Table 1. Chemical composition (at.% & wt.%) of cast WT-3 as supplied by the manufacturer

Element	Co	Cr	W	C	Fe	Ni	Si	Mn
at.%	47.3	31.7	3.9	9.7	2.4	2.1	2.6	0.3
wt.%	49.7	29.5	12.6	2.1	2.4	2.1	1.3	0.3

Table 2. EDX analyses of the proportion of metallic elements in the three main phases in WT-3 (at.%) taken from bulk specimen.

Element	Composition (at.%)		
	Co-rich matrix	Cr-rich carbide	W-rich carbide
Si	2.3	0.7	8.3
Cr	25.0	82.1	29.2
Fe	3.1	1.0	1.1
Co	63.8	12.5	34.5
Ni	2.7	0.4	1.3
W	3.1	3.3	25.6
Total	100.0	100.0	100.0

Table 3. EDX analysis of the elements present in the different regions of the thin foil as indicated in Figure 6 (at.%)

Element	Composition (at.%)				
	Co-rich matrix	Cr-rich carbide	Interfacial oxide	Oxide on surface of Co-rich matrix	Oxide on surface of Cr-rich carbide
O	4.5	7.6	55.9	47.9	33.0
Si	2.5	0.0	1.4	12.7	10.6
Cr	19.4	74.5	23.2	14.8	35.7
Fe	3.1	1.2	9.3	9.9	5.6
Co	63.0	12.4	6.8	12.1	12.0
Ni	1.9	0.1	1.8	2.0	1.2
W	5.6	4.1	1.7	0.7	1.8
Total	100.0	100.0	100.0	100.0	100.0

Table 4. EDX analysis of the interfacial oxide as indicated in Figure 9(b)

Oxide	at. %
O	57.1
Si	1.1
Cr	24.0
Fe	3.8
Co	10.9
Ni	1.4
W	1.6

Table 5. Ring information from the SADP of the interfacial oxide (Figure 9c) compared with that for pure $CoCr_2O_4$ (JCPDS 022-1084)

Ring	measured d spacing (nm)	Miller indices (hkl)	a (nm)	a(nm) (average)	a(nm) ($CoCr_2O_4$)
R1	0.2615	3 1 1	0.867	0.8584	0.8364
R2	0.2120	4 0 0	0.848		
R3	0.1520	4 4 0	0.860		

Table 6. EDX analysis of the elements present in the different regions of the thin foil (Figure 11)

Element	Composition at.%	
	W-rich carbide	Co-rich matrix
Si	6.9	1.8
Cr	28.9	23.4
Fe	1.3	3.3
Co	33.1	65.6
Ni	1.2	2.3
W	28.6	3.6
Total	100.0	100.0