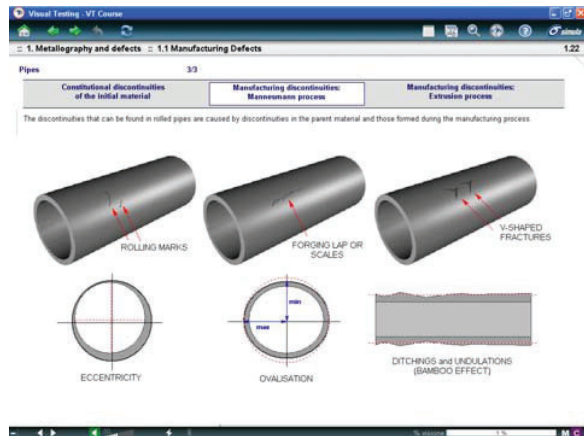


## VT - VISUAL TESTING

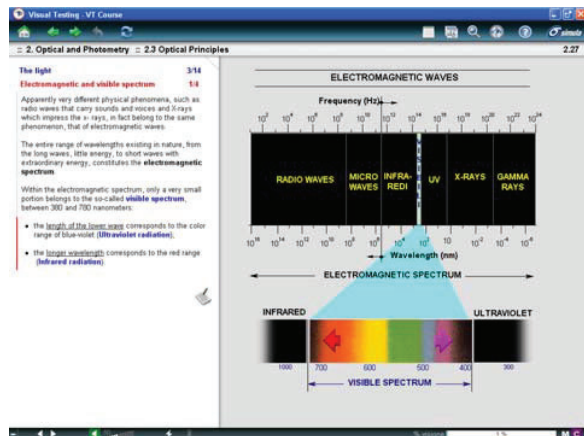
### 1. METALLOGRAPHY and DEFECTS

- 1.1 Manufacturing Defects
- 1.2 Welding Defects
- 1.3 Service Induced Defects
- 1.4 Metallography
- Self-evaluation Test



### 2. OPTICAL and PHOTOMETRY

- 2.1 Physiology of Vision
- 2.2 Optical Principles
- 2.3 Photometry
- Self-evaluation Test



### 3. EQUIPMENT and TOOLS

- 3.1 Measuring Instruments
- 3.2 Temperature Indicators
- 3.3 Vision Aids Tools
- 3.4 Endoscopes
- 3.5 Other Systems
- Self-evaluation Test



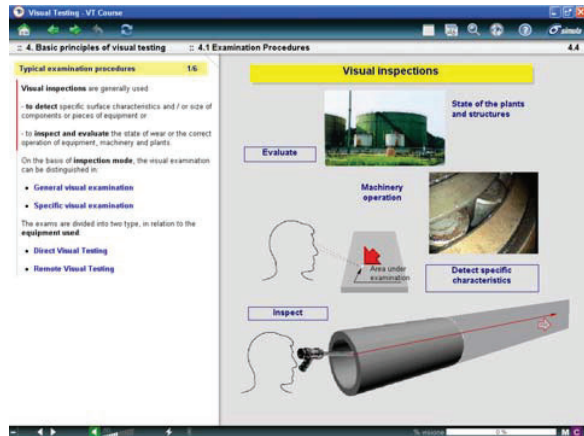
**NDT Supply.com, Inc.**  
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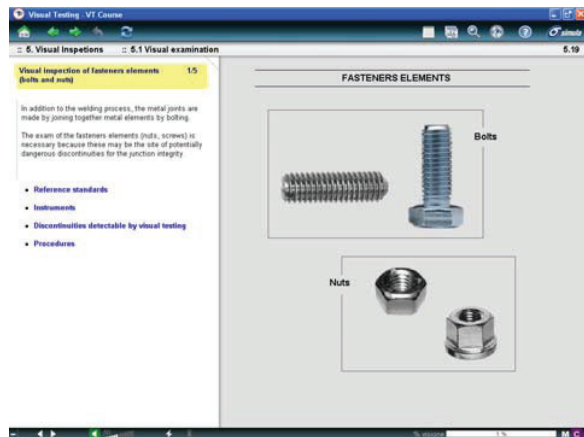
#### 4. BASIC PRINCIPLES

- 4.1 Examination Procedures
- 4.2 Basic Principles of Examination
- 4.3 Safety Aspect
- Self-evaluation Test



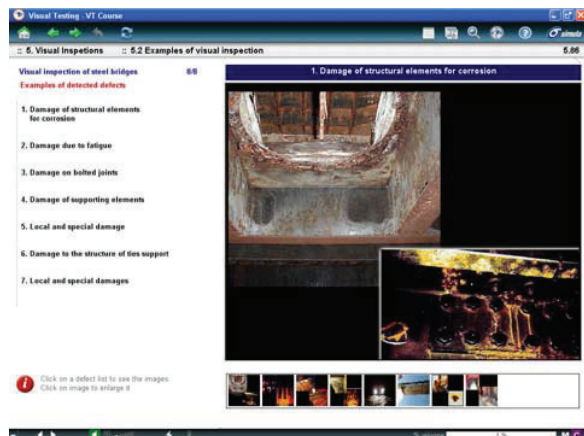
#### 5. VISUAL INSPECTIONS

- 5.1 Visual Inspection of steel products
- 5.2 Visual Inspection of welded joints
- 5.3 Visual Inspection of connection elements
- 5.4 Visual inspection of tubes
- 5.5 Visual Inspection of valves
- 5.6 Visual Inspection of pumps
- Self-evaluation Test



#### 6. EXAMPLES OF VISUAL INSPECTION

- 6.1 Inspection in automotive industry
- 6.2 Inspection of oil tanks
- 6.3 Visual inspection of steel bridges
- 6.4 Automotive industry
- 6.5 Power Generation and plant
- 6.6 Aerospace
- 6.7 Building and Construction



#### FINAL TEST

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## VISUAL TESTING: DETAILED CONTENTS

### **1. METALLOGRAPHY and DEFECTS** ([>> VT](#))

#### **1.1 Manufacturing Defects**

- Production of Steels
- Defects in steel production
- Forging (and pressing)
- Castings
- Pipes
- Extruded
- Wire drawing
- Thermomechanical processing

#### **1.2 Welding Defects**

- Welded joints
- Welding symbols
- Defects in Welded Joints

#### **1.3 Service Induced Defects**

- Introduction
- Cracks in operation
- Loss of material
- Deformations

#### **1.4 Metallography**

- Metallographic sample
- Metallographic techniques

#### **1.5 Self-evaluation Test**

- Manufacturing Defects
- Welding Discontinuities
- Service Defects
- Metallography

### **2. OPTICAL and PHOTOMETRY** ([>> VT](#))

#### **2.1 Physiology of Vision**

- The vision
- Tests of visual acuity
- Parameters of vision
- Human eye sensitivity
- Visual defects

#### **2.2 Optical Principles**

- The light
- Fundamental laws of optics
- Focusing and Scattering
- Defects and limits of instruments

#### **2.3 Photometry**

- Light sources
- Propagation and light measurement
- Measurement of lighting quantity
- Sensors for photometry
- Artificial lighting

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### **3. EQUIPMENT and TOOLS** ([>> VT](#))

#### **3.1 Measuring Instruments**

- Introduction
- Graduated metal ruler
- Goniometers
- Calipers
- Micrometer
- Test Indicators
- Welding gauge
- Other measuring tools

#### **3.2 Temperature Indicators**

- Temperature measurement
- Types of thermometers

#### **3.3 Vision Aids Tools**

- Magnifier system
- Special optical systems
- Mirrors
- Stroboscope

#### **3.4 Endoscopes**

- Endoscopy
- Measurement methods
- Application fields

#### **3.5 Other Systems**

- Closed-circuit television systems
- Computerized systems
- Image processing systems
- Automated Visual Inspection
- Robotic systems

### **4. BASIC PRINCIPLES** ([>> VT](#))

#### **4.1 Examination Procedures**

- Introduction
- Typical examination procedures
- Evaluation and documentation
- Standards

#### **4.2 Basic Principles of Examination**

- Introduction
- Inspector of visual testing
- Object to be examined
- Optical Equipment
- Lighting for visual examination
- Examination recording

#### **4.3 Safety Aspect**

- Introduction
- Danger from light sources
- Risk assessment
- Recommendations and Protection means

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## 5. VISUAL INSPECTIONS ([>> VT](#))

### 5.1 Visual Inspections

- Visual Inspection of steel products
- Visual Inspection of welded joints
- Visual Inspection of connection elements
- Visual inspection of tubes
- Visual Inspection of valves
- Visual Inspection of pumps

### 5.2 Examples of Visual Inspections

- Inspection in automotive industry
- Inspection of oil tanks
- Visual inspection of steel bridges
- Automotive industry
- Power Generation and plant
- Aerospace
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