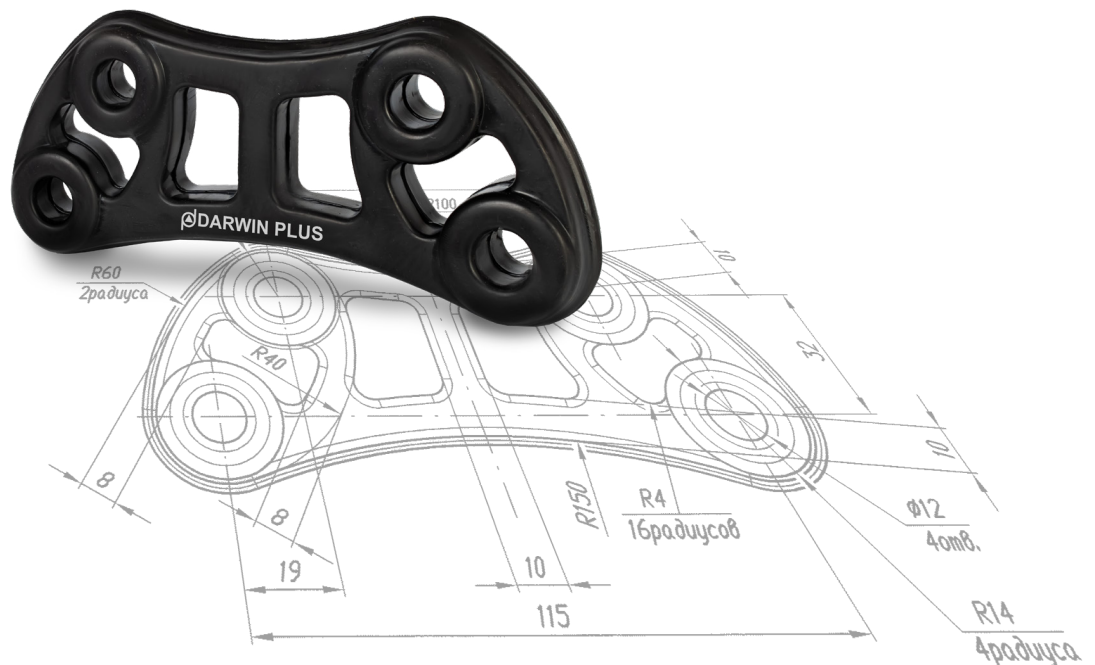


Rubber molded parts

DARWIN PLUS



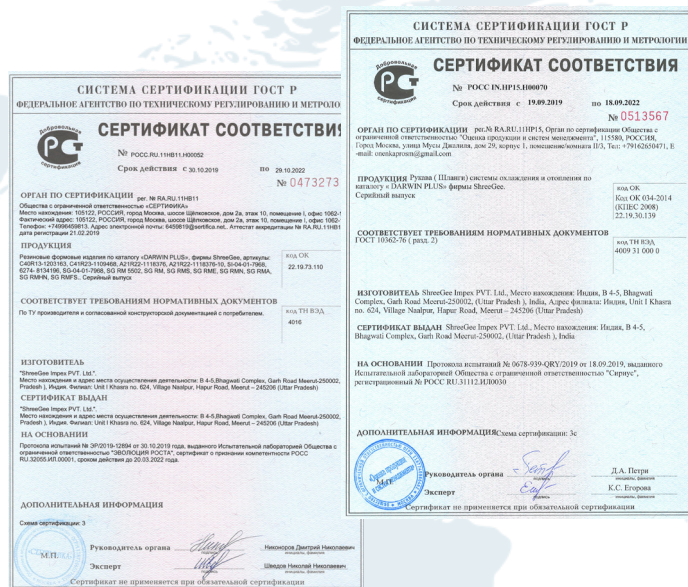
CERTIFICATION

IATF 16949:2016 — global technical specification and quality management standard for the automotive industry.

NQA Certificate No: T74279
IATF Certificate No: 0389024
First Issue Date: 10 March 2021
Valid Until: 9 March 2024

ISO 9001:2015 — the latest version of the international management system standard

Certificate No. 74279
ISO Approval Date: 17 January 2018
Reissued: 10 March 2021
Valid Until: 9 March 2024
EAC Code: 14



Voluntary certificate of conformity GOST R is an official document confirming the compliance of certified products with the requirements of national (state) standards in Russia.

Certificate for molded parts
№ POCC RU.11HB11.H0052
Certificate for hoses parts
№ POCC IN.HP15.00070

Due to the volume and quality of manufactured products, ShreeGee Impex Pvt. Ltd. became an export organization recognized by the state and awarded the corresponding certificate.



Manufacturer ShreeGee Impex Pvt. Ltd. is the member of CAPEXIL, a non-profit making organization setup in 1958 by the Ministry of Commerce, Government of India to promote export of Rubber, Chemical and Allied Products from India.



DARWIN PLUS rubber products portfolio consists of v-belts, hoses and molded parts for industrial, agricultural and automobile applications. DARWIN PLUS trademark belongs to the ShreeGee group, which unites all the brands, production units and sales branches of DARWIN PLUS - A-ShreeGee Product, a leading Indian manufacturer of rubber products. Being an ISO-9001 and IATF 16949 certified company, with the experience of more than 20 years with customers worldwide, DARWIN PLUS meets the requirements of international standards BS, JIS, RMA, DIN, SAE, ASTM, GOST and custom customer's specifications.

"Quality in a product is not what we put into it. It is what the customer gets out of it."



ABOUT COMPANY

ShreeGee Impex Pvt. Ltd. India under the DARWIN PLUS trademark is the India's largest manufacturer and exporter of industrial rubber goods. Production includes hoses, sleeves for cooling, heating and turbocharging systems, air filters, fuel systems, crankcase ventilation, oil systems, molded products based on NR, SBR, CR, EPDM, AEM, NBR and HNBR rubber, rubber based on silicone rubber MQ, VMQ, FVMQ and FKM, agricultural and industrial V-belts, variable transmission belts, car belts, tooth and poly-V belts.

Production sites of DARWIN PLUS brand products are certified to IATF 16949:2016 and ISO 9001:2015

SHREEGEE KEY VALUES

We apply international standards and use modern technologies and world practice in the field of development and production processes. ShreeGee's activities are built on the following fundamental principles in order to meet the requirements and high expectations of our consumers and market.

- Health, safety and environment are our main priority;
- Quality assurance and quality control for manufactured products;
- Implementation of projects within the agreed time frame;
- Efficient quality-to-price ratio;
- Individual approach to each consumer/project;

QUALITY ASSURANCE



WE MAKE QUALITY!

ShreeGee systematically provides products and services that meet or exceed our customers' needs and expectations. We are committed to adhering to our quality management system and actively striving for continuous quality improvement through activities and efforts that enhance the efficiency of our quality management system. A team of engineers is responsible for ensuring that all products and equipment comply with established international standards and for the continuous improvement of our «quality management culture.»

We have implemented a quality control system at every stage of the production process, from the acceptance of raw materials at our production facility to the delivery and installation of the final product at the customer's facility. The Efficiency System helps our team set our quality goals at a high level and at the same time keep them realistic.

The high professional level of the company's specialists, the use of high-quality raw materials, modern equipment, the company's own research and laboratory base (R&D) for the research and development of rubber provides the opportunity to manufacture a high-quality product according to international standards.

The quality of manufactured products is controlled at all production stages starting with the procurement of raw materials, production of rubber compounds, production processes and finished products.



Following these principles, our professionalism in the field of production and marketing of DARWIN PLUS rubber goods has been confirmed by certification according to IATF 16949:2016 & ISO 9001:2015 standards.

The certification system includes the following:

- Engineering design, product development and testing (hoses and drive belts).
- Production and sales/marketing of manufactured products (hoses and drive belts).
- Procurement, supply and customer feedback system.

All QC employees are continuously trained and certified/re-attested according to the following International Quality Systems:

- ISO.
- IATF.
- QS ShreeGee.

ShreeGee also provides its customers with engineering and design services for a variety of industrial and automotive products made from standard rubber compounds and modern composite polymers developed by the engineers and process specialists from the Product Research and Development Department.

Darwin Plus guarantees the compliance of hoses/sleeves with the requirements of international and Russian standards, provided that the consumer observes the conditions of transportation, storage, installation and operation established in this Technical Specification. Upon the expiry of the guaranteed storage period, the use of hoses is considered acceptable, provided that their properties indicated in the SGH 1801 Specification are preserved. If the requirements are met, the consumer makes a decision concerning the possibility of their application. The decision shall be documented officially with an act or report.

DARWIN PLUS products are hereby guaranteed to be free from defects in materials, construction (if designed by the ShreeGee factory) and workmanship at the time of delivery, and are guaranteed to comply with production specifications or agreed specifications. The warranty for DARWIN PLUS products is valid for one year or 100,000 km of run, provided that they are properly installed by a qualified technician using special tools and subject to the installation instructions. The maintenance intervals indicated by the equipment manufacturer are only binding for the period of the warranty period specified above. In all warranty cases, an analysis of the respective DARWIN PLUS products shall be carried out.

The above analysis is based on the following criteria:

Analysis of defective products;
 Engineering assessment and examination results; Installation conditions;
 Operating conditions;

Recommendations applicable to original equipment.

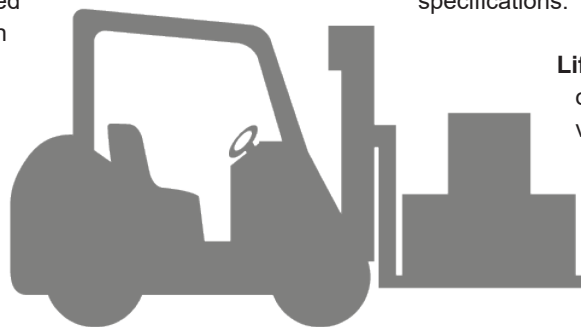
The warranty does not cover the following cases:

- Failure to comply with the transportation and storage conditions;

Packaging: In accordance with the logistic sheet, DARWIN PLUS hoses are supplied in the package that protects them against deformation, damage and loss during transportation. In addition, fuel hoses are protected with plugs and individual package in order to avoid the contamination of internal surfaces. By agreement with the consumer, another type of the package and container is allowed, which ensures the use of mechanical means during the performance of loading and unloading operations.

Packaged hoses can be transported by all means of transportation in closed vehicles subject to the transportation rules applicable to each type of vehicle.

Storage: Hoses shall be stored in closed rooms at a temperature from 0 °C to +25 °C on racks in a packed form or on the floor in containers under conditions that exclude their deformation and



SHREEGEE WARRANTY

- A defect resulting from natural wear and tear of the product;
- Installation in a non-professional workshop;
- Installation without modern equipment and appropriate tools;
- Installation, maintenance and replacement in violation of the instructions for the original products;
- Operation in improper conditions (changes in the vehicle design, participation in races, etc.);
- Contamination of the product with foreign inclusions or materials, aggressive liquids, etc.
- Failure not caused by our products;
- Use of counterfeit products;



PACKAGING, TRANSPORTATION AND STORAGE

damage. It is unacceptable to expose rubber goods to direct sunlight, oil, gasoline, kerosene, acids, alkalis, and gases harmful to rubber goods (VMQ, FS, FK, EPDM, AEM, NBR, NR, NE, polyurethane and HNBR).

In the case of storage of hoses at a sub-freezing temperature, some rubber goods become rigid; such goods shall be kept before testing or assembly at a temperature of (20-5) °C for at least 24 hours so that they could take their original shape.

Storage period: Maximum 5 years* based on standard storage specifications.

Lifetime: In accordance with standards or instructions of the equipment/ vehicle manufacturer.

***The warranty is only valid if the storage, installation and operating conditions are complied with in accordance with the technical standards**

3. RUBBER & SILICONE MOLDED AND INJECTION MOLDED PARTS DARWIN PLUS

Our design department with highly qualified specialists can create in the shortest time possible a molding tool project and a mold for a press die that fully complies with the set tasks and standards and develop a technology for the production of the required goods.

Type of rubber EPDM, AEM, NBR and silicone DARWIN PLUS molded parts: seals, jackets, gaskets, fasteners, gaskets, vibration isolators, shock absorbers and molded parts and molded hoses.

Advantages of molded hoses :

- Precise hose shape guarantees excellent tightness & hermeticity;
- Resistant to heat, ozone , ultraviolet and chemical coolants; Braided synthetic thread reinforcement;
- The maximum working pressure of casted /molded hoses with an inner diameter of up to 40 mm is 0.4 MPa, for hoses with an inner diameter of more than 40 mm - 0.3 MPa;

Our molded parts are manufactured in accordance with ASTM D2000 (Standard Classification System for Rubber Products in Automotive Applications);



TC SGH RM 1802 (Technical Specification of the ShreeGee manufacturing plant for the production of molded parts); Specification of the part will be as per technical specifications and design documentation agreed with the customer.

Design:

- Material

Vulcanized rubber compound based on EPDM, AEM, NBR, HNBR or silicone rubber.

- Color

Black, red, blue and orange. Special version: transparent and Green color.

- Specification

Load type dynamic or static as per drawing. Hardness 50-80 sh A.

- Application

Molded products are designed for the OE of trucks, buses and agricultural machinery. They are often used in the supply system (fuel pipelines, exhaust pipes and charge air system) and in the gas exhaust system.

RUBBER COMPOUND BASE	WORKING MEDIUM*	WORKING TEMPERATURE*
AEM	Oils, air with oil vapors	From -45 °C to +150 °C (for short duration up to +175 °C)
NBR	Engine oils, mineral oils, petroleum oils and fuels.	From -40 °C to +100 °C (for short duration up to +120 °C)
HNBR	Diesel fuel, gasoline and petroleum oils and greases.	from -45 °C to +150 °C
VMQ	Air, air with oil vapors and coolant	Blue compound for the temperature range from -50 to 130 °C Red compound for the temperature range from -50 to 200 °C Orange compound for the temperature range from -50 to 250 °C Black oil-fuel resistant compound for the temperature range from -50 to 130 °C
FS	Fuel, diesel and oil	from -45 °C to +150 °C (for short duration up to +160 °C)
FKM	Fuel, diesel and oil	from -25 °C to +250 °C (for short duration up to +300 °C)

DARWIN PLUS molded parts are manufactured from the rubber as per ASTM D2000

The material properties of oil-petrol resistant rubbers are presented for reference only.

For the precise selection of Material, please contact our specialists info@shreegeempex.com

Reference Information. The final composition of the compound is selected on the basis of the customer's specifications, standard tests are carried out. Test reports are provided along with samples of prototypes & finished products. After the verification of the drawing with the number / name of the hose from the customer, the product is marked in accordance verified drawing.

PHYSICAL PROPERTIES OF DIFFERENT RUBBERS

E - Excellent, G - Good, F - Satisfactory, P - Poor.

<i>Properties</i>	NBR	EPDM	CR	SILICONE	FKM	NR	SBR	PU	HNBR	FVMQ	IIR	Aflas
<i>Abrasion resistance</i>	G	G	G	P	G	E	E	E	G	P	G	G
<i>Resistance to acids</i>	F	G	F	F	E	F	F	P	E	F	G	E
<i>Chemical resistance</i>	F	E	F	G	E	F	F	F	G	E	E	E
<i>Cold resistance</i>	G	G	F	E	P	G	G	G	G	G	G	P
<i>Compression resistance set</i>	G	G	F	G	E	G	G	F	G	G	F	G
<i>Dynamic properties</i>	G	G	F	P	G	E	E	E	G	P	F	G
<i>Electrical properties</i>	F	G	F	E	F	G	G	F	F	E	G	E
<i>Elongation</i>	G	G	G	F	F	F	F	F	G	F	G	F
<i>Flame resistance</i>	P	P	G	F	E	P	P	P	P	G	P	E
<i>Heat resistance</i>	G	G	G	E	E	F	F	F	E	E	G	E
<i>Permeability</i>	G	G	G	P	G	F	F	G	G	P	E	G
<i>Oil resistance</i>	E	P	F	F	E	P	P	G	E	G	P	E
<i>Ozone resistance</i>	P	E	G	E	E	P	P	E	G	E	G	E
<i>Tear resistance</i>	F	G	F	P	F	G	G	G	F	P	G	P
<i>Tensile strength</i>	G	G	G	P	G	E	E	E	E	F	G	G
<i>Water resistance</i>	G	E	F	G	F	G	G	P	E	F	G	G

The material properties of rubber are for reference only.

For the precise selection of material, please contact our specialists info@shreegeeimpex.com

CHEMICAL RESISTANCE OF SILICONE RUBBERS

Nº	Working medium	Testing 7 days at °C	Result*
1	Acetamide	150	A
2	Acetone	20	B
3	Aniline	100	A
4	Petrol	20	B
5	Brake fluid AT	100	A
6	Butanol	117	B
7	Butylacetate	20	B
8	Calcium hydroxide, (saturated)	20	A
9	Chlorobenzene	20	B
10	Cloroform	20	C
11	Clophene	150	A
12	Vapour up to 2,5 atu	138	A
13	Diphenyl	150	B
14	Diesel oil	20	B
15	Dinamo oil	150	B
16	Mineral oil	20	B
17	Acetic acid	20	A
18	Hydrofluor acid 5%	20	C
19	Gear oil DTE BB	150	A
20	Gear oil DTE HH	150	A
21	Gear oil DTE extra heavy	150	A
22	Gear oil Type SEA 90	150	A
23	Prestone	20	A
24	Glycerin	100	A
25	Hexa ethoxydisiloxane	20	B
26	High pressure compressor oil	150	A
27	Isopropyl alcohol	82	B
28	Potassium 20%	20	A
29	Potassium hydroxide 50%	20	A
30	Potassium permanganate solution	20	A
31	Carbolineum	20	A
32	Cooking salt solution 10%	20	A
33	Carbon tetrachloride	20	B
34	Compressor oil, light	150	A
35	Ball bearing fat	150	A
36	Linseed oil	100	A

Nº	Working medium	Testing 7 days at °C	Result*
37	Methanol	65	B
38	Methylen chloride	20	C
39	Mineral oil ASTM No. 1	150	A
40	Mineral oil ASTM No. 3	150	B
41	Mineral oil SEA 10	150	A
42	Mineral oil SEA 20	150	A
43	Mineral oil SEA 30	150	A
44	Motor oil viscose static	150	A
45	Sodium 20%	20	A
46	Soda 50%	20	A
47	Nitrobenzene	20	A
48	Oleic acid	150	C
49	Olive oil	150	A
50	Perchlor	20	C
51	Petroleum ether	20	C
52	Petroleum	20	B
53	Phenol	60	A
54	Phosphoric acid 30%	20	A
55	Pyridine	20	B
56	Regulator oil	150	C
57	Castor oil	150	A
58	Hydrochlorid acid 10%	20	A
59	Nitric acid concentrated	20	C
60	Nitric acid	20	B
61	Sulfuric acid, concentrated	20	C
62	Sulfuric acid, 10%	20	A
63	Shock absorber oil	20	A
64	Styrol	20	B
65	Turbentine oil	20	B
66	Toluene	20	B
67	Transformer oil	150	B
68	Tri	20	C
69	Tri glycol	20	A
70	Vaseline	150	A
71	Water	100	A

* As per table: **A - Excellent resistance**, **B - Conditional resistance**, **C - Poor resistance**.

The material properties of rubber are for reference only.

For the precise selection of material, please contact our specialists info@shreegeeimpex.com

CHEMICAL RESISTANCE OF RUBBERS COMPOUNDS

Type	Designation	Rubbers	High resistance to substances:	Low resistance to substances:
Silicone	VMQ, MQ, PVMQ	Silicone rubber	<ul style="list-style-type: none"> - Engine oils and gear oils (mineral oils) - Diluted saline solutions - Temperate water - Dry heat - Ozone, weather conditions 	<ul style="list-style-type: none"> - Concentrated acids and alkalis - Superheated steam over + 120 ° C - Petroleum oils and fuels - Ketones
	FKM, FPM, VITON	Fluoroelastomer	<ul style="list-style-type: none"> - Petroleum products - Fuel and mixture with methyl or ethylene alcohols - Diesel or mixtures with biodiesel - Mineral oils and greases - Silicone oils and greases - Strong vacuum - Ozone, weather conditions and high temperature air - Strong acids 	<ul style="list-style-type: none"> - Ketones - Low molecular weight acids (formic and acetic acid) - Superheated steam - Low molecular weight ethers and esters - Phosphate ester hydraulic fluids - Skydrol (R)
EPDM	EPDM	Ethylene propylene diene rubber	<ul style="list-style-type: none"> - Alcohols - Automotive Brake Fluid - Ketones - Diluted acids and bases - Silicone oils and greases - Steam up to +200 °C, - Water, - Phosphate Ester Hydraulic Fluids - Skydrol (R) - Ozone, Wear & tear and Weather conditions. 	<ul style="list-style-type: none"> - Aliphatic and aromatic hydrocarbons - Diester greases - Halogenated solvents - Petroleum oils and greases
AEM	AEM, VAMAC	Ethylene Acrylic rubber	<ul style="list-style-type: none"> - Ozone, weather conditions and hot air - Automatic transmission fluids - Power steering fluids & Water 	<ul style="list-style-type: none"> - Fuel - Ketones - Automotive Brake Fluid
NBR	NBR	Nitrile Butadiene Rubber	<ul style="list-style-type: none"> - Petroleum oils and fuels - Aliphatic hydrocarbons - Vegetable oils - Silicone oils and lubricants - Ethylene glycol - Diluted acids - Water up to + 100 °C 	<ul style="list-style-type: none"> - Aromatic hydrocarbons - Automotive brake fluids - Chlorinated hydrocarbons - Ketones - Simple & complex Esters - Hydraulic fluids based on phosphoric acid esters - Skydrol (R) - Strong acids Ozone, weather conditions and sunlight
HNBR	HNBR	Hydrogenated Nitrile Butadiene Rubber	<ul style="list-style-type: none"> - Petroleum oils and greases - Aliphatic hydrocarbons, - Vegetable oils - Silicone oils and greases, - Ethylene glycol - Diluted acids, bases and saline solutions - Water & steam up to + 150 °C 	<ul style="list-style-type: none"> - Chlorinated hydrocarbons - Ketones - Simple & complex Esters - Strong acids

The material properties of rubber are for reference only.

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DARWIN PLUS RUBBER PRODUCTS

**V-BELTS**

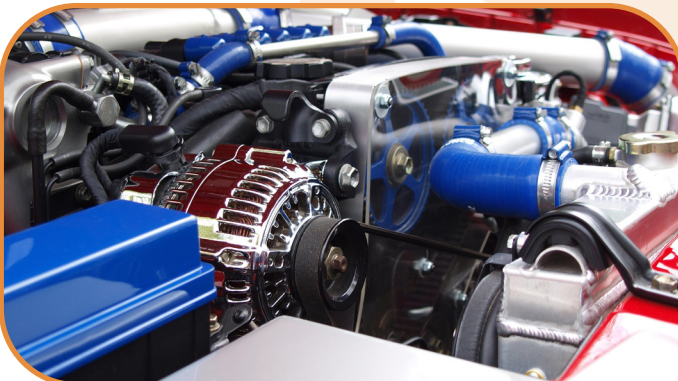
- CLASSICAL SECTION
- NARROW SECTION
- BANDED BELTS
- HEXAGONAL BELTS
- VARIATOR BELTS
- RIBBED (POLY) BELTS

**HOSES**

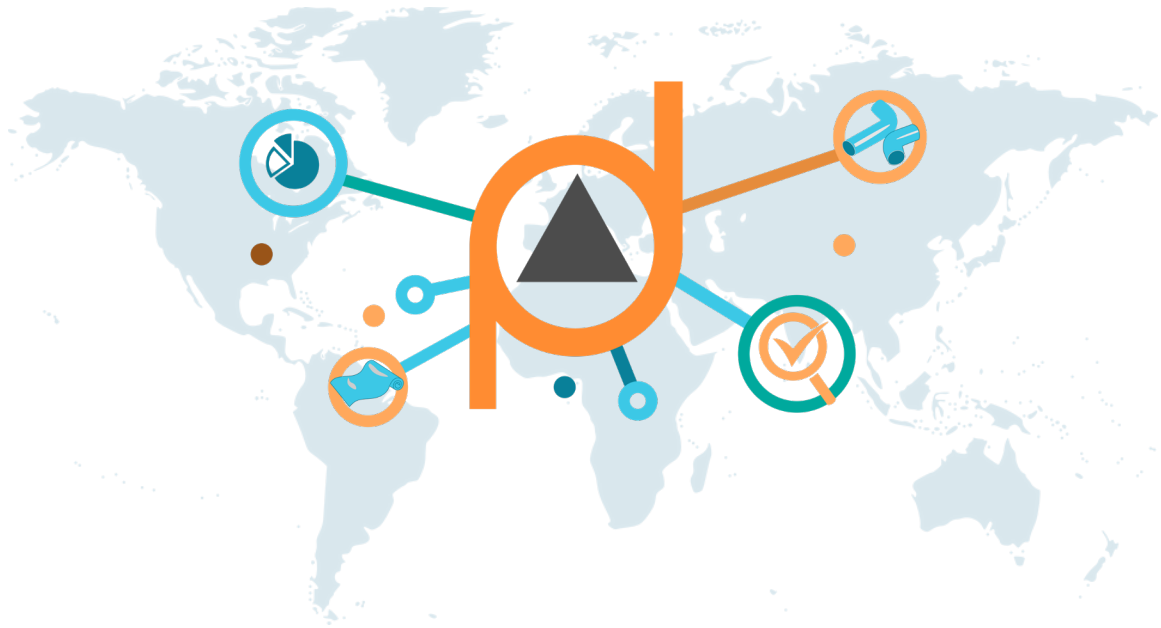
- RADIATOR AND INTERCOOLER (CAC) HOSES
- FUEL SYSTEM HOSES
- HOSES FOR OIL MEDIUM
- AIR HOSES

**RUBBER MOLDED PARTS**

- MOLDED HOSES
- OIL & FUEL RESISTANT MOLDED PARTS
- O-RINGS, SHOCK ABSORBERS, VALVES, BUSHINGS, ETC.
- METAL BONDED RUBBER PARTS



The information shown in the catalog is for information purposes only. The manufacturer **DAWRIN PLUS ShreeGee impex pvt ltd.** reserves the exclusive right to make any changes to the structure, design and specification, change components in the manufactured products at any time without prior warning to improve the quality of products and ensure the further development of the production process. January 18, 2021



B 4-5, Bhagwati complex, Gandhi Nagar, Garh road, Meerut-250 002(U.P.) INDIA
R.O. :45 Gandhi Nagar, Garh road, Meerut-250 002(U.P.) INDIA

Tel: **+91-121-266439192**
Telefax: **+91-121-2664392**

Email: info@shreegeeimpex.com
Website: www.shreegeeimpex.com

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