

EN 1427: Determination of softening point ($T_{R\&B}$)

Ring and ball method

✓ $28\text{ °C} < T_{R\&B} < 150\text{ °C}$:

- Two brass rings and two steel balls
- Controlled rate heating
- Falling distance $25 \pm 0,4\text{ mm}$
- Ring holder and assembly –
Upper edge of the rings $\approx 50\text{ mm}$ below liquid level
- Glass beaker - $D > 85\text{ mm}$, $H > 120\text{ mm}$

✓ Temperature measuring device

- Distilled bath water ($T = 0 - 90\text{ °C}$)
- Glycerol ($T = 30 - 155\text{ °C}$)

✓ Magnetic stirrer placed at the bottom of the beaker
 $\approx 40\text{ mm}$ and diameter 8 mm , 100 r/min .



✓ Bath liquid

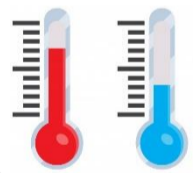
- Distilled bath water ($28\text{ °C} < T_{R\&B} < 80\text{ °C}$)
- Glycerol ($80\text{ °C} < T_{R\&B} < 150\text{ °C}$)

✓ Release agent

- Vaseline or (glycerol + mineral talc)
- Pouring plate ($\approx 50\text{ mm} \times 75\text{ mm}$ and $1,5\text{ mm}$ thick)

✓ Prepare the samples according to EN 12594

- ✓ Heat the two rings to a temperature $< 100\text{ °C}$ above the expected $T_{R\&B}$
- ✓ Place the rings in the pouring plate treated with the release agent
- ✓ Pour slightly the bitumen in the rings
- ✓ Let the specimens cool down at least 30 min .
- ✓ Cut the excess of binder with a hot knife before testing to ensure horizontal surface of the specimen



- Initial T for bath liquid:
 - Water: $5 \pm 1\text{ °C}$
 - Glycerol: $30 \pm 1\text{ °C}$
- Place the apparatus, the ring holders, the steel balls and the sample rings in the appropriate T in the bath inside a thermostatic device e.g. a refrigerator, for $15-20\text{ min}$.



- Take all the fixtures outside the bath and dry them gently
- Place all the fixtures in the appropriate position as quickly as possible and the balls using forceps in the ball centering guides
- Start the test



- For the automatic equipment the starting T should be ensured that is within the range of 5 ± 1 or $30 \pm 1\text{ °C}$
- Stir the bath liquid and heat from below with a rate 5 °C/min .
- The first 3 min . are intended to settle the heating rate of 5 °C/min .
- The temperature increase after the first 3 min . should be $4,4-5,6\text{ °C/min}$.



- Record the $T_{R\&B}$ when the ball interrupts the ray of light of the automatic equipment.
- If the difference between the two $T_{R\&B}$ exceeds 1 °C for $T_{R\&B} < 80\text{ °C}$ and 2 °C for $T_{R\&B} > 80\text{ °C}$ repeat the test
- Express the average result of the two $T_{R\&B}$ measurements for
 - $T_{R\&B} < 80\text{ °C}$ in the nearest $0,2\text{ °C}$
 - $T_{R\&B} > 80\text{ °C}$ in the nearest $0,5\text{ °C}$

