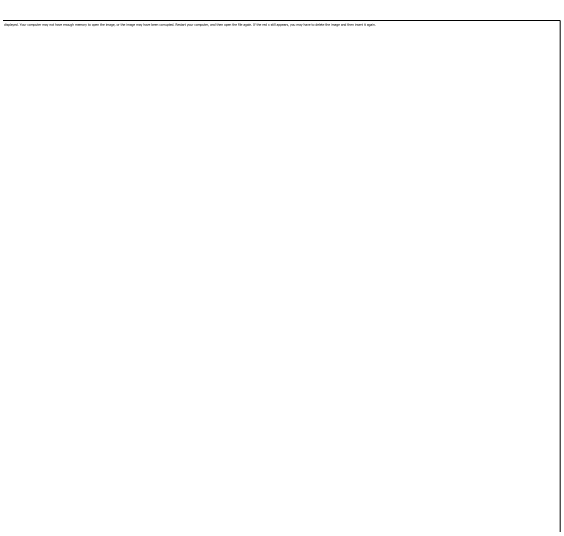
CUTOMER INFO

DESIGN AND DEVELOPMENT

After the setup of JICA project in PITAC, it was able to make the complex jobs with high efficiency and the skilled workforce trained from Japan made the PITAC role obvious in developmental phase. One and after getting intricate jobs, PITAC received a job regarding the designing and manufacturing of Plastic Spray Bottle Mold.

DESIGN PHASE

The designing requirement of the model was to design a slide core which had to accommodate the extraction of a curved surface undercut. This was something new for PITAC, so the team had a discussion about how to tackle the problem. The subsequent solution from the meeting came out to follow the cam follower mechanism. We established a computer based model and simulated it to figure out whether the mechanism works or not. After thorough analysis and several design iterations we came up with the required working model.



MANUFACTURING PHASE

Besides facing design constraints, the manufacturing team also faced several manufacturing constraints while making the required cam parts. But PITAC's multi-disciplinary team eventually came up with the required solution to these constraints. Manufacturing of plastic trigger sprayers includes high output trigger sprayers with dip tube. So it was very difficult to manage the mechanism of this trigger sprayer.

The main focus in manufacturing the trigger sprayers was that it should be easy to control the accuracy and the amount of liquid that it can dispense; this solves the problem of wastage of any type of liquid used that most consumers experience when using a sprayer. Different machines

were involved in manufacturing the plastic injection mold for this trigger sprayer like CNC machining center, EDM wire cut, NC Milling machine and many other machines.

DESIGN DEVELOPMENT AND MANUFACTURING OF PIPE TEE MOLD FOR MECHFIT INDUSTIRES

CUSTOMER INFO

MECHFIT INDUSTRIES

Plot#601, Sundar Industrial Estate, Lahore, Punjab 54000

Phone +92 423 7918788

Cell: +92 321 8462771

DESIGN AND DEVELOPMENT

Mechfit Industries Ltd is a Pipe Fitting manufacturing company. They approached PITAC to design and manufacture Pipe Tee mold. The plastic material used in these parts was High density Polyethylene (HDPE). Thus the main issue that was identified the shrinkage factor of HDPE, which was controlled successfully.

DESIGNING PHASE

PITAC used a multi-disciplinary team to evaluate the process to come up with a solution. Our round table discussion examined the project from all aspects technical, design and material properties while ensuring quality and reliability. So we came up with the solution to design a sample mold for the lowest possible shrinkage factor and observe the product quality in the trial shot. If the quality of the trial shot part was not up to the standard we would increase the mold cavity size (due to increase the shrinkage value) until the product quality came out to be flawless.

This approach directed us towards the selection of a particular shrinkage value and the mold trial shot came out to be faultless.

The result was a successful product which the customer is still using to date.

MANUFACTURING PHASE

Usually in manufacturing phase, normally thick parts as well as severe differences in wall thickness result in the parts being affected by shrinkage. The challenge was for us to reduce overall shrinkage while meeting the superior strength and resistance to elements these parts require. However the shrinkage ratio for HDPE according to the standard used in PITAC is between 2% to 6% which is a big range. The parts had significant thickness which made the selection of shrinkage factor very difficult.

DESIGN DEVELOPMENT AND MANUFACTURING OF BIKE PEDAL MOLD FOR RISEN ENGINEERING

CUSTOMER INFO

RISEN ENGINEERING

Al Hafeez Shopping Mall, Main Blvd Gulberg, Block D 1 Gulberg III, Lahore, Punjab 54660

Risen Engineering is a motorcycle parts manufacturing company and a vendor of Atlas Honda.

DESIGN AND DEVELOPMENT

Risen Engineering Private Limited approach PITAC for the development of Mold of bike pedal. As PITAC is famous for designing and manufacturing the products at the subsidized rate, so mostly the products that can only be imported or locally very high manufacturing cost are developed from the PITAC at the low rate than the market. PITAC's team designed and manufactured the mold which was a success of the PITAC and its team.

DESIGNING PHASE

The designing team used the Solid works and CADCAM software during the designing procedure. After initial designing, it was consulted with the customers and then after small changings, it was finalized for the manufacturing.

MANUFACTURING PHASE

Due to increase in complexity of the parts an exceptional amount of CNC machining details was required using very small tool cutters. Furthermore the mold design constituted of a lot of pins which resulted in the difficulty to assemble the mating parts because the pins had to be held in place and aligned parallel to each other.

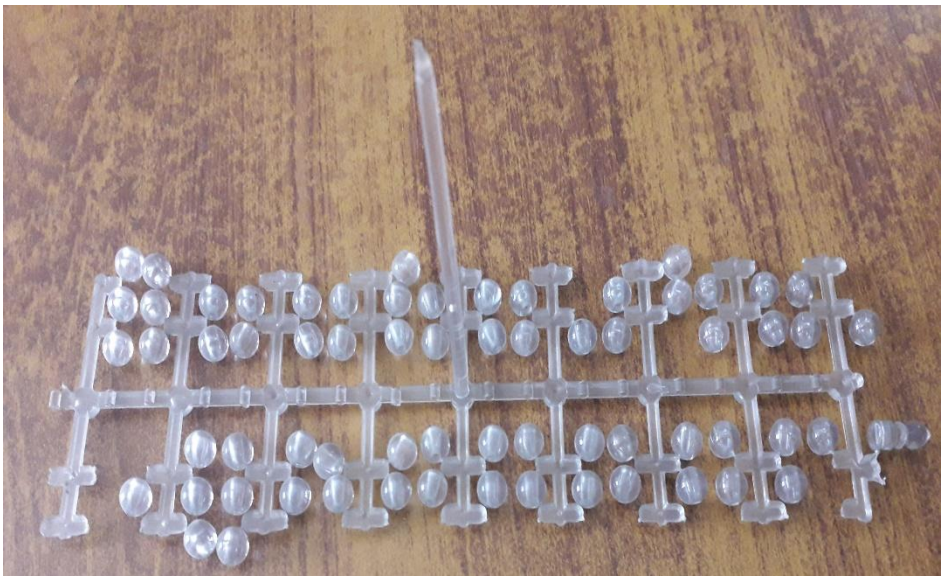
The manufacturing and assembly section of PITAC is very experienced and competent and overcame these complications which resulted in a successful trial shot of the project. The customer was very happy and has given several work orders of other parts since then.

DESIGN DEVELOPMENT AND MANUFACTURING OF TASBIH MOLD FOR A.S. PLASTIC

CUSTOMER INFO

DESIGN AND DEVELOPMENT

Plastic mold design department has done a lot of complicated and tricky jobs and all the jobs were successful under the supervision of highly skilled engineers and all the other team. The A.S plastic company consulted with PITAC for the manufacturing of mold of Tasbih. Although the designed was not difficult but the manufacturing was bit tricky because of the small in size of runners. But at the end PITAC was successful in manufacturing the mold.



DESIGNING PHASE

The designing of this mold was not intricate and complicated. The team of highly skilled designers easily made the design without any complication.

MANUFACTURING PHASE

A.S Plastic gave PITAC work order for Tasbih mold. This mold had to accommodate all the Tasbih beads along with the head bead. The Tasbih beads were very small in size which meant that the runner and gates used to fill these bead cavities had to be small as well. The small size runner made it very difficult for us to polish it. The most problematic part was the manufacturing and assembling of the small slide core pins which had to fit in the bead cavities. The slide core pins were used to make hole in the beads. This mold required a lot of effort and experienced personnel to achieve the desired objective. This mold was very cost efficient and reliable. The customer gave due credit and appreciated

PITAC's Plastic Mold Department for this incredible achievement.