11.D15 We are asked to specify a practical heat treatment for a 2014 aluminum alloy that will produce a minimum yield strength of 345 MPa (50,000 psi), and a minimum ductility of 12%EL. From Figure 11.27(a), the following heat treating temperatures and time ranges are possible to the give the required yield strength.

Temperature (°C)	Time Range (h)
260	not possible
204	0.3-15
149	10-700
121	300-?

With regard to temperatures and times to give the desired ductility [Figure 11.27(b)]:

Temperature (°C)	Time Range (h)
260	<0.02, >10
204	<0.4, >350
149	<20
121	<1000

From these tabulations, the following may be concluded:

It is not possible to heat treat this alloy at 260°C so as to produce the desired set of properties—attainment of a yield strength of 345 MPa is not possible at this temperature.

At 204°C, the heat treating time would need to be about 0.4 h, which is practical.

At 149°C, the time range is between 10 and 20 h, which is a little on the long side.

Finally, at 121°C, the time range is unpractically long (300 to 1000 h).