

# QUALITY CONTROL

- QUALITY– FITNESS FOR USE
  - CONFORMANCE TO REQUIREMENTS
- REQMTS-- FINISHED PRODUCT MUST MEET ESTABLISHED SPECS

QLTY DEV+QLTY MAINT+QLTY IMP=QLTY  
CONTROL SYSTEM

QUALITY CONTROL –  
TO MEASURE ACTUAL QUALITY  
PERFORMANCE WITH STANDARDS  
AND APPLY CORRECTIONS

# OBJECTIVES OF QUALITY CONTROL

- CUSTOMER SATISFACTION
- OPTIMUM QLTY AT MIN PRICE
- PROVIDE QLTY GOODS
- COST REDUCTION
- CONFORMITY OF PURPOSE
- IMPROVE QLTY BY PROCESS CONTROL ETC

## FUNCTIONS OF QC

- FORMULATE QUALITY POLICY
- WORK OUT DETAILS OF PRODUCT  
REQMTS,SPECS,COST AND PROFIT
- SELECT INSPECTION PLAN
- DETECT DEVIATIONS FROM SPECS

# QUALITY CHARACTERISTIC

A PHYSICAL OR CHEMICAL PROPERTY, TEMP, TASTE, SMELL ETC. USED TO DEFINE NATURE OF PRODUCT IS A QUALITY CHARACTERISTIC. IT CONTRIBUTES TO FITNESS OF USE FOR THE PRODUCT CLASSIFICATION .

- TECHNOLOGICAL --- LENGTH, DIAMETER ETC
- CONTRACTUAL --- GUARANTEE, SAFETY ETC
- TIME ORIENTED --- RELIABILITY, MAINTAINABILITY ETC
- ETHICAL --- HONESTY, INTEGRITY ETC

# Quality of Design

A good Q.O.D. must ensure

- Consistent performance over its stipulated life span in terms of rated output, efficiency, overload capacity etc.
- Consider various modes of failure due to stress, wear, distortion, corrosion etc

IT IS CONCERNED WITH TIGHTNESS  
OF SPECS FOR MANUFACTURE OF

PRODUCT.e.g.  $\pm .001\text{mm}$  TOLERANCE IS BETTER

IN DESIGN THAN  $\pm .01\text{ mm}$

## Quality of conformance:

How well the manufactured product conforms to the Q.O.D. Various factors are –

- Incoming raw materials, machines, tools etc
- Proper process selection and process control
- Level of operators



# FACTORS AFFECTING Q.O.D

- TYPE OF CUSTOMER
- PROFIT CONSIDERATION
- ENVIRONMENTAL CONDITIONS
- SPECIAL REQUIREMENTS OF PRODUCT
- HIGH Q.O.D MEANS HIGHER COST, HIGHER VALUE

# COST OF QUALITY

- IT IS THE COST OF CARRYING OUT THE COMPANY'S QUALITY FUNCTIONS.
- COST OF PREVENTION
- COST OF APPRAISAL
- COST OF INTERNAL FAILURES
- COST OF EXT FAILURES

# Cost of prevention

Costs associated with personnel engaged in designing, implementing and maintaining quality system. It includes:-

- Cost of quality planning
- Cost of documenting
- Process control cost
- Cost of trg
- Cost for preventing recurring defects

- Cost of investigation, analysis and removal of defects
- Cost of consciousness programs

# Cost of appraisal

Costs of measuring, evaluating or auditing of products and purchased materials to assure conformance with quality standards

e.g. inspection and

test, calibration, audits, evaluation of stock and spare parts.

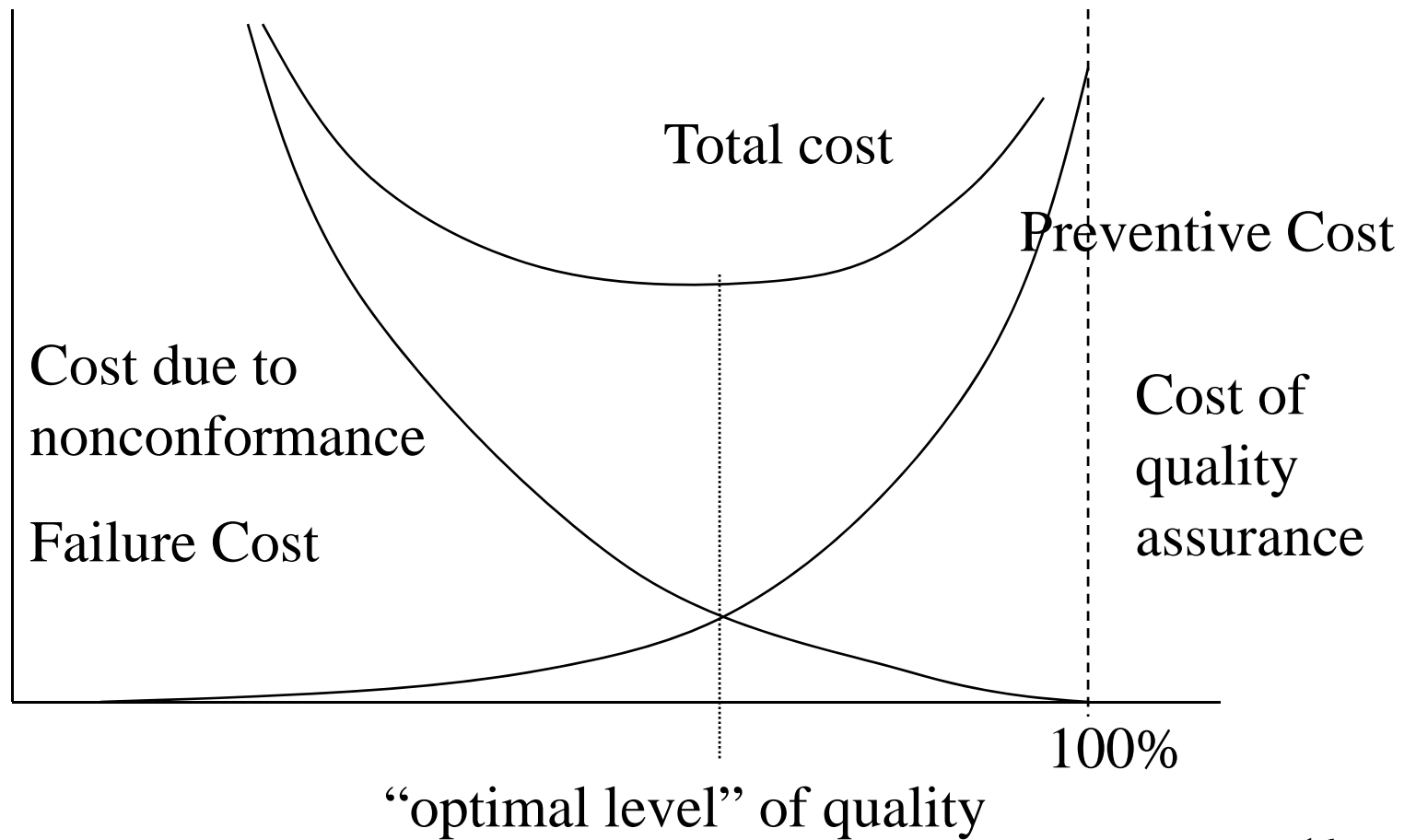
# Cost of internal failures

Cost of defective products that fail to meet  
qilty reqmts and result in mfg losses e.g.  
scrap, rework and repair, re-inspection and  
re-test after repairs, disposition cost etc.

# Cost of external failures

Costs due to defective products being shipped to customers e.g. processing complaints, service to customers, inspecting and repairing defective items, replacements, giving concessions to customers etc

# Economic Model of Quality of Conformance





# REQMTS OF QUALITY PRODUCT

- SUITABILITY- FOR THE SPECIFIC TASK
- RELIABILITY-EFF &GOOD PERFORM ANCE
- DURABILITY- DESIRED LIFE
- WORKABILITY- USER FRIENDLY

- AFFORDABILITY - BE ECONOMICAL
- MAINTAINABILITY - EASY TO MAINTAIN
- AESTHETIC LOOK - ATTRACTIVE
- CUSTOMER SATISFACTION- MEET REQMTS
- ECONOMICAL - REASONABLY PRICED
- VERSATILITY- MULTI PURPOSE

# QUALITY POLICY

DECIDED WRT:-

- MANUFACTURING PROCESS
- EFFECT ON SALES
- CHANGING NATURE OF CUSTOMERS
- INSPECTION COSTS
- OPTIMUM USE OF RESOURCES

# QUALITY POLICY

DECISION ON:-

- STANDARD OF OUTGOING QLTY
- CUSTOMER RELATIONS
- VENDOR RELATIONS

## EVOLUTION OF QUALITY CONTROL:-

- Quality movement started in medieval Europe
- Craftsmen started guilds in late 13<sup>th</sup> century.
- Product inspection started in Great Britain in mid 1750 and brought Industrial revolution in early 19<sup>th</sup> century.
- Concept of Interchangeability introduced in 1798.
- Introduction of Go and No Go gauges in 1800.

- Principles of scientific management introduced around 1900 giving division of labour and increased productivity.
- Rise in productivity gave negative effect to Quality.
- Moving Automobiles assy line was introduced in 1913 requiring good quality parts.
- SQC introduced in 1924
- WW 11 gave birth to Quality in manufacturing industries and Military applications

- Quality revolution in Japan after WWII  
AND Japanese became leaders in Quality  
by 1970. Penetrated American market and  
movement led to TQM.
- Several Quality standards followed and  
one of them is ISO 9000 Quality system  
standards

## Important steps in the Evolution of QC:-

- Craftsmanship
- Supervisor's control
- Inspection
- SQC