Applying Science. Enriching Life.
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JUBILANT LIFE SCIENCES - AT A GLANCE

Jubilant is driven by the motive to add value to millions of lives through innovations and cutting-edge technology. And in the last three decades, Jubilant Life Sciences has emerged as a leading pharmaceutical outsourcing organisation in the world. It is one of the leading manufacturers of Solid Dosage Formulations & APIs, Radiopharmaceuticals, Allergy Therapy Products, Contract Manufacturing of Sterile Injectables and OCL (Ointments, Creams and Liquids). The Company is backward integrated into Fine Chemicals, Advance Intermediates, Crop Science Chemicals, Nutrition Ingredients, through Pyridine Chemistry and Life Science Chemicals. The drive for excellence has seen Jubilant attain leadership position in key businesses it operates in. The Company is globally No.1 in manufacture of Pyridine & its 14 derivatives, using agricultural feedstock. This process leaves around 50%* lesser carbon footprint as compared to petroleum route. Jubilant - Applying Science to Enrich Life.

Jubilant Life Sciences:
An integrated Pharmaceutical and Life Sciences Company offering end-to-end solutions across pharmaceutical value chain

- **Revenues FY2013: US $ 950 Mn**
- Servicing customers in over 98 countries
- Partners 19 out of the top 20 pharmaceutical companies, and 6 out of the top 10 agrochemical companies globally
- 7 manufacturing locations in India and 3 manufacturing locations in North America
- Manufacturing facilities approved by leading regulatory agencies like USFDA, UKMHRA, ANVISA Brazil, PMDA Japan, AFSSAPS France and other leading international bodies

LEADERSHIP POSITIONS

**APIs**
- **Globally No.1 in 4 APIs;** and ranked among Top 3 in 3 APIs

**Generics**
- **No.1 in US in 3 products;** and ranked among Top 3 in 5 products

**Radiopharmaceuticals**
- **No.1 in North America in 3 Nuclear Medicine products**

**PPES**
- **Globally No.1 in Pyridines & its 14 derivatives**

**Nutrition Ingredients**
- **Globally No.2 in Niacinamide**

**Allergy Immunotherapy**
- Ranked among Top 3 suppliers in North America

**Contract Manufacturing Organisation**
- Ranked among Top 5 Contract Manufacturers in North America in Sterile Injectables

**Life Science Chemicals**
- **Globally No.7 in Ethyl Acetate and Acetic Anhydride**

* Carbon footprint estimation is cradle-to-gate adopting PAS 2050 and CHG Protocols
NORTH AMERICA

Kirkland, Quebec, Canada
US FDA approved facility for contract manufacturing of Ointments, Creams and Liquids (OCL) and Radiopharmaceuticals

Ottawa, Canada
DDDS Office

Spokane, Washington, USA
US FDA approved facility for contract manufacturing of Sterile Injectable and Allergy Therapy Products

Horsham, Pennsylvania, USA
Jubilant Cadista - Sales & Marketing Head Office

Malvern, Pennsylvania, USA
DDDS Office

Salisbury, Maryland, USA
US FDA approved facility for Generics (Tablets & Capsules)

Raleigh North Carolina, USA
Clinical Research Centre and Jubilant Life Sciences Marketing Office

Bedminster, New Jersey, USA
Clinical Research Centre and Jubilant Life Sciences Marketing Office

EUROPE

Merelbeke, Belgium
Regulatory & Generic Marketing

Dusseldorf, Germany
Jubilant Clinsys, Europe Office

CHINA

Shanghai, China
Marketing Office
INDIA

**Noida, Uttar Pradesh**
Corporate Office
R&D Centres

**Roorkee, Uttarakhand**
US FDA, UK MHRA, ANVISA Brazil
and PMDA Japan approved facility
for Generics

**Gajraula, Uttar Pradesh**
Largest integrated Pyridine & its
derivatives facility in the world

**Samlaya, Gujarat**
Animal Nutrition Products

**Bharuch, Gujarat**
SEZ for Vitamins and Life
Science derivatives

**Ambernath, Maharashtra**
Exclusive Synthesis - Pyridine
derivatives

**Nira, Maharashtra**
Life Science Chemicals

**Bengaluru, Karnataka**
State-of-art Discovery Centre

**Nanjangud, Karnataka**
US FDA, AFSSAPS France &
PMDA Japan approved
APIs facility
Jubilant’s approach to sustainable development focuses on the **triple bottom line of Economic, Environmental and Social Performance**. It also stresses on Corporate Governance which is the guiding pillar for the triple bottom line approach, and follows a structured methodology for risk identification and management. Jubilant’s Corporate Sustainability Program has been recognised by institutions like **Global Reporting Initiative (GRI)**, **International Finance Corporation (IFC)** and **Confederation of Indian Industry (CII)**.

Key highlights of Jubilant’s sustainability initiatives:

1. **Approach to reduce ecological footprint leveraging 3R (Reduce-Recycle-Reuse) principles across business verticals and processes.**
2. **Signatory to UNGC & follows the principle of human rights** at workplace.
3. **Food and Agriculture Centre for Excellence (FACE):** An initiative **between CII and Jubilant Bhartia Group** to build capacity while leveraging technology and innovation to improve productivity and the environmental footprint of agriculture. **FACE** acts as a catalyst in the integrated development of India’s agriculture and food sector.
4. Reaching out to **65 villages, 350,000 people and 13,500 students** through community development programs covering **primary education, basic healthcare and livelihood generation**.
5. Jubilant Bhartia Foundation, in collaboration with Schwab Foundation, **organises ‘The India Social Entrepreneur of the Year Award’** to identify the visionary social entrepreneurs.
6. **Transparency** in sharing sustainability key indices with stakeholders.
7. **The Corporate Sustainability Report of Jubilant has continuously been rated A+,** since 2007 by (Global Reporting Initiative) GRI.
ENABLERS
Jubilant Life Sciences nurtures innovations, offers excellent quality and always stretches to inspire confidence in its customers. Over the years it has evolved to be the 'Partner of Choice' to 19 of the top 20 pharmaceutical and 6 of the top 10 agrochemical companies.

Jubilant has a robust Business Excellence framework which translates business strategic objectives to initiatives, which when driven through various toolkits/methodologies, become enablers for achieving business goals. Lean Six Sigma has become the DNA of the organisation, where every employee is engaged in driving innovation and breakthrough improvements. The initiative spans across all businesses of Jubilant globally aimed at driving excellence in Supply Chain (SCOR framework), Manufacturing (Lean Six Sigma & TPM), R&D (QbD & Design for Six Sigma), Project Management & Innovation, at both Operational & Strategic Levels.

The R&D team provides critical support for manufacturing and Company’s new business work plans. A team of 1100 qualified and well-experienced scientists positioned in state-of-art R&D centres located in Noida, Gajraula and Bengaluru, specialises across the value chain of pharmaceuticals research. The laboratories are well equipped with facilities that support and carry out research and development pertaining to generics including APIs & Solid Dosage Formulations, Drug Discovery, Chemistry/Process Development of Advance Intermediates, Fine Chemicals, Contract Research, Analytical Research, Biological Support including Pharmacokinetics and identifying newer opportunities in Clinical Research.

The R&D team also aids in avoiding any potential infringement on third party’s intellectual property by developing research strategies as well as better understanding of emerging threats and identifying newer opportunities.

The R&D team is forward integrated into the manufacturing of the Company spread across ten locations: seven in India and three in North America. All the manufacturing units of Jubilant meet global standards and are accredited by major international regulatory agencies.

The Company has a strong People Excellence framework to attract, groom & retain the best talent in the industry to serve its customers. Jubilant has a culture of nurturing innovations and rewarding performers. The employees are encouraged, supported and rewarded for innovations & initiatives that enable the Company to offer best solutions to its customers.
BUSINESS OUTLINE

The businesses of Jubilant Life Sciences are classified under two segments - Pharmaceuticals and Life Science Ingredients.

**Pharmaceuticals:**

- Generics [Active Pharmaceutical Ingredients (APIs) and Solid Dosage Formulations]
- Specialty Pharmaceuticals [Radiopharmaceuticals, Allergy Therapy Products, Sterile Injectables & OCL (Ointments, Creams & Liquids)]
- Drug Discovery and Development Solutions
- Healthcare

**Life Science Ingredients:**

- Proprietary Products and Exclusive Synthesis (Advance Intermediates, Fine Chemicals, Crop Science Chemicals, Exclusive Synthesis)
- Nutrition Ingredients
- Life Science Chemicals
GENERICS (SOLID DOSAGE FORMULATIONS)

In an effort to make healthcare truly inclusive, governments across the world are looking for cost effective healthcare. Therefore, putting pressure on innovator pharmaceutical companies to bring down the cost of medicines.

Jubilant Life Sciences partners global pharmaceutical companies in an endeavour to offer cost effective generics with speed to market. The generics business is backward integrated into APIs business of the Company and focuses on manufacturing & sale of proprietary solid dosage formulations including CVS, CNS and Anti-allergy categories.

The Company has 31 commercial products across geographies including the United States and Europe. It is also one of the largest exporters of oral solid formulations to Japan.

The Company has 58 ANDAs in USA, 41 dossiers in Europe, 20 filings in Canada and over 500 filings in other countries across the world.

GENERICS [ACTIVE PHARMACEUTICAL INGREDIENTS (APIs)]

Jubilant has 27 commercial APIs focusing on CVS, CNS, Anti-infective and Anti-ulcerants which are marketed to leading generics companies. Jubilant’s forward integration into generics, 65 US DMFs to its credit, and excellent track record has given the Company momentum in key markets like North America, South America, Europe, Japan, Korea, Middle East and Australia.

SPECIALTY PHARMACEUTICALS [STERILE INJECTABLES & OCL (OINTMENTS, CREAMS AND LIQUIDS)]

Jubilant HollisterStier Contract Manufacturing & Services is an integrated Contract Manufacturing Organisation (CMO), manufacturing Sterile Injectables and OCL. Its contract manufacturing facilities are located across North America & India and provides specialised manufacturing services for global leaders in the pharmaceutical and biopharmaceutical industries.
SPECIALTY PHARMACEUTICALS (ALLERGY THERAPY PRODUCTS)

HollisterStier Allergy, business unit of Jubilant Life Sciences, has been a leader in the United States immunotherapy industry for more than 90 years. Over these years the Company has expanded its customer base to include allergists, ENT doctors and clinics, primary care physicians, hospitals, and pharmacies in the US, Canada, Australia, and many other international markets. It currently has over 200 allergenic extracts and mixes, and a line of specialised skin test devices in the market. To simplify patient treatment, the Company offers customised patient prescriptions to its customers. Innovation is a tradition at Jubilant. Continuous focus on product innovation enables the Company to offer doctors the requisite tools needed to treat and cure patients suffering from the effects of allergies.

SPECIALTY PHARMACEUTICALS (RADIOPHARMACEUTICALS)

Jubilant Life Sciences develops, manufactures and commercialises radiopharmaceuticals used for the diagnosis and treatment of diseases. The Company serves markets globally, and is the market leader in North America in four Nuclear Medicine segments. Clinical applications include diagnostic imaging for cardiology, oncology, lung, kidney, brain and bone, as well as radiotherapy for thyroid and cancer. The Company has a strong new product development pipeline, in particular for Rubidium Rb - 82 (a Rubidium Generator, for PET Cardiology), and generic products.

DRUG DISCOVERY AND DEVELOPMENT SOLUTIONS (DDDS)

End-to-end innovative drug discovery & development solutions are provided by Jubilant Biosys Ltd., Jubilant Chemsys Ltd., and Jubilant Clinsys Ltd., subsidiaries of Jubilant Life Sciences Ltd. These solutions seamlessly integrate with preclinical infrastructure to provide high quality and efficient translational and clinical development (Phase I - IV) solutions to the global pharmaceutical & biotech industries.

HEALTHCARE

In its efforts towards making healthcare truly inclusive, Jubilant Life Sciences is committed to create an affordable, world class healthcare delivery system for the middle and lower income group people, living across West Bengal, India. The Company has set up two hospitals at Barasat (Jubilant Kalpataru Hospital) & Berhampore (Rabindranath Thakur Diagnostic & Medical Care Centre) catering to the local people.
ADVANCE INTERMEDIATES

Jubilant Life Sciences is **globally No.1 manufacturer of Pyridine & its 14 derivatives**. The Company has **more than thirty years of experience** in Pyridine chemistry and is the only manufacturer of Pyridine & Picolines with **complete backward and forward integration**. The Advance Intermediates portfolio comprises of Pyridine, Picolines, Cyanopyridines and Piperidine. The Company has **an environment friendly production process and is the lowest cost manufacturer across the globe**. Jubilant’s Pyridine qualifies as a green product, as it is manufactured via the biomass route which gives it a **benefit of 50.6% in carbon footprint** compared to the conventional petroleum route. The world class manufacturing facility is located in Gajraula, Uttar Pradesh. The facility has ZERO discharge and is OHSAS 18001, ISO 9001, & ISO 14001 certified.

NUTRITION INGREDIENTS

Jubilant is the **second largest manufacturer of Niacinamide & Niacin** (Vitamin B3) worldwide. With **backward integration up to the initial raw material stage and global scale of operation**, Jubilant delivers unmatched advantages of consistent quality and availability of Niacinamide and Niacin to the customers globally. The Company’s **manufacturing facilities are certified by international regulatory authorities**, and its products conform to major international pharmacopoeias. Jubilant is the **largest manufacturer of Choline Chloride in India**, having capacity of 22000 MT/ Annum. The Animal Nutrition business offers high quality products in the category of Vitamin and Mineral Premixes, Betaine, Acidifiers, Toxin Binders, Growth Promoters and Emulsifiers. The manufacturing facility is **FAMI-QS certified** along with **ISO accreditations**.

FINE CHEMICALS

Jubilant’s Fine Chemicals business offers wide range of Advance Intermediates manufactured from Pyridine & Piperidine, which are derived from molasses as the starting material and find application in about **280 APIs, 50 agrochemicals, personal care and fine & specialty chemicals**. These Fine Chemicals are manufactured through environment friendly process with lesser carbon footprint as compared to petroleum route, hence are classified as **green fine chemicals**. This business is **backward integrated to the Pyridines business and serves its customers globally**. The Company offers **167 Pyridine & Piperidine based products** through in-house R&D and enjoys global leadership in 12 of them.

CROP SCIENCE CHEMICALS

Jubilant’s Crop Science Chemicals business offers Agroactives and Key Advance Intermediates for the agrochemical industry. Leveraging its **strength of full backward integration in Pyridine, Picolines & its derivatives**, the Company strives to provide cost effective, reliable and long term sustainable solutions to all its agrochemical customers. Under Agroactives, the Crop Science business offers **Chlormequat Chloride (CDC)**, which finds application as a plant growth regulator in wheat, grapes, soybean and ornamental etc. It also offers Key Advance Intermediates for Agroactives which are **Symtet (2,3,5,6 – Tetrachloropyridine)** and **PCP (2,3,4,5,6 – Pentachloropyridine)** which are used in Insecticide (Chlorpyrifos) and Herbicides (Triclopyr and Fluroxypyrmeptyl). The Company has many more products in the pipeline. Jubilant’s latest offering **Symtet is produced through a niche technology developed by in-house R&D**, using Pyridine as the starting material, which is produced captively. This product is eco-friendly as it generates less effluents and uses green chemistry which **helps in reduction of greenhouse gas emissions**.
EXCLUSIVE SYNTHESIS

Exclusive Synthesis business acts as an outsourcing partner for many pharmaceutical and agrochemical innovators. It offers complete Product Life Cycle services for a wide range of products to its customers in the intermediates and APIs space. Its biocides portfolio finds wide applications in paints & coatings and personal care industry. Jubilant’s experience in Pyridine chemistry, backward and forward integration, application of latest project management techniques and excellent customer service makes it the ‘Partner of Choice’ to global companies.

LIFE SCIENCE CHEMICALS

Jubilant manufactures a range of Life Science chemicals of Acetyl group and holds leadership position in most of them.

Acetyls
Jubilant offers a basket of Acetyl products which include Ethyl Acetate, Acetic Anhydride, Acetic Acid, MCAA (Monochloroacetic Acid), SMCA (Sodium Monochloro Acetate) and Acetaldehyde. The Company has the capability to produce Acetyls from agro-based feedstock including molasses and alcohol. Acetyls find applications in diverse industries such as Pharmaceutical, Crop Protection, Food & Beverages, Textiles, Packaging, Adhesives, Aromatics, etc.

Speciality Gases
Product offerings include Carbon Dioxide and Mixtures of Carbon Dioxide and Ethylene Oxide which mainly find applications in Beverage, Healthcare and Engineering Industry.
AWARDS AND ACCOLADES

Entrepreneurs of the Year 2013 - Shyam S Bhartia & Hari S Bhartia, presented by the President of India at AIMA Managing India Awards

Annual Greentech Safety Award 2013 - Silver Award under chemical sector, Gajraula Plant, India

CII - National Award for Excellence in Energy Management 2013, Gajraula Plant, India awarded as Energy Efficient Unit

FICCI Quality System Excellence Awards 2012, Silver prize under large scale category - Gajraula Plant, India

NDTV Profit Business Leadership Award 2012 under Corporate Social Responsibility category, to Jubilant Life Sciences

7 Star category Certificate from the Directorate of Industries, UP (valid for 2 years), Gajraula Plant, India

National Quality Excellence Award for best-in-class manufacturing presented by Stars of the Industry Group, Gajraula Plant, India

CII-National Award for Excellence in Water Management 2012 as Water Efficient Unit, Gajraula Plant, India

Economic Times - Frost & Sullivan India Manufacturing Excellence Gold Award - Process Sector for 2012 - Second time in a row, Gajraula Plant, India

I.C.C. Award for Water Resource Management in Chemical Industry for the year 2011, Gajraula Plant, India

Winner of Golden Peacock Award for Sustainability 2012, Gajraula Plant, India

Winner of Golden Peacock Environment Management Award 2012, Gajraula Plant, India

Winner of Golden Peacock National Quality Award - 2011 in Pharmaceutical Sector under Large Enterprises category, presented during the 22nd World Congress on Total Quality, organised in association with ET Now, Gajraula Plant, India

Lifetime Achievement Award 2010-11 - Shyam S Bhartia, presented by Mr. Anand Sharma, Minister of Commerce and Industry, Govt. of India at CHEMEXCIL's Export Award

Ernst & Young Entrepreneur of the Year Award 2010 - Shyam S Bhartia, & Hari S Bhartia, under Life Sciences & Consumer Products category

Bio-Spectrum Person of the year Award 2009 - Hari S Bhartia
JUBILANT LIFE SCIENCES LTD.

Principal International Subsidiaries

USA
Jubilant HollisterStier LLC
3525, N. Regal, Spokane,
Washington 99207, USA
T: +1 509 489 5656
F: +1 509 484 4320

Jubilant Cadista Pharmaceuticals Inc.
207, Kiley Drive, Salisbury,
Maryland 21801, USA
T: +1 410 860 8500
F: +1 410 860 8719

Jubilant Clinsys Inc.
1 Crossroad Drive, Building A
Second Floor, Bedminster,
New Jersey 07921, USA
T: +1 908 947 7777

Jubilant Life Sciences (USA) Inc.
1 Crossroads Drive, Building A,
Second Floor, Bedminster,
NJ 07921, USA
T: +1 908 658 9988
F: +1 908 658 9927

Germany
Jubilant Clinsys, Inc.
Münsterstrasse 248
40470 Düsseldorf
T: +49 211 61663270
F: +49 211 61663111

Canada
Jubilant HollisterStier Inc.
Contract Manufacturing & Services Division
16751 Trans-Canada Highway,
Kirkland, Québec, Canada H9H 4J4
Tel: +5146307074
Fax: +5146948220

Jubilant DraxImage, Inc.
16751, TransCanada Highway,
Kirkland (Montreal), Québec,
Canada H9H 4J4
Tel: +514 630 7030
Fax: +514 694 9295

Belgium
Jubilant Pharmaceuticals N.V.
Axxes Business Park,
Guldensporenpark, Blok C - nr 22,
Geliijkvolers links
9820 Merelbeke, Belgium
T: +32 9 233 1404
F: +32 9 233 0016

China
Jubilant Life Sciences (Shanghai) Ltd.
Room No. 3403, Hongkong Plaza,
South Tower, 283, Huai Hai Zhong Road,
Shanghai-200021, China
T: +86 21 6390 7388
F: +86 21 6390 7399

Principal Indian Subsidiaries

Noida
Jubilant Clinsys Ltd.
C-46, Sector 62, Noida-201301,
Uttar Pradesh, India
T: +91 120 436 4000
F: +91 120 240 4336

Jubilant Chemsys Ltd.
B-34, Sector 58,
Noida 201301
T: +91 120 4093301
F: +91 120 2518776

Gujarat
Jubilant Infrastructure Ltd.
Plot No.P1-L1, with Jubilant SEZ
Plot No.05, GIDC Industrial Estate,
Vilayat Village Vilayat,
Taluka - Vagra, Dist. - Bharuch – 390012, Gujarat, India
T: 02641 221025/292222
F: 02641 221015

Bengaluru
Jubilant Biosys Ltd.
Drug Discovery Center
No 96, Industrial Suburb,
2nd Stage Industrial Area,
Yeshwanthpur, Bengaluru-560022

Kolkata
Jubilant First Trust Healthcare Ltd.
78, Jessore Road, South Barasat,
Kolkata 700127
24 pgs (North) West Bengal, India
T: +91 33 4036 3636
F: +91 33 2584 2855

Corporate Office
1A, Sector 16A, Noida-201301, Uttar Pradesh, India
Tel: +91 120 4361000
Fax: +91 120 2516628
email: support@jubl.com
www.jubl.com
In the past 90 years, the allergy division of Jubilant Life Sciences, Jubilant HollisterStier Allergy has evolved into a world leader in providing high quality products to the global immunotherapy market for the diagnosis and treatment of allergies. Its cGMP facility manufactures products to meet the high quality standards followed in the allergy industry.

Since its inception, the allergy division is dedicated to provide allergy sufferers with products that will enhance their quality of life. The continuous focus of scientists on product innovation enables the company to give doctors the tools to provide exceptional treatment plans to their patients. The Company’s exclusive Acetone Precipitated (AP) product line is well known throughout the industry, and AP Dog extract is referenced by name in allergy and immunotherapy practice parameters. The Acetone Precipitated (AP) line of extracts is a complete line of skin test devices including both single test and multiple skin tests.

Jubilant HollisterStier Allergy has been a long standing leader in the North American immunotherapy industry. The Company is focused on maintaining its leadership while expanding its global presence to serve its customers better. The Company currently has distribution agreements allowing its products to be sold in Canada, New Zealand, France, South Korea and Australia, and is working on applications to market products in India and Mexico. The Company is also the exclusive supplier of industry guideline recommended 10mg/mL Histamine Dihydrochloride for the US allergy market. In 2012, the Company obtained its International Organization for Standardization (ISO) 13485:2003 Medical Device Certification. This demonstrates the Company’s ability to provide medical devices that meet the strict requirement of ISO standards and assures the best quality.

Jubilant Life Sciences is the only provider of the
Allergy and Asthma Diagnostic and Immunotherapy Products and Supplies
- Single test and multiple skin test devices
- Diagnostic supplies and sets
- Diluents, racks, and trays
- Pulmonary supplies (resale items)
- Syringes (resale items)
- Sterile empty and evacuated vials
- Storage and shipping containers (resale items)
- Educational/Reference materials

Allergenic Extracts
- Standardised grass pollen extracts
- Non-standardised tree, grass and weed pollen extracts
- AP product line of extracts
- Standardised mite extract
- Standardised venom
- Mold extracts
- Foods (resale item for diagnostic use)

WARNING: ANAPHYLAXIS

See full prescribing information for complete boxed warning

Intended for use only by licensed healthcare provider experienced in administering Non-standardised Allergenic Extracts and trained to provide immediate emergency in the event of a life threatening reaction
Non-standardised Allergenic Extracts can cause serious systemic reactions, including anaphylactic shock and death
Do not inject intravenously
Initial dose for immunotherapy must be individualised based on the degree of sensitivity of the patient
Observe patients for at least 30 minutes following administration
Immunotherapy may not be suitable for patients with medical conditions that reduce their ability to withstand a systematic reaction
Non-standardised Allergenic Extracts can cause serious systemic reactions, including anaphylactic shock and death, especially in patients who have severe or steroid-dependent asthma, cardiovascular disease, or in patients who use beta blockers
Local reactions at the injection site include: erythema, swelling, pruritus, tenderness and pain
Systemic reactions include: generalised skin erythema, urticaria, pruritus, angioedema, rhinitis, wheezing, laryngeal edema, and hypotension

For full prescribing information please view the complete package insert online at www.hsallergy.com
CONTRACT MANUFACTURING OF
STERILE INJECTABLES AND OCL (OINTMENTS,
CREAMS AND LIQUIDS)
Jubilant HollisterStier Contract Manufacturing & Services is an integrated Contract Manufacturing Organisation (CMO), able to manufacture Sterile Injectables and OCL (Ointments, Creams and Liquids). It is well positioned to service the entire spectrum of the Life Sciences industry requirements from virtual biotechnology organisations to large scale leading pharmaceutical and biopharmaceutical companies.

**Manufacturing Prowess**

Quality is a part of Jubilant’s corporate culture, it can be seen in every aspect of the Company from processes to manufacturing facilities. In the manufacturing facilities a full-range of support and services are provided to streamline the manufacturing process, such as on-site assistance from process qualifications and regulatory submittals through product release. Recently the Company has incorporated laboratory outsourcing services as well. Its quality unit maintains an integrated quality assurance program that emphasises quality design, validation and proper use of facilities and equipment.

With contract manufacturing facilities located across North America and India, the Company provides specialised manufacturing services for global leaders in the pharmaceutical and biopharmaceutical industries. Jubilant HollisterStier manufactures the following in the locations noted:

**Sterile Fill/Finish - Spokane, Washington, USA**
- Phase I - commercial sterile injectables, lyophilization
- Laboratory services

**Sterile and Non-sterile Fill/Finish - Montreal, Quebec, Canada**
- Commercial sterile injectables, lyophilization
- Sterile ophthalmics and otics
- Non-sterile topicals and liquids
- Laboratory services

**Small Volume Commercial Solid Dosage - Salisbury, Maryland, USA**
- Tablets and capsules

**Large Volume Solid Dosage - Roorkee, Uttarakhand, India**
- Tablets and capsules

**Product Offerings**

**Sterile Manufacturing**
- Sterile injectables (vials and ampoules)
- Sterile ophthalmics & otics (tubes and bottles)
- Freeze-drying (lyophilization)
- Laboratory services (analytical and microbiological services)

**OCL (Ointments, Creams and Liquids) Manufacturing**
- Non-sterile Ointments, Creams, Liquids (bottles, tubes, jars)

**Solid Dosage Formulations (tablets and capsules)**

Jubilant Life Sciences Limited is a global Pharmaceutical and Life Sciences Company engaged in manufacture and supply of APIs, Solid Dosage Formulations, Radiopharmaceuticals, Allergy Therapy Products and Life Science Ingredients. It also provides services in Contract Manufacturing of Sterile Injectables and Ointments, Creams and Liquids and Drug Discovery and Development. The Company’s strength lies in its unique offerings of Pharmaceutical and Life Sciences products and services across the value chain. With 10 world class manufacturing facilities in India, US and Canada and a team of over 6200 multicultural people across the globe, the Company is committed to deliver value to its customers spread across 98 countries. The Company is well recognised as a ‘Partner of Choice’ by leading pharmaceuticals and life sciences companies globally. To know more log on to www.jubi.com

Corporate Office: 1A, Sector 16A, Noida-201301, U.P., India, Tel: +91 120 4361000, Fax: +91 120 2516628
End-to-end innovative drug discovery & development solutions are provided by Jubilant Biosys Ltd., Jubilant Chemsys Ltd. and Jubilant Clinsys Ltd., subsidiaries of Jubilant Life Sciences Ltd. These solutions seamlessly integrate with preclinical infrastructure, to provide high-quality, efficient translational and clinical development (Phase I - IV) solutions to the global pharmaceutical & biotech industries.

Jubilant offers integrated discovery & development solutions spanning across Target Identification/Target Validation (TI/TV) through Lead Optimisation (LO)/Preclinical Candidate (PCC) and Clinical Trial Services for multiple therapeutic areas. The Company has rapidly emerged as a leading collaborator for biotechnology and pharmaceutical companies worldwide, due to its prodigious capabilities in Oncology, Metabolic Disorders, CNS, Pain and Inflammation. For each of these therapeutic areas, Jubilant has developed in-depth expertise in Discovery Informatics, Medicinal Chemistry, Structural Biology, Biology, In-vivo and In-vitro Biology and Translational Sciences.

The discovery team focuses on early stage lead generation across various target classes. It also uses a wide range of technologies, including High Throughput Screening, Molecular Modelling, Medicinal Chemistry, Structural Biology and others, to identify novel starting points that are then selectively taken through the preclinical discovery process. This is further augmented by Jubilant’s expertise in Animal Pharmacology with Multiple Pharmacology and In-vivo models enabled internally to deliver high quality IND ready candidates. Jubilant continues to demonstrate optimal to excellent outcomes to its global pharmaceutical collaborators.

### Jubilant Drug Discovery

- More than 700 people are working on drug discovery spread across three locations: Noida and Bengaluru in India and Malvern in USA
- The Company demonstrated outcomes and expertise in 50 programs leading to preclinical decision outcomes with some leading to successful clinical outcomes across multiple therapeutic areas
- The company has exploratory and translational outcomes across target and disease platforms enabling ‘right shots at the goal’

### Jubilant offers integrated and robust preclinical and ‘early stage POC’ portfolio management

Jubilant offers customised innovative solutions across the drug discovery value chain to the biotechnology and pharmaceutical industry. The Company provides flexibility through its business models so that it can cater to each client’s requirements in the best possible manner. The business models are: Full Time Equivalent (FTE) based, Fee For Service (FFS) based, Milestone and Hybrid Models and Risk Sharing Model.

The clinical research arm, Jubilant Clinsys provides the entire spectrum of clinical research services for Phase I - IV clinical research including Clinical Trial Management, Clinical Data Management, PK/PD, Biostatistics, Strategic Sourcing, Medical Writing and Pharmacovigilance Services. This is leveraged through global project management teams and supported by therapeutic experts that provide collaborators with strategic and operational expertise.

Jubilant collaborates with the world’s leading pharmaceutical and biotech companies, academic institutions and research foundations. Innovative and rigorous science, excellence in execution, and absolute integrity, combined with flexible business models has enabled Jubilant to deliver valuable outcomes in a relatively short period. The hallmark of Jubilant’s collaborative model is value creation for its partners.
Jubilant Life Sciences Limited is a global Pharmaceutical and Life Sciences Company engaged in manufacture and supply of APIs, Solid Dosage Formulations, Radiopharmaceuticals, Allergy Therapy Products and Life Science Ingredients. It also provides services in Contract Manufacturing of Sterile Injectables and Ointments, Creams and Liquids and Drug Discovery and Development. The Company's strength lies in its unique offerings of Pharmaceutical and Life Sciences products and services across the value chain. With 10 world class manufacturing facilities in India, US and Canada and a team of over 6200 multicultural people across the globe, the Company is committed to deliver value to its customers spread across 98 countries. The Company is well recognized as a ‘Partner of Choice’ by leading pharmaceuticals and life sciences companies globally. To know more log on to www.jubl.com

Corporate Office: 1A, Sector 16A, Noida-201301, U.P., India, Tel: +91 120 4361000, Fax: +91 120 2516628

### DMFs Filed

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All supplies and technology package will be governed by the patent law of the importing country.

### Molecules available under Research & Development

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Jubilant Life Sciences Limited is a global Pharmaceutical and Life Sciences Company engaged in manufacture and supply of APIs, Solid Dosage Formulations, Radiopharmaceuticals, Allergy Therapy Products and Life Science Ingredients. It also provides services in Contract Manufacturing of Sterile Injectables and Ointments, Creams and Liquids and Drug Discovery and Development. The Company's strength lies in its unique offerings of Pharmaceutical and Life Sciences products and services across the value chain. With 10 world class manufacturing facilities in India, US and Canada and a team of over 6200 multicultural people across the globe, the Company is committed to deliver value to its customers spread across 98 countries. The Company is well recognized as a ‘Partner of Choice’ by leading pharmaceuticals and life sciences companies globally. To know more log on to www.jubl.com
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Jubilant Life Sciences, through its subsidiary, Jubilant DraxImage, is the market segment leader in North America for thyroid radiotherapy, lung and bone imaging. The Company develops, manufactures and markets innovative diagnostic and therapeutic radiopharmaceuticals for the global Nuclear Medicine marketplace.

The Company provides a growing portfolio of radiopharmaceuticals and complementary equipment to assist physicians in the diagnosis, treatment and monitoring of disease in patients undergoing Nuclear Medicine procedures. Clinical applications include diagnostic imaging for cardiology, oncology, lung, kidney, brain, and bone as well as radiotherapy for thyroid disease and cancer. With more than 30 years of service to the Nuclear Medicine community, customers have come to depend on the Company for high quality and reliable radiopharmaceuticals.

Jubilant DraxImage is the market leader in North America within the following Nuclear Medicine segments:

- I-131 Diagnostics & Therapy for thyroid disorders and thyroid cancer
- Lung imaging (MAA)
- Bone imaging (MDP)
- Cardiac imaging (Sestamibi, Rubidium Rb-82)

Jubilant is now ready to expand its leadership position into the nuclear cardiology market segment with the market introduction of its Rubidium-82 generator. This cardiovascular PET agent coupled with generic Sestamibi, introduced in 2009, will position Jubilant DraxImage to be the first company to provide both SPECT and a PET myocardial perfusion imaging agents. Beyond the above mentioned cardiovascular PET imaging agents Jubilant DraxImage continues to develop a robust pipeline of Nuclear Medicine products leveraging its research expertise in both chemistry and engineering. Some of the products under development are:

- I-131 MIBG, for the palliative treatment of neuroblastoma, a type of neuroendocrine tumor for which no approved treatment is available for refractory/relapse patients
- Tc-99m Exametazime Injection, a generic of Ceretec®, a diagnostic radiopharmaceutical for SPECT imaging of the brain and infections
- Gadopentate Dimeglumine, a generic of Magnevist®, the most widely used contrast agent in Magnetic Resonance Imaging (MRI)

To serve its global customers better, the company has established in Latin America, Europe and Asia a series of distribution partnerships with local players well entrenched in their respective markets. Furthermore, in early 2011, the Company established in India its first international subsidiary (Jubilant DraxImage Limited) and offers hospitals in India and their patients a wide range of Nuclear Medicine products such as Tc-99m Generator, Thallium-201, Iodine-131 capsules & solution as well as a lyophilized kits used for bone (MDP), kidney (DTPA), lung (MAA) and myocardial perfusion (Sestamibi) imaging. Jubilant DraxImage, is gearing up to achieve leadership position in Nuclear Medicine in India.

**Product Offerings**

- HICON®I-131 solution (thyroid radiotherapy)
- Iodine-131 capsules (thyroid disease diagnostic and radiotherapy)
- Xenon-133 (lung)
- Lyophilized kits: MDP (bone), MAA (lung), DTPA (lung and kidney), Sestamibi (cardiac) and Glueceptate (kidney/brain)
- Rubidium Rb-82 Generator (cardiovascular PET)
Jubilant Life Sciences manufactures Pyridine, Picolines, Cyanopyridines and Piperidine. These are used as Advance Intermediates/building blocks for the production of a range of agrochemicals, pharmaceuticals, dyes, solvents, metal finishes, fine chemicals, etc. The products are approved by more than 275 global pharmaceutical, agrochemical and other industrial customers, who rely on Jubilant’s consistent quality and service. Their trust and support has helped Jubilant grow to the Number 1 position in the market for Pyridine & its derivatives globally.

The Company manufactures the Advance Intermediates via the biomass route, using agricultural feedstock. Jubilant derives 50.6% benefit in the manufacture of Pyridine, as compared to the conventional petroleum route. The Company has backward and forward integrated world scale plants that are ZERO discharge and ISO 9000, ISO 14001 & OHSAS 18001 certified.

Product Offerings

**Pyridine**

Pyridine, a basic organic chemical, is a versatile building block and an excellent solvent used in agrochemical, pharmaceutical and other industries. It is completely soluble in Water, Alcohol, Ether and Benzene. It acts as an acid scavenger and can catalyse reactions.

**Applications**

- The largest application of Pyridine globally is in the manufacturing of Bipyridyl Herbicides: Paraquat and Diquat
- Pyridine is used in the manufacturing of agrochemical: Symtet, which in-turn is used for the manufacturing of insecticide Chlorpyrifos
- Pyridine is also used in industries like: dyestuffs & textiles, agrochemicals, pharmaceuticals and electronics
- Pyridine is used as a solvent, and for metal finishes

**REACH Status:** Registered as Full Phase in and Transported Isolated Intermediate (TII)

**Alpha Picoline**

Alpha Picoline, also called 2-Picoline or 2-Methylpyridine, is a clear organic liquid. It is completely soluble in Water, Alcohol and Ether.

**Applications**

- The largest application of Alpha Picoline is 2-Vinylpyridine monomer (2 VP), which is used in the manufacturing of VP Latex
- Other application of Alpha Picoline is in the manufacturing of agrochemicals: Picloram and Nitrpyrin
- Alpha Picoline is also the raw material for 2 Cyanopyridine
- It is also used in the pharmaceuticals industry

**REACH Status:** Pre-registered
**Beta Picoline**

Beta Picoline, also called 3-Picoline or 3-Methylpyridine, is a clear organic liquid. It is completely soluble in Water, Alcohol and Ether.

**Applications**

- The largest application of Beta Picoline is in the manufacturing of Vitamin B3 (Niacinamide)
- Beta Picoline is a significant intermediate for agrochemicals like Chlorpyrifos, Haloxyfop and Fluazifop Butyl
- Also used in pharmaceutical intermediates

**REACH Status:** Registered as Full Phase in and Transported Isolated Intermediate (TII)

**Gamma Picoline**

Gamma Picoline, also called 4-Picoline or 4-Methylpyridine, is a clear organic liquid. It is completely soluble in Water, Alcohol and Ether.

**Applications**

- Gamma Picoline finds application in the manufacturing of several catalysts such as DMAP and the drug INH & other pharmaceuticals
- Gamma Picoline is used in the manufacturing of 4-Vinylpyridine (4 VP)
- Gamma Picoline is also the raw material for 4-Cyanopyridine

**REACH Status:** Pre-registered

**2-Cyanopyridine**

2-Cyanopyridine is a white to off-white solid at room temperature with almond like odour. It is derived from Alpha Picoline.

**Applications**

- 2-Cyanopyridine finds applications in pharmaceuticals, agrochemicals & fine chemicals
- 2-Cyanopyridine is converted to Chromium and Zinc Picolinate for use in human and animal nutrition

**REACH Status:** Pre-registered

**3-Cyanopyridine**

3-Cyanopyridine is a white crystalline solid.

**Applications**

- 3-Cyanopyridine is used in the manufacturing of Niacinamide & Niacin (Vitamin B3)
- Other major application areas of 3-Cyanopyridine are: Pymetrizone, 2 Chloro Nicotinic Acid, and 3-Aminomethylpyridine, pharmaceuticals & agrochemicals

**REACH Status:** Registered as Transported Isolated Intermediate (TII)
4-Cyanopyridine

4-Cyanopyridine is a white to off-white solid at room temperature. It is derived from Gamma Picoline.

Applications

4-Cyanopyridine finds applications in the manufacturing of the drug INH and other pharmaceuticals and agrochemicals

REACH Status: Pre-registered

Piperidine

Piperidine is a colourless fuming liquid, derived by the hydrogenation of Pyridine.

Applications

The major application of Piperidine is for the production of Dipiperidinyl Dithium Tetrasulfide, which is used as a rubber vulcanisation accelerator

Piperidine is also used as a solvent and base in agrochemical and pharmaceutical industries for Mepiquat Chloride, Dipyridamoiil and Minidoxil

REACH Status: Pre-registered
EXCLUSIVE SYNTHESIS

[Image of a scientist working in a laboratory]

JUBILANT
LIFE SCIENCES
Jubilant Life Sciences’ Exclusive Synthesis business acts as an outsourcing partner for many Life Science and Agrochemical innovators, and offers a wide range of services to its customers.

Given the challenges faced by the pharmaceutical industry today, it is imperative to adapt to the new environment. Jubilant implements flexible & scalable solutions in a confidential and secure framework, aimed at helping its customer to succeed.

**Jubilant offers complete Drug Life Cycle Services to global pharmaceutical companies.**

**Active Selection**

Jubilant is always on the look-out for symbiotic relationships with other successful innovators. And in order to do that Jubilant is more than willing to offer its skills.

The graph below shows how Jubilant can impact the life cycle of a drug. It also highlights where all Jubilant Exclusive Synthesis and Active Selection can be of benefit.

---

**A typical drug development life span**
Product Offerings
Jubilant’s strength in Pyridine based chemistry enables it to partner leading agrochemical companies and offer them contact manufacturing services in multi-ton scale. The Company partners with leading agrochemical companies to develop and supply key intermediates for agroactives.
These strong offerings are supported by excellence in R&D

R&D Services
Jubilant provides Process R&D, Scale-up and Manufacturing Services to Pharmaceutical and Life Sciences Innovators for non-GMP Intermediates. The Company applies Design For Six Sigma (DFSS) and Design of Experiments (DOE) concepts to develop processes with criteria on environmental impact, scalability, ease of operation and robustness. These processes are:
- Route design, process development and process optimisation from Phase I to III
- Process improvement for launched products, dosage as well as actives
- Regulatory and Analytical support required for CMC section of registrations

R&D Facilities
- Exclusive Synthesis has R&D facilities at Noida and Gajraula, U.P, India for Intermediates, APIs and Solid Dosage Forms
- Jubilant has a fully equipped analytical laboratory with advance equipment including: NMR, XRD, Reaction Calorimeter, LC-MS, Prep HPLC, Particle Size Analyser, Optical Microscope, Stability Chambers, Polarimeter, IR, DSC, TSC etc
- All projects in R&D are coded and distributed to maintain strict confidentiality

Exclusive Synthesis - Intermediates & APIs
Custom Manufacturing Intermediates & APIs
Jubilant focuses on manufacturing of both Clinical and Commercial phase products at small scale as well as at large scale. The manufacturing happens at two kinds of plants: Pilot Plants and Commercial Plants.

Pilot Plants
Jubilant has a state-of-art Kilo-lab and Pilot plants at Gajraula, U.P, India for Non-regulatory steps synthesis. The Company also has Reactors ranging from 20L to 630L (Including Glass assemblies and Cryogenic reactors, Autoclaves operating at 58 Kg/cm² and 280°C). At these facilities operations are carried out at both very high (450°C) and very low (-80°C) temperatures.

Commercial Plants
Jubilant operates large commercial plants at Gajraula, U.P, India for Non-regulatory steps and at Nanjangud, Karnataka, India for cGMP intermediates and APIs. DCS process control systems are used widely at these plants. The plants also have High Vacuum System, Highly Efficient Distillation Columns with structured packing of 30 meters packed height, and Solvent Recovery Plants.
The Gajraula plant has 100 reactors (including MSGLR, SS, Hastealloy and Cryogenic) ranging from (1KL to 12KL) with a reactor volume of 600KL, along with Autoclaves operating at 58 Kg/cm² & 280°C, Bromination and Fluorination facilities.

Jubilant Exclusive Synthesis - Your Partner of Choice
Positive Evolution of cost effective drug production and delivery to patients is a demand led worldwide reality. Enhanced competition means, that growth in the future demands adaptation to the new environment. Active Selection from Jubilant Exclusive Synthesis supports the partners so they in-turn can fully focus on servicing patients globally in a changing pharmaceutical world. The customers are further supported by Jubilant Exclusive Synthesis business model’s cornerstones: Lean 6 Sigma, Modern Production facilities and International Best Practice.
Advantages

- Jubilant is working with large & mid-size innovator pharmaceutical, biotech & crop science companies
- The Company supplies commercial products and has executed several long-term agreements
- Several commercial scale projects of Jubilant are in late phase discussions
- Several projects of Jubilant are in progress in Phase-I, Phase-II and Phase-III

Technology Platforms

All core technologies and chemical conversions are operated at large scale and are globally competitive. Jubilant has a track record of safely operating a range of hazardous processes. The classical chemical technologies are also operated at various scales of manufacturing.

Project Management

The company has set up a Project Management Office (PMO) to improve overall coordination. Every customer project is handled with care by a certified Project Manager. He/she is the single point of contact for customers, communicates regularly with customers on project progress, documentation etc. and tracks progress at every stage using Enterprise Project Management (EPM) software.
Jubilant’s Fine Chemicals business offers over 167 products that are mainly Pyridine and Piperidine based intermediates developed through in-house R&D. These products find application in about 280 APIs of various therapeutic segments and 50 agrochemicals.

Jubilant Fine Chemicals holds global market leadership in 12 Fine Chemicals. The Company aims to retain its Number 1 position in all its 65 commercialised products, and strengthen its presence in other non-commercialised products. Jubilant’s Fine Chemicals business is completely backward integrated from feedstock i.e. Pyridine, Picoline & Cyanopyridines, which provide cost leadership and competitive edge over others. This unique integration makes the Company truly sustainable in its operations and quality of its offerings, with long term interest in all these products. All products are benchmarked with internationally acceptable standards and their performance is suitable for all demanding applications, across all industries.

Jubilant Fine Chemicals has a unique culture of excellence.

**Excellence driven by Innovation**

For Jubilant Fine Chemicals, growth comes through new product development on new Chemistry & Technological platforms. This is accomplished by putting strong focus on innovation through a dedicated R&D team that handles customer enquiries for advance derivatives of its products and improved specifications.

**Technological Excellence**

The Company has developed expertise in niche technological capabilities like Amination (Chicibeben reaction), Grignard Rxn. Sodamide/Sodium Methoxide Rxn., Photochlorination, Halogenation & Dehalogenation, Vapour phase Rxn (upto 450°C), High Pressure Reaction and many more. Currently, the Company is focusing on developing products on Fluorination Chemistry. Through continuous innovation over the last 10 years, the Fine Chemicals business has been granted 34 process patents in various countries including India, Japan, USA, UK, Ireland, China and Switzerland.

**Manufacturing Excellence**

Jubilant operates 11 manufacturing units for Fine Chemical business in 3 locations in India. Gajraula, U.P, India has 7 plants with a total reactor volume of 400KL, Ambernath, Maharashtra, India has 2 plants with a total reactor volume of 170KL and Bharuch, Gujarat, India has 2 plants. Quality, Safety and Environmental Protection are the foremost commitments at Jubilant’s plants, coupled with constant efforts to build efficiencies and economies of scale without compromising on quality. All of the Company’s manufacturing plants follow global standards of best manufacturing practices.


**Process Excellence**

The Company continuously works on process optimisation and cost reduction initiatives using Lean Six Sigma to work towards improving yields, debottlenecking capacities in order to achieve and retain Number 1 position globally.

**Green Chemistry**

As part of Corporate Social Responsibility, one of Jubilant’s principle goal lies in developing processes and technologies, which could contribute to reducing carbon footprint and making the planet greener. To achieve this, the Company is producing captive feedstock, i.e. Ethanol from eco-friendly route, and not by the conventional petroleum route. The starting material for all Fine Chemicals is Pyridine & Picoline derived ethanol from bio-route using molasses, thus leading to the reduction of carbon footprints in the range of 10% to 30% in comparison to competitors. This makes the Company truly sustainable in its operations and quality of its offerings.

By using Green Chemistry Toolbox along with Solvent Recovery Plants, Multi-effect Evaporators and Waste Heat Boilers, Jubilant is increasing productivity by drastically cutting waste and the customers’ carbon footprint.

**Customer Base**

Jubilant’s Fine Chemicals business has a base of 165 global customers and services, out of which 65 customers active with the company on a regular basis. The Company also offers customised products as per the customer’s requirements.
# Commercialised Fine Chemicals

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<thead>
<tr>
<th>S.no.</th>
<th>Product</th>
<th>Pharma End Use</th>
<th>Agro End Use</th>
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<tbody>
<tr>
<td>1</td>
<td>2-(Aminomethyl)piperidine</td>
<td>Flecainide acetate</td>
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</tr>
<tr>
<td>2</td>
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<td>3</td>
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<td>Lamivudine, Vitamin D Analogues</td>
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<td>Doxylamine, Flavour &amp; Fragrances</td>
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<td>3-Chloropyridine</td>
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<td>46</td>
<td>4-DMAP</td>
<td>Abacavir, Lamivudine &amp; other uses as catalysts</td>
<td>Captan, Chloropyrifos, Clethodim &amp; other uses as catalysts</td>
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<td>Nicergoline, Timepidium bromide</td>
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<td>5-Ethyl-2-Methylpyridine</td>
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<td>5-Methylnicotinic acid</td>
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<td>Azacyclonol</td>
<td>Fexofenadine</td>
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<td>52</td>
<td>Cetylpyridinium chloride</td>
<td>Mouthwases (Disinfectant)</td>
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<tr>
<td>53</td>
<td>Ethyl isonipecotate</td>
<td>Maropitant, Bilastine, Vandetanib</td>
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<td>58</td>
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<td>Eperisone.HCl, Tolperisone. HCl</td>
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<td>Pyridine hydrobromide</td>
<td>Cephalexin, Clarithromycin, Cephradine</td>
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<td>62</td>
<td>Pyridine hydrochloride</td>
<td>Raloxifen, Dilitiazem</td>
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<td>63</td>
<td>Pyridine-2-aldehyde</td>
<td>Bisacodyl, Sodium Picosulfate</td>
<td>Pyriprole</td>
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<td>Pyridine-3-acetic acid</td>
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<td>65</td>
<td>Pyridine-4-aldehyde</td>
<td>Donepezil, Trime doxime</td>
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## Range of Fluro Pyridines being launched

<table>
<thead>
<tr>
<th>S.no.</th>
<th>Product</th>
<th>Pharma End Use</th>
<th>Agro End Use</th>
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<tbody>
<tr>
<td>1</td>
<td>2-Amino-3-chloro-5-(trifluoromethyl) pyridine</td>
<td>Fluazinam</td>
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<td>2</td>
<td>2-Amino-5-(trifluoromethyl) pyridine</td>
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<td>3</td>
<td>2-Chloro-3-cyano-6-(trifluoromethyl) pyridine</td>
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<td>4-Chloro-3-fluoropyridine</td>
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<td>2-Chloro-3-(trifluoromethyl) pyridine</td>
<td>Flazasulfuron</td>
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<td>7</td>
<td>2-Chloro-4-(trifluoromethyl) pyridine</td>
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<td>Pyroxsulam</td>
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<td>8</td>
<td>2-Chloro-5-(trifluoromethyl) pyridine</td>
<td>Tipranavir</td>
<td>Fluazifop / Fluazifop P, Pyridyal</td>
</tr>
<tr>
<td>9</td>
<td>2, 3-Dichloro-5-(trifluoromethyl) pyridine</td>
<td></td>
<td>Chlorfluazuron, Fluopicolide, Haloxyfop-etotyl, Haloxyfop-methyl, Fluazuron</td>
</tr>
<tr>
<td>10</td>
<td>2, 6-Dichloro-5-fluoro-3-methylpyridine</td>
<td>Trovafloxacin, Altrofloxac, Tosufloxacin</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>2, 6-Dichloro-4-(trifluoromethyl) pyridine</td>
<td></td>
<td>Flonicamid</td>
</tr>
<tr>
<td>12</td>
<td>3, 5-Dichloro-2, 4, 6-trifluoropyridine</td>
<td></td>
<td>Fluroxypyr-meptyl</td>
</tr>
<tr>
<td>13</td>
<td>3, 5-Difluoro-2-cyanopyridine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2-Fluoro-4-methylpyridine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>2-Fluoro-6-methylpyridine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>6-(Trifluoromethyl)-2-hydroxypyridine</td>
<td></td>
<td>Picoxystrobin</td>
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</tbody>
</table>
**Acetyl Products**

Jubilant offers a basket of Acetyl products like Ethyl Acetate, Acetic Anhydride, Acetic Acid, MCAA (Monochloroacetic Acid), SMCA (Sodium Monochloro Acetate) and Acetaldehyde. Acetyl products cater to a diverse range of industries from Pharmaceuticals, Crop Protection, Food & Beverages, Textiles, Packaging, Adhesives, Aromatics, etc.

The Company is the largest producer of Acetaldehyde from in-house alcohol-based production process, which is used captively. It is also the largest consumer of Acetic Acid in India.

**Product Offerings**

**Ethyl Acetate** - Ethyl Acetate is an important downstream product of Ethyl Alcohol and Acetic Acid. In the production of Ethyl Acetate, Jubilant saves an estimated 2.29 tonne CO2 per tonne. This saving is due to the usage of bio-based ethanol instead of petroleum feedstock. Jubilant is also the 7th largest Ethyl Acetate manufacturer in the world and has a considerable domestic market share.

**Applications**

Ethyl Acetate is an important ingredient in diverse industries such as:
- Paints and Coatings
- Adhesives
- Packaging
- Printing
- Pharmaceuticals
- Synthesis

**Acetic Anhydride** – Jubilant holds almost half of the domestic market share in the production of Acetic Anhydride. It is also the 7th largest global manufacturer of Acetic Anhydride and the 4th largest in terms of merchant sales globally.

**Applications**

- It is an important ingredient for industries like: Cellulose Acetate, Dyes, Pharmaceuticals, Agrochemicals
- It is also an intermediate in the making of detergents

**Acetic Acid** – Jubilant is the largest consumer of Acetic Acid in India. The Company also supplies Acetic Acid to a variety of industries for their consumption.

**Applications**

- It is a key raw material for the production of a wide number of products
- It is used in fields as diverse as: Purified Terephthalic Acid (PTA) applications, Printing Ink, Pharmaceuticals, Aromatics, Food etc.

**Monochloroacetic Acid (MCAA)/Sodium Monochloro Acetate (SMCA)** – Jubilant is the only integrated producer, manufacturing Monochloroacetic Acid/Sodium Monochloro Acetate by utilising Acetic Acid and Acetic Anhydride. The Company is a prominent exporter of MCAA and SMCA.

**Applications**

MCAA/SMCA are used in industries as diverse as:
- Surfactants
- Herbicides
- Vitamins
Acetaldehyde – Jubilant is the 3rd largest manufacturer of Acetaldehyde in the world and the largest global producer of Acetaldehyde from Ethyl Alcohol route. The Company derives its competitive advantage through proprietary technology and proximity of its plants to high quality-low cost feedstock.

Applications
The most common derivatives of Acetaldehyde are the Synthetic Pyridines, Pentaerythritol, Acetate Esters (Ethyl Acetate, Isobutyl Acetate), 1, 3-Butylene Glycol, Peracetic Acid & Glyoxal.

Advantages
Jubilant has more than three decades of chemistry knowledge and easy availability of feedstock for its distilleries

Location advantage: Acetyls production sites situated at Gajraula (Uttar Pradesh) & Nira (Maharashtra) are located in the largest sugarcane producing states of India providing alcohol at competitive prices, thus reducing the price of production

Ample availability of Acetic Acid in Asia region

- Jubilant’s manufacturing excellence enables it to provide higher efficiencies in entire Acetyls value chain
- Jubilant’s strong customer relationships
- Both the manufacturing facilities of the Company adopt highest standards of safety, and are ISO 9001/OHSAS 18001 certified
- Jubilant focuses on customising the products through superior quality and on-time delivery. Six Sigma initiatives are adopted where the Company constantly benchmarks and improves the product line-up to enhance efficiency measures
- Jubilant’s Ethyl Acetate and Acetic Anhydride are KOSHER and HALAL certified

Speciality Gases
Jubilant’s Speciality Gases portfolio comprises of two products: Carbon Dioxide (CO2) and a mixture of CO2 & Ethylene Oxide (ETO)

Product Offerings
Liquid Carbon Dioxide (CO2) – Jubilant manufactures 99.9% pure colourless liquid CO2 at its two production locations: Gajraula (Uttar Pradesh) and Nira (Maharashtra). Both the plants are ISO 9002 certified by the Bureau Veritas Quality International. Gajraula plant also has FSSC 22000:2010 certification. Both the units have their own storage facilities.

Range offered in Carbon Dioxide:
- Food & Beverage Grade
- Engineering Grade for Fire Extinguishers, Welding (MIG)
- Pharmaceuticals & Dry Ice Manufacturing
- Horticulture & Agriculture Industry
Applications

Used in Healthcare, Beverages and Engineering industry

Ethylene Oxide Mixture (ETO) – ETO mixtures are used by healthcare facilities worldwide for sensitive instruments which cannot be adequately sterilised by either steam or liquid disinfectants. ETO, even with repeated use, treats most medical material gently. Its property of permeating through barrier packaging enables medical instrument to be sealed prior to sterilisation, which in-turn ensures maintenance of sterility for an enhanced period. The Company’s ETO plant is ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 certified. The company provides ETO in cylinders of 30 & 35 kg.

Product Offerings

Jubilant offers various ETO, CO2 mixtures for disposable medical sterilisation:

- 30% Ethylene Oxide + 70% Carbon Dioxide
- 90% Ethylene Oxide + 10% Carbon Dioxide
- 10% Ethylene Oxide + 90% Carbon Dioxide
- 20% Ethylene Oxide + 80% Carbon Dioxide
- 13% Ethylene Oxide + 87% Carbon Dioxide
- 70% Ethylene Oxide + 30% Carbon Dioxide

The Company also has the capability to manufacture Ethylene Oxide mixtures of other combinations as per the customer’s requirements.
Jubilant Life Sciences is a significant player in the nutrition market, it manufacturers and markets a wide range of Nutrition Ingredients and Formulations for application across feed, food, pharmaceutical, agrochemical, technical and personal care. The Company enjoys a strong position of trust and reliability with its customers across the globe on account of its quality of products and services.

Jubilant has a global footprint of customers in over 50 countries and established business relationships with top Premix/Feed Manufacturing, Nutritional, Cosmetics and Agrochemical companies across the globe.

The Company has wholly owned subsidiaries in USA, Europe and China. Outside India, Jubilant holds Vitamin B3 stocks in warehouses in Antwerp, New Jersey and Shanghai.

**Vitamin B3 – Niacinamide & Niacin**

Jubilant is currently the second largest manufacturer of Niacinamide & Niacin (Vitamin B3) worldwide, and is the leading manufacturer with complete backward integration to the basic feedstock. Jubilant delivers unmatched advantages of consistent quality & availability for Niacinamide & Niacin, leveraging its global scale of Pyridine manufacturing operations. The Company has expanded its nutrition business further with 10,000 TPA capacities for 3-Cyanopyridine and Niacinamide at SEZ Bharuch, Gujarat.

**Backward Integration**

The complete backward integration, (Molasses – Alcohol – Acetaldehyde – Pyridine/Beta Picoline – Niacinamide / Niacin) up to the basic feedstock, is one of the major advantages that the Company has over the other manufacturers of Niacinamide and Niacin. The molasses obtained from sugarcane enables Jubilant to use bio-ethanol as the primary feedstock in the manufacturing of Niacinamide and Niacin.

**Care for Environment**

Since Jubilant uses bio-ethanol as its primary feedstock unlike other manufacturers who use petroleum based feedstock (Naphtha), it manages to save a considerable amount of Greenhouse Gases emissions. This process even helps Jubilant’s customers build a greener supply chain as they use Niacinamide and Niacin produced by the Company.

The benefit derived in the carbon footprint of Vitamin B3 manufactured by Jubilant, as compared to the conventional petroleum route, is 25% and 17% for Niacinamide and Niacin respectively.

**Manufacturing**

The manufacturing facilities are certified for Kosher, Halal, FAMI-QS and cGMP regulations.

**Product Offerings**

- Niacinamide feed grade
- Niacinamide free flow
- Niacin feed grade
- Custom offering of different particle sizes ranging from fine powder to coarse granular
- Customised packaging ranges from packs of Cartons to Laminated bags to Jumbo Bags

Niacinamide and Niacin products conform to -

The latest versions of all major pharmacopoeias i.e. USP, BP, JP, CP, EP and FCC
All major regulations for applications into Animal Feed, Human Food and Pharmaceuticals

**Applications**

Animal Nutrition: In poultry, dairy, pet food and veterinary drugs industry

Human Nutrition: In food supplements, dietary supplements, infant nutrition and beverage industry

Pharmaceuticals: In multivitamin tablets, for treatment of diabetes and high cholesterol levels

Cosmeceuticals: In skin creams, hair lotions and other personal care products

Technical Applications: In metal brighteners and metal plating industry

Agrochemicals: Used as starting raw material for production of patented agrochemical molecules

**Vitamin B4 – Choline Chloride**

Jubilant Life Sciences is India’s largest manufacturer of Synthetic Choline Chloride. This compound is used to create products that are offered in different forms for animal feed applications, all of which duly meet international quality standards. Choline is also known as Vitamin B4 and is an essential nutrient that is widely distributed in foods, principally in the form of ‘phosphatidylcholine’. It can also be used as free Choline and is necessary for the structure and function of all cells, thus making it crucial for sustaining life.

To have complete control over all quality aspects, Jubilant manufacturing plant also has a backwardly integrated corn cob manufacturing facility, which is unique to the organisation. The highly sophisticated on-site quality control laboratory along with the elaborate QC and QA protocols ensure that Jubilant stands up to its most precious promise to the world - consistent delivery of the topmost quality.

**Product Variants**

- Anichol 60 – Choline Chloride 60% Dry Vegetable carrier based
- Anichol 75 – Choline Chloride 75% Aqueous
- RPC – Rumen Protected Choline

**Applications**

Choline Chloride is used in:

- Poultry
- Dairy
- Pet food
- Pharmaceuticals with Choline enriched products

**Manufacturing**

The manufacturing facility is certified by ISO 9001:2008 and is FAMI-Qs quality compliant with a production capacity of 22000 MT/annum

**Speciality Products**

Jubilant offers Specialty Feed Supplements to farmers across the globe, thus helping them to continuously increase their returns on investments, which are mainly Vitamin and Minerals Premixes, Betaine, Organic Mineral Premix, Acidifiers, Toxin Binders, Chromium based Growth Promoter, Feed Emulsifier and Liver Treatment Products.
Product Variants

AciFeed - Feed Acidifier for mould & bacteria inhibition
BGTMDS/MultiminPlus - Trace Mineral Premixes
EnCroMix - Organic Tri-Chromium preparation for energy utilisation
Hi Feed Phytase - Hi Performance Thermo-tolerant Micro-granulated Phytase
Hi-Pro-Min-Organic Mineral premix for poultry
JubiDOL - Feed emulsifier

- OsmoBetaine – Betaine for osmo-regulation in livestock
  ToxiCOP/Protect Plus - Broad spectrum mould and Mycotoxin binder
  WinTox - Liquid formulation for nourishment, detoxification and rejuvenation of vital organs

Manufacturing

The premix manufacturing facility is FAMI-QS quality complaint with a production capacity of 5000 MT/annum