



ROBUSTHANE

POLYURETHANE - A STRONG RESILIENT VERSATILE POLYMER

POLYURETHANE
WHEEL
PRODUCT CATALOG

POLYURETHANE

A STRONG
RESILIENT
VERSATILE
POLYMER

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THE ISMAT CHRONICLE

1994

Established Ismat Rubber

Ismat set up a manufacturing unit, targeted to the rubber needs of construction, oilfield, marine and automobile industries in the UAE. With a strong technical background and reinforcement from Ismat Chennai, the company quickly established itself as one of the leading solution providers for rubber and engineering products in the region.

1996

Expansion into Rubber Extrusion

Having the foresight to anticipate a demand for extruded products, Ismat built a full-fledged rubber extrusion plant. Our proliferating product portfolio served a rapidly expanding customer base more effectively than ever.

2000

Consolidation of A Growing Titan

Exponential growth necessitated a move to bigger premises. The new location admitted an expandable superstructure of 20,000 square feet, in Sharjah's prime Industrial area 15. In the same year Ismat was also awarded the prestigious ISO 9001 certificate.

2002

Diversification into Manifold Products

Ismat began to spread its wings, taking on the new lining business. We launched into the manufacture of all types of rubber rollers for conveyor systems, the printing industry, as well as rubber lining of butterfly valves, tanks and pipes.

01

25+
YEARS IN
BUSINESS

ABOUT ISMAT

Ismat is a high-concept, technically sophisticated manufacturer of rubber moulded, extruded, lining and polyurethane products.

Based in Sharjah - UAE since 1994, we cater to large OEMs in the construction, marine, oilfield and other manufacturing sectors for all their rubber requirements.

The founder, Mr.Yakub envisioned Ismat as a forward-thinking engineering company driven by innovation and a passion for state-of-the-art products that meet the accelerating demands of our customers.

2007

Escalation with Polyurethane Production

Always ahead of the curve, Ismat grasped the potential of polyurethane early on, and set up a division to manufacture it. The outstanding engineering properties of this compound makes it ideal for demanding mechanical, chemical, thermal and electrical applications. By now, Ismat was clearly on the forefront of business, becoming a reliable provider for a comprehensive range of rubber products in the market in the region.

2010

Pioneering Green Production with Terrain

Being a future-oriented company, Ismat took proactive steps in going green. Our Terrain flooring products utilize recycled automotive tyres – a smart, ecologically responsible innovation that goes a long way towards protecting the environment.

2016

Acceleration with Anti-Vibration Mounts

Noise pollution is a serious health and safety hazard. Ismat is once again taking the lead in addressing this problem with breakthrough technology. Our BULWARK division manufactures a catalog of cutting edge mounts designed to reduce noise and vibration, contributing to a quieter work and living environment.

2019

Upgrading the manufacturing facility is KEY to any industry

Additions on new hydraulic molding presses, fully automated VMC Machines for tooling, a new integrated storage facility and a revamped state of the art laboratory are just some of the initiatives taken in 2019. The company also complied with the new ISO 9001 2015 QMS, ISO 14001 2015 HSE and 45001 2018 OHSAS with an eye to comply with the requirements of its international audience.

O2

ABOUT POLYURETHANE

If there is one ingredient that's present in all of the things that you see, it would have to be polyurethane. From liquid paints, coatings, and adhesives to sturdy materials like blades, wheels, rollers etc - polyurethane is integrated into all these objects. In other words, it's all around us at home, in our offices, and even in schools.

1930

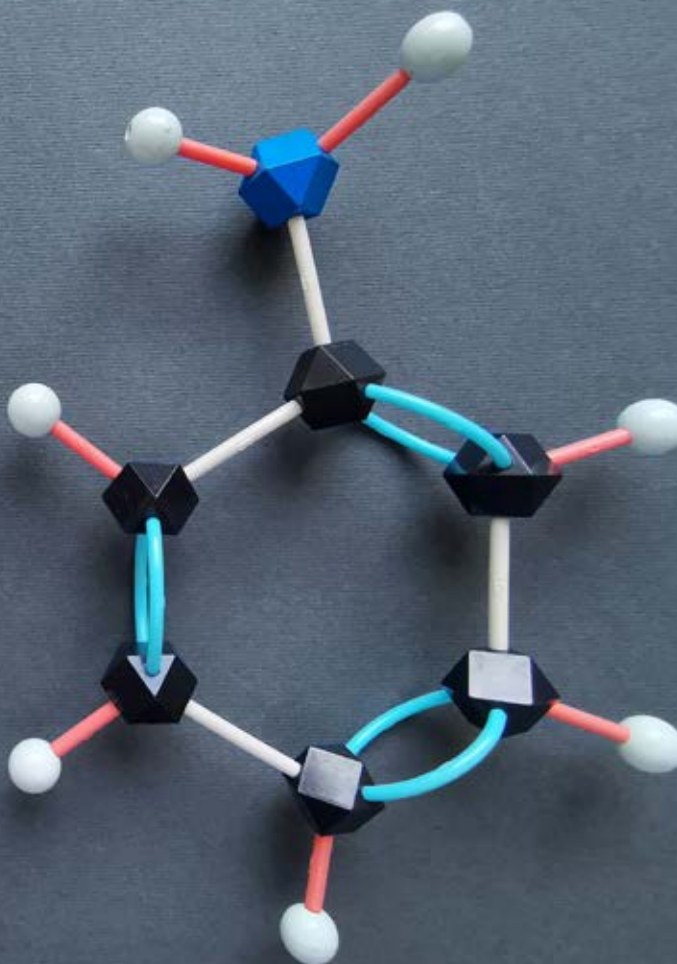
HISTORY OF POLYURETHANE

Polyurethane was first discovered in the 1930's by Professor Otto Bayer in his quest to search for an alternative for natural rubber during the World War II.

But he discovered more than what he longed for – polyurethane. It then turned out to be one of the most important compounds in almost all of the things around us today; a product that's far greater than a substitute for natural rubber. Because of his discovery, he was referred as the Father of the polyurethanes engineering. Nowadays, polyurethane comes in many forms to make it suitable to a myriad of applications because of its flexibility to substitute aplenty of materials that are either scarce or expensive.



Aniline
 C_6H_7N



1950

FIRST
POLYURETHANE
SURFBOARD
WAS MADE

03



AN INTRODUCTION TO POLYURETHANE WHEELS

Polyurethane wheels have all the advantages of rubber, plastic and metal. They have excellent mechanical and chemical properties compared to other materials making it a very popular choice in the selection process.

Additional properties of polyurethane wheels include resistance to impact, abrasion and tear, shock absorption qualities, ease of customization, minimal heat build-up, hydrolysis resistance, and low-temperature performance, reduction in noise pollution, resistant to ultraviolet radiation, they are flexible and non-corrosive. They come in a wide range of hardness – from 20 Shore A to 80 Shore D.

A wide selection in soft,

hard, rigid and integral skin options gives polyurethane an absolute advantage over all other options in both rubber and plastics.

Polyurethane wheels are manufactured using the casting, hydraulic press molding or injection molding process. The wheels come in complete solid polyurethanes and for more heavy duty applications comes with an inner core consisting of either cast iron, aluminum or steel structure. The outer tread consists of polyurethane material, this helps the polyurethane wheels to function as a good shock absorber and cushioning agent helping it work efficiently on bumpy and uneven terrains while keeping the noise level dramatically low.

Polyurethane wheels have a higher load bearing capability, higher tensile strength and wear resistance compared to rubber or plastic wheels. The load capacity of urethane wheels is up to 5 X that of rubber caster wheels with the same dimensions. Polyurethane wheels have higher elastic memory and flexibility compared to plastic wheels. They provide better grip and traction reducing the load on the wheel to provide the required driving force. Each wheel can be customized by hardness, flexibility, tear strength, color and other parameters based on the application demand, this gives polyurethane wheels an unmatched advantage over rubber, plastic and metal wheels.

04

INDUSTRIES SERVED

MATERIAL
HANDLING



TRANSPORT AND
LOGISTICS

ELEVATORS AND
ESCALATORS



INDUSTRIAL
WHEELS



01 MATERIAL HANDLING

FORKLIFT POLYURETHANE WHEELS

With the market dynamics changing, the need for more cost effective material handling solutions becomes imperative. The material handling equipment's need to be able to handle heavy pay loads at the same time be faster and efficient, this puts increasing demand on the polyurethane wheels and tires. To counter

this we use the highest polyurethane grades to ensure that we keep up with the customers' expectations.

Ismat rubber, designs and manufactures polyurethane wheels made from Methylene Diphenyl Diisocyanate (MDI), Naphthalene diisocyanate (NDI) and p-phenylene



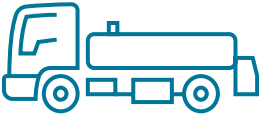
diisocyanate (PPDI), based polyurethane elastomers. We manufacture forklift drive wheels, load wheels, forklift press on tire, pallet truck wheels, AGVs, AS/RS wheels, conveyor systems, guide rollers, stacker wheels, providing complete solutions for the material handling industry.

Our wheels meet the strict quality requirements and performance demand of the material handling industry by providing durable and reliable products. This is possible with in-house product design and custom designed high performance polyurethane formulations.

PROPERTIES OF HIGH PERFORMANCE POLYURETHANE WHEELS:

- Excellent dynamic and mechanical properties.
- High load bearing properties.
- Low heat build-up
- Hydrolysis resistance
- Low-temperature performance
- Resistant to ultraviolet radiation
- Flexible and non-corrosive
- High resistance to cut and tear
- Low compression set
- Working temperatures between -20°C To + 110°C
- Resistance to hydrocarbons, greases and solvents





02 TRANSPORTATION & LOGISTICS:

Large percentage of our polyurethane wheel production is dedicated towards the transportation and logistics section due to the scale and magnitude of this industry. We manufacture polyurethane wheels for different service areas within and outside the airport such as wheels for baggage and cargo handling, lifting vehicles, motorized luggage carts, pallet trailers, the baggage conveyor systems, ground support equipment, the luggage storage and logistic systems within the airport areas.

Handling large cargo volumes under tight

schedules is a high demand job. Aircrafts have a short turnaround time between flights and require smooth and reliable transition of material handling. Our products meet the rigid requirements of the airline industry. Even under extreme weather conditions our rollers performance is unaffected. Our roller design and the materials used - provide excellent durability, characterizing excellent wear, tear and impact resistance, low compression set enables smooth movement of material at high speed.







03 ELEVATORS AND ESCALATORS:

Elevators and escalators are part of our day to day life. They are a popular mode of transporting people in all public and private arenas. Maintenance and upkeepment of these utilities is paramount to make sure that they work seamlessly.

Polyurethane guide wheels and rollers perform a critical role in the smooth flow. Our wheels keep the elevators in place and help them stabilize against the steel guides ensuring that the elevator stays in place to ensure a smooth ride. These wheels also act as an Anti-lock system in case the

cable malfunctions. Hence the polyurethane wheels are an integral part in the working of elevators and escalators.

Safety, performance and reliability of the polyurethane wheels under varied working environments is paramount as most escalators and elevators work in high traffic area's transporting people, any disruption in the service causes logistical problems. Our rollers are manufactured from high quality polyurethanes,



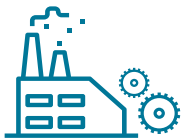
capable of handling high load and speed, they have excellent resistance against wear and tear even under extreme weather conditions ensuring long working life. This ensures low maintenance costs on the system which has huge cost savings in the long run.

Our wheels are used in both passenger and service lifts and all types of escalators which are widely used in Shopping Centers, Airports, Hotels, Stadiums, Department Stores, Office Buildings, Arenas, Convention Centers, Train Stations, and Underground Stations.

Having an in-house design and development team helps us to develop custom made products based on individual requirements of each customer. This gives the customer flexibility to change the design or the material based on their specific application requirements.







04 INDUSTRIAL WHEELS:

Polyurethane wheels are used in a wide variety of industrial applications such as overhead conveyor systems, industrial carts, Industrial washer and dryer systems, Roll forming industries, Automated parking systems and many more.

We specialize in manufacturing custom made wheels specific to each industry, this

is possible due to our in-house design and development team which tirelessly works on new product development. This helps us to provide the right solutions for any machine or engineering applications.

Manufacturing polyurethane wheels with the highest standards maximizes safety, productivity, reducing

down time on maintenance which results in high cost savings.

We manufacture industrial wheels from very small loads to heavy duty industrial wheels which are manufactured from the highest grades of polyurethanes. All industrial wheels are machined to the size requirements of each customer, providing keyways and bearings making it ready to use for the customer.

We also offer industrial wheels with softer compounds which are non-marking, good for wet area usage providing good surface grip, are hydrolysis resistant.



O5

TYPES OF POLYURETHANE WHEELS



01 DRIVE WHEEL:

We manufacture medium to heavy duty drive wheels in high grade Polyurethanes, giving good electrical conductive properties, better wet grip for wet and slippery floors, manufactured in soft and hard compounds based on working conditions of the fork lifts. Our drive wheels come with a keyway or in a stud hole configuration. The inner metal core come in pressed steel or cast iron options. They are extensively used in material handling industries in fork lifts and cargo carts.

All wheel tread are non-marking offering good dynamic load capacity, mechanical wear resistance and a good compression set. All polyurethane wheels are resistant to many chemicals and oils having low water absorption which make these wheels ideal for most material handling applications.

Our polyurethane drive wheels can handle medium to high load capacities ranging from 1000 Kgs up to 10,000 Kgs. There are different ways to manufacture the wheels – either bonding them directly on the metal core

of the fork lift wheel or with an option of press on tire, which can be directly pressed on the metal core for easy replacements.

KEY BENEFITS OF OUR DRIVE WHEELS

- Manufactured with high grade polyurethanes
- Manufactured in soft and hard compounds
- Options of keyway or stud holes for inner hubs.
- Wide choice of tread materials
- Impact, tear and wear resistant
- Very high load capacities

CORE OPTIONS IN DRIVE WHEELS:



DRIVE WHEEL WITH
PLAIN BORE & KEYWAY -
RECESSED TYPE



DRIVE WHEEL WITH
PLAIN BORE & KEYWAY



DRIVE WHEEL -
DOMED TYPE

02 GUIDE WHEEL:

Guide rollers are used in a wide range of industrial applications. Guide rollers are non-marking, anti-corrosive have low rolling resistance, high impact and tear resistance, high load capacity, low compression set

and are heat resistant.

They are used for guiding equipment's and keeping them aligned across the travel length. Our guide rollers are manufactured in high grade polyurethane to combat the tough working conditions these rollers are subjected to.

APPLICATIONS FOR GUIDE ROLLERS:

- Material Handling
- Sliding doors
- Elevators
- Escalators
- Forklift Trucks
- Conveyor Belts
- Production Lines

EXAMPLES OF OUR GUIDE ROLLERS

Some examples of guide wheels that we manufacture:



Polyurethane guide rollers with steel roller on the inside, complete with high grade bearings for smooth movement.



Polyurethane guide rollers with steel roller on the inside fixed with circlip to keep the bearing in place, complete with high grade bearings for smooth movement.



Polyurethane guide rollers with steel roller on the inside fixed with circlip to keep the bearing in place, complete with high grade bearings for smooth movement.

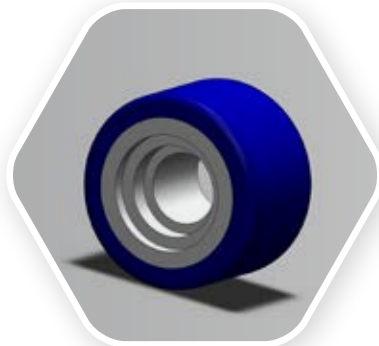


03 LOAD BEARING WHEEL:

LOAD WHEEL EXAMPLES



Polyurethane bonded to the metal core with ball bearing



Polyurethane wheels without ball bearings for applications with higher speed and load capacities.

Polyurethane load wheels are used in high loading equipment's and machinery. The core of the wheels are in cast iron or machined steel for higher load bearing capacity. They are usually fixed with bearings for easy movement.

Load wheels have a wide application range, they are used in forklifts wheels, AGVs, conveyor lines, in rotating drum assembly etc.

Our load bearing wheels are made from high quality polyurethane, this helps increase productivity, has longer operating life, helps in cost reduction and improves the overall performance.



04 PRESS ON TIRE:

We manufacture high quality press on tyres in options of both rubber and polyurethane materials which are manufactured by casting or molding directly on the steel rim or alternatively we offer tyres with separate steel core press on system for easy installation on the existing tyres. We also offer wheels with either a symmetrical or asymmetrical conical centre.

Press on tyres have a very wide application range and are offered in hardness range from 65 to 75 shore A in rubber for low load capacity operations and from 80 to 95 shore A in polyurethane for applications where working conditions are severe.

Our choice of threads are non-marking, non-slip have very high wear, tear and impact resistance against chemicals and oils and can be custom designed based on individual requirements of each customer.

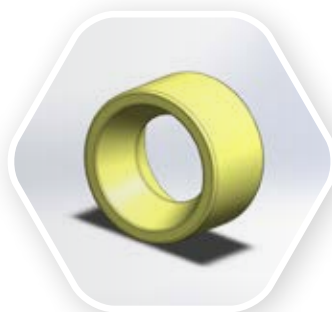
Press on tyres are a cost effective way to replacing the existing tyres, high quality insures productivity and efficiency.

PRESS ON TYRES - DESIGN

We offer custom design solutions to our customers based on their requirements. Some of the common designs used in press on tyres are given below.



High grade polyurethane directly casted on a solid steel roller, ideal solution for the most heavy duty applications.

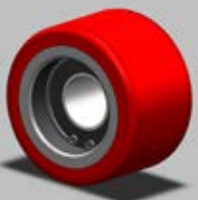
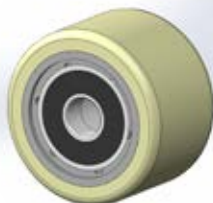


CONICAL WHEELS

An excellent alternative to metal bonded wheels, offers excellent service life, excellent mechanical properties including high speed, high load capacity, abrasion resistance and low compression. They are non-marking and resistant to many oils and greases.

05 CONVEYOR WHEEL:

CONVEYOR WHEEL DESIGNS:



Conveyor roller wheels form an integral part of the material handling systems, often found in large warehouse operations on production lines to transport materials along the conveyor system. The conveyor wheels help to transport goods in a safe, efficient and orderly manner along the conveyor system. The rollers can be powered by gravity, manually or by motor. To maintain efficiency of the conveyor system, it is vital that the conveyor wheels are made of high quality and durable material.

We manufacture a wide range of conveyor roller wheels for both - flexible

conveyors and fixed roller based conveyor systems. We manufacture the wheels for the overhead conveyor system which are mounted from the ceiling and used where objects are required to hang during painting, cooling or curing process. We also manufacture conveyor wheels for gravity based system and for driven conveyors in standard and non-standard sizes based on the requirements from our customers.

Our conveyor wheels are produced to tight tolerances have high load bearing capacity and suited to work under a variety of environmental conditions.

PROPERTY		Test Method	Unit	Grade			
				DMD 69360	DMD 69370	DMD 69375	DMD 69380
MDI-Ester	Hardness	ISO48-4	Shore A	60	70	75	80
	10% Modulus	DIN 53504	MPa	0.8	1	1.4	1.7
	100% Modulus	DIN 53504	MPa	2.6	3.4	4.3	5.1
	200% Modulus	DIN 53504	MPa	3.6	4.8	6.1	7.4
	300% Modulus	DIN 53504	MPa	5	6.6	8.8	10.7
	Tensile Strength	DIN 53504	MPa	44	45	54	54
	Elongation	DIN 53504	%	560	570	565	580
	Tear Strength: Without nick	ISO 34-1	kN/m	60	76	85	98
	Tear Strength: With nick	ISO 34-1	kN/m	38	46	53	56
	Resilience	DIN 53512	%	61	53	52	45
	Abrasion loss	ISO 4649	mm ³	20	20	20	20
	Compression set (deflection /22 h / 70° C)	ISO 815-1	%	29	30	34	27
	Hardness at -5° C	ISO 48-4	Shore	63A	72A	77A	83A
	Hardness at 80° C	ISO 48-4	Shore	53A	63A	69A	75A
	Specific gravity			1.23	1.23	1.23	1.24

Applications:	Drive wheels						
	Load wheels						
	AGVs						
	Idler wheels						
	Conveyor rollers						
	Elevators & Escalators						
	Airport equipments						



	DMD 69385	DMD 69390	DMD 69392	DMD 69395
	85	90	92	95
	2.1	2.9	3.2	5
	6	7.9	8.4	11.8
	8.5	11.5	12.3	17
	12.3	17	18.8	25.5
	53	54	54	52
	595	545	490	480
	110	131	146	170
	61	63	71	86
	41	38	32	30
	20	25	25	25
	30	27	30	32
	88A	93A	95A	97A
	80A	85A	87A	91A
	1.24	1.24	1.24	1.24



RESOURCES

PROPERTY		Test Method	Unit	Grade			
				DMT 59360	DMT 59365	DMT 59370	
MDI-PTMEG	Hardness	DIN 53505	Shore A	60	65	70	
	10% Modulus	DIN 53504	MPa	0.8	0.9	1	
	100% Modulus	DIN 53504	MPa	2.2	2.5	3.5	
	200% Modulus	DIN 53504	MPa	2.5	4	5.5	
	300% Modulus	DIN 53504	MPa	4	6.5	9	
	Tensile Strength	DIN 53504	MPa	9	17	21	
	Elongation	DIN 53504	%	400	400	390	
	Tear Strength: Without nick	ISO 34-1	kN/m	34	43	52	
	Tear Strength: With nick	ISO 34-1	kN/m	8	11	12	
	Resilience	DIN 53512	%	73	68	63	
	Abrasion loss	ISO 4649	mm ³	15	17	17	
	Compression set (deflection /22 h / 70° C)	ISO 815-1	%	18	18	18	
	Hardness at -5° C	53505	Shore	63A	66A	72A	
	Hardness at 80° C	53505	Shore	59A	64A	68A	
	Specific gravity			1.06	1.07	1.08	
				DMT 13060	DMT 13065	DMT 13070	
MDI-PTMEG	Hardness	DIN 53505	Shore A	60	65	70	
	10% Modulus	DIN 53504	MPa	0.8	1	1.1	
	100% Modulus	DIN 53504	MPa	2	2.7	3.5	
	200% Modulus	DIN 53504	MPa	2.5	3.8	4.7	
	300% Modulus	DIN 53504	MPa	3.5	4.5	7	
	Tensile Strength	DIN 53504	MPa	15	20	28	
	Elongation	DIN 53504	%	450	460	480	
	Tear Strength: Without nick	ISO 34-1	kN/m	35	45	55	
	Tear Strength: With nick	ISO 34-1	kN/m	8	18	19	
	Resilience	DIN 53512	%	76	75	74	
	Abrasion loss	ISO 4649	mm ³	35	35	35	
	Compression set (deflection /22 h / 70° C)	ISO 815-1	%	22	23	25	
	Hardness at -5° C	53505	Shore	64A	67A	73A	
	Hardness at 80° C	53505	Shore	58A	63A	69A	
	Specific gravity			1.05	1.07	1.07	

						Applications:
	DMT 59375	DMT 59380	DMT 59385	DMT 59390	DMT 59393	
	75	80	85	90	95	Drive wheels
	1.2	1.5	2.2	3.6	4.1	Load wheels
	4.5	5.5	8	12	13.5	AGVs
	7	9.5	14	21	24	Idler wheels
	12	17	28	38	39.5	Conveyor rollers
	32	42	43	43	43	Elevators & Escalators
	390	380	350	350	300	Airport equipments
	64	78	94	111	120	
	15	20	35	52	55	
	58	48	37	30	20	
	17	18	20	24	30	
	19	19	23	25	25	
	77A	82A	88A	95A	97A	
	73A	78A	83A	89A	91A	
	1.1	1.11	1.12	1.15	1.15	
	DMT 13075	DMT 13080	DMT 13085	DMT 13092		Applications:
	75	80	85	92		Drive wheels
	1.3	1.5	2	3.3		Load wheels
	4.3	4.7	6	9		AGVs
	6	7	9	12.5		Idler wheels
	9	10.5	13	17		Conveyor rollers
	36	41	44	46		Elevators & Escalators
	480	480	480	490		Airport equipments
	65	75	95	115		
	20	21	35	49		
	73	70	66	57		
	35	35	40	45		
	25	26	26	27		
	78A	84A	87A	93A		
	73A	76A	83A	88A		
	1.08	1.09	1.1	1.11		

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