



SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

INTERNSHIP REVIEW

(JANUARY 2022– JANUARY 2022)

INTERNSHIP COMPLETED AT

INTERMED,

4,G.K.INDUSTRIAL ESTATE, ARCOT ROAD, PORUR

CHENNAI-600116

SUBMITTED BY

KM LINGESAN

40910004

MASTER OF SCIENCE IN CHEMISTRY

SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY,

CHENNAI-600119

1. INTERNSHIP CERTIFICATE:-



InterMed

(Government Recognized Export House)

FACTORY: #4, G.K. INDUSTRIAL ESTATE, ARCOT ROAD, PORUR, CHENNAI-600 116.
TEL: 91-044-2386 0360/2476 6460 FAX: 91-044-42180932
E-mail: adminchennai@intermedindia.com

28-04-2022,
Chennai.

To Whomsoever It May Concern

This is to certified that M.Lingesan (M.Sc Chemistry) Final Year Student of SATHYABAMA UNIVERSITY, Chennai, has successfully completed his Internship Training in the different departments like FR&D, QC, QA, Solid orals Production, Liquid Oral Production, Topical products and Packing in our company from 07.04.2022 to 28.04.2022.

During the period of his Internship Training with us he had been exposed to different process was found punctual, Hard Working and Inquisitive.

We wish his every success in his Life and Career.



Dr.K.Balaji,
FR&D Head,
Intermed.

ABOUT THE COMPANY:-

INTERMED in PORUR, chennai, recognised for satisfying the needs of the customer base The company was founded in 2003 and has since become a well-known name in its area. No 4 G K Industrial Estate ARCOT road PORUR-600116 is the address. It has received JD verified, JD Escrow, and JD Trusted stamps. Providing evidence of the company's credentials. Through its offerings, the company strives to provide a favourable experience.

This company offers a diverse range of products, including pharmaceuticals, pharmaceutical products, tablets, rugged tablet computers, and so on....

We have been gradually updating our factory by reinvesting profits, and we are now a WHO-GMP approved facility capable of producing tablets, capsules, syrups, dry syrups, ointments, and creams.

WHAT WE DID:-

We learned about the industry and the employees on the first day. How they handle equipment and what they're used for, as well as how they make pills, syrup, ointments, capsules, and transdermal patches Then we learned how they determine the tablet's expiration date, and we researched how the industry should operate. We just have the opportunity to observe how they use the machines; we are unable to Handel any instruments..

1. SOP'S STUDIED :-

DOCUMENTATION PRACTICES AND MANAGEMENT:

- 1.The purpose and scope of documentation management and processes.
- 2.The preparation and maintenance of general GMP documents is required.
- 3.Use of GMP documents.
- 4.process management printed in controlled copies.
- 5.Access GMP documents.
- 6.For blank fields and sections, use N/AS.
- 7.Signing and date requirements.

2. Products they produce:-

❖ **Tablets:-**

- Paracetamol.
- Nifedipine.

❖ **Capsules:-**

- Fluconazole.

❖ **Ointments:-**

- B beauty cream.
- Clotrimazole.

❖ **Syrup:-**

- Cofix.

❖ **Transdermal patches:-**

- menthol(painkiller) 5%
- Lidocaine 4% pain relieving patch (shoulder, neck, back pain)

3. INSTRUMENTS SEEN:-

- High Performance Liquid Chromatography
- Ultra Violet Visible Spectroscopy
- Gas Chromatography
- Centrifuge Machine
- Tablet hardness tester
- Hot Air Oven
- Vacuum Oven
- pH Meter

5.1 FOURIER TRANSFORM INFRARED SPECTROSCOPY (FTIR):

PRINCIPLE:

The FTIR method is particularly useful for identifying organic and inorganic compounds. It can be used to analyse solids, liquids, and gases as well as quantify some components of an unknown mixture. Fourier Transform Infrared Spectroscopy (FTIR) refers to a change in the way data is collected and processed from an interference pattern to a spectrum. It produces an infrared absorption spectrum that acts as a molecular "fingerprint," making it a useful tool for detecting different types of chemical bonds in a molecule. As may be observed in this annotated spectrum, the wavelength of light absorbed is distinctive of the chemical bond.

SUMMARY

The FTIR instrument passes infrared light in the range of 10,000 to 100 cm^{-1} through a material, with part of it being absorbed and some passing through. The sample molecules transform the absorbed radiation into rotational and/or vibrational energy. The resulting signal at the detector appears as a spectrum, ranging from 4000 cm^{-1} to 400 cm^{-1} , and represents the sample's molecular fingerprint. FTIR analysis is a great tool for chemical identification because each molecule or chemical structure produces a unique spectral fingerprint.

When assessing industrially created material, FTIR spectroscopy is a well-established technique for quality control, and it is frequently used as the initial stage in the material analysis process. A change in the absorption bands' distinctive pattern suggests a change in the material's composition or the presence of contamination. If visual inspection reveals flaws with the product, FTIR microanalysis is usually used to pinpoint the source. This method is excellent for determining the chemical composition of tiny particles (10-50 microns) as well as larger areas on the surface.



5.2 Performance Liquid Chromatography :-

HPLC is a type of column chromatography that involves pumping a sample mixture or analyte in a solvent (known as the mobile phase) through a column with chromatographic packing material at high pressure (stationary phase). A moving carrier gas stream of helium or nitrogen transports the sample. HPLC is capable of separating and identifying chemicals in any material that can be dissolved in a liquid at trace quantities as low as parts per trillion. HPLC is employed in a number of commercial and scientific applications, including pharmaceutical, environmental, forensics, and chemicals, due to its versatility.

Sample retention time will vary depending on the interaction between the stationary phase, the molecules being analysed, and the solvent, or solvents used. As the sample passes through the column it interacts between the two phases at different rate, primarily due to different polarities in the analysts. Analysts that have the least amount of interaction with the stationary phase or the most amount of interaction with the mobile phase will exit the column faster.



(High Performance Liquid Chromatography)

5.3 Ultra Violet Visible Spectroscopy:-

Absorption spectroscopy or reflectance spectroscopy in part of the ultraviolet and the complete, neighbouring visible spectrum areas is referred to as ultraviolet–visible spectroscopy (UV–Vis or UV/Vis). This means it makes use of visible and neighbouring light. The visible range absorption or reflectance has a direct impact on the apparent colour of the substances involved. Atoms and molecules undergo electronic transitions in this region of the electromagnetic spectrum.



(ULTRA VIOLET VISIBLE SPECTROSCOPY)

5.4 Gas Chromatography:-

Chromatography is a method of separating and studying substances that can be evaporated without breakdown in analytical chemistry. Testing the purity of a chemical is a common application for GC.or



separating the various elements of a combination [1] GC can be used to separate pure substances from a mixture in preparative chromatography.

(E) (GAS CHROMATOGRAPHY)

5.5 Centrifuge Machine:-

A centrifuge is a device that separates different components of a fluid using centrifugal force. This is accomplished by spinning the fluid at a high speed inside a container, separating fluids of various densities (for example, cream from milk) or liquids from solids. It operates by making denser substances and particles to migrate in a radial direction outward. Objects that are less than the tube rise to the top, while low-density substances rise to the bottom. A centrifuge is a filter that separates impurities from the main body of fluid. Low-density compounds sink to the bottom of the tube, while high-density substances ascend to the top. [1] A centrifuge is a filter that separates impurities from the main body of fluid.

5.6 Tablet hardness tester:-

Tablet hardness testing is a laboratory technique used by the pharmaceutical industry to measure a tablet's breaking point and structural integrity, as well as how it changes "during storage, transit, packing, and handling conditions prior to use." A tablet's breaking point is determined by its shape. Although it is comparable to friability testing, they are not the same.

In the 1930s, the first tablet hardness tests debuted. The Strong-Cobb tester was first presented in the 1950s. Robert Albrecht patented it on July 21, 1953, and it employed an air pump. The tablet breaking force was calculated using arbitrary Strong-Cobbs units. The new one produced results that differed from those of the earlier testers. Electro-mechanical testing machines were developed later.

introduced. Motor drives and the ability to submit measurements to a computer or printer are common features.

Compression testing and three-point bend testing are the two basic methods for determining tablet hardness. The analyst places the tablet in a consistent manner for compression testing, and the tablet is crushed between a stationary and a moving jaw. The original machines used a spring and a screw thread to continuously apply stress until the tablet broke. A sliding scale was used to determine the hardness of the tablet after it shattered.



(TABLET HARDNESS TESTER)

5.7 pH Meter:-

A pH metre, sometimes known as a PH metre, is a device that measures the acidity or alkalinity of a solution.

The PH scale is used to express the degree of acidity or alkalinity. On a scale of 0 to 14, it is rated. The pH measurement provides quantitative information about the degree of activity of an acid or base in terms of hydrogen ion activity. The ratio of hydrogen ions $[H^+]$ to hydroxyl ions $[OH^-]$ concentrations determines the pH value of a substance. The material is acidic if the H^+ concentration is more than the OH^- concentration; that is, the pH measurement is less than 7. The material is basic if the OH^- concentration is more than H^+ and the pH is greater than 7. The material has a pH of 7 if there are equal numbers of H^+ and OH^- ions present. Free hydrogen and hydroxyl ions are present in acids and bases, respectively.

For a given set of conditions, the connection between hydrogen ions and hydroxyl ions in a solution is constant, and either one can be calculated by knowing the other.



(pH METER)

4. Real time exposure in laboratory:

Stability studies- Testing Laboratory:-

Scope: Instrumentation used at the Stability laboratory during the procedure

Objective: To broaden my understanding of the stability laboratory.

The goal of this stability test is to determine the drug's expiration date; the date will be determined based on the stability check in three situations.

Long-term circumstances

Conditions of accelerated stability

Conditions of intermediate stability

If the drug passes the accelerated stability testing, we can make a deal with regulatory agencies and market our products on the condition that we submit long-term stability tests within 36 months.

The parenteral is placed in several chambers, each of which is kept at a different temperature, and this method is used to determine the expiry date for each condition.

The world is divided into four zones based on temperature and humidity.

5. DEPARTMENTS:-

The main process of the department are:-

- ❖ Store
- ❖ QC (quality control)
- ❖ QA (quality assurance)
- ❖ Production
- ❖ Packing

STORE PROCESS:-

Steps involved in raw material ware house:-

- ❖ Receiving
- ❖ Sampling
- ❖ Quarantine
- ❖ Storing
- ❖ Dispensing

RECEIVING OF RAW MATERIAL:-

- Raw material is supplied by vendors by placing order.
- After receiving the raw materials check the “observation on pack”.
- Segregate the raw material according to batch number.
- Pre entry cleaning of raw materials by vacuum cleaner.
- Weighing of the raw materials.

SAMPLING OF RAW MATERIAL:-

- Obtain line clearance from a QA person prior to sampling.
- QC personnel perform various tests on a sample of raw material in the lab and fill out the forms "OBSERVATION ON SAMPLING AREA & PACK" and "CERTIFICATE OF ANALYSIS."
- "APPROVED LABEL" and "SAMPLED LABEL" labels will be pasted.
- The raw materials are then sent to be stored.

STORING OF RAW MATERIALS:

The raw material is kept at three different temperatures in a permitted area.

AMBIENT: not more than 35c.

CONTROLLED TEMPERATURE ROOM: Nearly 15 to 25c.

COLD ROOM: between 2 to 8c.

DISPENSING OF RAW MATERIAL:-

Raw ingredients are distributed from a dispensing booth in the manufacturing area's lab.

There is an unique provision for dispensing the material in the case of dispensing..

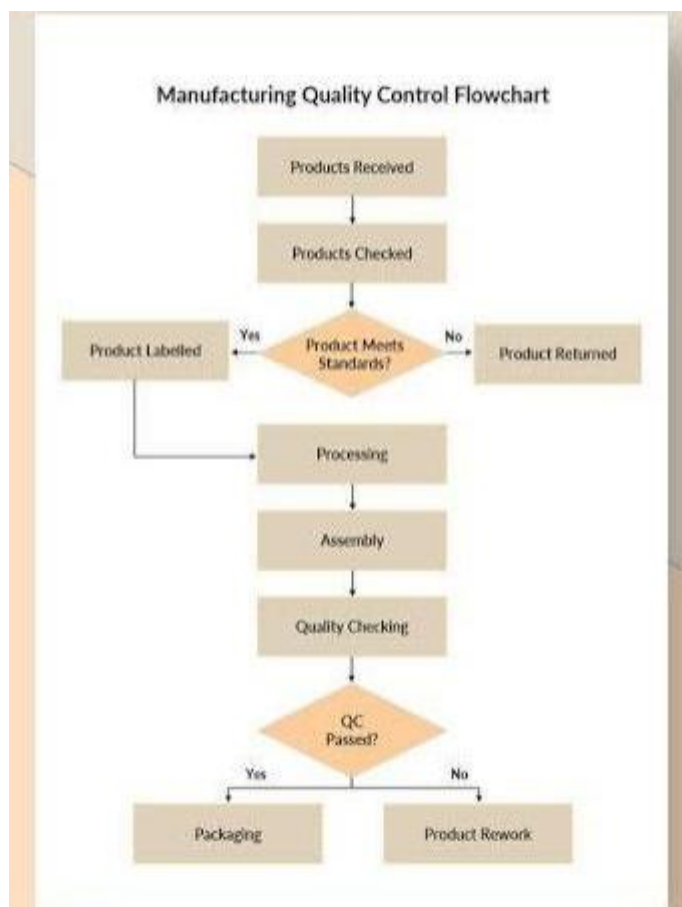
6. QUALITY CONTROL:-

The company's primary concern is to provide high-quality products and services in order to earn our clients' trust.

We've put in place a quality and safety management system that follows WHO-GMP guidelines and procedures.

We're also working with our employees, customers, and suppliers to improve our process, products, and quality and safety management system.

Our quality focus extends to all aspects of manufacturing processes, from raw material sourcing through the most advanced manufacturing technologies, functional operations, and completed formulation delivery. To ensure the highest quality inputs, vendors are assessed and sorted according to strict quality, product, production, service, and delivery requirements.



7. QUALITY ASSURANCE:-

The quality assurance department is led by skilled personnel who are continually examining quality concerns by conducting systematic sampling and testing at every level of the manufacturing process, from raw materials to intermediate and finished pharmaceutical formulations.

To assure excellent output of completed products, a regular valuation procedure, test methodologies, water and environment, as well as periodic calibration of all instruments are carried out.

8. QUALITY CONTROL LABORATORY:-

All activities are administered through four parts, which are overseen by a superior high-tech quality control laboratory.

- Instrumental Analysis Laboratory.

- Wet Analysis Laboratory.
- Microbiological Testing laboratory.
- Packing material testing laboratory.

11. PACKING:-

Pharmacological packaging (also known as drug packaging) refers to the packages and techniques used to package pharmaceutical preparations. It encompasses all operations, from manufacturing to medicine distribution to the final customer. Packaging is frequently used in the dispensing, dosing, and administration of pharmaceutical products.

❖ TYPES OF STORAGING:-

- Primary Storage
- Secondary Storage
- Tertiary Storage

❖ PRIMARY STORAGING:-

- Any single component of a container closure system is referred to as primary packaging. Containers are common (e.g. ampoules, vials, bottles).

❖ SECONDARY STORAGING:-

- The external packaging of the primary packaging that groups packets and further protects or labels the drug product is known as secondary packaging.

❖ TERTIARY STORAGING:-

Bulk handling, storage, and distribution all require tertiary packing.

➤ SUMMARY AND CONCLUSION:-

I can honestly state that my Internship at Intermed was one of the most memorable experiences of my life. This course has taught me a lot about quality assurance and medication product analysis. Not only did I obtain practical skills, but I also gained a lot of experience outside of my field. Thank you very much for taking the time out of your busy schedules to provide us with intellectual suggestions. This internship has been really beneficial to my practical skills..

➤ **REFERENCE:-**

<https://www.pharmaguideline.com/2010/12/different-climatic-zones-for-stability.html?m=1>

<https://www.intermedindia.com/qualitycontrol.html>

[https://en.m.wikipedia.org/wiki/Drug_packaging#:~:text=Pharmaceutical%20packaging%20\(or%20drug%20packaging,channels%20to%20the%20end%20consumer.&text=Packaging%20is%20often%20involved%20in,use%20of%20the%20pharmaceutical%20product.](https://en.m.wikipedia.org/wiki/Drug_packaging#:~:text=Pharmaceutical%20packaging%20(or%20drug%20packaging,channels%20to%20the%20end%20consumer.&text=Packaging%20is%20often%20involved%20in,use%20of%20the%20pharmaceutical%20product.)

THANK YOU