

ASNT QUESTIONS & ANSWERS BOOK

MAGNETIC FLUX LEAKAGE TESTING

Levels I, II, and III Review Questions
Book MF



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BOOK

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The American Society for Nondestructive Testing Inc.



Documents

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Technical Reviewers

Timothy S. Roach, Technical Editor
Martin T. Anderson, Technical Editor

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Russ Pack
Hussein Sadek
Ram P. Samy

Publications Review Committee

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Publications Team:

Toni Kervina, Director of Publications

Editorial:
Cynthia M. Leeman, Educational Materials Supervisor

Production:
Joy Grimm, Production Manager
Synthia Jester, Graphic Artist/Illustrator

ASNT Mission Statement:
ASNT exists to create a safer world by advancing scientific, engineering, and technical knowledge in the field of nondestructive testing.

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The ASNT *Code of Ethics* was developed to provide members of the Society with broad ethical statements to guide their professional lives. In spirit and in word, each ASNT member is responsible for knowing and adhering to the values and standards set forth in the Society's Code. More information, as well as the complete version of the *Code of Ethics*, can be found on ASNT's website, asnt.org.

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REFERENCES

Recommended References

The following references were used in formulating the questions in this book.

Reference A

ASNT, 2008, *Nondestructive Testing Handbook, Vol. 8: Magnetic Testing*, third edition, The American Society for Nondestructive Testing, Columbus, OH.

Reference B

ASNT, 2004, *Nondestructive Testing Handbook, Vol. 5: Electromagnetic Testing*, third edition, The American Society for Nondestructive Testing, Columbus, OH.

Reference C

ASNT, 2010, *MFL Compendium: Articles on Magnetic Flux Leakage*, The American Society for Nondestructive Testing, Columbus, OH.

Reference D

ASNT, 2017, *Magnetic Particle Classroom Training Book*, The American Society for Nondestructive Testing, Columbus, OH.

Reference E

ASNT, 2018, *Electromagnetic Testing Classroom Training Book*, The American Society for Nondestructive Testing, Columbus, OH.

Reference F

Bray, D.E., and R.K. Stanley, 1996, *Nondestructive Evaluation: A Tool In Design Manufacturing and Service*, CRC Press Inc., Boca Raton, FL.

Reference G

ASM, 2018, *ASM Handbook, Volume 17: Nondestructive Evaluation of Materials*, ASM International, Materials Park, OH.

Reference Codes

Each question in this book is followed by letter(s) and page number(s) indicating the specific recommended reference where the answer may be found. For example:

12. Which of the following is a diamagnetic material?
- a. Cobalt.
 - b. Nickel.
 - c. Silver.
 - d. Iron.

A.95

In this example, the letter “A” refers to Reference A in the list above and 95 is the specific page in Reference A where the answer to the question is located.

Reference Usage

Total Reference A Total = 13

Level I (7)
Level II (1)
Level III (5)

Reference B Total = 19

Level I (8)
Level II (0)
Level III (11)

Reference C Total = 9

Level I (2)
Level II (5)
Level III (2)

Reference D Total = 3

Level I (1)
Level II (1)
Level III (1)

Reference E Total = 44

Level I (17)
Level II (24)
Level III (3)

Reference F Total = 5

Level I (0)
Level II (0)
Level III (5)

Reference G Total = 2

Level I (0)
Level II (0)
Level III (2)

LEVEL I

Review Questions

1. Magnetic flux leakage testing (MFL) will most easily detect changes in the following materials:
 - a. paramagnetic.
 - b. nonferromagnetic.
 - c. ferromagnetic.
 - d. diamagnetic.

A.8; E.7
2. In NDT, the term “method” refers to:
 - a. a group of techniques that share a common probing energy.
 - b. the order in which the work is completed.
 - c. a group of procedures detailing the work.
 - d. a strategy to accomplish the inspection.

B.2
3. Which of the following is strictly considered a “surface” method?
 - a. Radiographic testing.
 - b. Magnetic flux leakage testing.
 - c. Ultrasonic testing.
 - d. Liquid penetrant testing.

B.5, 6
4. When testing thin-wall steel pipe with MFL, the indication may be detected:
 - a. in the middle of the pipe wall.
 - b. on the outer surface.
 - c. near the long seam.
 - d. on the inside and outside diameters.

C.11; E.192
5. A unit of magnetic flux density is the:
 - a. henry.
 - b. tesla.
 - c. oersted.
 - d. ohm.

A.34 Table 7
6. Magnetic flux leakage is most reluctant to travel in:
 - a. high-carbon steel.
 - b. air.
 - c. ferromagnetic materials.
 - d. diamagnetic materials.

D.165
7. MFL search coils detect a change in the material because:
 - a. at a discontinuity the flux leakage is forced out of the material and into the air.
 - b. the temperature of the flux field changes.
 - c. a harmonic vibration is established.
 - d. the polarity rapidly changes.

E.19
8. Hall effect sensors are:
 - a. nonconductive material.
 - b. ferromagnetic material.
 - c. semiconductor material.
 - d. wound carbon material.

E.50
9. A document that provides recommendations for the qualification and certification of NDT test personnel is:
 - a. *ANSI/ASNT CP-105*.
 - b. *ASQ-2121*.
 - c. *ISO 7928*.
 - d. *SNT-TC-1A*.

B.16; E.219
10. Which of the following is a flux-sensing device that is dependent on some sort of time variation of field intensity?
 - a. Search coil.
 - b. Magnetodiode.
 - c. Transducer.
 - d. Ferroprobe.

A.143; E.82