



NEWS VIEWS

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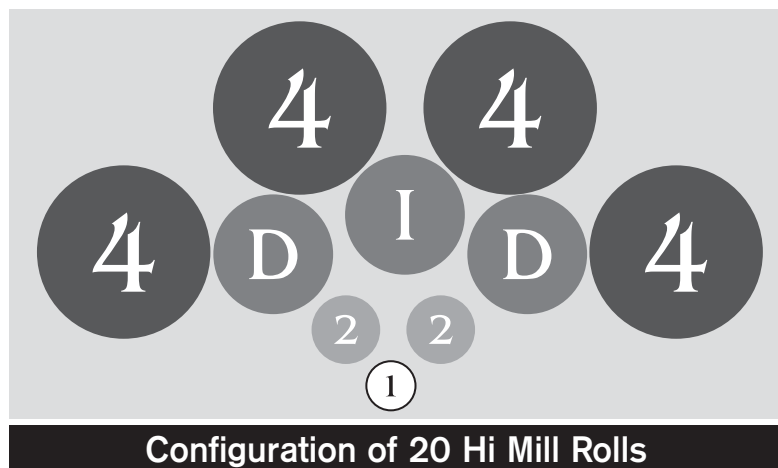
Determination to Establish Excellence
Through Efficiency and Expertise



20 Hi Mill Rolls

20 Hi Mills are unique in feature as they have chockless floating work rolls and a cluster configuration for the back-up bearings. Configuration of 20 Hi Mill Rolls is given below.

- 1 = Work Roll
- 2 = Intermediate Roll
- D = Drive Roll
- I = Idler Roll
- 4 = Back Up Bearings



It constitutes of 2 work rolls, 4 intermediate rolls, 2 idler rolls, 4 drive rolls and 8 back up bearings. 20 Hi Mills are superior on following aspects.

1. Gauge accuracy
2. Thickness uniformity
3. Proper surface
4. Good productivity
5. Minimum mill setting time
6. Lesser maintenance
7. Both ferrous & non-ferrous materials can be rolled.
8. Rolls are small in diameter hence smaller grinder is required for re-grinding.

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Dee Tee stands for total quality movement

Different materials and hardness are used in 20 Hi Mill rolls. The hardness and the raw material of rolls depends upon various application of mills. General steel grades and hardness of 20 Hi Mill rolls are-

Rolls	Steel Grades	Hardness Range
Work Rolls	AISI D-2	60/64 Rc
	AISI M-2	61/65 Rc
	AISI M-1	61/65 Rc
	AISI M-35	62/65 Rc
	ASP - 2023	61/67 Rc
	ASP - 2030	61/67 Rc
Intermediate Rolls	SPZ (H-11 M)	55/60 Rc
	AISI H-13	53/56 Rc
	AISI H-12	54/57 Rc
	AISI D-2	55/60 Rc
Drive Rolls	SPZ (H-11 M)	55/60 Rc
	AISI H-13	53/56 Rc
	AISI H-12	54/57 Rc
	AISI D-2	55/60 Rc
Idler Rolls	SPZ (H-11 M)	55/60 Rc
	AISI H-13	53/56 Rc
	AISI H-12	54/57 Rc
	AISI D-2	55/60 Rc

Chemical composition of material used to make rolls is as following :

	C %	Si %	Mn %	Cr %	Mo %	V %	W %	Co %
AISI D-2	1.4-1.6	0.3-0.5	0.3-0.5	11-13	0.7-1.2	0.7-1.0		
SPZ (H-11 M)	0.4-0.45	0.8-1.2	0.25-0.5	4.75-5.5	1.25-1.5	0.3-0.5		
AISI H-13	0.3-0.4	0.8-1.2	0.2-0.4	4.75-5.5	1.25-1.75	0.8-1.2		
AISI H-12	0.3-0.4	0.8-1.2	0.2-0.4	4.75-5.5	1.25-1.75	0.1-.5	1.0-1.7	
AISI M-2	0.78-0.88	0.2-0.4	0.2-0.4	3.75-4.5	4.5-5.5	1.6-2.2	5.5-6.75	
AISI M-1	0.75-0.85	0.2-0.4	0.2-0.4	3.75-4.5	7.75-9.5	0.9-1.3	1.15-1.85	
ASP 2023	1.28			4.0	5.0	3.1	6.4	
ASP 2030	1.28			4.0	5.0	3.1	6.4	8.5

Heat Treatment of 20 Hi mill rolls :

Heat treatment of rolls is carefully done in gas fired neutral salt bath furnaces. The advantages of salt bath are, superior temperature uniformity, lesser surface oxidation and scale formation. The uniformity of microstructure through the entire length and section comes from accuracy of temperature and precise residence time in the salt bath. At DeeTee we maintain accuracy of furnaces within +/- 5 Degree. They are Austenitized to suitable temperature; residence time in the bath depends on the section and composition of material. Rolls are then quenched suitably to attain the desired mechanical properties/hardness. Rolls are multiple tempered to required hardness. Hardness is checked at extreme ends and at the middle by Indentation type testers as well as Equotip tester.

Sub-zero / Cryogenic Treatment :

While heat treating work rolls, some amount of austenite is retained after heat treatment which gives softness in the microstructure of rolls. To reduce retained austenite and to convert the same into martensite, sub-zero treatment is recommended.

In sub-zero treatment, work rolls are hardened as per normal HT cycle. After initial tempering they are cooled to sub-zero temperature i.e. between -70°C / -80°C . At this temperature retained austenite is transformed to martensite. Rolls are held at this temperature for 6 to 8 hours. Finally rolls go through tempering cycle to achieve suitable hardness. Due to stabilisation of metal, stresses and strains are removed and better life is obtained. Sub-zero treatment is much useful to D2 / D3 steels and also for High Speed Steels.



Cryogenic treatment is done by evaporation of liquid nitrogen, where temperature goes down to -185°C . After this treatment rolls are allowed to come to room temperature and then multiple tempered for required hardness.

Hardness by Sub-zero / Cryogenic treatment increases by 1/2 HRC.



Benefits of Sub-zero treatment :

1. Life of roll increases.
 2. Soft spots are reduced.
 3. Wear resistance improves.
 4. Dimensional stability is achieved.
 5. Higher hardness is achieved.
 6. Less susceptible to surface cracks.
 7. Stable and compact micro structure is obtained.
 8. Longer runs and better polishability of rolls.
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Tools WHICH LAST LONGER - *Slitting Line Tooling, Tube/Section Mill Rolls, Tube Cut Off Knives, Cold Rolling Mill Rolls, Leveller Rolls, Fins, Steel Centers, Friction Saws, Shear Blades, H.S.S. Saws, C.T. Saw Bodies & 20 Hi Mill Rolls.*

