Thermalloys AB

Heat resistance

The heat resistance of FeCrAl, FeCrNi and CrNi alloys is shown in this table. The temperature limits listed, °C/°F, are those temperatures where the protecting oxide starts to fall off-the scaling temperature. Even if the materials can be used at these temperatures, use at lower temperatures prolonges the service life.
Kanthal APM is manufactured using powder metallurgy, hence the improved hot strength as compared to the other FeCrAl alloys.

Properties/Ranking	Less good	Good	Very good	Better	Best
Hot strength, T>600C/1112F	Kanthal AF, A1, D Tp 446		Alloy 600 Tp 310 Kanthal APM		Alloy 800HT 253MA Alloy 601
Oxidation resistance in dry air	Tp 309, 1050° C/1922F Alloy 800HT, 1050° C/1922F	Tp 446, 1100° C/2012F Alloy 600, 1100° C/2012F	253MA, 1150° C/2102F Alloy 601, 1150°C/2102F Tp 310, 1150°C/2102F		Kanthal APM, 1425° C/2600F Kanthal A1, 1400°C/2552F Kanthal AF, 1300° C/2372F Kanthal D,1300°C/2372F
Oxidation resistance in moist air	Tp 309, 900° C/1652F Alloy 800HT, 900° C/1652F	Tp 446, 950° C/1752F Alloy 600, 950°C/1752F	253MA, 1000° C/1832F Alloy 601, 1000°C/1832F Tp 310, 1000°C/1832F		Kanthal APM, 1200° C/2192F Kanthal A1, 1200°C/2192F Kanthal AF, 1200° C/2192F Kanthal D, 1200°C/2192F
N2, nitrogen from an oxygen plant	Tp 446, 650° C/1202F Tp 309, 650°C/1202F	253MA, 750° C/1382F Tp 310, 800°C/1382F	Alloy 600, 1000° C/1832F Alloy 601, 1000°C/1832F Alloy 800HT, 900°C/1652F	Kanthal APM, 1050° C/1922F Kanthal A1, 1050°C/1922F Kanthal AF, 1100° C/2012F Kanthal D, 1000°C/1832F Not preoxidized	Kanthal APM ,1200° C/2192F Kanthal A1, 1200°C/2192F Kanthal AF, 1200° C/2192F Kanthal D, 1200°C/2192F Preoxidized
Ar, Argon	Tp 446, 950° C/1752F Alloy 800HT, 950° C/1752F Alloy 600, 950° C/1752F	253MA, 1000° C/1832F Alloy 601, 1000° C/1832F Tp 310, 1000°C/1832F			Kanthal APM, 1425° C/2600F Kanthal A1, 1400°C/2552F Kanthal AF, 1300° C/2372F Kanthal D, 1300°C/2372F
Exothermic gas: 10CO, 15H2, 5CO2, 70N2	Tp 446	253MA, 850° C/1562F Tp 310, 850°C/1562F	Alloy 800HT, 950° C/1752F	Alloy 601, 1000° C/1832F Alloy 600, 1000°C/1832F	Kanthal APM, 1150° C/2102F Kanthal A1, 1150°C/2102F Kanthal AF, 1150° C/2102F Kanthal D, 1100°C/2012F
Endothermic gas: 20CO, 40H2, 40N2	Tp 446	253MA, 700° C/1292F Tp 310, 750°C/1382F	Alloy 601, 900° C/1652F Alloy 600, 900°C/1652F Alloy 800HT, 800°C/1472F	Kanthal D, 1000° C/1832F	Kanthal APM, 1050° C/1922F Kanthal A1, 1050°C/1922F Kanthal AF, 1050° C/1922F
H2, hydrogen, dewpoint<-50	Tp 446, 900° C/1652F	253MA, 1000° C/1832F Alloy 800HT, 1000°C			Kanthal APM, 1425° C/2600F Kanthal A1, 1400°C/2552F Kanthal AF, 1400° C/2552F Kanthal D, 1300°C/2372F
Vacuum, 10-3 torr					Kanthal APM, 1150° C/1922F Kanthal A1, 1150°C/1922F Kanthal AF, 1200° C/2192F Kanthal D, 1100°C/2012F
Oxidizing SO2, SO3-containing gas *		Alloy 800HT, 600° C/1112F	253MA, 900° C/1652F Tp 446, 950°C/1752F Tp 310, 950°C/1752F		Kanthal APM, 1200° C/2192F Kanthal A1, 1200°C/2192F Kanthal AF, 1200° C/2192F Kanthal D, 1150°C/2012F
Reducing sulfur containing gas		253MA, 650° C/1202F Alloy 800HT, 600° C/1112F Tp 310, 650°C/1202F	Tp 446, 700° C/1292F		Kanthal APM, 1025° C/1877F Kanthal A1, 1025°C/1877F Kanthal AF, 1025° C/1877F Kanthal D, 1000°C/1832F
Molten metals; Cu **, Zn, Mg		253MA	Kanthal APM, A1, AF, D SS2322		Thermalloys CMA
Molten aluminum	Metallic materials dissolve!				Thermalloys CMA
Cracked ammonia			253MA, 750° C/1382F SS2361, 800°C/1382F	Alloy 800HT, 900° C/1652F Kanthal APM, 900°C/1652F Kanthal A1, 900° C/1652F Kanthal AF, 900°C/1652F Kanthal D, 900° C/1652F	Alloy 601, 1000° C/1832F Alloy 600, 1000°C/1832F

* Under deposits, conditions may be reducing
** Nickel containing alloys are rapidly attacked
Since a number of process parameters do influence the materials behaviour, the information given above are only to be considered as guidelines, not as guaranteed values.