

MOLYCOP

CRUSH AND GRIND

ROD MILLING TECHNICAL SPECIFICATIONS

HEAT TREATED RODS

MOLYCOP.COM

HEATED TREATED RODS

TECHNICAL SPECIFICATIONS

Molycop is a major supplier of grinding media to the mining industry.

HTR50 GRADE

The Molycop HTR50 grade is described below; a comparison to a standard “as-rolled” 1090-grade grinding rod is also included.

1090 GRADE

The 1090 grade has the chemical requirements of AISI 1090. The as-rolled 1090 grade has a typical through hardness of 30 Rc (see comparison information below).

PRODUCT SPECIFICATIONS

1. Minimum surface hardness of 50 Rc
2. Straightness of 1/2” over the length of the bar
3. Chemistry requirements
4. Quenching parameters

CHEMISTRY

Molycop HTR50 chemistry ranges are designed to achieve consistent hardenability factors.

Having consistent hardenability factors result in uniform hardness properties after heat-treatment. The hardenability factors and heat-treat parameters are designed to produce a hardness profile that has a high surface hardness (for increased wear) with a lower hardness core (for increased toughness). Molycop’s HTR50 grinding rod chemistry is as follows.

TYPICAL RESULTS

Following production, Molycop performs periodic hardness measurements of the Molycop HTR50 bars with the following average results:

1. Surface - 54 Rc
2. 1/2” below surface - 47 Rc
3. Core - 39 Rc
4. Annealed ends – less than 35 Rc
5. Average volumetric hardness - 45 Rc
6. Hardness profile – see Comparison section

HAZARD IDENTIFICATION

Heat Treated Grinding Rods often contain shards or “bear-claws” (partially) attached to the annealed ends. These pose a cutting/laceration hazard when painting and handling bundles. Proper personal protective equipment is to be used when working with processed Grinding Rod.

Chemistry - HTR50							
C		Mn		Si		P	S
MIN	MAX	MIN	MAX	MIN	MAX	MAX	MAX
0.60	1.00	0.60	1.00	0.10	0.40	-	-

(Cu, Ni, Cr, and Mo are present in residual amounts only)

Chemistry - 1090							
C		Mn		Si		P	S
MIN	MAX	MIN	MAX	MIN	MAX	MAX	MAX
0.85	0.98	0.60	0.90	0.15	0.35	0.040	0.050

(Cu, Ni, Cr, and Mo are present in residual amounts only)

The above is intended as a guide only. Individual ball hardness readings may fall outside the range listed above.

GRINDING ROD COMPARISONS

Heat Treated rods contain lower carbon and higher alloy levels than 1090 rods. The heat-treated rods consist of a hard tempered martensite case with a tough bainite/pearlite core.

The higher hardness rods reduce mill consumption significantly. Molycop HTR50 mill trials have shown consumption decreases of approximately 20% - 25% over 1090 rods.

SUPPLY AND QUALITY GUARANTEE

Long established strategic relationships with local and foreign raw material suppliers allow us to ensure all balls supplied to our customers are made from the highest quality products and meet strict Molycop specifications. This combined with our global manufacturing network gives our customers the confidence in the quality of the product that only Molycop is able to assure.

PACKAGING OPTIONS

Molycop heat treated grinding rods can be supplied in strapped bundles with bundle weights or rod counts to suit individual customer requirements. The product can be transported in bulk by open top trucks or in standard 20ft containers.

If you require grinding media for your operations, or just want more information, we're here to answer any of your questions.

Contact us today for more information
www.molycop.com

