

CRYSTALLIZATION AUTOMATION

Process Overview

Crystallization describes the production of a solid, single component, **crystalline phase from a multi component fluid phase**. This is a **unit operation** involving **heat and mass transfer**. Crystallization may be from vapors, melts or solutions. The importance of crystallization lies primarily in the **purification** achieved during the process and in the physical properties of the product. In the **pharmaceutical industry**, crystallization is usually performed on a small scale from solutions, often **in jacketed or agitated vessels**. The conditions of crystallization, necessary for suitable purity, yield and crystal form. The two stages of crystallization are nucleation and crystal growth. Crystallization is a rate process, this means that the time required for crystallization depends on some driving force. It is generated by **Temperature change, Evaporation of solvent, Chemical reaction, Changing the solvent composition**.

Need For Automation

Process automation is widely preferred in the pharmaceutical industry, where the need for **quality productivity** and **safety** are in focus. Crystallization is one of the frequently used **solvent recovery** technique in the industry. The crystallization is opted when the **purity of the recovered** substance is very significant. The automation is needed for this process to maintain, the desired atmosphere in the crystallization vessel, supporting the **formation of crystals/ enhancing the crystal growth**. Process automation system should have intelligent design to understand various customer needs like prevent unauthorized access of the system, alarms on parameter deviation and reports on equipment/ crystallization period etc., Improper maintenance of process parameters will lead to **longer crystallization period, or batch failure**.

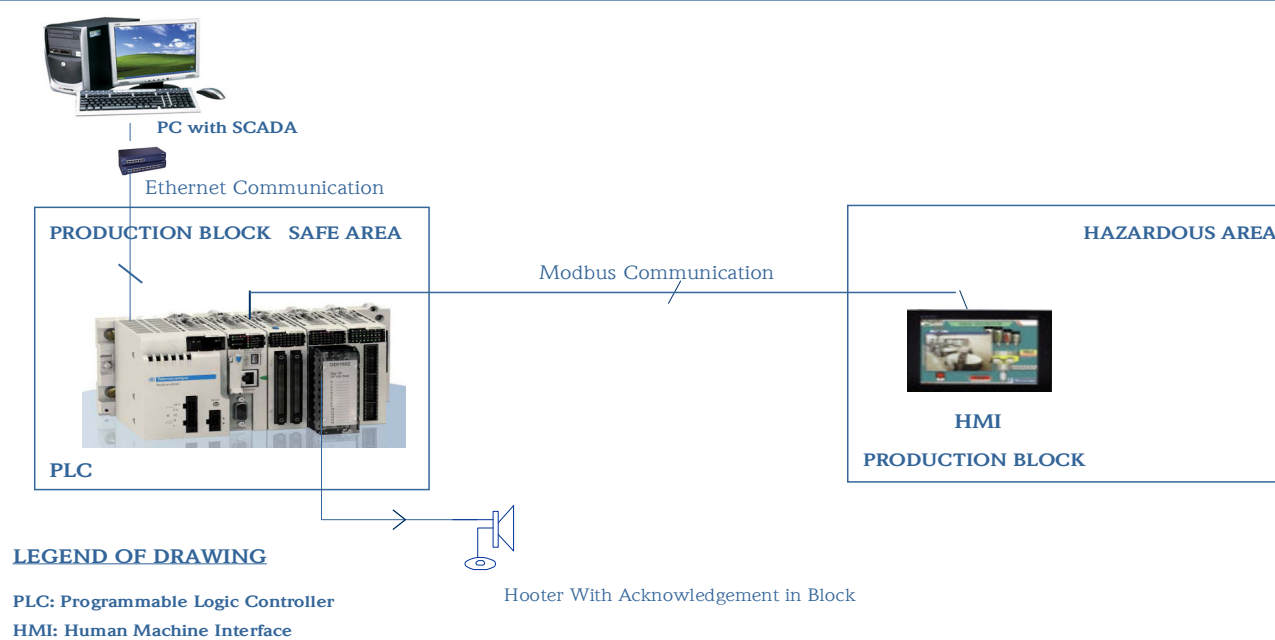
System Components Control System (Software- Hardware) HMI, SCADA

A **control system** with Open architecture design provides complete flexibility, high performance & ease of operation to the end user. The high-performance processor is considered which is capable of multi-tasking, best memory management & high reliable. **Remote I/O modules** for far spread blocks, **HMI's** at various production blocks for ease of operation. Remote process monitoring is performed by **SCADA** and various management information reports.

The system uses advanced software tools and components to build the necessary logic for better process controlling and process. The software includes features like Graphics, Trending, History and reports on customized formats.

An **internal FAT** will be conducted on the Panel Engineered & simulation test will be conducted at our in-house to analysis right logic & controlling developed in the system to ensure stringent control.

System Architecture



System Components Field Instruments (Sensors, Transmitters, Control Elements)

The better controlling needs effective sensors to read the process, transmitters to send the read parameters to control system, better logic to address and best control element to execute. The hooters & annunciators, alarms on process deviation. The precise controlling enhances the accuracy of the system. The performance of the system is dependant on the Instruments.

The field instruments used in the projects is from **POLMON manufactured** instruments or **from the reputed manufactures**. The instruments used are **tested at our in-house** and sent to end-user after checking to ensure product quality.

System Benefits

- ❑ Stabilized maintaining of temperature during the batch in set period
- ❑ Achieved Purity of the product
- ❑ Greatly minimized manual intervention
- ❑ Efficient utilization of power resources, utility etc.,
- ❑ Immediate alarm for operators attention on any deviation
- ❑ Prevents unauthorized access of the system
- ❑ Minimizes the time consumed and batch duration.

More Information

For more information on POLMON solutions, contact your POLMON account manager

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