

**Table 1: DGMS standard for a permissible limit of ground vibration.  
(Technical Circular Number 7 Dated 29/08/1997)**

Type of structure	PPV in mm/s at the foundation level of structure at the Dominant excitation frequency, Hz		
	< 8 Hz	8-25 Hz	> 25 Hz
<b>(A) Buildings/structures do not belong to the owner</b>			
1. Domestic houses/structures (Kuchcha, brick and cement)	5	10	15
2. Industrial buildings	10	20	25
3. Objects of historical importance and sensitive structures	2	5	10
<b>(B) Buildings belonging to mine owner with a limited span of life</b>			
1. Domestic houses/structures	10	15	25
2. Industrial buildings	15	25	50

**Table 2: US Bureau of Mines standard of damage due to air overpressure**

Over-pressure (dB)	Over-pressure (KPa)	Air Blast Effects
177	14.00	All windows break
170	6.00	Most windows break
150	0.63	Some windows break
140	0.20	Some plate glass windows may break and rattle
136	0.13	USBM interim limit for allowable air blast
126	0.05	Complaints likely

**Table 3: Perceptible limits of continuous vibration levels**

Approximate vibration levels (mm/s)	Degree of perception
0.10	Not felt
0.15	Threshold of perception
0.35	Barely noticeable
1.0	Noticeable
2.0	Easily noticeable
6.0	Strongly noticeable
14	Very strongly noticeable

**Table 4: Threshold values of vibration (measured on roof) for the safety of roof in the underground workings for different RMR**

<b>RMR of roof rock</b>	<b>Threshold values of vibration in terms of peak particle velocity (mm/s)</b>
<b>20-30</b>	<b>50</b>
<b>30-40</b>	<b>50-70</b>
<b>40-50</b>	<b>70-100</b>
<b>50-60</b>	<b>100-120</b>
<b>60-80</b>	<b>120</b>

[Ref. No. DGMS (Tech) (S&T) Circular No. 06 of 2007, Dhanbad, Dated 28/05/2007]

**Table 5: Threshold values of vibration (measured on pillars) for the safety of roof in the underground workings for different RMR**

<b>RMR of roof rock</b>	<b>Threshold values of vibration in terms of peak particle velocity (mm/s)</b>
<b>20-30</b>	<b>20</b>
<b>30-40</b>	<b>20-30</b>
<b>40-50</b>	<b>30-40</b>
<b>50-60</b>	<b>40-50</b>
<b>60-80</b>	<b>50</b>

[Ref. No. DGMS (Tech) (S&T) Circular No. 06 of 2007, Dhanbad, Dated 20/05/2007]

**Table 6: DGMS-Stipulated Maximum Permissible Charge in a Shot Hole**

<b>Type of explosive</b>	<b>Degree of gassiness of the coal mine &amp; type of application</b>	<b>Maximum permissible charge per shot hole (g)</b>
<b>P<sub>2</sub></b>	<b>Degree I mine (in cut face)</b>	<b>790</b>
<b>P<sub>3</sub></b>	<b>Degree I, II, III mines (in cut face)</b>	<b>1000</b>
<b>P<sub>5</sub></b>	<b>Degree I- 'BOS'</b>	<b>1000</b>
<b>P<sub>5</sub></b>	<b>Degree II &amp; III- 'BOS'</b>	<b>565</b>

**Table 7: DGMS norms for use of permitted explosives in I, II & III degree coal mines**

Degree of gassiness of coal seam	Classification of gassiness	Type of permitted explosives
<b>I</b>	<0.1% of gas in the general body of air and rate of emission of such gas is less than 1m <sup>3</sup> /t of coal production	<b>P<sub>1</sub>/P<sub>3</sub>/P<sub>5</sub></b>
<b>II</b>	>0.1% of gas in the general body of air and rate of emission of such gas is less than 10m <sup>3</sup> /t of coal production	<b>P<sub>3</sub>/P<sub>5</sub></b>
<b>III</b>	Rate of emission of the gas is greater than 10m <sup>3</sup> /t of coal production	<b>P<sub>3</sub>/P<sub>5</sub></b>

**Table 8: Threshold of vibration for rock damage**

Rock Mass Quality (Q)	Threshold value of Peak Particle Velocity, PPV (mm/s)
<b>Poor – Fair</b>	<b>232 – 450</b>
<b>Fair – Good</b>	<b>450 – 1410</b>
<b>Good – Very Good</b>	<b>&gt;1400</b>

### **Guidelines for blasting in hot strata**

- 1. No blast holes should be charged if the temperature of blast holes exceed 80°C.**
- 2. Hot holes should be flushed with water or a mixture of bentonite, sodium silicate and guar-gum solution to bring down the temperature below 80°C.**
- 3. Select the number of holes in a way to accomplish the blasting operation within 2 hrs. from the charging of first hole.**
- 4. Temperature at the bottom of the blast holes must be checked for existence of fire and recorded before charging of holes.**
- 5. Record the temperature of holes at a regular interval of time.**
- 6. Detonator should not be placed within the blast hole.**
- 7. Only slurry and emulsion explosives should be used.**
- 8. All the explosive, cast boosters and detonating cords should be used subjected to proper testing by approved laboratories in respect to temperature sensitivity and impact sensitivity for safe handling in mines.**
- 9. Sleeping of blast holes shall not be permitted in coal mines where hot strata exists.**
- 10. No PETN/TNT based cast booster shall be used for initiating non-cap sensitivity slurry/emulsion explosive in coal benches and overburden benches of fiery coal seam.**
- 11. Noncombustible stemming materials such as sand, drill cutting or crushed stones should be used after charging all holes.**