

CoA/M/MP-26



3 8006 10059 2875

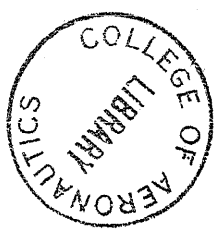
ST. NO.  
U.D.C. R 30513  
AUTH.

CoA Memo M. and P. No. 26

April, 1964

THE COLLEGE OF AERONAUTICS

DEPARTMENT OF PRODUCTION AND INDUSTRIAL ADMINISTRATION



TEST REPORT NO. PLB0/9

Comparison of PERPRO tools RD92 against Sanvik S1P  
under roughing conditions

SUMMARY

Tools of grade RD92 and S1P were tested to 0.030 in. flank wear when machining EN9 at 300 fpm with 0.030 in/rev. feed and 0.10 in. depth of cut. The results showed that while there was no significant difference in tool life between the two grades, RD92 suffered greater crater wear and nose deformation than did S1P.

R  
30513

Test conditions

The following conditions were used during the tests:-

Work material: EN 9  
Cutting speed: 300 fpm  
Depth of cut: 0.10 in.  
Feed: 0.030 in/rev.

and the tools used were:-

S1P NT 179	RD92 NT 173
S1P NT 180	RD92 NT 176
S1P NT 181	RD92 NT 177
S1P NT 182	

Test results

The flank wear was measured at suitable intervals as in figure 1 and the results are given in Tables 1 - 7.

Figure 2 shows the growth of the flank wear of the two grades and figure 3 shows Tallysurf records of the crater wear at the end of the tests.

From figure 2 it is evident that although S1P gave a slightly longer life than RD92 there was no great difference between the two grades. The tabulated results, however, show that the wear scar of S1P was greatest at the depth of cut but with RD92 the greatest wear was nearer the tool point. There was also more deformation at the tool nose with RD92. The Tallysurf records, figure 3, show that the crater wear was greater with RD92 than with S1P.

Photographs of the flank and crater wear are given in figure 4 - 7.

[During the tests a number of tips of both grades chipped at the nose radius but this was caused by a fault on the lathe rather than a fault in the tips].

Conclusions

The results showed that there was no significant difference in tool life between S1P and RD92, under the cutting conditions investigated, although the wear pattern was different and RD92 suffered greater nose deformation and crater wear.

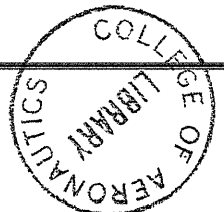




Table 2

Tool: NT 180                      Cutting speed: 300 fpm  
Work material: EN 9                Depth of cut: 0.10 in.  
Feed: 0.030 in/rev.                Date: 6/2/64

---

TIME min	FLANK WEAR			DEFORM- ATION	HARDNESS vpn	REMARKS
	Fa	Fb	Fc			
6	.0125	.0035	.006		260	
12	.014	.0055	.008			
18	.0145	.0055	.008		242	new bar
24	.015	.0065	.008			
30	.015	.007	.010			
36	.015	.0085	.013		253	new bar
42	.015	.0085	.016			
48	.016	.0085	.0165			
54	.016	.0085	.017			
60	.0165	.009	.0205	.0005		
66	.0165	.009	.023	.0005		
72	.0165	.009	.024	.0005		
78	.0165	.0095	.0255	.001		nose broke as a result of lathe slowing down.

---

Table 3

Tool: NT 181  
Work material: EN 9  
Feed: 0.030 in/rev.

Cutting speed: 300 fpm  
Depth of cut: 0.10 in.  
Date: 6/2/64

---

TIME min	FLANK WEAR			DEFORM- ATION	HARDNESS vpn	REMARKS
	Fa	Fb	Fc			
6	.0025	.0025	.0025		260	
12	.0035	.005	.006			
18	.004	.006	.010		242	new bar
30	.005	.006	.010			
42	.006	.0065	.014			
54	.0075	.0075	.016	.001		
60	.0075	.008	.017	.001		
66	.009	.010	.018	.001		
72	.009	.010	.020	.001	249	
84	.0095	.0105	.021	.001		Nose chipped due to lathe slowing down.

---

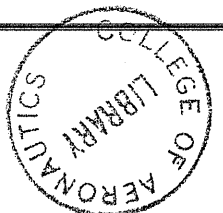




Table 5

Tool: NT 173  
Work material: EN 9  
Feed: 0.030 in/rev.

Cutting speed: 300 fpm  
Depth of cut: 0.10 in.  
Date: 23/1/64

---

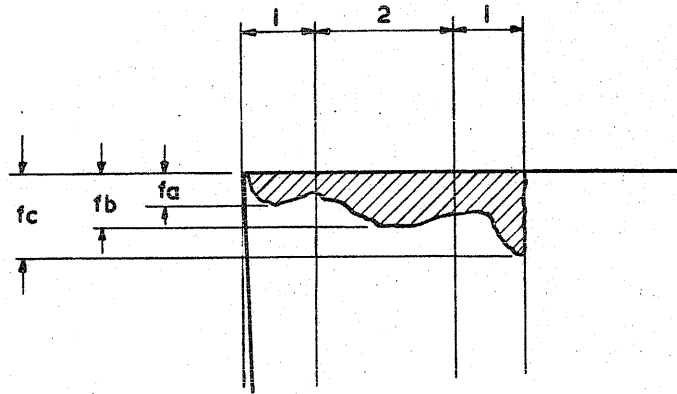
TIME min.	FLANK WEAR			DEFORM- ATION	HARDNESS vpn	REMARKS
	Fa	Fb	Fc			
3	.0035	.003	.0035	.0015		
6	.0035	.003	.0035	.0015		
12	.005	.006	.005	.002	274	
18	.006	.007	.006	.002		
24	.007	.007	.006	.002		
30	.008	.008	.0065	.0025		
36	.010	.0125	.0075	.004		
42	.0115	.013	.0085	.004	235	new bar
48	.0125	.014	.010	.004		
54	.0135	.0145	.014	.004		
60	.014	.015	.0165	.004		
66	.014	.016	.019	.004		
72	.015	.016	.0195	.0045		
78	.018	.021	.020	.006		
84	.023	.0245	.020	.0065		
90	.0275	.029	.0205	.0065		
96	.0315	.0325		.0085		

---









FLANKWEAR MEASUREMENT

FIG. 1

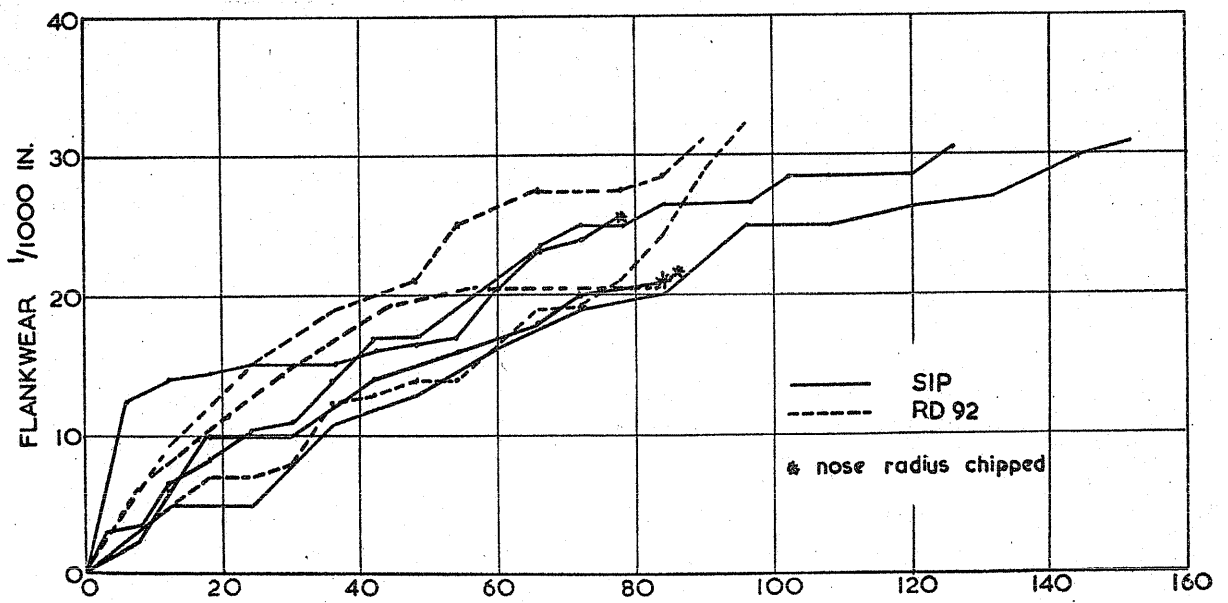


FIG. 2. CUTTING TIME - MIN.

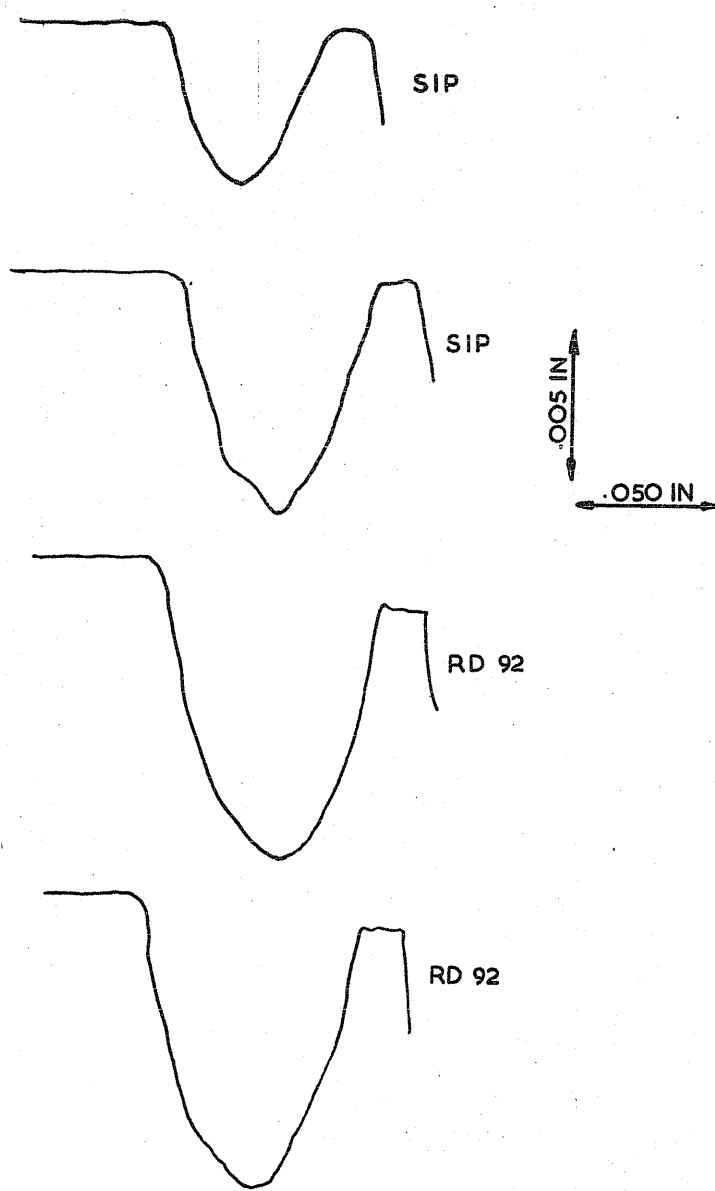
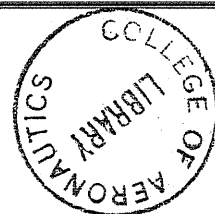
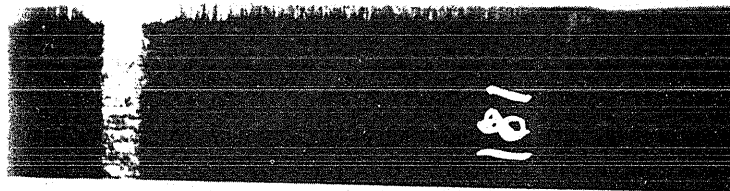
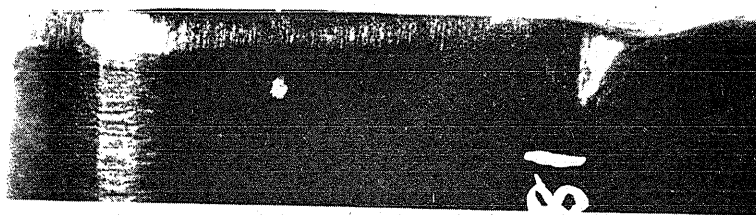


FIG. 3. CRATER WEAR

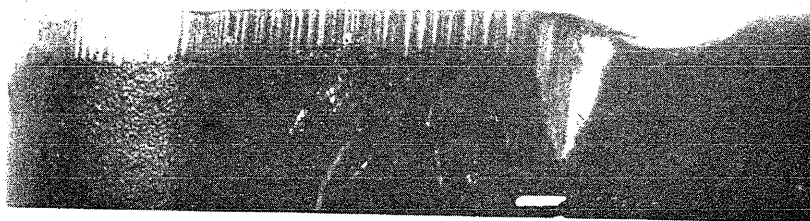




A



B



C

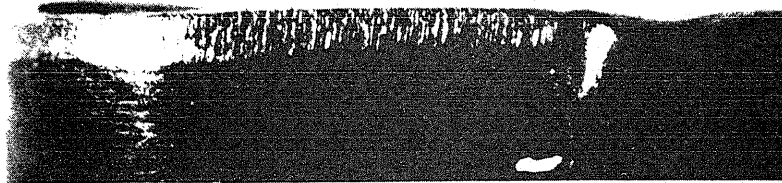
Fig. 4 Flankwear grade SIP  
A .010 in wear  
B .020 in wear  
C .030 in wear

---

A



B



C

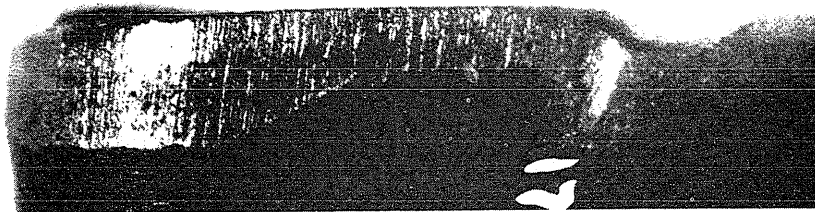
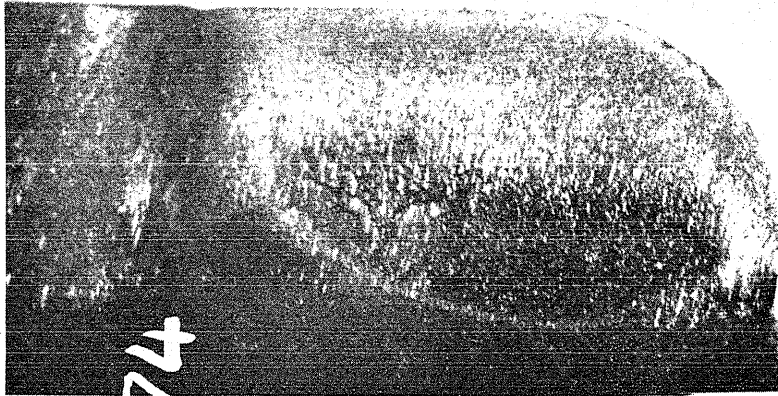
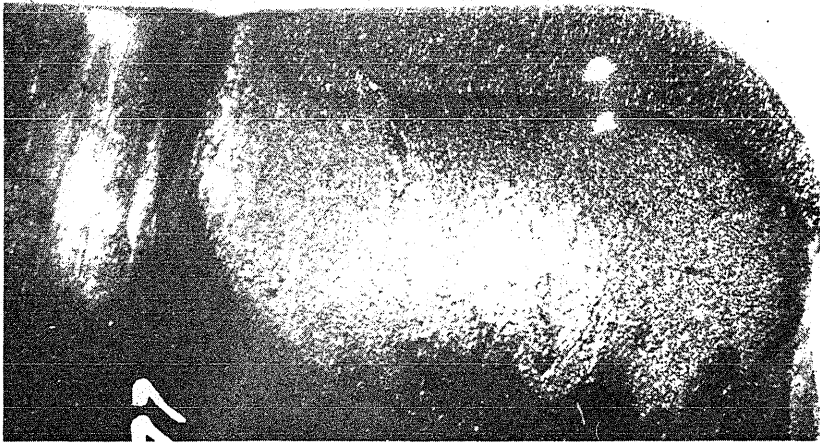


Fig. 5 Flankwear grade RD92  
A .010 in wear  
B .020 in wear  
C .030 in wear





A



B



C

Fig. 7 Crater wear grade RD92

Corresponding to    A .010 in flankwear  
                              B .020 in flankwear  
                              C .030 in flankwear

