

Index

A

alignment, 14, 31
 assembly tooling, 32
 precision support posts, 35
 principles, 31
alumina, 16
aluminum nitrate, 16
ANSYS, 18, 65
APV25, 4, 21, 71, 91, 110
 characterization at low T, 80
 operation modes, 77
Araldite®, 18, 39
argon, 25, 54
assembly tooling
 small prototype module, 31

B

beam
 secondary, 87
 shape, 96
 X5, 87
bonding, 76
breakdown, 3, 74
bulk
 leakage current, 83
 modulus, 48
 temperature fluid, 22

C

capillary pipe, 25, 54
carbon fiber, 17, 19, 54
charge collection efficiency, 3
cold finger, 54
colloidal silica, 50
composites
 mechanical properties, 46
 theoretical models, 48
 thermal dilatation, 42
compressor, 54, 65
convective boiling, 30
cooling
 cryogenic micro pump, 25
 evaporative cooling, 25
 micro tube, 53
 warm compressor, 26
covariance, 90
cryostat, 86
cyanoacrylate, 39
Czochralski silicon, 71, 73

D

deconvolution mode, 79
depletion voltage, 75
design
 cryogenic module, 13
 large propotype module, 72
 small prototype module, 14
detector
 processing, 73
dose, 3

E

edgeless
 insensitive layer, 105
 silicon microstrip sensors, 81
 silicon pad sensors, 81
edgeless silicon detectors, 10
effective gap, 101
elastic modulus, 46
elastic scattering, 81
electrical characterization
 results, 78
electrical module, 71
elongation at break, 46
emissivity, 22
epoxy
 filled, 39
 layer thickness, 51, 67
 mechanical properties, 46
 thermal conductivity, 19
 thermal dilatation, 42
 thermoelastic properties, 39
error
 gap width (edgeless), 101
 thermal dilatation tests, 45
expansion coefficient, 49

F

feedthrough, 16
filling factor, 48, 49
finite element, 18, 65
fit
 least squares, 90
 parameters, 98
 results, 98
 tracking, 88
Float Zone silicon, 4, 71, 73
flow
 single-phase, 56
 two-phase, 56

full-depletion potential, 3
fused quartz, 39, 42, 47

G

gap
 effective gap, 101
 fit parameter, 98
 metrology, 84, 103
 model function, 96
gluing jigs, 32

H

H3 Beam, 87
hardener, 39
heat
 exchanger, 54
 load, 21, 55
heat transfer coefficient, 22, 27
 convective boiling, 30, 66
 laminar flow, 29
 nucleate boiling, 30, 66
 single-phase flow, 27
 turbulent flow, 29
 two-phase flow, 30
homogenous flow model, 57
hybrid, 54
 characterization, 77

J

jigs, 32

L

laminar flow
 pressure drop, 57
leakage current, 3, 21, 74
luminosity, 3, 1
 measurement, 8
 upgrade, 4

M

material engineering, 4
material properties, 18
mechanical properties
 epoxies, 46
 filled epoxies, 47
mesh, 21, 66
metrology
 gap measurement, 103
 inlet pipe diameter, 58
 micro tube, 15, 53, 107
MINUIT, 98, 101

mobility, 78
 model function, 96, 101
 module
 components, materials, 15, 72
 design principles, 13
 geometry, 21, 72
 simulation, 65
 thermal simulation, 18
 thermal tests, 59

modulus
 bulk, 48
 shear, 48
 Young, 46, 49
 Monte Carlo, 95

N

noise, 78
 nucleate boiling, 30

O

ORCA, 88, 99
 oxygenated silicon, 4, 6

P

peak mode, 79
 pedestal, 79
 photolithography, 73
 pitch adapter, 14, 16, 54, 75
 plateau, 102
 Poisson's ratio, 49
 pressure drop, 27, 57
 processing, 73
 Pyrex®, 16

Q

quality factor, 56

R

R&G Type L, 18
 radiation dose, 3
 radiation hard epoxies, 18
 readout electronics, 4, 71, 80, 110
 low temperature tests, 77
 residuals, 91
 resistivity, 75
 rise time, 79
 Rutapox, 39

S

silica glass, 16
 silicon
 Czochralski, 73
 edgeless detector, 10
 Float Zone, 73
 large detector, 71, 73
 material properties, 17
 silicone adhesive, 39

simulation
 Monte Carlo, 95
 thermal, 22
 thermal tests, 65
 sintering, 76
 smearing, 91
 space charge region, 3
 spacer, 71
 SPS, 87
 strip, 73
 Stycast®, 18, 39
 sub-cooled liquid, 56
 support plate, 75

T

TEC, 85
 Teflon®, 32
 telescope
 CMS tracker, 85
 tensile strength, 18
 filled epoxies, 46
 thermal
 conductivity, 3, 107
 dilatation, 3, 107
 thermal conductivity, 14, 17
 thermal dilatation, 14, 42
 thermal radiation, 22, 54, 59, 60
 thermal shield, 54
 thermal tests
 compressor system, 54
 experimental setup, 53
 meta-stable states, 63
 results, 59
 thermoelastic
 properties, 18
 TOB, 85, 92, 99
 total cross section, 81
 tracker
 CMS tracker, 85
 LHC, 1
 resolution, 95
 transconductance, 78
 turbulent flow
 pressure drop, 57
 two-phase flow, 15, 25, 58, 107
 Type L, 39

V

vacuum, 16, 54
 vapour fraction, 56

Y

yield strength, 46
 Young modulus, 18, 39