

Unit 9 - Week 8

Course outline

How does an NPTEL online course work?

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

● Erosive wear of ultra-high temperature ZrB₂-based ceramic composites

● Computational analysis in assessing wear

● Basics of ceramics coating techniques

● Erosive wear of WC-Co coating

● Abrasive wear of WC-Co coating

Quiz : Assignment 8

Solution For Assignment 8

Text Transcripts

DOWNLOAD VIDEOS

WEEKLY FEEDBACK

Assignment 8

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-25, 23:59 IST.

1) Tendency to form borosilicate phase in ZrB₂-SiC at high temperature increases with

1 point

- increase in SiC content
 decrease in SiC content
 no relation to SiC content

No, the answer is incorrect.
Score: 0

Accepted Answers:
increase in SiC content

2) Though mechanical properties are largely improved, the erosion resistance is slightly improved with the addition of Ti in initial powder mixture used for ZrB₂-SiC composites. This can be attributed to

1 point

- high stresses in the near crater center
 low stresses in the near crater center
 none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
high stresses in the near crater center

3) Select proper relation between inter-splat boundary and mechanical properties of WC-Co coatings

1 point

- a. weak inter-splat boundary reduces elastic modulus
 b. weak inter-splat boundary reduces indentation toughness
 c. weak inter-splat boundary reduces wear
 d. a and b
 e. a, b and c

No, the answer is incorrect.
Score: 0

Accepted Answers:
d. a and b

4) Plasma spray coating requires

1 point

- low temperature and medium particle velocity
 high temperature and medium particle velocity
 high temperature and low particle velocity
 high temperature and high particle velocity

No, the answer is incorrect.
Score: 0

Accepted Answers:
high temperature and medium particle velocity

5) Decarburization in WC-Co coating results in

1 point

- superior mechanical properties and superior wear performance
 superior mechanical properties and inferior wear performance
 inferior mechanical properties and inferior wear performance

No, the answer is incorrect.
Score: 0

Accepted Answers:
inferior mechanical properties and inferior wear performance

6) Select correct statement on the effect of erodent hardness on erosion rate of WC-Co coating

1 point

- Erosion rate increases with increase in hardness of erodent
 Erosion rate decreases with increase in hardness of erodent
 Erosion rate has no relation with hardness of erodent

No, the answer is incorrect.
Score: 0

Accepted Answers:
Erosion rate increases with increase in hardness of erodent

7) Abrasive wear rate of WC-Co coating

1 point

- decreases with increase in ratio of hardness of abrasive particle to hardness of the coating
 increases with increase in ratio of hardness of abrasive particle to hardness of the coating
 does not have any relation with hardness of abrasive particle and hardness of coating

No, the answer is incorrect.
Score: 0

Accepted Answers:
increases with increase in ratio of hardness of abrasive particle to hardness of the coating

8) Match the erodent to dominant erosion mechanisms for WC-Co coating

1 point

Erodent	Dominant erosion mechanism
i. SiO ₂	I. ploughing and microcutting
ii. SiC	II. microchipping
iii. Al ₂ O ₃	III. cracking and delamination

- i-III, ii-II, iii-I
 i-II, ii-I, iii-III
 i-II, ii-III, iii-I
 i-I, ii-II, iii-III

No, the answer is incorrect.
Score: 0

Accepted Answers:
i-II, ii-III, iii-I

9) Abrasive wear rate of WC-Co coating

1 point

- decreases with increase in sub-surface crack zone width
 increases with increase in sub-surface crack zone width
 has no relation with sub-surface crack zone width

No, the answer is incorrect.
Score: 0

Accepted Answers:
increases with increase in sub-surface crack zone width

10) Select proper conditions to assess damage of supersonic aircrafts due to impact of atmospheric debris

1 point

- particle erosion in ambient conditions
 particle erosion in high temperature conditions
 slurry erosion conditions

No, the answer is incorrect.
Score: 0

Accepted Answers:
particle erosion in high temperature conditions