

# MECHANICAL DRIVES/POWER TRANSMISSION

## CLASS FORMAT:

Lab + classroom

The participant is able to “learn-by-doing” in the course; this knowledge can be transferred to the workplace.

## STANDARD CLASS SIZE:

NTT recommends a class of 12 participants for the best results.

## NTT PROVIDES:

- 3-days (24 contact hours) of on-site instruction
- Textbook, “Mechanical Drives Power Transmission” and the lab book “Mechanical Drives On-Site Lab”
- Classroom consumables
- Completion certificates
- Shipping and all instructor travel logistics

## CLIENT PROVIDES:

- Classroom, with easy access, of 750 square feet or greater
- Projection screen, white board and/or flip charts
- A dock facility or a forklift is needed to unload the training equipment
- A pallet jack to move the crates after they have been unloaded may also be needed
- The equipment should be placed in the training room for the NTT instructor to test and setup prior to the start of class

## SHIPPING:

2 crates at 1,350 lbs.

- 2 crates @ 62” x 32” x 49” and 2 sets of equipment, 5 trainers per set, or
- 9 cases at 815 lbs.



*The payoffs and rewards associated with proper installation and maintenance of mechanical drives can be enormous in terms of operating efficiency, wear and tear on equipment, unscheduled downtime and lost production.*

Learn to install and maintain mechanical drives. Examine all the common mechanical drives including belts, chains and gears. Learn the roles of proper lubrication, bearings, proper alignment and fastening techniques, troubleshooting, spotting the symptoms of failure and selection of the appropriate remedy.

This is an excellent cross training opportunity for plant and process engineers, maintenance mechanics, supervisors, machinery designers and field service personnel.

## COURSE AGENDA

### INTRODUCTION: MECHANICAL POWER TRANSMISSION

- Laws of motion
- Mechanical advantage
- Basic machines
- Friction

### PRIME MOVERS

- AC synchronous
- Operating characteristics
- Selection considerations

### BUSHINGS, KEYS, AND KEYWAYS—HANDS-ON

- Square, flat, tapered, Woodruff keys
- Tapered, QD, and split bushings
- Sizing and fit
- Symptoms of failure

### BEARINGS—HANDS-ON

- Types and construction
- Bearing loads
- Numbering systems
- Installation and removal
- Bearing failure
- Troubleshooting

### GENERAL LUBRICATION CONSIDERATIONS

- Oil versus grease
- Quantity and frequency

# MECHANICAL DRIVES/POWER TRANSMISSION

## COURSE AGENDA, continued

### BELT DRIVE SYSTEMS

- V-belt, flat, synchronous/timing
- Operation principles
- Proper tension
- Belt selection
- Factoring service
- Installation and adjustment
- Bearing failure
- Troubleshooting

### GEAR DRIVE SYSTEMS

- Open and closed systems
- Parallel, concentric and right angle
- Load factors and selection
- Service factoring
- Installation
- Backlash adjustment and alignment considerations
- Lubrication
- Troubleshooting

### CHAINS—LAB EXERCISES

- Precision roller chain
- Sprocket selection
- Silent chain
- Engineering chains
- Installation and maintenance

### COUPLINGS—LAB EXERCISES

- Rigid, flexible and chain couplings
- Universal joints
- Load factors
- Installation and alignment

### CLUTCHES AND BRAKES

- Mechanical, friction, centrifugal and plate clutches
- Mechanical, hydraulic, pneumatic and electric brakes

### MECHANICAL VARIABLE SPEED DRIVES

- Open
- Closed

