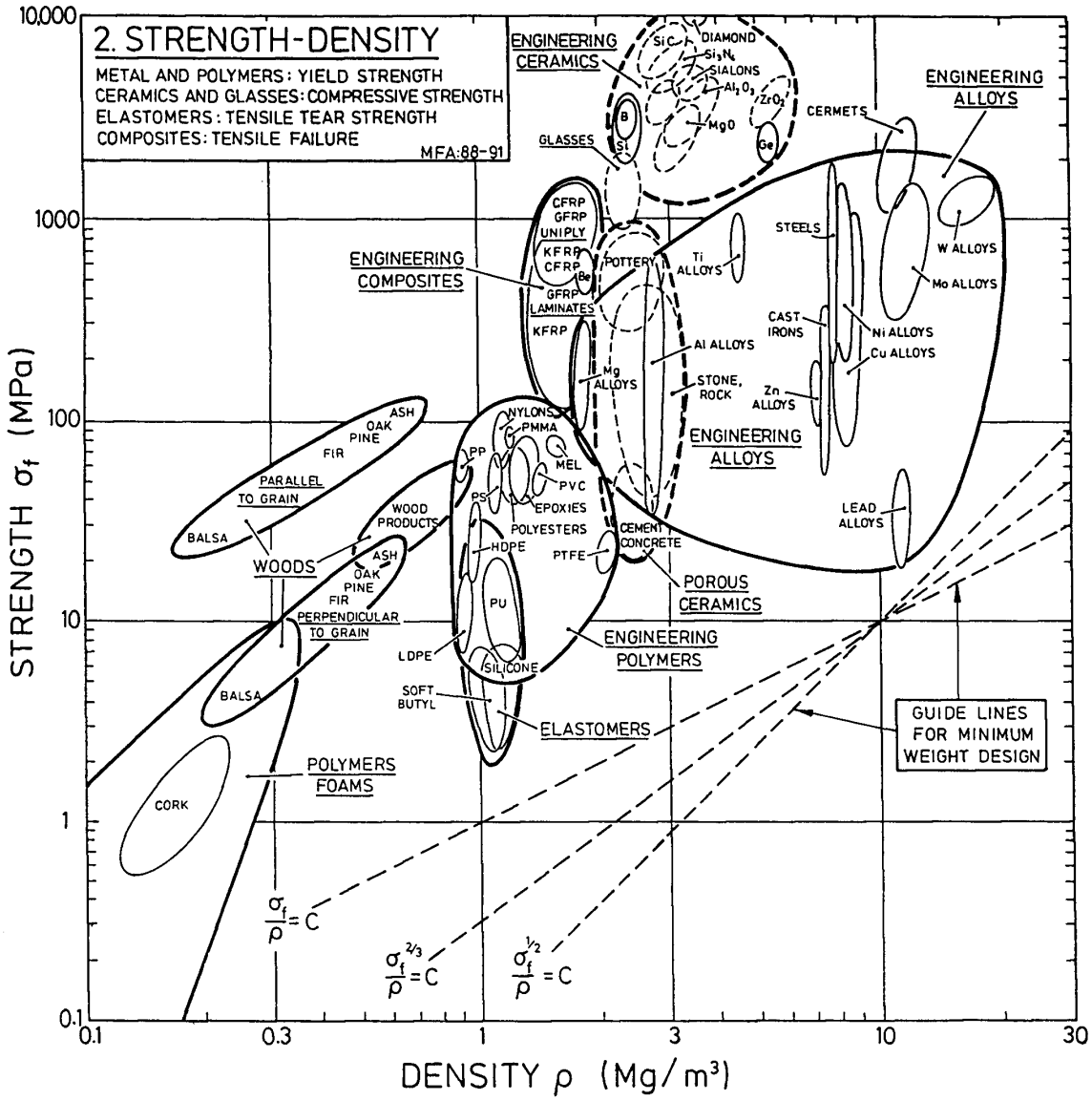

2. STRENGTH-DENSITY
METAL AND POLYMERS: YIELD STRENGTH
CERAMICS AND GLASSES: COMPRESSIVE STRENGTH
ELASTOMERS: TENSILE TEAR STRENGTH
COMPOSITES: TENSILE FAILURE
MFA:88-91
ENGINEERING CERAMICS
SiC
DIAMOND
Si3N4
SIALONS
Al2O3
ZrO2
MgO
B
Si
Ge
GLASSES
CERMETS
ENGINEERING ALLOYS
CFRP
GFRP
UNIPLY
KFRP
CFRP
Be
GFRP
LAMINATES
KFRP
ENGINEERING COMPOSITES
POTTERY
Ti ALLOYS
STEELS
W ALLOYS
Mo ALLOYS
CAST IRONS
Ni ALLOYS
Cu ALLOYS
Al ALLOYS
Mg ALLOYS
STONE, ROCK
Zn ALLOYS
ENGINEERING ALLOYS
LEAD ALLOYS
ASH
OAK
PINE
FIR
PARALLEL TO GRAIN
BALSA
WOODS
WOOD PRODUCTS
ASH
OAK
PINE
FIR
PERPENDICULAR TO GRAIN
BALSA
CORK
POLYMERS FOAMS
NYLONS
PMMA
PP
MEL
PVC
PS
EPOXIES
POLYESTERS
HDPE
PTFE
CEMENT CONCRETE
POROUS CERAMICS
PU
LDPE
SILICONE
SOFT BUTYL
ENGINEERING POLYMERS
ELASTOMERS
GUIDE LINES FOR MINIMUM WEIGHT DESIGN
σf/ρ = C
σf^2/3/ρ = C
σf^1/2/ρ = C
STRENGTH σf (MPa)
DENSITY ρ (Mg/m3)
10,000
1000
100
10
1
0.1
0.1
0.3
1
3
10
30