Table: DGMS standard for a permissible limit of ground vibration. (Technical Circular Number 7 of 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
(A) Buildings/structures do not belong to the owner			
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) Buildings belonging to mine owner with a limited span of life			
1. Domestic houses/structures	10	15	25
2. Industrial buildings	15	25	50

Table: 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: 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

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

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

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

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

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

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

DGMS-Stipulated Maximum Permissible Charge in a Shot Hole

Type of explosive	Degree of gassiness of the mine & type of application	Maximum permissible charge per shot hole (g)
P_2	Degree I mine (in cut face)	790
P_3	Degree I, II, III mines (in cut face)	1000
P_5	Degree I- 'BOS'	1000
P_5	Degree II & III- 'BOS'	565

Usage classification of permitted explosives

Degree of gassiness of coal seam	Classification of gassiness	Type of permitted explosives
I	<0.1% of gas in the general body of air and rate of emission of such gas is less than $1m^3/t$ of coal production	$P_1/P_3/P_5$
II	>0.1% of gas in the general body of air and rate of emission of such gas is less than $10m^3/t$ of coal production	P_3/P_5
III	Rate of emission of the gas is greater than $10m^3/t$ of coal production	P_3/P_5

Blasting Procedures in Hot Holes

1. **Select the number of holes properly so that the total blasting operation should not exceed 2 h from the charging of first hole.**
2. **Measure the temperature of holes.**
3. **Use water at least 12 h before blasting to flush hot holes till the temperature comes down below 80°C.**
4. **Record the temperature of holes at a regular interval of time.**
5. **Use a mixture of bentonite, sodium silicate and water in holes which do not retain water to seal micro-fractions and cracks. Guar-gum up 5% may also be used for the same purpose.**
6. **Check before charging whether the detonating cord (or any other suitable device) is detached from the main reel or not? If not, then detach it immediately before charging operation starts.**
7. **Stemming operation should be done after charging all holes.**