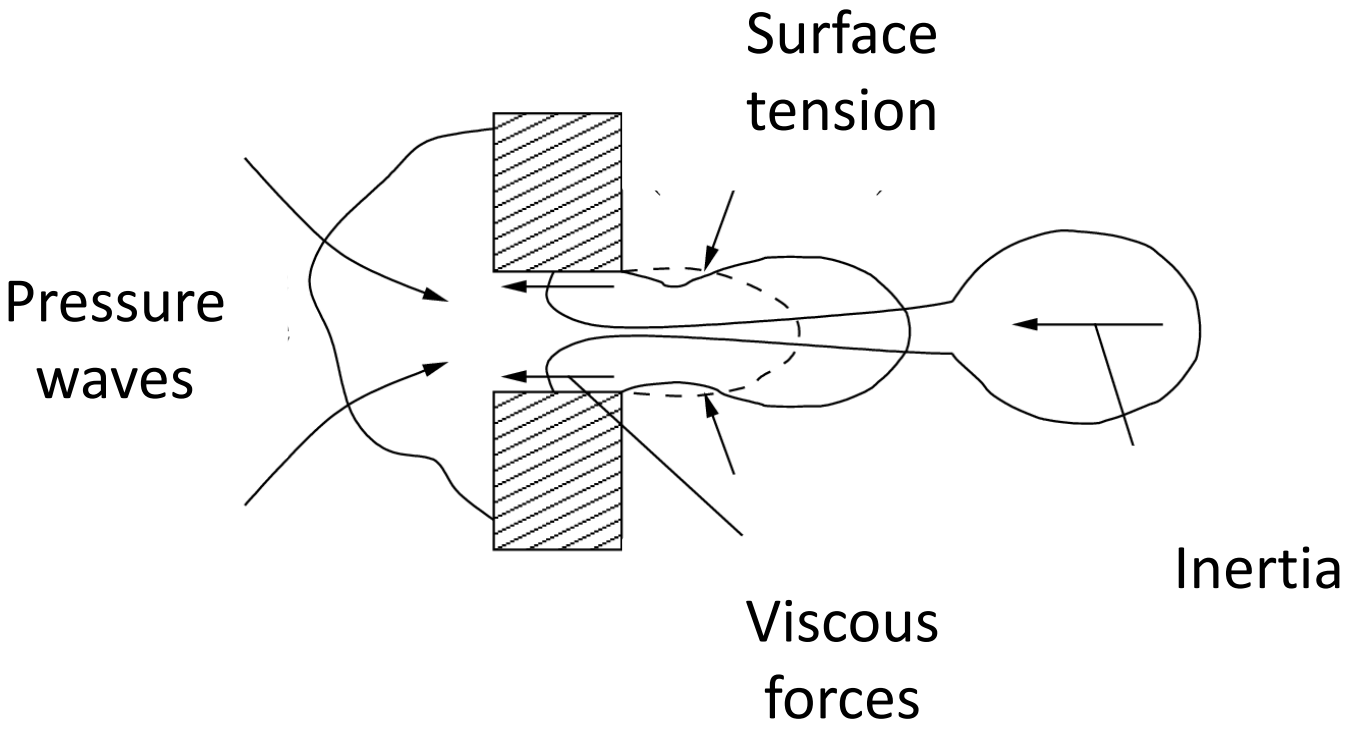
Inkjet Printing

carmelo.demaria@centropiaggio.unipi.it

PRINTABILITY OF INKS

Printability of inks

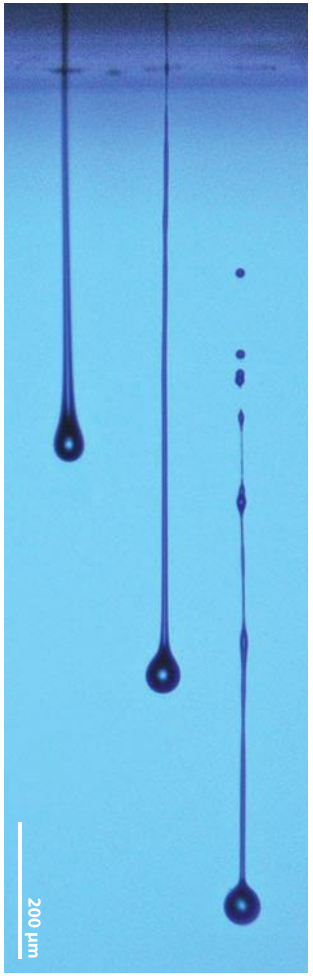


Adimensional analysis

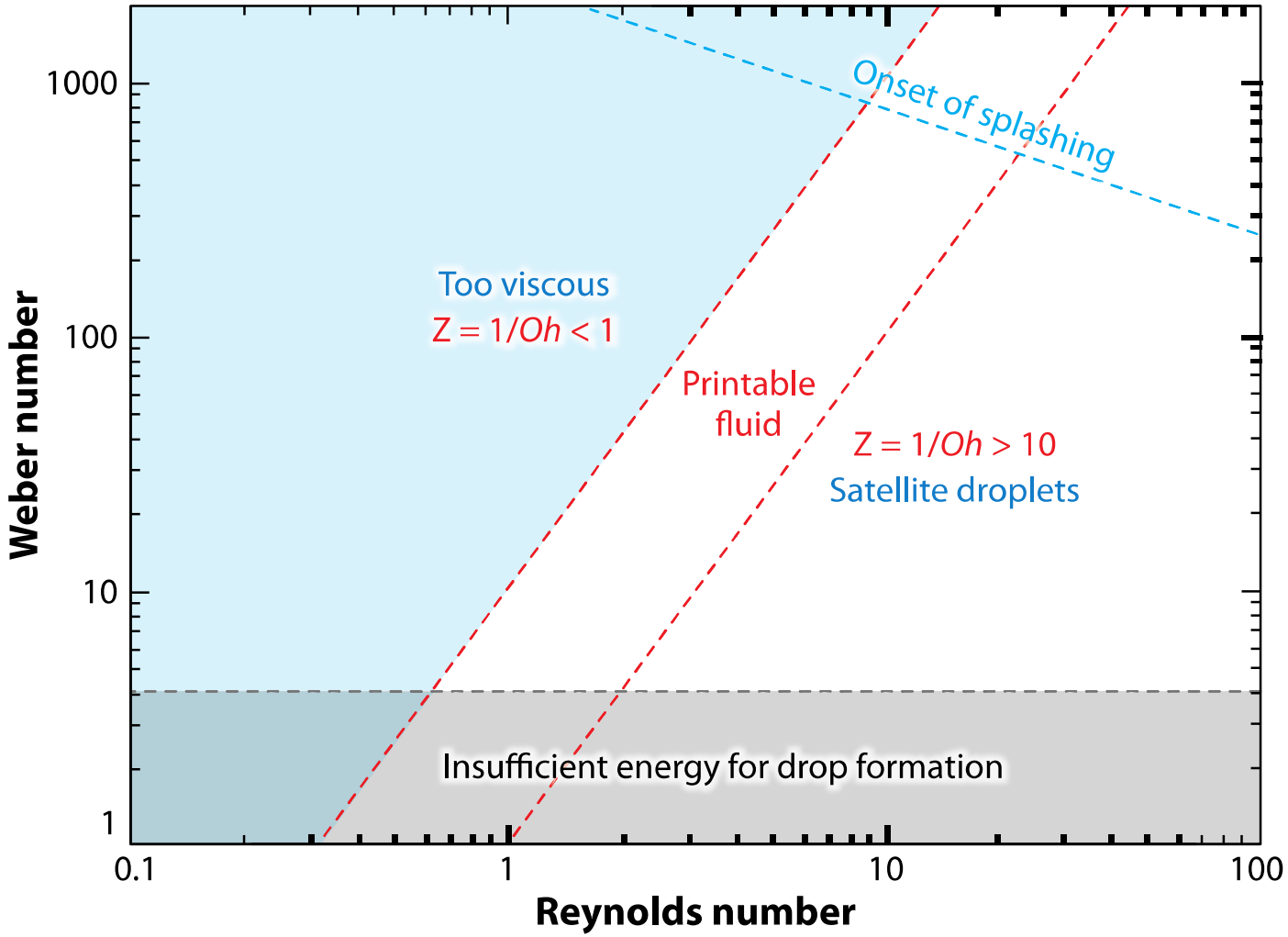
$$Re = \frac{v r a}{h} = \frac{\text{inertial forces}}{\text{viscous forces}}$$

$$We = \frac{v^2 r a}{g} = \frac{\text{inertial forces}}{\text{surface forces}}$$

$$Oh = \frac{\sqrt{We}}{Re} = \frac{\text{viscous forces}}{\text{surface forces}}$$

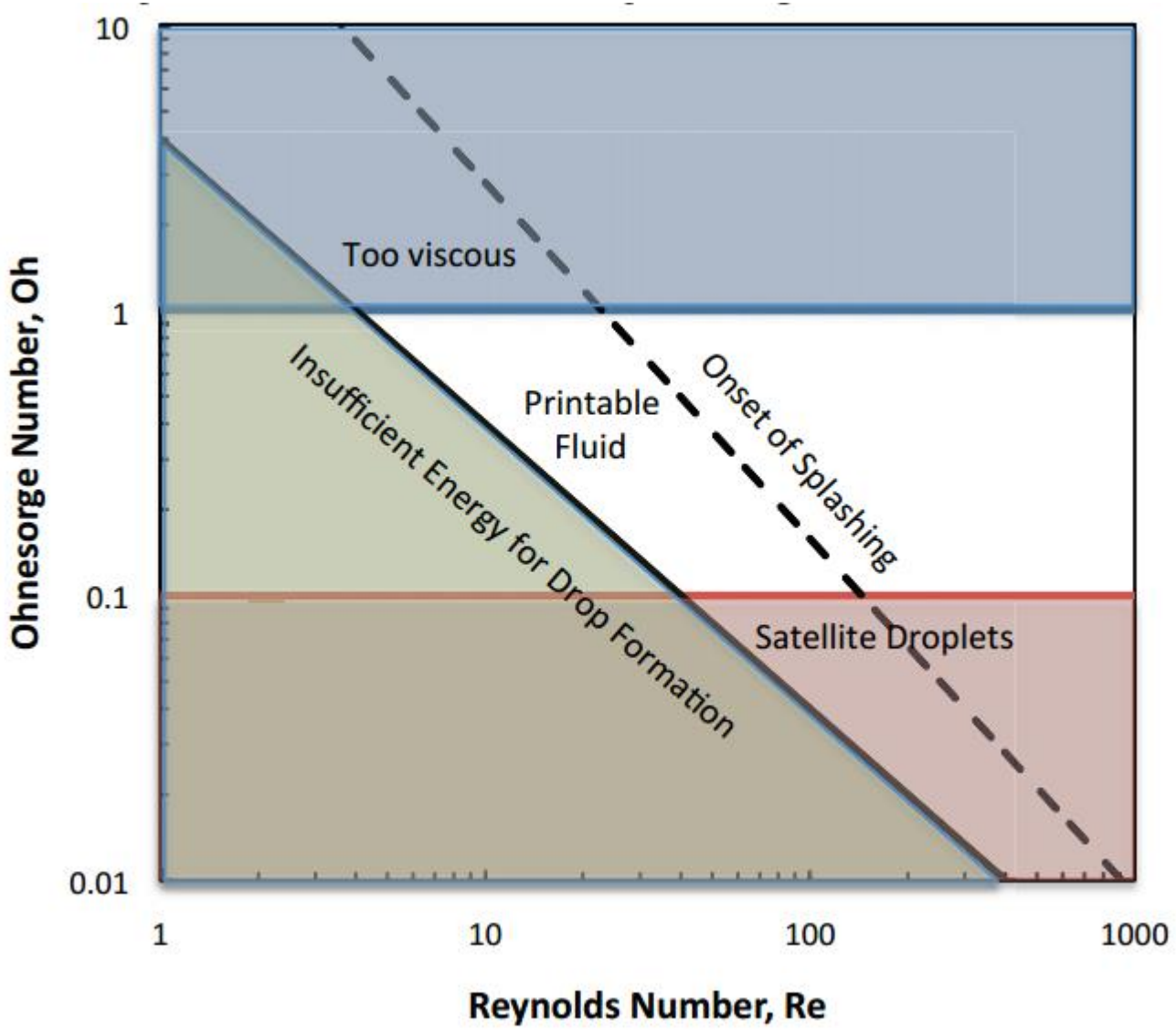


Physics of drops: ejection



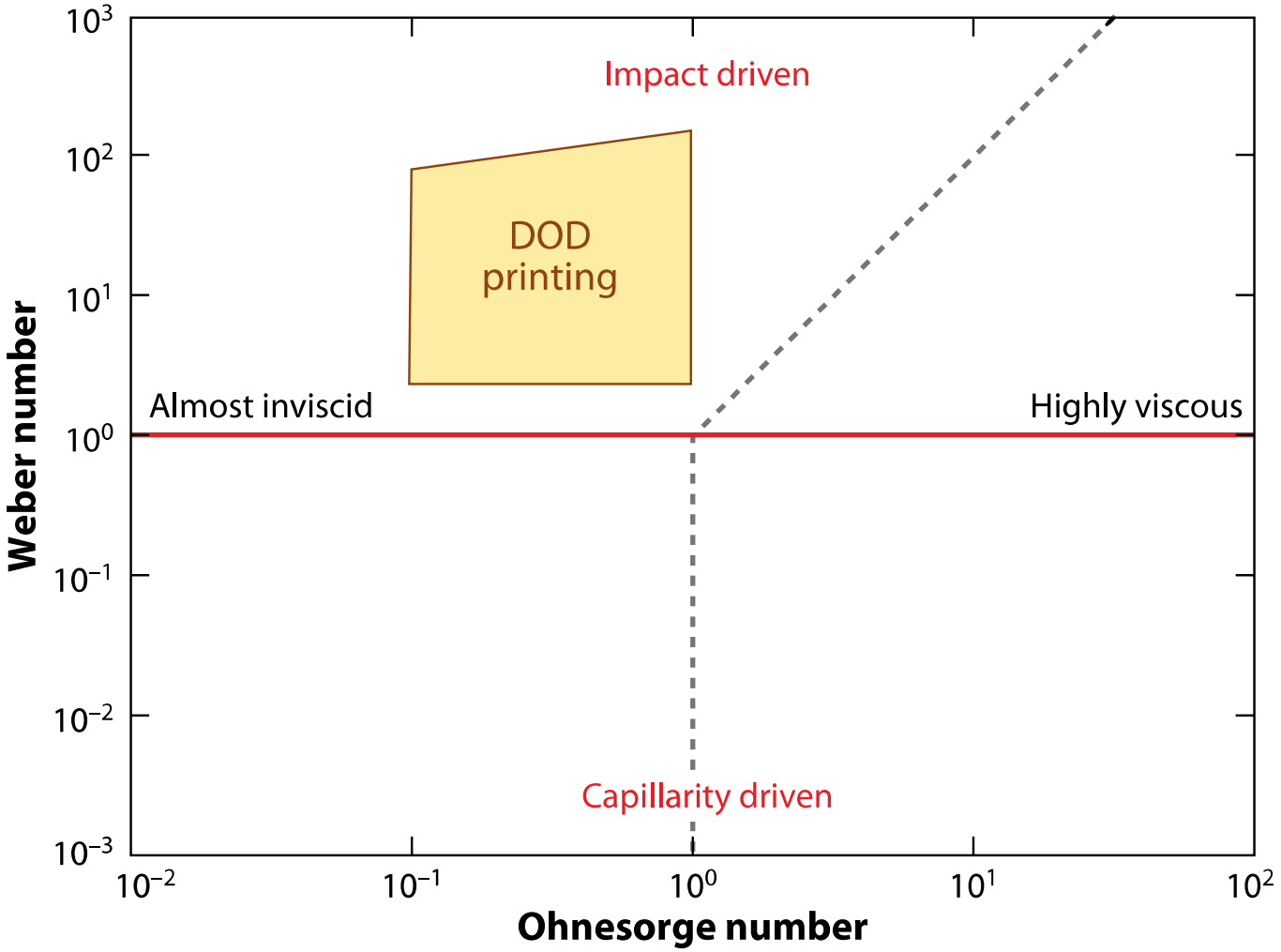
B. Derby, Annu. Rev. Mater. Res. 2010. 40:395–414

Physics of drops: ejection



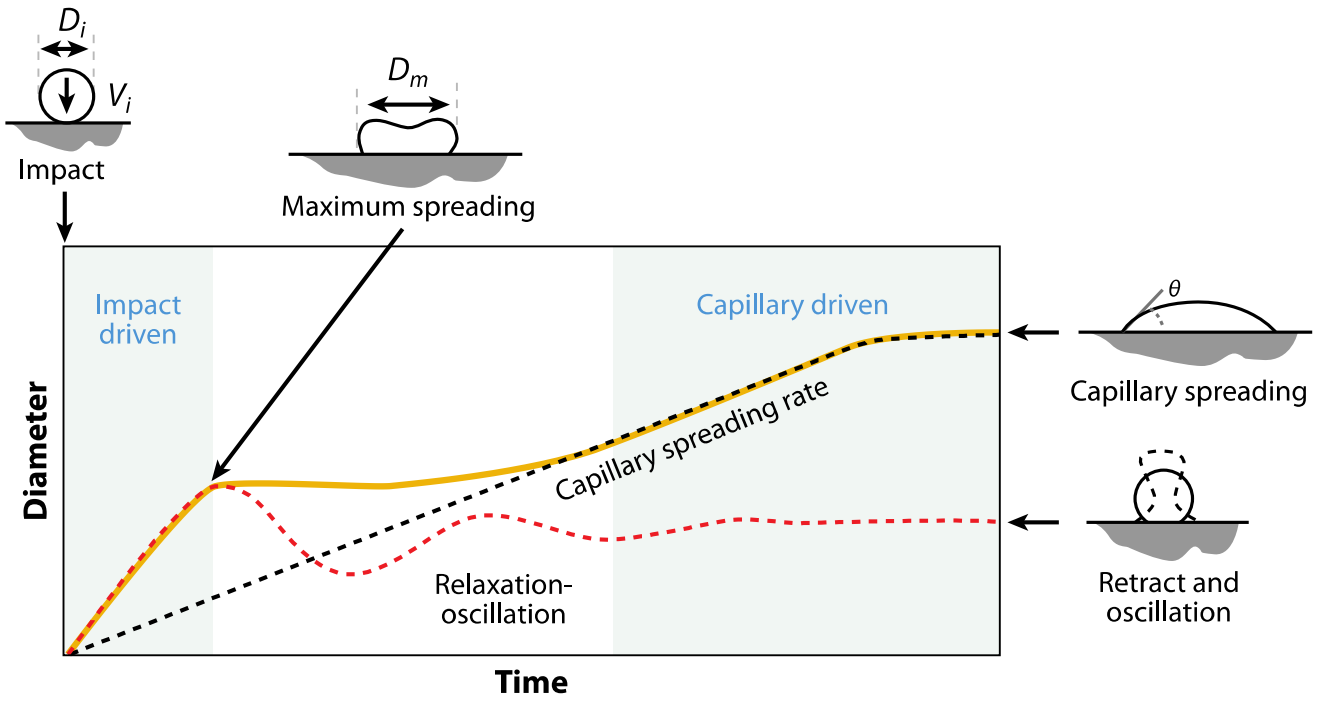
GH. McKinley, M Renardy, 2011

Physics of drops: impact



Schiaffino S, Sonin AA. 1997. Phys. Fluids 9:3172–87

Physics of drops: impact



- The final diameters is a linear function D_i
- The drop footprint increases with decreasing the contact angle and is about $3D_i$ at a contact angle of 10°
- Coffee ring effect