

**MATERIAL SAFETY DATA SHEET**
  
 IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION HAZARD COMMUNICATION STANDARD #29 C.F.R. 1910.1200

**SECTION I – PRODUCT DESCRIPTION**

**PRODUCT IDENTIFICATION – HASTELLOY X**
  
**COMMON NAME / GRADE - HAST X**

**SECTION II – HAZARDOUS INGREDIENTS**

BASE METAL, ALLOYING ELEMENTS, METALLIC COATING	% COMPOSITION BY WEIGHT (a)	CAS #	ACGIH TLV (mg/m <sup>3</sup> ) (b)
<b>BASE METAL</b>			
NICKEL (Ni)	47	7440-02-0	METAL, INHALE 1.5 <sub>s</sub> , Insoluble compounds as Ni: 0.2 <sub>s</sub> Soluble compounds as Ni :0.1 <sub>s</sub>
<b>ALLOYING ELEMENTS</b>			
ALUMINUM (Al)	0.5 MAX	7429-90-5	Welding fume as Al:5
BARON (B)	0.008 MAX	7440-42-8	METAL: NONE; OXIDE DUST TOTAL: 10
COLUMBIUM (Cb) + NIOBIUM (Nb)	0.5 MAX	7440-03-1	Nne
COBALT (Co)	1.5	7440-48-4	Elemental and Inorganic compounds as Co 0.02
COPPER (Cu)	0.5 MAX	7440-50-8	Dust and Mist as Cu:1; Fume:0.2
CHROMIUM (Cr)	22	7440-47-3	Metal and Cr III compounds as Cr:0.5; Water soluble Cr VI compounds as Cr: 0.05; Insoluble Cr VI compounds as Cr 0.01
IRON (Fe)	18	7439-89-6	Oxide dust and fume as Fe: 5
MANGANESE (Mn)	<1	7439-96-5	Elemental and Inorganic compounds as Mn :0.2
MOLYBDENUM (Mo)	9	7439-98-7	Insoluble compound as Mo: 3; Soluble compound as Mo:0.5
SILICON (Si)	<1	7440-21-3	10
TITANIUM (Ti)	0.15 MAX	7440-32-6	Total Oxide:10
TUNGSTEN (W)	0.6	7440-33-7	Insoluble compounds as W: 5 (STEL: 10) ; Soluble compounds as W: 1 (STEL: 3)

(a) % of alloying materials varies with grade of material – (b) 1965-1966 ACGIH threshold limit value.

**SECTION III – PHYSICAL DATA**

Material is (at normal conditions) – SOLID	Appearance and Odor – Appearance : varies - Odorless
Melting Point– ~2300	Specific Gravity - 0.297

**SECTION IV – FIRE AND EXPLOSION DATA**

Extinguishing media – Dry chemical powders, salt or inert gas – Do not use water or liquid explosion hazard could result  
 Special fire fighting procedure – If ignitable waste is generated. Special precautions and firefighting procedures should be followed ; Keep work areas free of the waste, store wet and keep away from heat and open flame – maintain humidity above 50% to prevent an electrostatic build-up. No smoking in area, use non-sparkling metal equipment.

**SECTION V – HEALTH HAZARD DATA**

Steel products in the natural state do not represent an inhalation, ingestion, or contact hazard. However, operations such as burning, welding, sawing, brazing, and grinding may release fumes and/or dust, which may present health hazard.

**SECTION VI – REACTIVITY DATA**

Stability – STABLE	Incompatibility (Material to avoid) - None
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**SECTION VII – SPILL, LEAK OR DISPOSAL PROCEDURE**

**SECTION VIII – SPECIAL PROTECTION INFORMATION**

Local exhaust ventilation should be utilized when welding, burning, grinding, or machining, NIOSH/MSHA approved dust and fume respirator should be used to avoid excessive inhalation of particulates, when exposure exceeds TLV's. Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by the welding standards.

*Our materials have not come in contact with Mercury, while at our facility.*