substrate transport mechanism (*60, 360*), including:

a plurality of first turning guides (*64, 164, 364*) spaced apart along the first precursor zone, at least some of the first turning guides adapted to support the substrate during a change in a direction of travel of the substrate toward the second precursor zone, and
a plurality of second turning guides (*66*, *166*, *366*) spaced apart along the second precursor zone, at least some of the second turning guides adapted to support the substrate during a change in a direction of travel of the substrate toward the first precursor zone.

2. The system of claim 1, further comprising a first divider (*34, 134, 334*) separating the isolation zone from the first precursor zone, and a second divider (36, *136*, *336*) separating the isolation zone from the second precursor zone, and in which the flow-restricting passageways includes a series of first passageways (*54*, *154, 354*) through the first divider and a series of second passageways (*56, 156, 356*) through the second divider.

3. The system of claim 1 or 2, in which at least some of the first turning guides are adjustably mounted within the first precursor zone for movement toward and away from the isolation zone, to thereby adjust a dwell time of the substrate in the first precursor zone.

4. The system of any preceding claim, in which the substrate transport mechanism further comprises:

a payout spool (72, 172, 372) for paying out the substrate from a coil (74, 174, 374) for receipt at a first end (76, 376) of the isolation zone; and
a take-up spool (74, 174, 374) for coiling the substrate received from a second end (84, 384) of the isolation zone opposite the first end.

5. The system of any preceding claims, further comprising:

a third precursor zone (190) separated from the first and second precursor zones and into which a third precursor gas different from the first and second precursor gases is introduced when the system is in use;
a third divider separating the third precursor zone from the isolation zone; and
a series of third passageways (192) extending through the third divider and into the third precursor zone from the isolation zone, the third passageways spaced apart along the third precursor zone and arranged for the substrate to be threaded therethrough back and forth between the second and third precursor zones and through the isolation zone.

6. The system of any preceding claim, further comprising:

a first precursor delivery system (*24*, *124, 324*) coupled to the first precursor zone for supplying the first precursor gas to the first precursor zone;
a second precursor delivery system (*26*, *126, 326*) coupled to the second precursor zone for supplying the second precursor gas to the second precursor zone; and
an inert gas delivery system (*28, 128, 328*) coupled to the isolation zone for injecting an inert gas into the isolation zone to achieve a pressure in the isolation zone that is greater than pressures within the precursor zones.

7. The system of any preceding claim, in which at least some of the passageways include a tunnel.

8. The system of any preceding claim, further comprising:

an exhaust line (440) connected to one or more of the precursor zones; and
a precursor trap (59, 410, 420) located in the exhaust line.

9. The system of claim 8, further comprising a recycling line (450) connected between the precursor trap and one or more of the precursor zones.

10. The system of any preceding claim, further comprising a radicals generator for supplying a precursor radical to one or more of the precursor zones.

11. The system of any preceding claim, in which at least some of the turning guides include a heated roller.

12. A method for depositing a thin film on a flexible substrate (12, 112, 312), comprising:

introducing a first precursor gas into a first precursor zone (14, 114, 314);
introducing a second precursor gas into a second precursor zone (16, 116, 316) spaced apart from the first precursor zone, the second precursor gas being different from the first precursor gas;
guiding a flexible substrate (12, 112, 312) back and forth between the first and second precursor zones and through a series of flow-restricting passageways (54, 56, 154, 156, 354, 356) of an