

Through information received from questionnaires to 45 Swedish pulp bleaching plants on material performance in service and spool tests JERNKONTORET<sup>1</sup> established that the only alloys not attacked by corrosion were Hastelloy C-276 and titanium grades 2 and 7.

In more recent trials<sup>2</sup> in the USA and Canada a test spool programme was carried out comparing 24 stainless steel and nickel base alloys with two titanium alloys in 38 different bleach plant environments. The most aggressive environments encountered had pH values as low as 1.4 and chloride levels of 5500 p.p.m. operating at temperatures of 70°C. On the exposed surfaces the ranking for pitting resistance of the more commonly encountered alloys is given in Table 8 :

Table 8

Rank	<u>Alloy</u>	<u>Total Pitting</u> <u>Depth (mil)</u>
1	Hastelloy G	Nil
1	Inconel 625	Nil
1	Hastelloy C 276	Nil
1	Titanium Grade 2	Nil
11	254 SMO	86
17	904L	250
19	Incoloy 825	311
23	317L Stainless Steel	690
25	316L Stainless Steel	1158

It can be seen that the high nickel alloys and titanium were unattacked and the ranking order for the stainless steel was in accord with the levels of alloying elements added to improve pitting resistance (chromium, molybdenum and nitrogen).

In the more severe conditions under the Teflon washers on the test spools the ranking order was similar but only titanium remained free from pitting in all of the locations :

Table 9

Rank	<u>Alloy</u>	<u>Total Pitting</u> <u>Depth (mil)</u>
1	Titanium Grade 2	Nil
2	Hastelloy C-276	1
3	Inconel 625	20
5	Hastelloy G	30
12	254 SMO	111.5
14	Incoloy 825	171
19	904L	223
22	317L Stainless Steel	288
25	316L Stainless Steel	415