7. **Auto Mold Hardness Checking**

**Background:** In our foundry, **sand molds** are prepared for casting various components. The **mold hardness** is a critical quality parameter that determines:

- Mold strength and dimensional stability,
- Metal flow behavior and surface finish, and
- Prevention of casting defects such as scabs, blowholes, penetration, and metal leakage.

At present, **mold hardness is checked manually** using a portable analog tester. The inspection is limited to:

- **First-piece inspection**, and
- **Hourly sampling**, rather than 100% mold checking.

The readings are noted manually and compared with specification limits.

### Problem Description:

The current **manual and sample-based hardness inspection** approach has several limitations:

- **Inconsistent measurement** due to operator handling differences.
- **Limited sampling** may miss defective molds.
- **Manual data entry** leads to errors and no traceability.
- **No real-time feedback** to production for process control.

Due to these issues, variations in mold hardness may go undetected, causing casting defects, rework, and rejection.

A **fully automated, real-time mold hardness checking system** is required to ensure that every mold produced meets the desired hardness criteria, and that the data is **digitally captured and integrated** with the company's ERP or quality database.

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