

## KEY MARKETS



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Lalbhair Group

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# Sulfones



energising possibilities  
stimulating growth

April 2023

## Legacy

Founded on September 05, 1947, by a legendary Indian, Mr Kasturbhai Lalbhai, Atul Ltd (Atul) is the first private sector company of the country to be inaugurated by the first Prime Minister, Pandit Jawaharlal Nehru.

## About us

Atul is one of the largest integrated chemical companies in India with annual revenue of about ₹ 5,000 cr. The Company manufactures about 900 products (such as *para* Cresol and derivatives, resorcinol and derivatives, vat dyes, sulphur dyes, herbicides, fungicides, tissue cultured date palms, active pharma ingredients and intermediates, epoxy resins, reactive diluents, etc) and 400 formulations and owns 140 brands. It serves a wide range of customers belonging to over 30 industries in around 75 countries and has established subsidiary companies in Brazil, China, Ireland, the UAE, the UK and the USA. The Company offers a wide range of products and applications used in Agriculture, Adhesives, Animal Feed, Automobile, Composites, Construction, Cosmetic, Defence, Dyestuff, Electrical and Electronics, Footwear, Food, Fragrance and Flavour, Glass, Home Care, Horticulture, Hospitality, Paint and Coatings, Paper, Personal Care, Pharmaceutical, Rubber, Soap and Detergent, Sport and Leisure, Textile, Tyre and Wind Energy industries.

The production facilities of Atul and its associate, joint venture and subsidiary entities are at Ambernath, Ankleshwar, Jodhpur, Panoli, Tarapur and Valsad in India and Somerset in the UK. The first manufacturing site of the Company in Atul, Gujarat is spread over 1,250 acres. The Company has its registered office in Ahmedabad and its head office at Atul, both in Gujarat, India. Its shares are listed both at NSE and BSE.

## Polymers - Performance Materials Business

Polymers Performance Materials Business of Atul Ltd is engaged in manufacturing aromatic sulfones, epoxy resins, reactive diluents and other curing agents for over 25 years. The manufacture of sulfones began with Dapsone (4,4'-Diaminodiphenyl sulfone or 4,4'-DDS), an API. Non-pharma applications of 4,4'-DDS were subsequently developed. Over the years, Atul has evolved into a global leader in 4,4'-DDS, particularly in the Aerospace industry. This has been enabled by the use of innovative manufacturing processes, including backward integration to 4,4'-DCDPS, a key intermediate. Atul is also a leading supplier of 4,4'-DCDPS to key manufactures of polysulfones globally.

Atul Ltd is in this business since 1960. The products are manufactured and marketed under the trade name Lapox. Business has received ISO 9001:2008 and ISO 14001 certification and has a NABL accredited laboratory for epoxy testing and analysis.

## Product range

**Resins:** Bisphenol-A and Bisphenol-F based resins, Modified and formulated resins, Cycloaliphatic resins, Epoxy phenol novolac resins, Multifunctional resins, Benzoxazine resins, Bismaleimide resins, Brominated resins and Dimer acid based resins

**Curing agents:** 4,4'-Diaminodiphenyl sulfone(4,4'-DDS) , 3,3'-Diaminodiphenyl sulfone (3,3'-DDS), and 4,4'-Dichlorodiphenyl sulfone(4,4'-DCDPS), Aromatic amines and adducts, Aliphatic amines and adducts, Cycloaliphatic amines and adducts, Phenalkamines, Polyamides and Polyamidoamines

**Reactive diluents:** Aliphatic (monofunctional, difunctional and trifunctional), Aromatic (monofunctional and difunctional) and Cycloaliphatic (difunctional)

**Accelerators, catalysts and flexibilisers**



## Product specification

Lapox® grade	Chemical Structure	Appearance	Melting point	Purity by HPLC	Ash content	Median particle size
		-	°C	%	%	μ
4,4'-Diaminodiphenyl sulfone ASH-10	<chem>Nc1ccc(S(=O)(=O)c2ccc(N)cc2)cc1</chem>	White to off-white powder	176 - 185	Min 99.0	Max 0.10	-
4,4'-Diaminodiphenyl sulfone micronised ASH-10 MIC		White to off-white powder	176 - 180	Min 99.0	Max 0.10	5 - 15
4,4'-Diaminodiphenyl sulfone free flow ASH-10 FF		White to off-white powder	176 - 185	Min 99.0	Max 0.10	-
3,3'-Diaminodiphenyl sulfone ASH-11	<chem>Nc1ccc(S(=O)(=O)c2cc(N)ccc2)cc1</chem>	White to brownish white powder	167 - 175	Min 99.0	Max 0.10	-
3,3'-Diaminodiphenyl sulfone Micronised ASH-11 MIC		Off-white to yellowish brown powder	167 - 175	Min 99.0	Max 0.10	Max 10
4,4'-Dichlorodiphenyl sulfone APIN-10	<chem>Clc1ccc(S(=O)(=O)c2ccc(Cl)cc2)cc1</chem>	White powder	147 - 150	Min 99.7	Max 0.10	-

Method: Melting point - ASTM D1519; Ash content - Atul

## Applications

- prepregs
- carbon fiber composites
- adhesives
- high performance epoxy coatings
- Electrical Moulding Compounds (EMC)
- copper clad laminates
- thermal paper
- flame retardant fibers
- polysulfones
- polyethersulfones
- polyphenylsulfones

## Key differentiators

- global leader for 4,4'-DDS and 3,3'-DDS
- major supplier to the aerospace industry for over two decades
- backward integrated for key intermediates
- continuous sulfonation technology
- DCS controlled operations
- strong R&D and technical support

