

Penetrant testing (PT) — Levels 1, 2 and 3

The penetrant testing training shall be in accordance with Tables 7 and 8.

Table 7 — General content

Content	Level 1 (% of total duration)	Level 2 (% of total duration)	Level 3 (% of total duration)
8.1 Introduction to terminology and history of penetrant testing (PT)	3	4	8
8.2 Physical principles of the method and associated knowledge	3	8	9
8.3 Product knowledge and capabilities of the method and its derived techniques	1	1	3
8.4 Equipment	12	8	8
8.5 Information prior to testing	3	8	22
8.6 Testing	12	12	4
8.7 Evaluation and reporting	37	19	10
8.8 Assessment	3	4	2
8.9 Quality aspects	6	12	21
8.10 Environmental and safety conditions	3	8	6
8.11 Developments	0	4	2

Table 8 — Penetrant testing (PT) — Levels 1, 2 and 3

Content		Level 1	Level 2	Level 3	
8.1 Introduction to terminology and history of penetrant testing (PT)	History	X	X	X	
	Purpose of NDT	What is testing?	X	X	X
		What is the purpose of NDT?	X	X	X
		Advantages of NDT	X	X	X
		History of NDT	X	X	X
		Value of NDT	X	X	X
		Methods of NDT	X	X	X
	Purpose of penetrant testing (PT)	Differences between NDT and PT	X	X	X
		Advantages of PT	X	X	X
	Terminology		X	X	X
8.2 Physical principles and associated knowledge concepts necessary for understanding the physical	Penetrant systems	Penetrant	X	X	X
		—	X	X	X
		—	X	X	X
	Basic physical principles of PT		X		
	Interaction between penetrant and dyes			X	

principles of penetrant testing (physics) may be the object of a preliminary course		Penetrant techniques	X	X	X
		— Water washable	X	X	X
		— Post emulsifiable	X	X	X
		— Solvent removeable	X	X	X
		Emulsifiers	X	X	X
		Cleaner	X	X	X
		Developer	X	X	X
		— Water	X	X	X
		— Solvent	X	X	X
		— Other	X	X	X
	Properties and characteristics	Penetrant	X	X	X
		Penetrant	X	X	X
		— Water	X	X	X
		— Solvent	X	X	X
		— Other	X	X	X
		— Water	X	X	X
		— Solvent	X	X	X
		— Other	X	X	X
		— Water	X	X	X
		— Solvent	X	X	X
8.3 Product knowledge and related capability of the method and derived techniques	Design and operation of penetrant	Aerosol spray cans	X	X	X
		— Compressed gas, liquefied gas, “atomization”			X
		Technique selection		X	X
		Technique application	X	X	X
		— Water	X	X	X
		— Solvent	X	X	X
		— Other	X	X	X
		— Water	X	X	X
		— Solvent	X	X	X
		— Other	X	X	X
8.4 Equipment	Design and operation of penetrant	Aerosol spray cans	X	X	X
		— Compressed gas, liquefied gas, “atomization”			X

	installations and units	Dip tanks	X	X	X
		Electrostatic systems, fluidized bed		X	X
		Semi-automatic systems		X	X
		Automatic systems		X	X
		Application	X	X	X
		Installation	X	X	
		–		X	
		–			
		–			X
		–			X
		–			
		–			X
		–			
		–			X
		–			X
8.5 Information prior to test	Information about the test object	Information	X	X	X
		–	X	X	X
		–	X	X	X
		–		X	X
		–	X	X	X
	Test conditions and application of standard	Application		X	X
		Information			X
		Preparation		X	X
		–			X
		–		X	X
		–			X
		–			X
		–			X
	Technique and sequence of performing test	Sequence		X	
		–		X	
		–		X	
		–			X
		–			X
		–		X	
	Instructions	Preparation of written procedure			X
		Preparation of written instruction		X	
		Documents			X
		Presentation of the standards, codes and procedures			X
		–			

8.6 Testing	Preparation and performance of the test	Performing inspection in accordance with written instruction	X			
		Supervision of personnel		X	X	
	Parameters	Preparation of the parts and influence of the surface quality	X	X	X	
		—	X	X		
		—	X	X		
		T		X	X	
		—		X	X	
		—	X	X	X	
		P		X		
		—		X		
		—		X		
		D	X	X	X	
		—	X	X		
		—		X	X	
		V	X	X	X	
		C	X	X		
		R	X	X		
		R	X	X		
I		X	X			
L		X	X			
t						
C	X	X				
8.7 Evaluation and reporting	Test report	V	X	X	X	
		R		X	X	
		R	X	X	X	
		—			X	
		p				
		S			X	
		P				
		P				
		V	ity	X	X	X
		—	hs		X	
		t				
	R	f	X			
c						
C			X	X		
A			X	X		
t						
Evaluation	R		X			
8.8 Assessment	Assessment of discontinuities	Influence of manufacture and material		X	X	
		Depth		X	X	
		Width		X	X	
		Shape		X	X	
		Position		X	X	
		Orientation		X	X	
		ISO 9712	X	X	X	

8.9 Quality aspects	Personnel qualification	Other NDT qualification and certification systems			X
	Documentation	Format and scope of working procedures			X
		Qualification of NDT personnel			X
		Availability of personnel			X
		Documentation		X	
		Verification	X		
		Training		X	X
		Records		X	X
		Control		X	
	Knowledge of applicable NDT application and product standards	Use of NDT		X	
		Non-destructive testing	X	X	X
		Joining	X	X	X
		Fasteners	X	X	X
Relevant standards					
8.10 Environmental and safety conditions	Chemicals	Control of pollutants	X	X	X
		Dust	X	X	X
		—	X	X	X
		—	X	X	X
		—	X	X	
		—			X
		—	X	X	
		—		X	
		—		X	
		—	X		
		—			X
	Accessories	Visual aids	X	X	X
		Dust	X	X	X
		Electronics	X	X	X
		Uniforms	X	X	
		Visual aids	X	X	X
		Personal protective equipment	X	X	X
Human factors	Environmental conditions			X	
	Role of breaks			X	
8.11 Developments		Special installations		X	
		Automotive installations		X	
		Creative and innovative special installations			X
		Tube installations			X