COMMONWEALTH AIRCRAFT CORPORATION

Proprietary Limited

MELBOURNE

MATERIAL SPECIFICATION

CA 385

PLASMA COATING MATERIALS.

1. DESCRIPTION

This specification covers the requirements for plasma spray coatings for use in aircraft and engine applications.

Details for the deposition of these coatings by the Plasma Spray Process are covered by CAP.133.

The coatings are applicable to new design, salvage of production parts and repair at overhaul.

2. CLASSIFICATION

Each coating material is identified by a dash number and the specification has been divided as follows:-

Hardfacing alloys	-1 to -10
Other metals	-11 to -20

3. CONDITION AND FORM

The coatings shall be supplied 'as-fabricated' and in powder form.

4. GRADE AND QUANTITY

Coatings shall be in accordance with the grade and quantity specified on the relevant Purchase Order.

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			C.A.C.	R.A.A.F.		
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PD470C

5. QUALITY

Each coating material shall be uniform in quality, shape, condition, and colour; it shall be dry and free from foreign materials detrimental to its spraying qualities and coating characteristics produced after spraying.

6. COMPOSITION

Chemical purity, in percent by weight, shall be in accordance with the following tables:

(a) TUNGSTEN CARBIDE - COBALT POWDERS

DESIGNATION	IRON		CARBON		COBALT		TUNGSTEN	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
CA.385-1, -2, -3 & -4.	-	2.00	3.60	4.20	11.00	13.00	Remainder	

(b) CHROMIUM CARBIDE/NICKEL-CHROMIUM POWDERS

NOTE: Composition applies to each powder before mixing in the proportions shown.

DESIGNATION	CHROMIUM CARBIDE		NICKEL-CHROMIUM	
	Min.	Max.	Min.	Max.
CA.385-5	74.00	76.00	Remainder	

6. COMPOSITION (Cont'd.)

CHROMIUM CARBIDE POWDERS

DESIGNATION	FREE (1) CARBON		IRON		SILICON		TOTAL CARBON		CHROMIUM	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
CA.385-5	-	0.20	-	0.70	-	0.10	12.75	-	86.00	-

(1) If determined.

NICKEL-CHROMIUM POWDERS

DESIG-NATION	CARBON		MANGANESE		IRON		SILICON		CHROMIUM		NICKEL	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
CA.385-5	-	0.25	-	2.50	-	1.00	-	1.50	18.00	21.00	76.00	80.00

(c) ALUMINIUM POWDERS

DESIGNATION	IRON AND SILICON		COPPER		ZINC		MANGANESE		OTHER IMPS. EACH		OTHER IMPS. TOTAL		ALUMINIUM	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
CA.385-11	-	1.00	-	0.20	-	0.10	-	0.05	-	0.05	-	0.15	99.00	-

(d) NICKEL-ALUMINIUM POWDERS

DESIGNATION	IMPURITIES TOTAL		ALUMINIUM		NICKEL	
	Min.	Max.	Min.	Max.	Min.	Max.
CA.385-12(1)	-	1.00	18.00	22.00	Remainder.	
CA.385-13(2)	-	1.00	4.00	5.00	Remainder.	

(1) Powder particles shall consist of an aluminium core enclosed in a nickel jacket.

(2) Powder particles shall consist of a nickel core enclosed in an aluminium jacket.

7. TECHNICAL REQUIREMENTS

7.1 Particle Size Range

The coatings shall conform, within expected limits, to the following particle size ranges, when tested using an approved method for sieve analysis (e.g. ASTM B 214):

DESIGNATION	PARTICLE SIZE RANGE
CA.385-1	-20 to +5 microns
CA.385-2	-325 mesh
CA.385-3 & -4	-200 to +325 mesh
CA.385-5	Chromium Carbide: -140 to +325 mesh
	Nickel-Chromium: -170 to -270 mesh
CA.385-11 & -13	-170 to +325 mesh
CA.385-12	-170 to +270 mesh

NOTE: - indicates passing sieve

+ indicates retained on sieve

7.2 Plasma Spraying

The powders shall be capable of producing acceptable plasma spray coatings.

8. PACKAGING

The coating materials shall be supplied in sealed containers to protect them against damage or contamination during shipment and storage.

9. STORAGE

The coating materials shall be stored under heated conditions at a temperature of 120°C.

10. PROCUREMENT

The following materials may be purchased for testing to this specification:

DESIGNATION	PROPRIETARY PRODUCT	SUPPLIER
CA.385-1	Plasmalloy 702-E Coating	Overseas - Giannini Scientific Corporation, U.S.A. Local - Brenco Pty. Ltd., Ascot Vale.
CA.385-2	Plasmalloy 702-F Coating	
CA.385-3	Plasmalloy 702-M Coating	
CA.385-4	Metco 71-NS Coating	Brown & Dureau Ltd., South Melbourne.
CA.385-5	Metco 81-NS Coating	Brown & Dureau Ltd., South Melbourne.

10. PROCUREMENT (Cont'd.)

DESIGNATION	PROPRIETARY PRODUCT	SUPPLIER
CA.385-11	Metco 54-NS Coating	Brown & Dureau Ltd., South Melbourne.
CA.385-12	Metco 404-NS Coating	Brown & Dureau Ltd., South Melbourne.
CA.385-13	Metco 450-NS Coating	Brown & Dureau Ltd., South Melbourne.

NOTE: The Metco 'NS' designation refers to the aircraft-quality grade of material.

11. ALTERNATIVE SPECIFICATIONS

CA.385-3 & -4	PWA.1302
CA.385-5	PWA.1307
CA.385-11	PWA.1320
CA.385-12	PWA.1321

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MATERIAL SPECIFICATION

CA.385

AMENDMENT NO. 1

PLASMA COATING MATERIALS

Add APPENDIX 1 to the specification.

A P P E N D I X 1.

Coating Hardness

The following typical 'as-deposited' hardnesses, determined by C.A.C. experience, are given for information only:

C.A.C. DESIGNATION	PROPRIETARY PRODUCT	HARDNESS (HV 300)
CA.385-1	Plasmalloy 702-E	700
CA.385-2	Plasmalloy 702-F	900
CA.385-3	Plasmalloy 702-M	900
CA.385-5	Metco 81-NS	550
CA.385-12	Metco 404-NS	140

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