Contaminant Adhesion to Various Materials

The surface finish of graphite materials may be a concern to customers considering the use of graphite condensers in pharmaceutical synthesis plants.

When considering the potential for drug contamination, the particles' ability to adhere to the contact surface is generally more decisive than the surface finish. A material's adhesion resistance (non-stick quality) can be determined by its "adhesive angle".

Comparison testing has been carried out by the process development department of a large international pharmaceutical company in Germany. The results are as follows:

Material	**Average Adhesive Angle**
IMPREGLON Tempocoat 3053 coating	21,6
GUTBROD DFP (PFA, 3 layers) green coating	23,7
GUTBROD EDLON PFA SC 7005 coating	25,3
Graphite (resin-impregnated)	**29,0**
Stainless steel, polished to 6.3 nm	31,6
Glass-lined steel PK 311	35,3
Stainless steel, electro-polished to 6.3 nm	35,7
IMPREGLON lacquer coating	36,0
Glass-lined steel K 911	36,6
Stainless steel, glass bead blasted	37,3

Summary

The favorable 'adhesive angle' of resin impregnated Graphite (better than polished stainless steel and glass-lined steel) helps to ensure minimal surface contamination. These test results confirm the long experience of our customers.

Graphite annular groove condensers with a GMP design are also suitable for the final stages in pharmaceutical synthesis (also see our GMP documentation).

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