

Subject Index

A

American Society of Mechanical Engineers Boiler and Pressure Vessel Code, 16

ASTM standards

A 508-84: 57

E 23-72: 89

E 23-82: 57

E 112-84: 112

E 208-69: 89, 90, 98, 99, 102, 103, 106

E 208-81: 12, 18, 20, 35, 39, 57, 64, 66-67, 69-70, 75, 108, 118, 120-126, 130, 147

E 399-72: 89

E 399-83: 32, 72

E 604-77: 89

B

Brittle-bead welding, effect of, on nil-ductility transition temperature, 1-15

C

Charpy impact characteristics, correlation with nil-ductility transition temperature, 27, 29-30

Charpy impact test, use of, to test nil-ductility transition temperature, 90, 102-103, 111-112

Charpy V-notch (CVN) testing, use of, to evaluate nil-ductility transition temperature, 57, 58-59

Compact tension fracture toughness test of steel plates, 89, 90

Computer modeling, use of, to develop probability distributions on relationship between NDTT and fracture toughness, 129-141

Crack-starter bead

effect of application of, on nil-ductility transition temperature, 34-55

effect of heat-affected zone at, on nil-ductility transition temperature, 69-85

effect of size and shape of, on nil-ductility transition temperature, 11, 15

effect of technique of, on nil-ductility transition temperature, 56-67

effect of welding conditions, on nil-ductility transition temperatures, 17-27

D

Drop-weight NDT temperature, fracture mechanics interpretation of, 142-159

Drop-weight test

of nonstandard geometries, 108-128

use of, to determine effect of heat-affected zone at the crack-starter bead on the NDTT, 69-85

Drop-weight test (*cont.*)

use of, to determine nil-ductility transition temperature of steel plates, 1-15, 16, 22-23, 34-55, 57, 67, 87-107

Dynamic tear test of steel plates, 89, 90

E

Embrittled materials, effect of bead application on, 52-54

graph, 54

table, 53

Energy balance analysis, 156-159

F

Fracture mechanics interpretation of drop-weight NDT temperature, 142-159

Fracture toughness, correlation with nil-ductility transition temperature, 30-31, 129-141

H

Heat-affected zone (HAZ)

effect of, at crack-starter bead on the nil-ductility transition temperature, 69-85

simulation of, and nil-ductility transition temperature, 44, 46, 49

Heat sink, effect of shape of, on nil-ductility transition temperature, 22, 25, 27

Heat tinting in ASTM Method E 208 testing, 103, 106

J

Japan Electric Association Code 4202

need to revise, 3, 8, 9, 11, 12

revision of, 14

L

Linear elastic fracture mechanics (LEFM), 35

N

Nil-ductility transition temperature correlation between charpy impact characteristics and, 27, 29-30
effect of brittle-bead welding on, 1-15

effect of crack-starter bead application on, 34-55, 56-67

effect of notch location on, 8-10, 14

illustration, 12

effect of preheating and interpass temperature on, 10-11, 14-15

effect of welding current on, 3, 6, 8, 14

effect of welding speed on, 12, 14

effects of crack-starter bead welding conditions on, 17-27

evaluation of, for nuclear vessel steels, 2, 16-33

relationship between fracture toughness and, 30-31, 129-141

relationship between hardness of welded bead zone and, 76-77

Nonstandard geometries, drop-weight testing of, 108-128

Notch location, effect of, on nil-ductility transition temperature, 8-10

illustration, 12

Nuclear vessel steels, evaluation of nil-ductility transition temperatures for, 2, 16-33

O

One-pass testing of nil-ductility transition temperature, 58, 59, 61, 64

Overlapping, effect of, on thermal cycles, 49, 55
illustration, 51

P

Preheating and interpass temperature, effect of, on nil-ductility transition temperature, 10-11, 14-15
table, 13

Q

Quantitative television microscope (QTM) for measuring inclusion content of steel, 118
table, 119
Quench and temperature effect, 46, 55

S

Scatter, possibility of, in nil-ductility transition temperature results, 35, 49, 52
Steel plate
drop-weight testing of, 87-107
effect of crack-starter bead technique on nil-ductility transition temperature, 56-67

effect of heat-affected zone on nil-ductility transition temperature, 77, 81

T

Thermal cycles
effect of, on fracture toughness, 17-18
effect of overlap on, 49, 55
Two-pass bead application, and nil-ductility transition temperature, 37, 55, 59, 61

W

Welded bead zone, relationship with nil-ductility transition temperature and, 76-77
Welding amperage, effect of, on nil-ductility transition temperature, 20, 22
Welding conditions, effect of, on drop-weight NDTT, 39
tables, 2, 4, 5
Welding current, effect of, on nil-ductility transition temperature, 3, 6, 8, 14, 20, 22
tables, 2, 4-7
Welding speed, effect of, on nil-ductility transition temperature, 12, 14