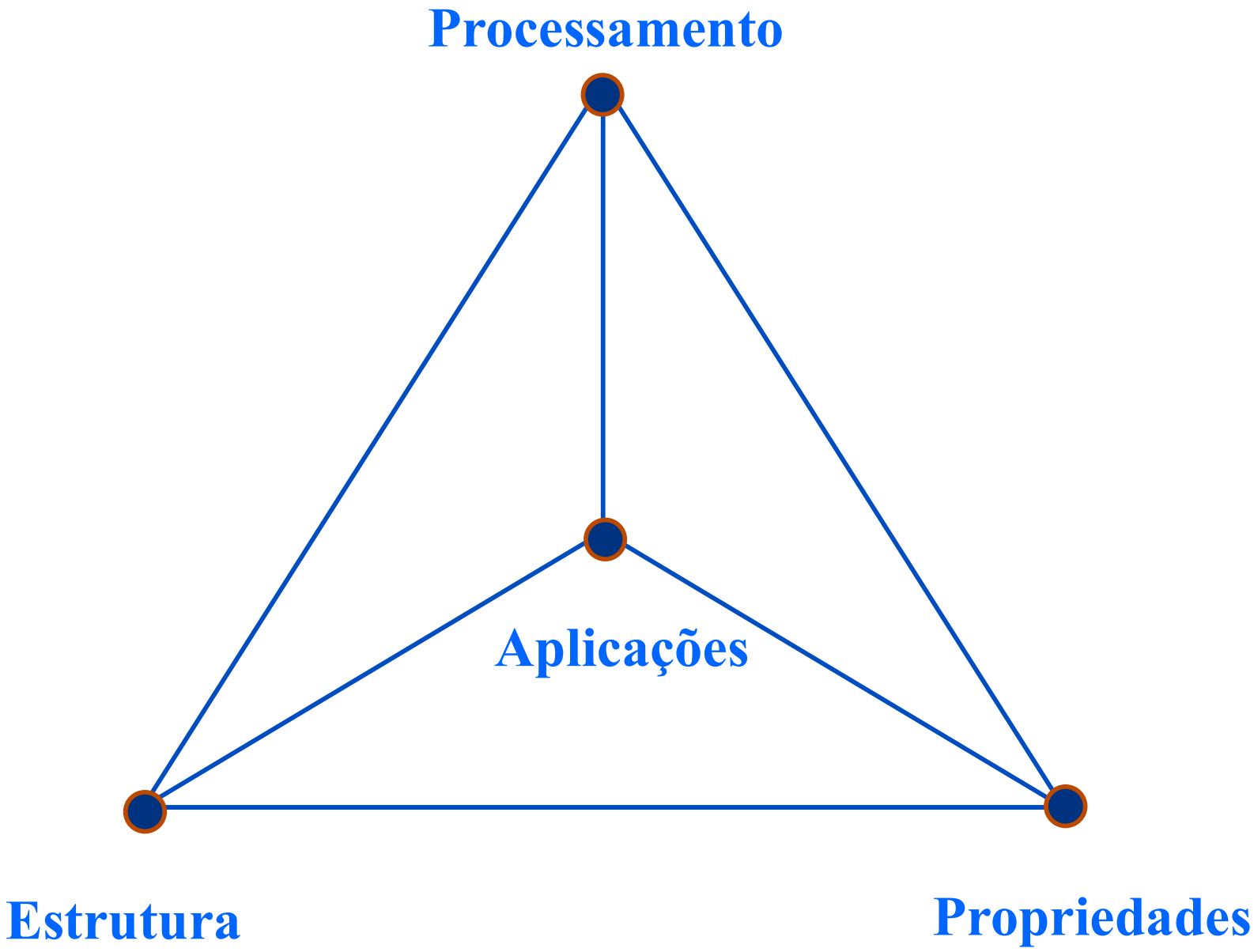
Engenharia de Materiais



Processamento

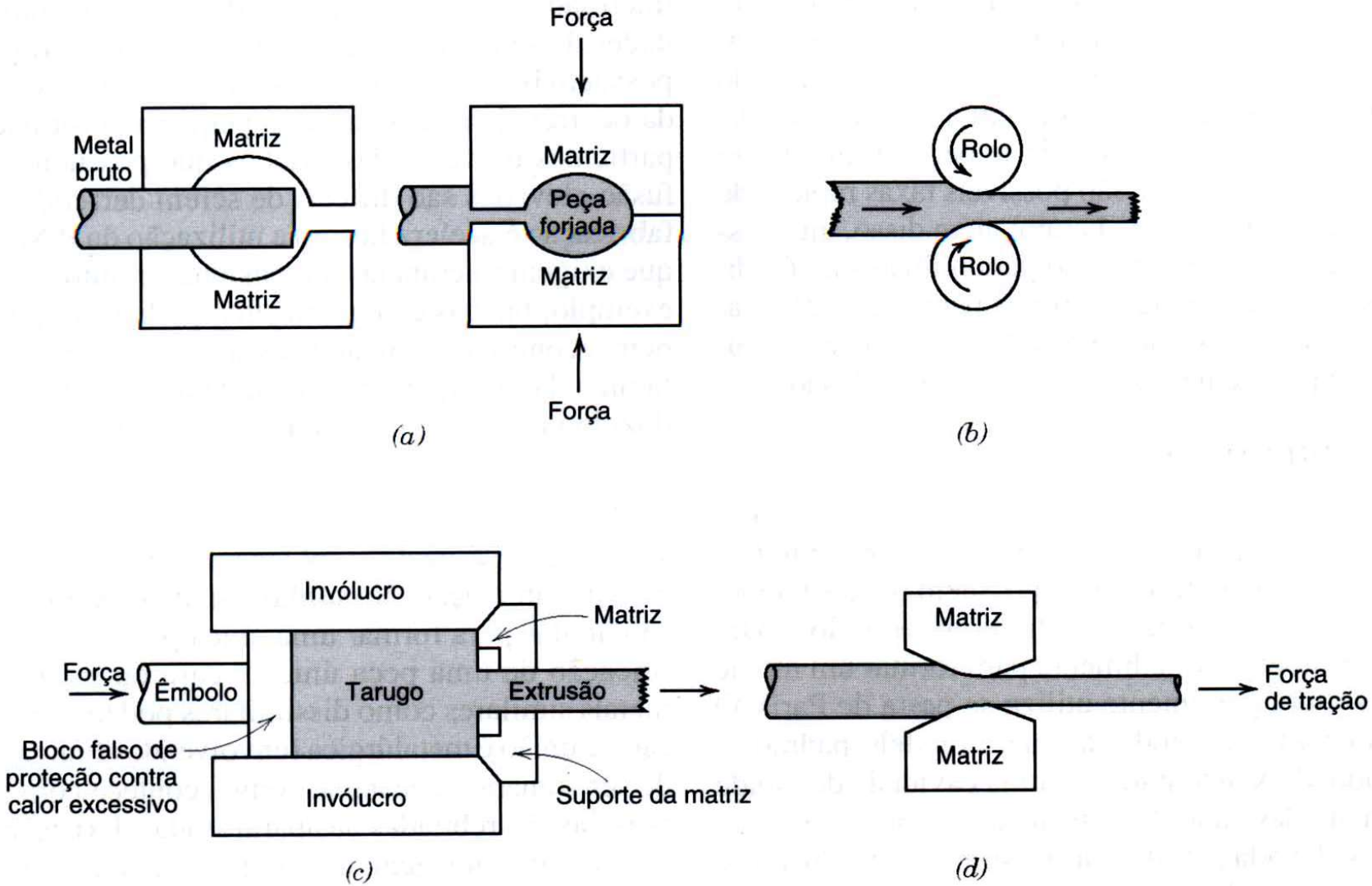


Fig. 12.2 Deformação de um metal durante (*a*) forjamento, (*b*) laminação, (*c*) extrusão e (*d*) estiramento.

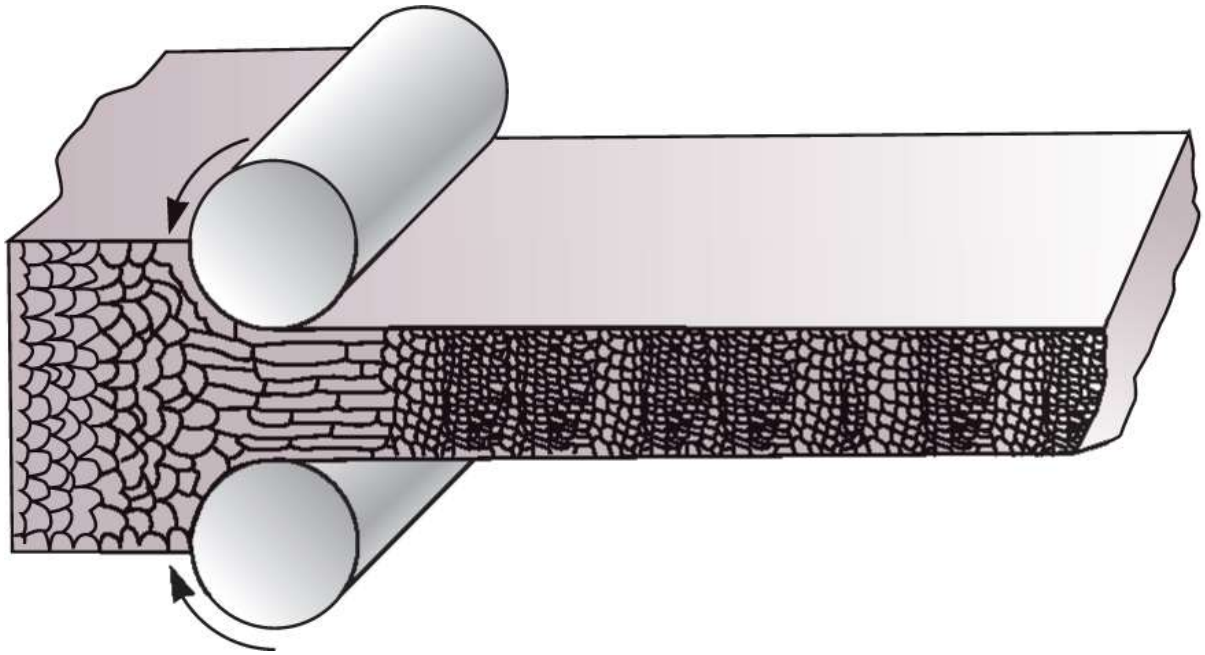


Figure 8-20
During hot working, the elongated, anisotropic grains immediately recrystallize. If the hot-working temperature is properly controlled, the final hot-worked grain size can be very fine.

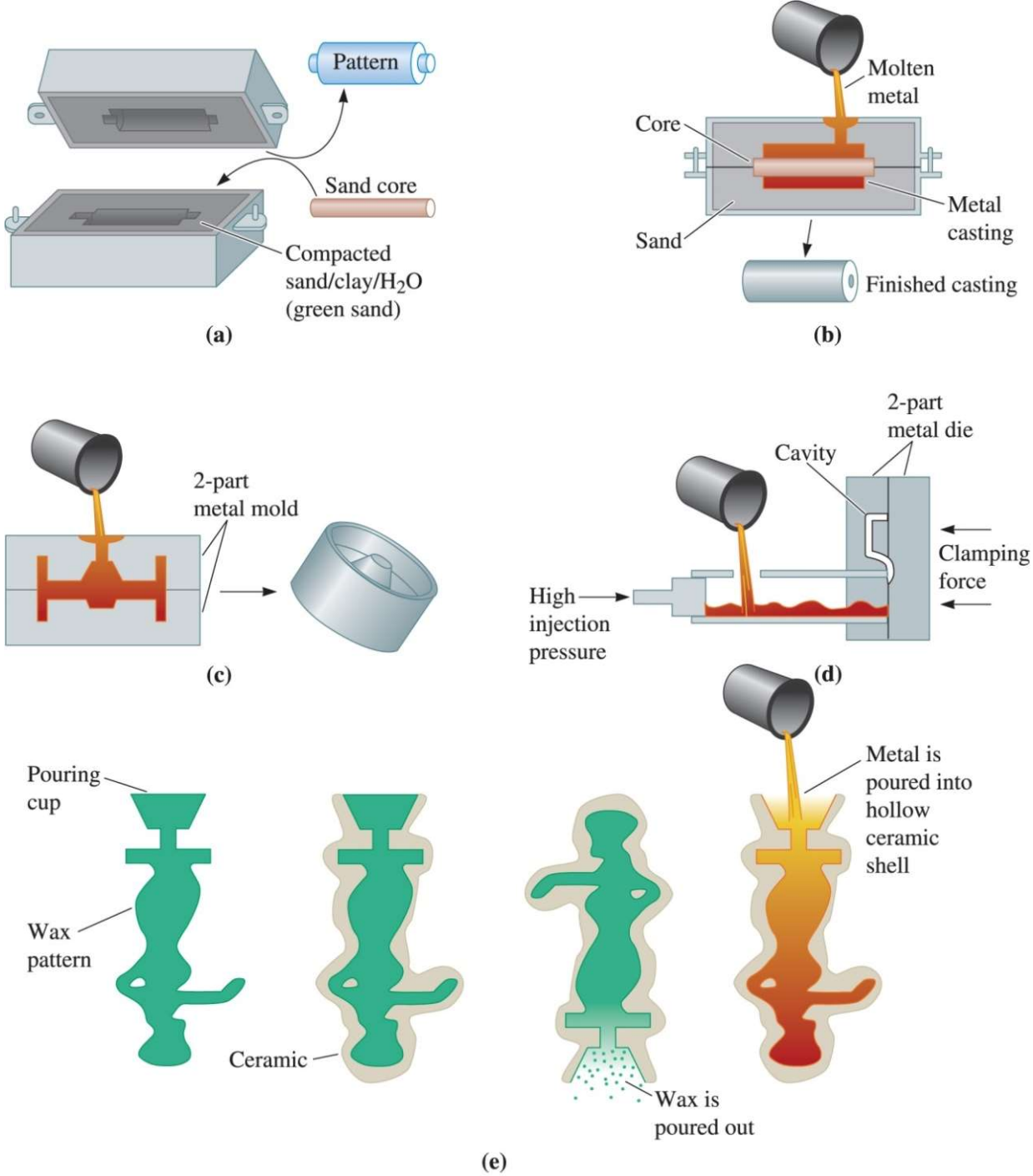


Figure 9-15 Four typical casting processes: (a) and (b) Green sand molding, in which clay-bonded sand is packed around a pattern. Sand cores can produce internal cavities in the casting. (c) The permanent mold process, in which metal is poured into an iron or steel mold. (d) Die casting, in which metal is injected at high pressure into a steel die. (e) Investment casting, in which a wax pattern is surrounded by a ceramic; after the wax is melted and drained, metal is poured into the mold.

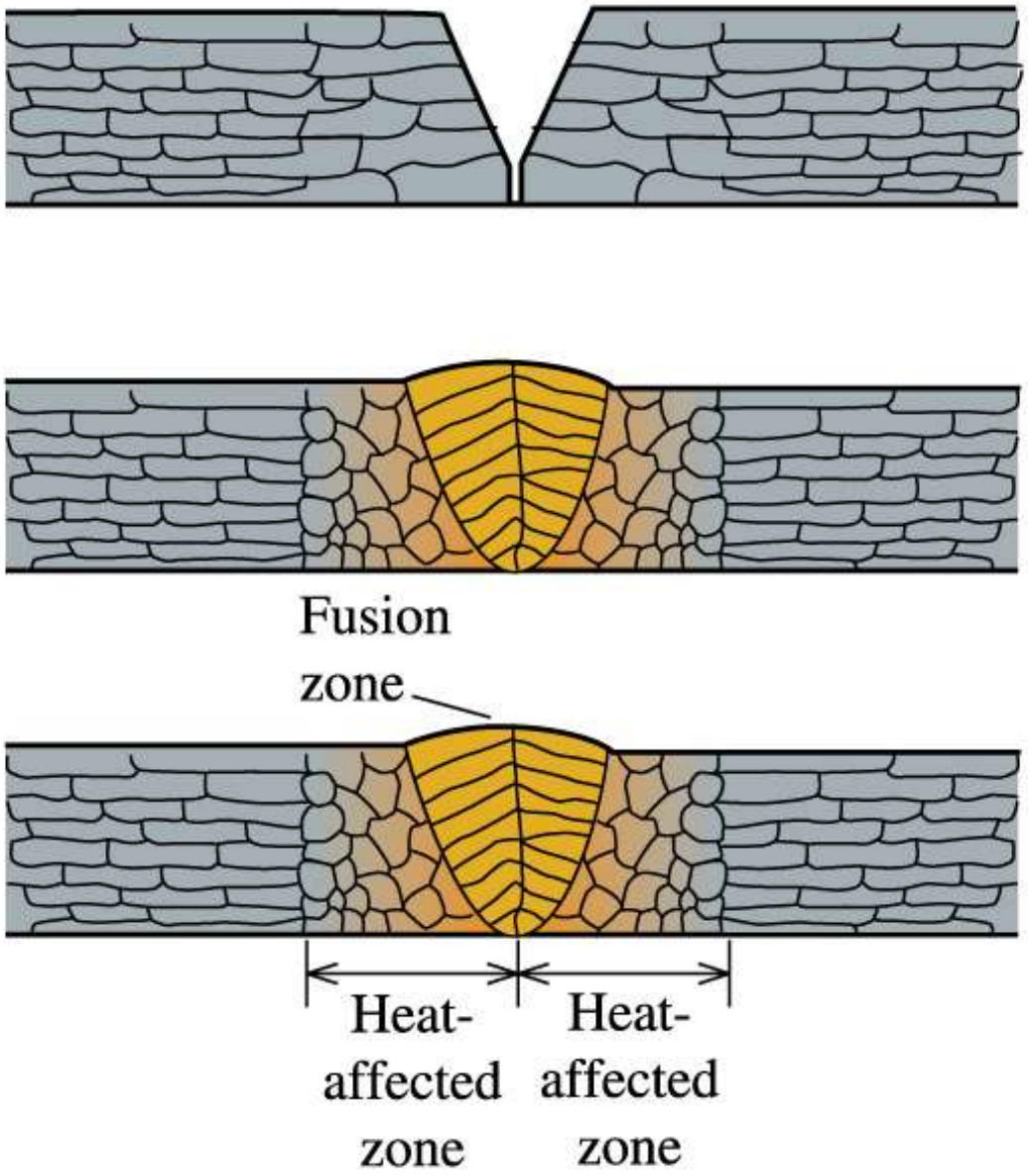


Figure 9-23
A schematic diagram of the fusion zone and solidification of the weld during fusion welding: (a) initial prepared joint, (b) weld at the maximum temperature, with joint filled with filler metal, and (c) weld after solidification.

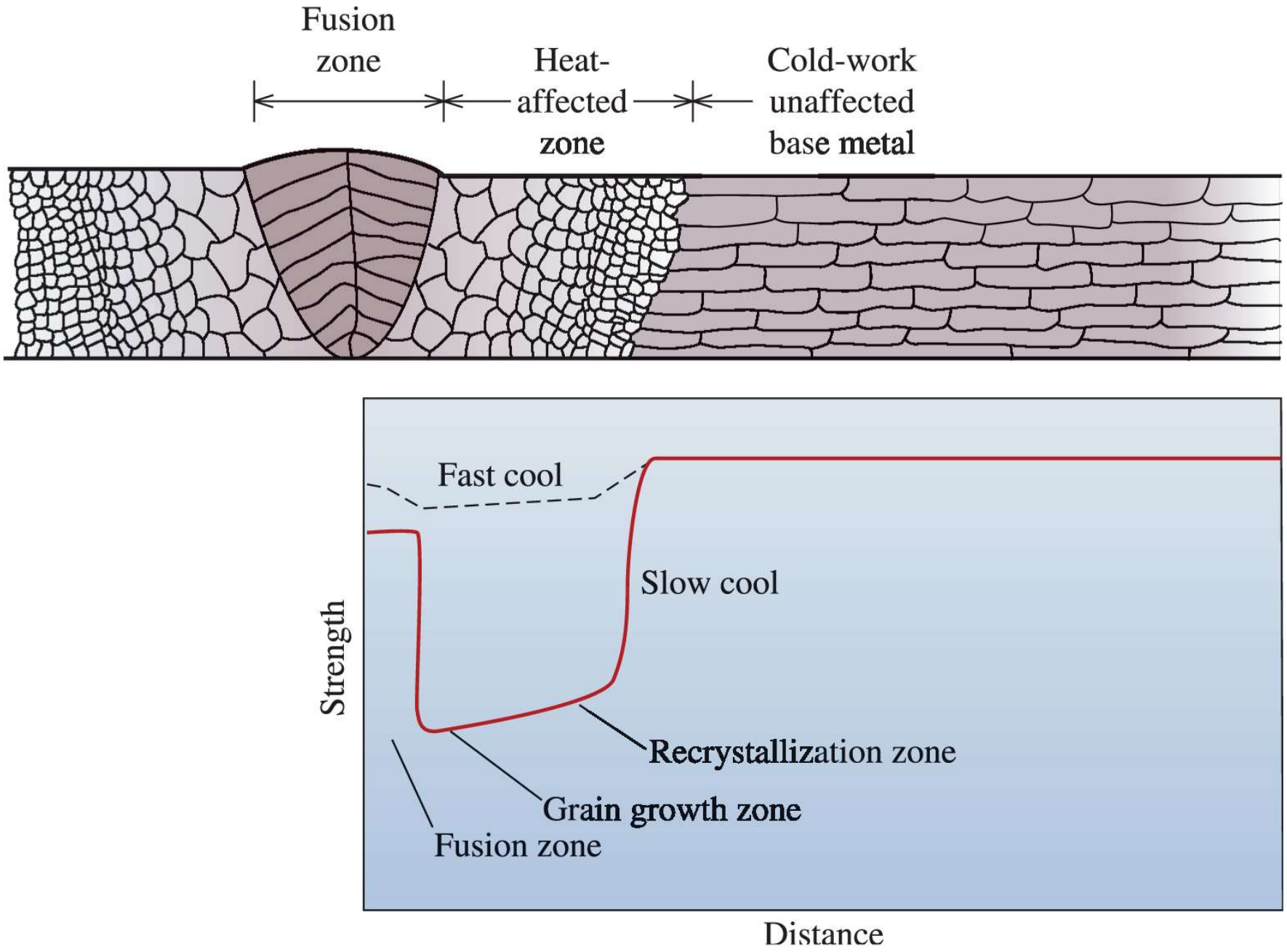


Figure 8-19 The structure and properties surrounding a fusion weld in a cold-worked metal. Note: only the right-hand side of the heat-affected zone is marked on the diagram. Note the loss in strength caused by recrystallization and grain growth in the heat-affected zone.

CST LAMINAÇÃO

http://www.youtube.com/watch?v=M98xHGalX-0&feature=related

Forging, Ring Rolling, Open-Die Forging, Hammer Forging- Kihlsteel.se

https://www.youtube.com/watch?v=XTU0Z-FkhtU

GERDAU

http://www.youtube.com/watch?v=eT7-B43yPW0&feature=related

Fundição

https://www.youtube.com/watch?v=pt6Tb1Wf1DA&ab_channel=LeandroS.Oliveira

Metal Casting at Home Part 10 Another Day in my Home Foundry

http://www.youtube.com/watch?v=M95bhPrDwA0

Processamento

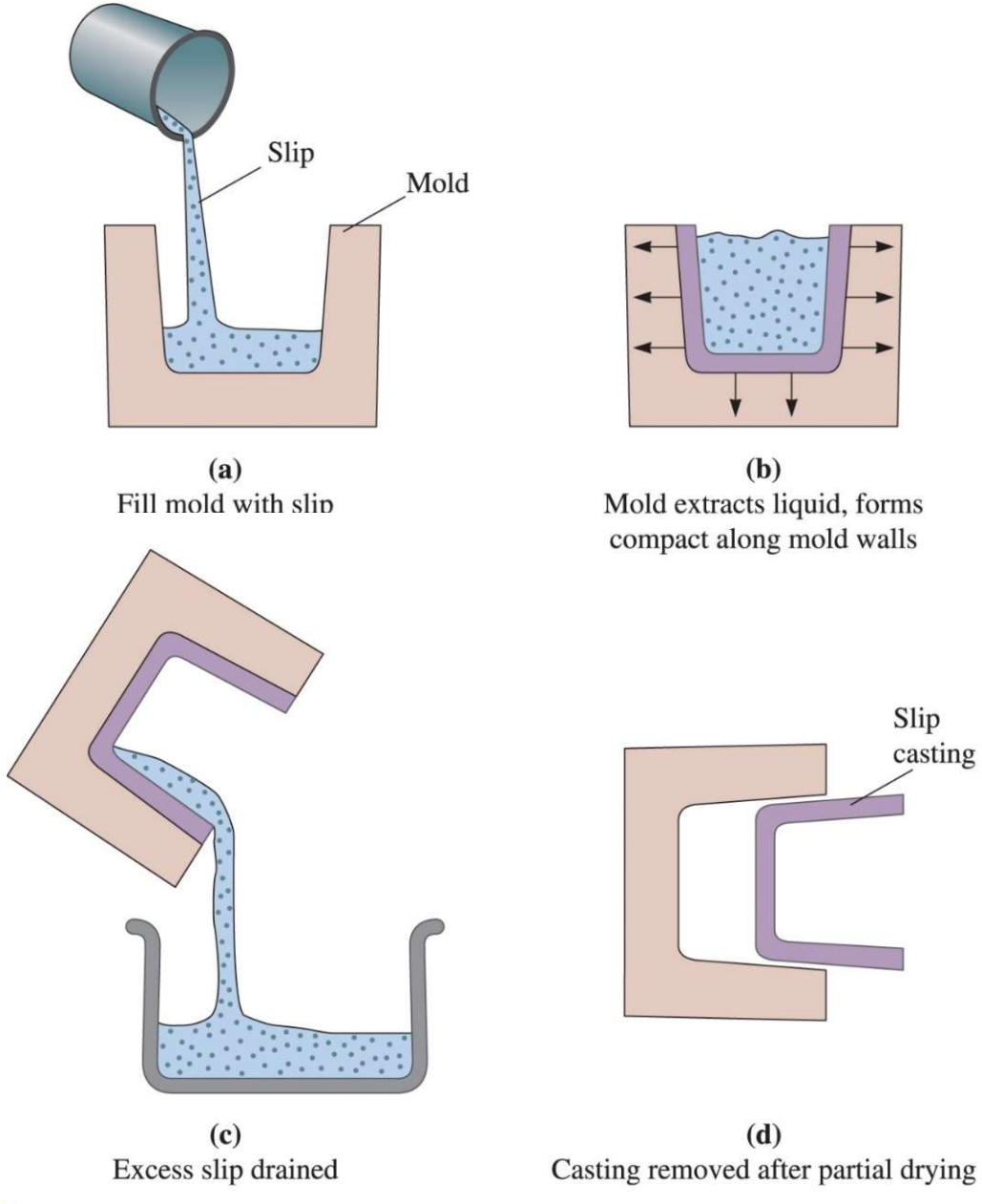
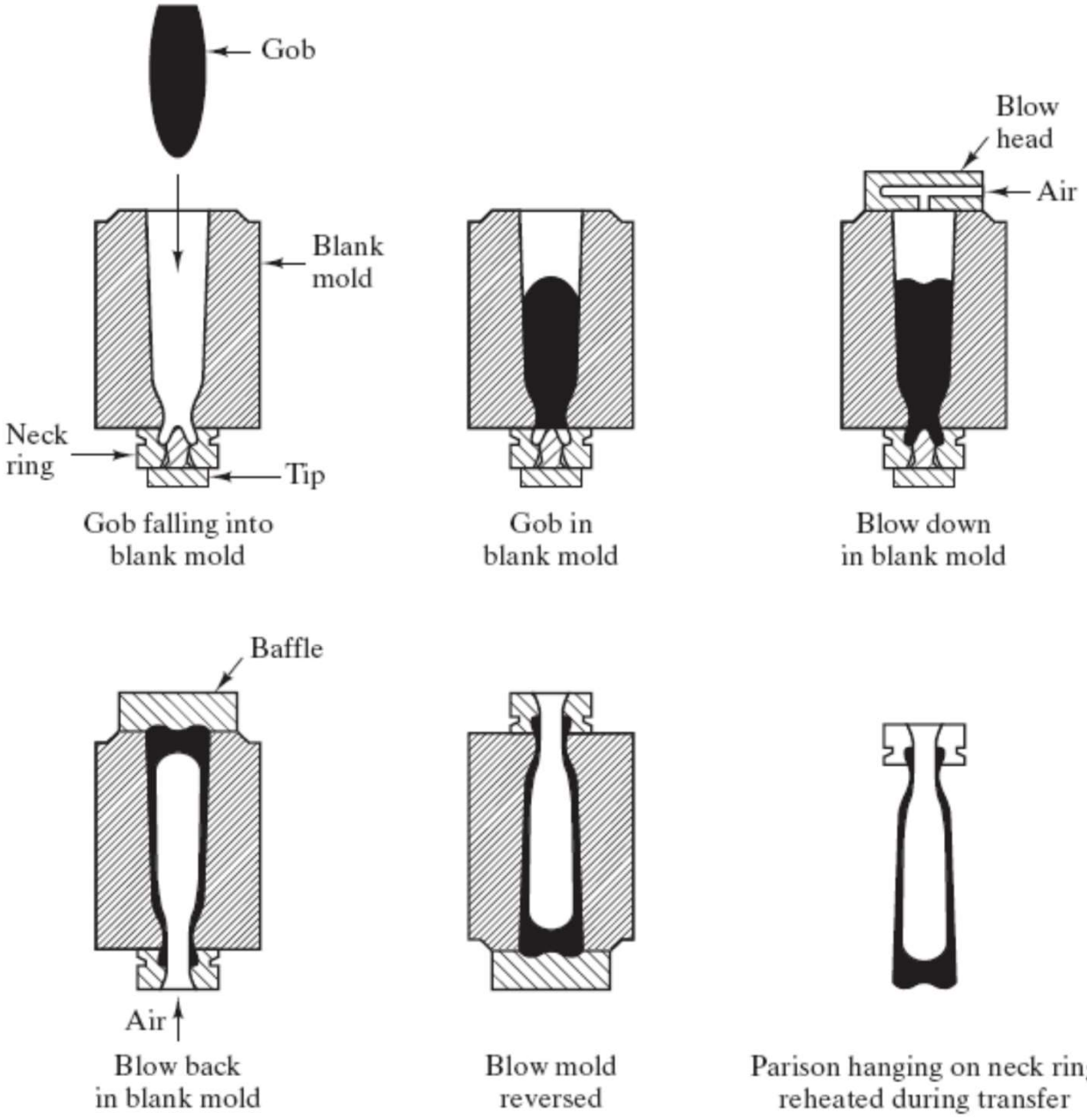
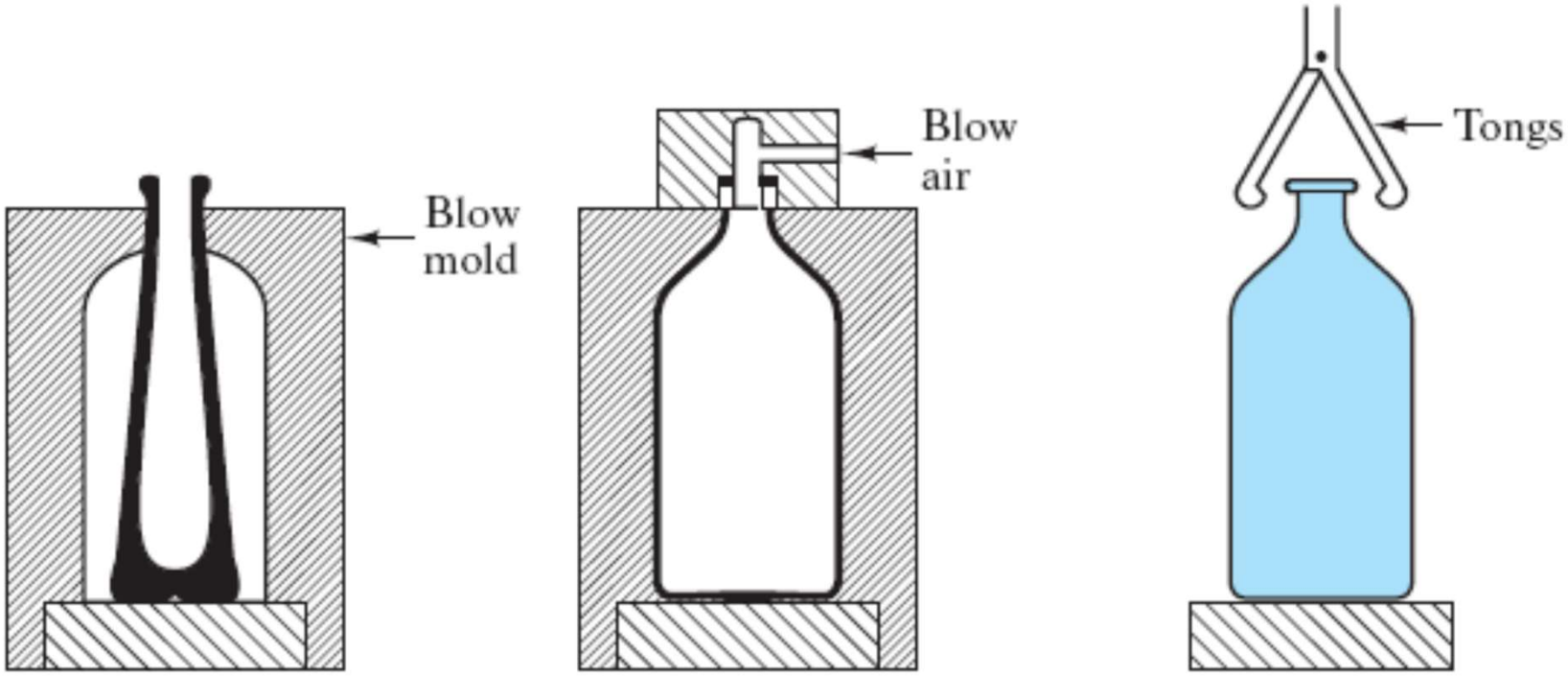


Figure 15-4 Steps in slip casting of ceramics. (*Source: From* Modern Ceramic Engineering, *by D.W. Richerson, p. 462, Fig. 10-34. Copyright © 1992 Marcel Dekker. Reprinted by permission.*)

Produção de Garrafas de Vidro



Produção de Garrafas de Vidro



Parison in
blow mold

Bottle blown
cooling

Finished bottle
removed by tongs

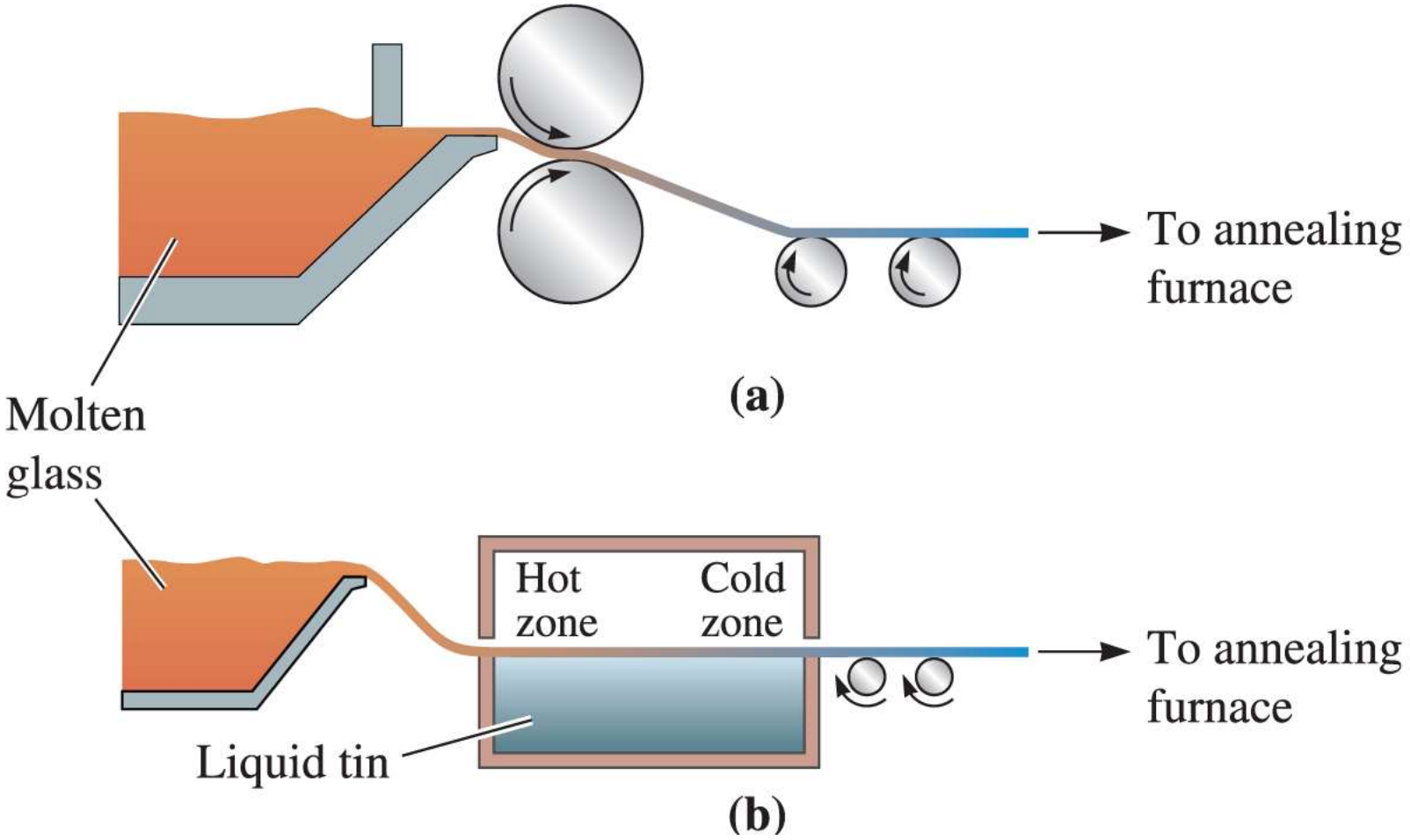


Figure 15-10 Techniques for manufacturing sheet and plate glass: (a) rolling and (b) floating the glass on molten tin.

Vídeo sobre Fibra Óptica - Processo de Fabricação

http://www.youtube.com/watch?v=EK9bblRKayA

Vídeo sobre processamento de revestimentos cerâmicos

http://www.youtube.com/watch?v=4Re-YWDtJVE

Vídeo sobre processamento por Colagem de Barbotina

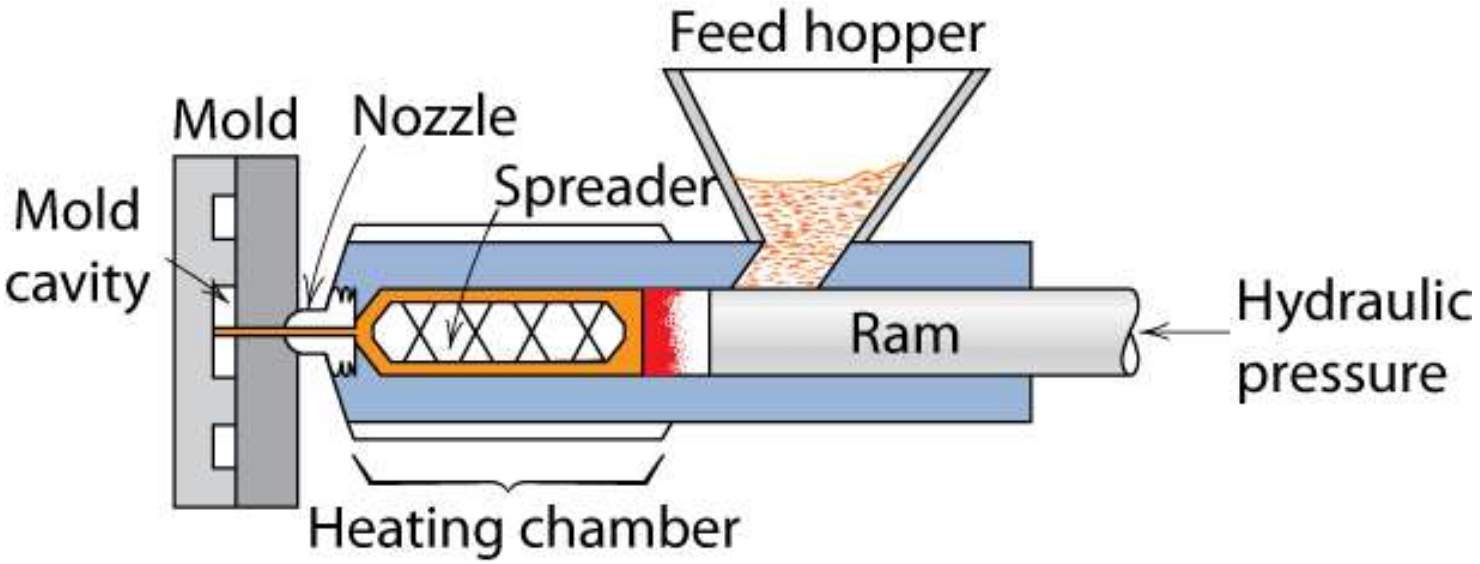
http://www.youtube.com/watch?v=hvwG1KdeFRk

Vídeo sobre processamento de vidro plano

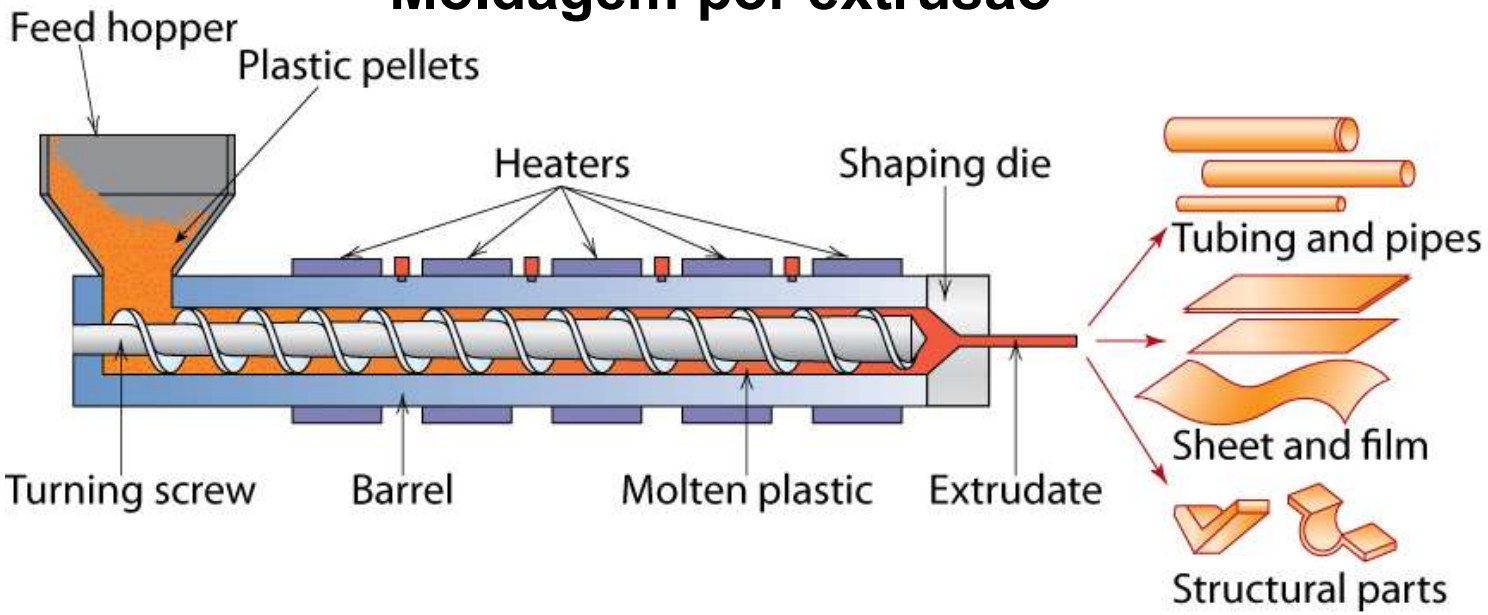
https://www.youtube.com/watch?v=KiSYdFXPJgc&ab_channel=JQCVIDROS

Processamento

Moldagem por injeção – a pistão



Moldagem por extrusão



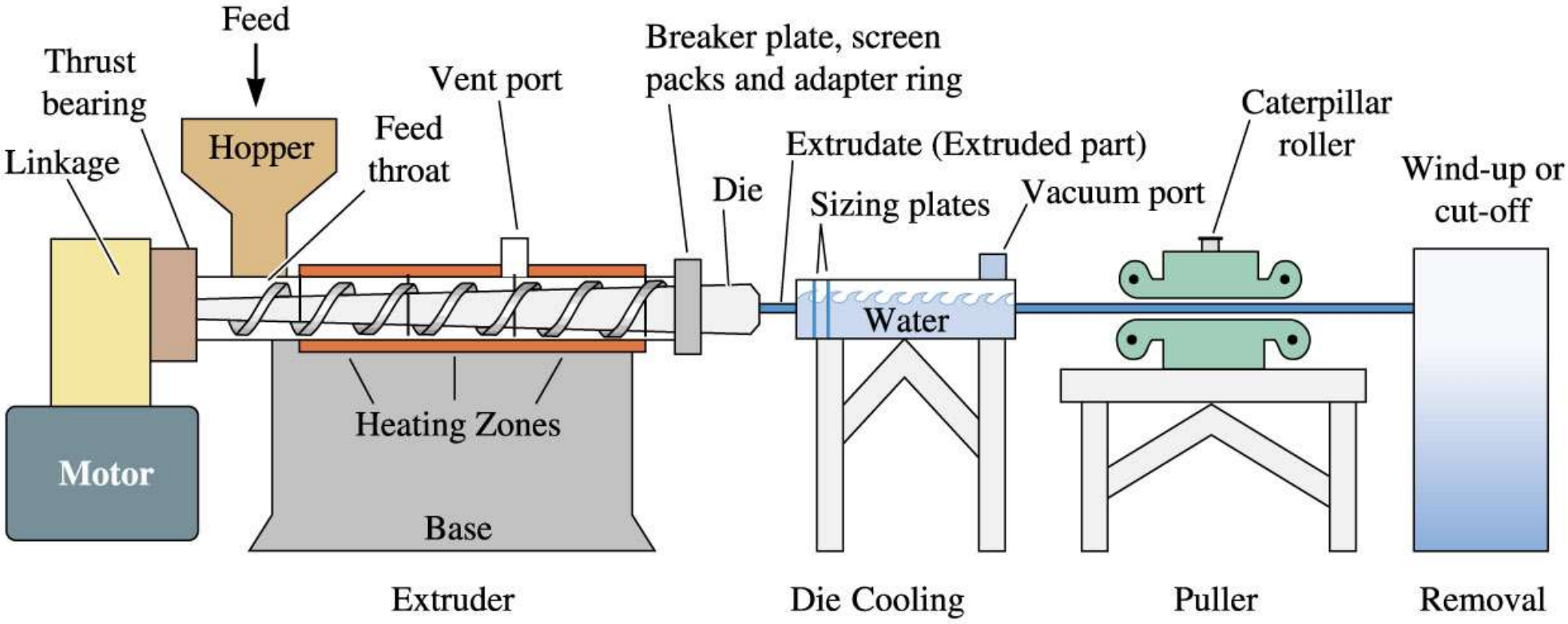
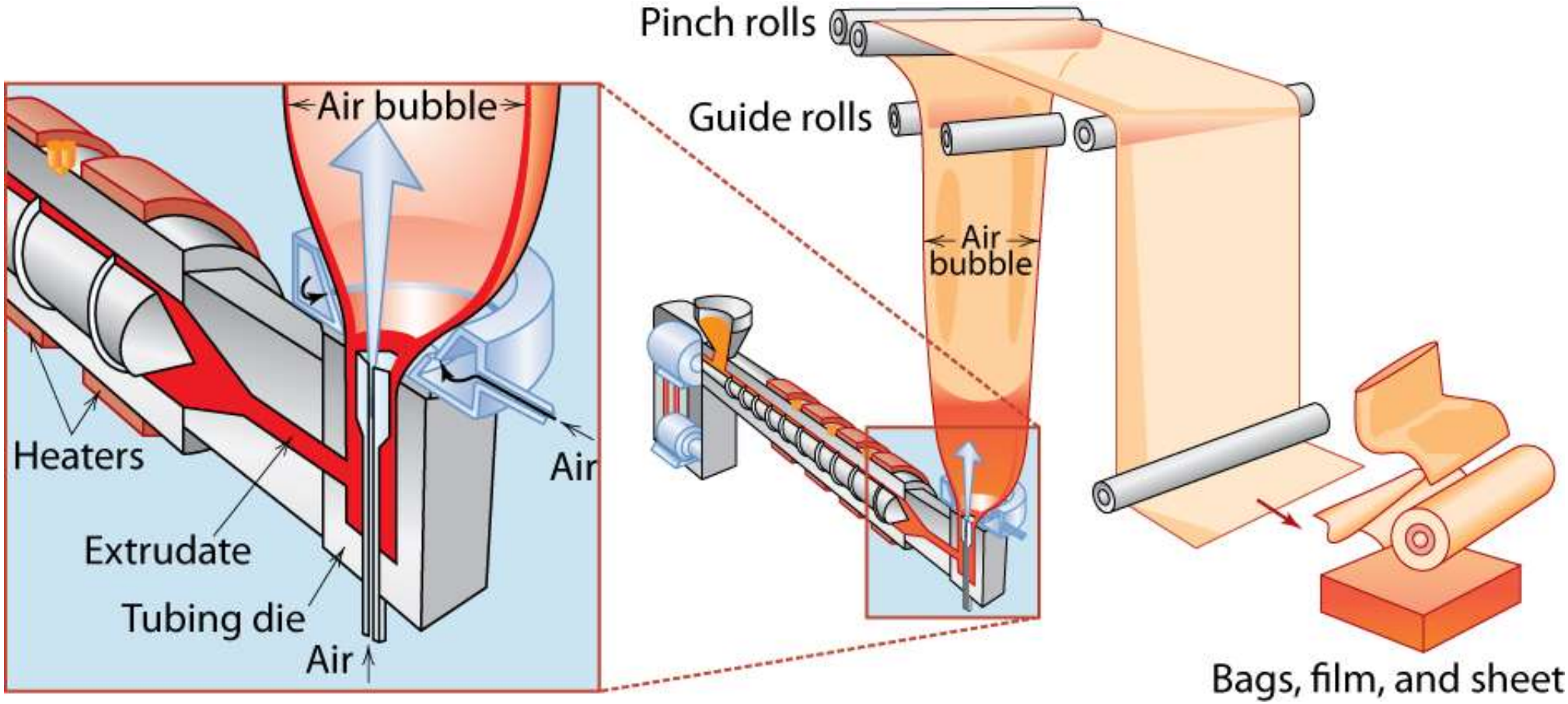


Figure 16-25 Schematic of an extruder used for polymer processing. *(Source: Adapted from* Plastics: Materials and Processing, Second Edition, *by A. Brent Strong, p. 382, Fig. 11-1. Copyright © 2000 Prentice Hall. Adapted with permission of Pearson Education, Inc., Upper Sadle River, NJ.)*

Extrusão de filmes, embalagens



Extrusora de Filme

https://www.youtube.com/watch?v=Ouw8UN_keZI

Injeção de Plástico

https://www.youtube.com/watch?v=M6wxHo2Wvso

Processamento de Polímeros Injeção

http://www.youtube.com/watch?v=fsYYFctFLuE

Processamento Sopro

http://www.youtube.com/watch?v=bu_QoXQUzJU

Vacuum Forming

http://www.youtube.com/watch?v=tKnIOKP4Igc

Aplicações

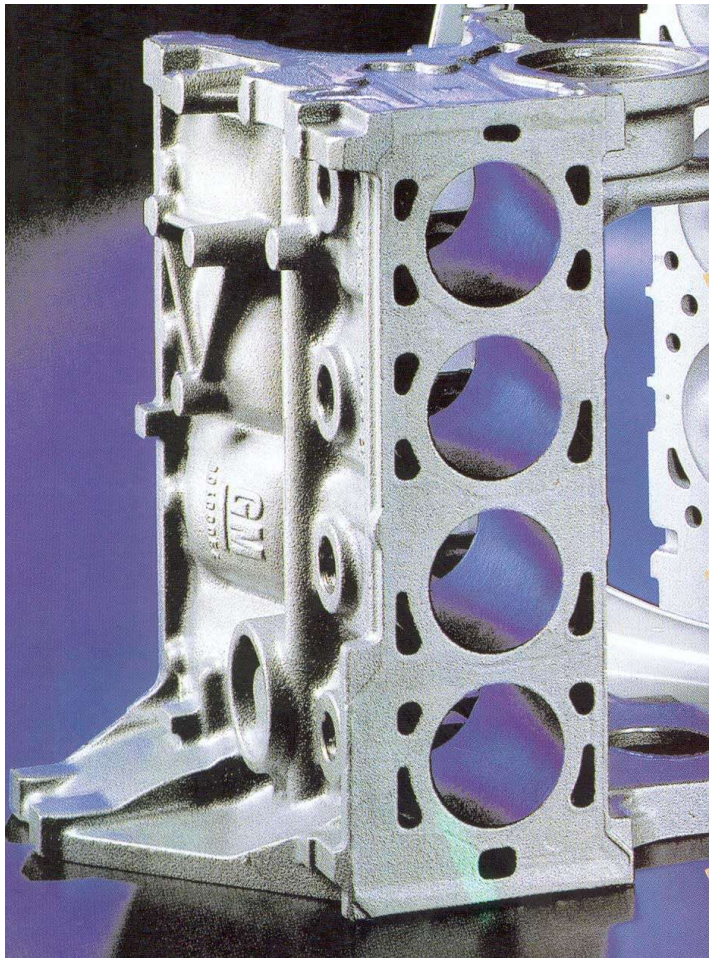
TABELA 1-1 ■ *Aplicações, propriedades e exemplos representativos para cada categoria de materiais*

	Exemplos de Aplicações	Propriedades
Metais e Ligas		
Cobre	Fios elétricos	Alta condutividade elétrica, boa conformabilidade
Ferro fundido cinzento	Blocos de motores para automóveis	Fundibilidade, usinabilidade, amortecimento de vibrações
Aços-liga	Ferramentas, chassis de automóveis	Endurecibilidade por tratamento térmico
Cerâmicas e Vidros		
SiO_2-Na_2O-CaO	Vidro para janelas	Transparência óptica, isolamento térmico
Al_2O_3, MgO, SiO_2	Refratários (revestimento resistente ao calor para fornos de fusão)	Isolamento térmico, refratariedade, inércia química
Titanato de bário	Capacitores para microeletrônica	Grande capacidade de armazenamento de cargas elétricas
Sílica	Fibras ópticas para a tecnologia da informação	Índice de refração adequado, baixas perdas ópticas
Polímeros		
Polietileno	Embalagens para alimentos	Facilidade de ser moldado para produzir filmes finos, flexibilidade e hermetismo
Epóxi	Encapsulamento de circuitos integrados	Isolante elétrico e resistência à umidade
Fenólicos	Adesivos para união de camadas de compensado	Resistência mecânica e à umidade

Engenharia de Materiais

Metais

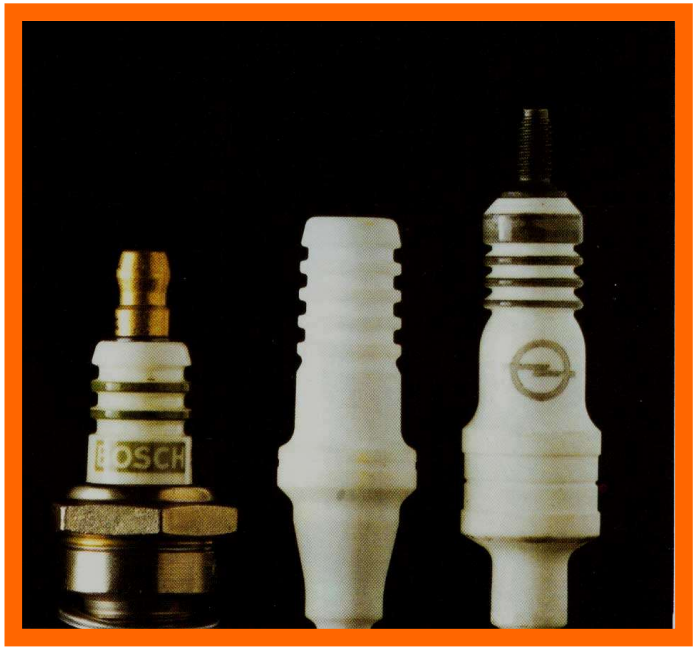
Produtos Metálicos



Engenharia de Materiais

cerâmicas

Produtos Cerâmicos



Engenharia de Materiais

Polímeros

Produtos Poliméricos

Bibliografia Consultada/Sugerida

[1] Materials Science and Engineering-An Introduction – Ninth edition - William D. Callister Jr. and David G. Rethwisch– John Wiley & Sons, Inc. **– Chapters 1, 6, 8, 15, 13, and 14.**

[2] Introduction to materials science for engineers – 6. ed. – J. F. Shackelford - Pearson Prentice Hall, 2004 – **Chapter 7.**

[3] Ciência e Engenharia dos Materiais - D. R. Askeland – P. P. Phulé – Ceangage Learning 2008 – **Capítulos 1, 6.**