

GENERAL INFORMATION

Alloys for heaters make special group of alloys which differ in combination of heat resistance and high electric resistance. It is necessary to admit such combination as rare, because achievement of each of specified properties separately is a difficult task.

Heat resistance is the most important parameter, which is predetermining service durability of heaters. More strict requirements are imposed on heat resistance of alloys for heaters, than to structural steels and alloys, namely, it is necessary more high working temperature – up to 1400°C.

SPECIALTY OF NICHROME

Nichroma – generalizing name of a class of the nickel-based alloys intended for manufacture of resistors and heating elements.

Nichrome Nichroma®80H, Nichroma®80, Nichroma®70, Nichroma®60 and Nichroma®30 have high specific electric resistance and are used in electroheating furnaces for all industries, in furnaces for annealing and drying, in household appliances and thermal action devices. Nichrome has the increased thermal stability, ductility and shape stability.

Advantages of alloy Nichroma®30 are lower price and rather low density (7,9 g/cm³), that allows to save up to 6% on weight. Operation temperature and corrosion resistance in the air environment, vacuum, oxidizing, carbon and nitrogen environments, nitrogen, ammonia, humid air, etc. isn't worse than at more expensive grade. Excellent resistance in sulfurous atmosphere and sulfur compounds atmosphere. The maximum working temperature – 1100°C. It is recommended to use Nichroma®30 alloy for production of heating elements and household heating appliances and also in furnaces and various electric devices of thermal action, which don't demand maximal working temperatures.

Classification	
DIN	1.4860, NiCr3020
UNS	N06004

Chemical composition, %				
Ni	Cr	C	Mn	Si
30.0-31.0	19.5-21.5	≤0.06	≤1.0	1.8-3.0
Fe	Cu	Al	REE	
rest	≤0.5	≤0.3	≤0.1	

Mechanical properties at 20°C	
Diameter, mm	Elongation, %, not less
0,12 – 0,5	18
0,5 – 1,00	18
1,0 – 12,0	25

CREEP CHARACTERISTICS	
Temperature, °C	Creep resistance, 10 ⁻⁶ /K
600	80
800	15
1000	4

PHYSICAL PROPERTIES		
Temperature, °C	Resistance μΩm	Exten. 10 ⁻⁶ /K
20	1,04	-
200	1,11	15,0
400	1,17	16,0
500	1,20	-
600	1,22	17,0
800	1,26	18,0
1000	1,30	19,0
1200	1,32	-

PROCESSING PROPERTIES	
Melting point	1390°C
Density	7.9 g/cm ³
Heat conductivity	13,0 W/m·K
Elastic modulus	200 KN/mm ²
Maximal work temperature	1100°C
Operating time	4300 hours

APPLICATION
Heating elements of electric calcination furnaces, electrical household appliances, resistance elements