



## Summarized Design Comparison Between Copper Nickel versus Stainless Steel

Over the past 40 years Aircraft Appliances and Equipment Limited (AAE) has made a number of improvement recommendations to the shipyards and to the U.S. Navy. One of these recommendations included changing the material used in the Aircraft/Helicopter fuel systems used on board U.S. Navy Vessels from Copper Nickel to Stainless Steel. After AAE's recommendation, the U.S. Navy initiated a study for its newest Aircraft Carrier ship and concluded that Stainless Steel could be used for shipboard aircraft refueling systems instead of the traditional Copper Nickel. AAE has since supplied numerous ship programs with Stainless Steel Filter Separators thus eliminating Copper Nickel Contamination in the fuel system as well as a significant savings in both weight and cost.

Below is a chart that provides a comparison between the materials:

<b>Properties</b>	<b>Stainless Steel</b>	<b>Copper Nickel</b>
Minimum Tensile Strength in ksi	95	45
Minimum Yield Strength in ksi	38	15
Allowable Stress in ksi	19.3	12.0
Cost	\$2.25/LB	\$6.50/LB
Fabrication Cost in x Units	\$1.00 x Unit	\$1.30 x Unit
<b>JP-5 Filter Separator</b>		
Weight Reduction	20-30% Lighter than Copper Nickel	
Cost Reduction (Filter Separator Unit)	20-25% less expensive than Copper Nickel	