

# TENSILE STRENGTH RATIO CERTIFICATION

## PROFICIENCY EXAMINATION

Revised 9-1-06

12-11-06

12-12-07

5-2-08

1-5-09

12-17-09

1-7-10

2-13-15

Applicant \_\_\_\_\_

Employer \_\_\_\_\_

**TENSILE STRENGTH RATIO (TSR) TECHNICIAN CERTIFICATION  
PROFICIENCY CHECKLIST  
AASHTO T 283**

Trial#	1	2	R
<b>Sample Preparation and Grouping:</b>			
1. Compact $\geq 6$ pucks to spec: $95 \pm 5$ mm thick and $7.0 \pm 0.5\%$ air voids.			
2. Store at room temperature for $24 \pm 3$ hrs.			
3. Determine specimen thickness ( $t$ )			
4. Obtain $G_{mb}$ (bulk specific gravity) for each puck.			
5. Using an associated $G_{mm}$ (Rice), calculate % air voids for each puck.			
6. Sort into 2 groups of 3 pucks each so that <u>average air voids of each group</u> are approximately equal.			
<b>“Dry” (Non-conditioned) Testing:</b>			
7. Before proceeding, be sure pucks have air-dried for $24 \pm 3$ hrs. <u>after</u> $G_{mb}$ determination.			
8. Place each dry puck in its own water-proof bag. Place bagged dry pucks in warm-water bath for 2 hrs. $\pm 10$ min. with 1” of water above surface of specimens.			
9. Test each puck in indirect tension; record maximum load for each. Calculate tensile strength for each.			
10. Calculate average tensile strength for dry set of pucks ( $S_{dry}$ ).			
<b>“Wet” (Conditioned) Testing:</b>			
11. Place puck in vacuum vessel with at least 1” of water below and above the puck; subject to vacuum saturation for 5-10 min. within specified vacuum range.			
12. Remove vacuum; keep puck submerged for another 5-10 min.			
13. Having already zeroed out a piece of plastic wrap on the balance, remove puck, quickly surface-dry it, and place it on the balance.			
14. Determine degree of saturation (i.e. is the weight displayed on the balance within the range needed?).			
15. If saturation $< 70\%$ , repeat vacuum procedure using more time and/or vacuum.			
16. If saturation $> 80\%$ , discard specimen.			
17. If degree of saturation is 70-80%, tightly wrap plastic film around puck, place sealed puck in plastic bag along with 10 ml water, seal outer bag and place in freezer for at least 16 hrs.			
18. Remove pucks from freezer and plastic bag; quickly place pucks into hot-water bath for $24 \pm 1$ hrs. (1” of water above surface of specimens); remove plastic wrap as soon as possible.			

19. After 24 ± 1 hrs. in hot-water bath, transfer pucks to warm-water bath for 2 hrs. ± 10 min.			
20. Obtain specimen thickness ( <i>t</i> ) then test each puck in indirect tension; record maximum load for each. Calculate tensile strength for each.			
21. <u>Calculate average tensile strength</u> for conditioned set of pucks ( $S_{\text{conditioned}}$ ).			
22. Calculate TSR: $TSR = \frac{S_{\text{conditioned}}}{S_{\text{dry}}} \times 100\%$ (to nearest whole number)			
Pass?			
Fail?			

Examiner \_\_\_\_\_ Date \_\_\_\_\_

Reviewer \_\_\_\_\_ Date \_\_\_\_\_