1. RISK ANALYSIS AND ASSESSMENT

The risk assessment was carried out under the current Italian law:
- **D.Lgs. 9 April 2008, No. 81**, "Implementation of Art. 1 of the Act 3 August 2007, No. 123, on the protection of health and safety in the workplace."

Text coordinated with:
- **D.L. 3 June 2008, No. 97**, converted with modifications from **L. 2 August 2008, No. 129**;
- **D.L. 25 June 2008, No. 112**, converted with modifications from **L. 6 August 2008, No. 133**;
- **D.L. 30 December 2008, No. 207**, converted with modifications from **L. 27 February 2009, n. 14;** - **18 June 2009, 69;**;
- **L. 7 July 2009, No.**;
- **D.Lgs. 3 August 2009, No. 106**;
- **D.L. 30 December 2009, No. 194**, converted with modifications from **L. 26 February 2010, No. 25**;
- **D.L. 31 May 2010, No. 78**, converted with modifications from **L. 30 July 2010, n. 122**; - **June 4, 2010, No. 96**;
- **L. 13 August 2010, No.**;
- **Constitutional Court judgment 2 November 2010, 310**;
- **D.L. 29 December 2010, No. 225**, converted with modifications from **L. 26 February 2011, n. 10;** - **D.L. 12 May 2012, No. 57**, converted with modifications from **L. 12 July 2012, No. 101**; - **October 1, 2012, No. 177**;
- **L. 24 December 2012, No.**;
- **D.Lgs. 13 March 2013, No. 32**;
- **D.P.R. 28 March 2013, No. 44;**
- **D.L. 21 June 2013, No. 69**, converted with modifications from **L. 9 August 2013, No. 98**;
- **D.L. 28 June 2013, No. 76**, converted with modifications from **L. 9 August 2013, No. 99**;
- **D.L. 14 August 2013, No. 93**, converted with modifications from **L. 15 October 2013, No. 119**;
- **D.L. 31 August 2013, No. 101**, converted with modifications from **L. 30 October 2013, No. 125**;
- **D.L. 23 December 2013, No. 145**, converted with modifications from **L. 21 February 2014, No. 9**;
- **D.Lgs. 19 February 2014, No. 19**;
- **D.Lgs. 15 June 2015, No.**;
- **L. 29 July 2015, No.**;
- **D.Lgs. 14 September 2015, No. 151**;
- **D.L. 30 December 2015, No. 210** converted with modifications from **L. 25 February 2016, No. 21**;
- **D.Lgs. 15 February 2016, No. 39**;
- **D.Lgs. 1 August 2016, No. 159**;
- **Agreement 7 July 2016**;
- **D.L. 30 December 2016, No. 244** converted with modifications from **L. 27 February 2017, n. 19;** - **D.D. 6 June 2018, No. 12**.

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Identifying the general policy used for risk assessment

The criterion adopted for the general estimation of risks is a semi-quantitative criterion of type R - E x P. More details are provided on the PSC.

2. OUTCOME OF RISK ASSESSMENT

Acronym	Activities	Damage Entity Chance
	- SITE AREA -	

	SITE AREA FEATURES	
Ca	Materials and "special" elements	
RS property	Asbestos	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Skin irritations, allergic reactions	E1 - P1 plus 1
Ca	Technical facilities	
RS property	Electrocution	E1 - P1 plus 1
Ca	Neighboring buildings	
RS property	Fall of material from above or level	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
RS property	Noise	E1 - P1 plus 1
	EXTERNAL FACTORS THAT POSE RISKS TO THE SITE	
Fe	Streets	
RS property	Investment, tipping	E1 - P1 plus 1

Acronym	Activities	Damage Entity Chance
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
Fe	Other construction sites	
RS property	Investment, tipping	E1 - P1 plus 1
RS property	Caesareans,squeezing	E1 - P1 plus 1
Fe	Buildings and neighbouring activities	
RS property	Investment, tipping	E1 - P1 plus 1
	RISKS THAT SITE PROCESSING POSES FOR THE SURROUNDING AREA	
Rt	Surrounding areas	
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Noise	E1 - P1 plus 1
RS property	Powders	E1 - P1 plus 1
RS property	Investment, tipping	E1 - P1 plus 1
Rt	Safe places and inland roads	
RS property	Investment, tipping	E1 - P1 plus 1
Rt	Other construction sites	
RS property	Investment, tipping	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
	- ORGANIZATION OF THE SITE -	
OR, New	Accessibility and main roadway of the site	
RS property	Investment, tipping	E1 - P1 plus 1
OR, New	General requirements for strip-outs	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1

RS property	Slips, drops in level	E1 - P1 plus 1
OR, New	Sub-fund demolition operational requirements	
RS property	Fall of material from above or level	E1 - P1 plus 1
OR, New	Brokk 50	
RS property	Fall of material from above or level	E1 - P1 plus 1
OR, New	Bridges and platforms	
RS property	Fall of material from above or level	E1 - P1 plus 1
OR, New	Trabatelli	
RS property	Falling materials from above or at the top	E1 - P1 plus 1
	- PROCESSES AND PHASES -	
Lf	**CONSTRUCTION SITE**	
Lf	**Realization (phase)**	
Lv	Responsible for the construction of the fence and access to the construction site	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Simple scale	
RS property	Fall from above	E3 - P3 - 9
RS property	Manual load handling	E2 - P3 plus 6
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Circular saw	
RS property	Electrocution	E3 - P1 plus 3
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
RS property	Burns	E1 - P1 plus 1
AT	Corner grinder (flexible)	
RS property	Electrocution	E3 - P1 plus 3
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Burns	E1 - P1 plus 1
AT	Electric drill	
RS property	Electrocution	E3 - P1 plus 3
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Burns	E1 - P1 plus 1
Rm	Noise for "Multipurpose Worker" [The level of exposure is "Included between the lower and lower values	E1 - P1 plus 1

	higher shares: 80/85 dB(A) and 135/137 dB(C)"."	
Lv	Worker for the construction of an electrical site	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P3 plus 3
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Simple scale	
RS property	Fall from above	E3 - P2 plus 6
RS property	Manual load handling	E1 - P2 plus 2
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Electric drill	

Acronym	Activities	Damage Entity Chance
RS property	Electrocution	E3 - P3 - 9
RS property	Inhaling powders, fibers	E1 - P3 plus 3
RS property	Punctures, cuts, abrasions	E1 - P3 plus 3
RS property	Burns	E1 - P1 plus 1
RS property	Electrocution	E1 - P2 plus 2
Rm	Noise for "Electrician (full cycle)" [The exposure level is "Greater than the higher values of action: 85 dB(A) and 137 dB(C)".]	E1 - P3 plus 3
Vb	Vibrations for "Electrician (Full Cycle)" [HAV "Included between 2.5 and 5.0 m/s2", WBV "Not present"]	E2 - P1 plus 2
Lv	Responsible for the construction of water system of the sanitation and sanitation of the site	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Simple scale	
RS property	Fall from above	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Electric drill	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
Roa	R.O.A. for "Gas Welding (acetylene)" [High Health Risk.]	E2 - P3 plus 6
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80	E1 - P1 plus 1

	dB(A) and 135 dB(C)".]	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**Slicing existing plant lines (phase)**	
Lv	Worker for the construction of an electrical site	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P3 plus 3
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Mobile scaffolding or trabating	
RS property	Fall from above	E3 - P2 plus 6
RS property	Fall of material from above or level	E3 - P1 plus 3
RS property	Manual load handling	E1 - P2 plus 2
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Electric drill	
RS property	Electrocution	E3 - P3 - 9
RS property	Inhaling powders, fibers	E1 - P3 plus 3
RS property	Punctures, cuts, abrasions	E1 - P3 plus 3
RS property	Burns	E1 - P1 plus 1
RS property	Electrocution	E3 - P2 plus 6
Rm	Noise for "Electrician (full cycle)" [The exposure level is "Greater than the higher values of action: 85 dB(A) and 137 dB(C)".]	E2 - P1 plus 2
Vb	Vibrations for "Electrician (Full Cycle)" [HAV "Included between 2.5 and 5.0 m/s2", WBV "Not present"]	E2 - P1 plus 2
Lv	Responsible for the construction of the site's water system	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Simple scale	
RS property	Fall from above	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Electric drill	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
Roa	R.O.A. for "Gas Welding (acetylene)" [High Health Risk.]	E2 - P3 plus 6
Lf	**BASEMENT, GROUND, FIRST, SECOND, THIRD, FOURTH, FIFTH**	
Lf	**Removing MCA materials and mineral wools (phase)**	
Lv	Responsible for removing asbestos insulating pipes or pipes or different parts of plants	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Electric screwdriver	
RS property	Electrocution	E1 - P1 plus 1

RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Mobile scaffolding or trabating	
RS property	Fall from above	E1 - P1 plus 1

Acronym	Activities	Damage Entity Chance
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Simple scale	
RS property	Fall from above	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
Am	Asbestos [High asbestos exposure level.]	E4 - P4 - 16
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**Removal of residual furniture and coatings (phase)**	
Lv	General employee with the task of handling and dismantling fixed furniture, furniture and Furnishing accessories.	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Circular saw	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Corner grinder (flexible)	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
AT	Electric drill	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1

RS property	Fall of material from above or level	E3 - P2 plus 6
AT	Simple scale	
RS property	Fall from above	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Manual load handling	E1 - P1 plus 1
AT	Mobile scaffolding or trabating	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
Lv	Person removing wood paneling	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
Lv	Plastic coating removal officer	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**Removing existing ceilings (phase)**	
Lv	Responsible for removing ceilings, plasters and interior coverings	
AT	Flag argano	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1

Acronym	Activities	Damage Entity Chance
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1

RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Electric Breaker Hammer	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
Vb	Vibrations for "Common Multipurpose Worker (Demolition)" [HAV "Included between 2.5 and 5.0 m/s2", WBV "Not Present"]	E3 - P3 - 9
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
Rm	Noise for "Common Multipurpose Worker (Demolitions)" [The level of exposure is "Greater than higher action values: 85 dB(A) and 137 dB(C)".]	E2 - P1 plus 2
AT	Mobile scaffolding or trabating	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Lf	**Plant removal at altitude (phase)**	
Lv	Plant removal officer	
AT	Flag argano	
RS property	Fall from above	E4 - P2 - 8
RS property	Fall of material from above or level	E4 - P2 - 8
RS property	Electrocution	E4 - P1 plus 4
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
AT	Stand argano	
RS property	Fall from above	E4 - P2 - 8
RS property	Fall of material from above or level	E4 - P2 - 8
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Electrocution	E4 - P1 plus 4
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Electric Breaker Hammer	

RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Noise	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Vibration	E1 - P1 plus 1
AT	Corner grinder (flexible)	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Noise	E1 - P1 plus 1
RS property	Vibration	E1 - P1 plus 1
Rm	Noise for "Common Multipurpose Worker (Demolitions)" [The level of exposure is "Greater than higher action values: 85 dB(A) and 137 dB(C)".]	E3 - P3 - 9
Vb	Vibrations for "Common Multipurpose Worker (Demolition)" [HAV "Included between 2.5 and 5.0 m/s2", WBV "Not Present"]	E3 - P3 - 9
But	Truck	
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Jets, sketches	E2 - P1 plus 2
RS property	Inhaling powders, fibers	E1 - P1 plus 1
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
RS property	Fires, explosions	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**Removing Sanitary Equipment (Phase)**	
Lv	Plant removal officer	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1

Acronym	Activities	Damage Entity Chance
AT	Electric Breaker Hammer	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
Vb	Vibrations for "Common Multipurpose Worker (Demolition)" [HAV "Included between 2.5 and 5.0 m/s2", WBV "Not Present"]	E3 - P3 - 9

Rm	Noise for "Common Multipurpose Worker (Demolitions)" [The level of exposure is "Greater than higher action values: 85 dB(A) and 137 dB(C)".]	E2 - P2 plus 4
AT	Rubble drain channel	
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
Lf	**Removal ceramic coatings (phase)**	
Lv	Person removing ceramic coatings	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Rubble drain channel	
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
AT	Electric Breaker Hammer	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Noise	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Vibration	E1 - P1 plus 1
AT	Bridge over easels	
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
Rm	Noise for "Common Multipurpose Worker (Demolitions)" [The level of exposure is "Greater than higher action values: 85 dB(A) and 137 dB(C)".]	E3 - P3 - 9
Vb	Vibrations for "Common Multipurpose Worker (Demolition)" [HAV "Included between 2.5 and 5.0 m/s2", WBV "Not Present"]	E3 - P3 - 9
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**Removing interior windows (phase)**	
Lv	Internal window removal officer	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Simple scale	
RS property	Fall from above	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1

MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
AT	Mobile scaffolding or trabating	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**Removing internal plasterboard partitions (phase)**	
Lv	Demolition officer for partitions	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Electric Breaker Hammer	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E2 - P3 plus 6
Vb	Vibrations for "Common Multipurpose Worker (Demolition)" [HAV "Included between 2.5 and 5.0 m/s2", WBV "Not Present"]	E3 - P3 - 9
Rm	Noise for "Common Multipurpose Worker (Demolitions)" [The level of exposure is "Greater than higher action values: 85 dB(A) and 137 dB(C)".]	E3 - P3 - 9
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are	E1 - P1 plus 1

Acronym	Activities	Damage Entity Chance
	acceptable.]	
AT	Mobile scaffolding or trabating	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Powders	E1 - P1 plus 1
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2

Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**Removing partitions (phase)**	
Lv	Internal window removal officer	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Simple scale	
RS property	Fall from above	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**Removing internal flooring (phase)**	
Lv	Person removing internal floors	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
AT	Rubble drain channel	
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Mini excavator	
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Fires, explosions	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3

Rm	Noise for "Excavator Operator" [The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
RS property	Slips, drops in level	E1 - P1 plus 1
Vb	Vibrations for "Excavator Operator" [HAV "Not Present", WBV "Included between 0.5 and 1 m/s2"]	E2 - P3 plus 6
But	Mini excavator with demolition hammer	
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Inhaling powders, fibers	E1 - P2 plus 2
RS property	Fires, explosions	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3
Rm	Noise for "Excavator Operator with Demolition Hammer" [The exposure level is "Major of the higher action values: 85 dB(A) and 137 dB(C)".]	E3 - P3 - 9
RS property	Slips, drops in level	E1 - P1 plus 1
Vb	Vibrations for "Breaker Operator with Demolition Hammer" [HAV "Not Present", WBV "Between 0.5 and 1 m/s2"]	E2 - P3 plus 6
But	Mechanical pala (minipala)	
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Fires, explosions	E3 - P1 plus 3

Acronym	Activities	Damage Entity Chance
RS property	Investment, tipping	E3 - P1 plus 3
Rm	Noise for "Mechanical Blade Operator" [The exposure level is "Less than the lower values of action: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Vb	Vibrations for "Mechanical Blade Operator" [HAV "Not Present", WBV "Included between 0.5 and 1 m/s2"]	E2 - P3 plus 6
Lf	**Demolition of sub-bottoms (phase)**	
Lv	Screed removal officer	
AT	Flag argano	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Electric Breaker Hammer	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1

RS property	Inhaling powders, fibers	E1 - P1 plus 1
Rm	Noise for "Common Multipurpose Worker (Demolitions)" [The level of exposure is "Greater than higher action values: 85 dB(A) and 137 dB(C)".]	E3 - P2 plus 6
Vb	Vibrations for "Common Multipurpose Worker (Demolition)" [HAV "Included between 2.5 and 5.0 m/s2", WBV "Not Present"]	E2 - P2 plus 4
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
AT	Rubble drain channel	
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
But	Mini excavator with demolition hammer	
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Inhaling powders, fibers	E1 - P2 plus 2
RS property	Fires, explosions	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3
Rm	Noise for "Excavator Operator with Demolition Hammer" [The exposure level is "Major of the higher action values: 85 dB(A) and 137 dB(C)".]	E3 - P3 - 9
RS property	Slips, drops in level	E1 - P1 plus 1
Vb	Vibrations for "Breaker Operator with Demolition Hammer" [HAV "Not Present", WBV "Between 0.5 and 1 m/s2"]	E2 - P3 plus 6
But	Mechanical pala (minipala)	
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Fires, explosions	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3
Rm	Noise for "Mechanical Blade Operator" [The exposure level is "Less than the lower values of action: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Vb	Vibrations for "Mechanical Blade Operator" [HAV "Not Present", WBV "Included between 0.5 and 1 m/s2"]	E2 - P3 plus 6
Lf	**PROVVISIONAL WORKS (phase)**	
Lf	**Installation scaffolding (various site stages) (subphase)**	
Lv	Fixed metal scaffolding assembly and dismantling	

AT	Flag argano	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Simple scale	
RS property	Fall from above	E1 - P1 plus 1

Acronym	Activities	Damage Entity Chance
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Electric drill	
RS property	Electrocution	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
Rm	Noise for "Bridger" [The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
MC1	M.M.C. (lifting and transporting) [Lifting and carrying loads are acceptable.]	E1 - P1 plus 1
AT	Fixed metal scaffolding	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Fall from above	E1 - P1 plus 1
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
But	Tower cranes	
RS property	Fall of material from above or level	E3 - P1 plus 3
RS property	Electrocution	E3 - P1 plus 3
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Gruista (Tower Crane)" [The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Lf	**Tank remediation (phase)**	
Lv	Tank remediation officer	
AT	Simple scale	
RS property	Fall from above	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Manual load handling	E1 - P1 plus 1
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Argano on tripod stand	

RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
RS property	Confined environments	E1 - P1 plus 1
RS property	Fall from above	E1 - P1 plus 1
Ch	Chemist [Definitely risk: "Inconsequential to health."]	E1 - P1 plus 1
But	Tanker	
RS property	Inhalation of fumes, gases, vapours	E1 - P1 plus 1
RS property	Fires, explosions	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
Lf	**FACCIATE (phase)**	
Lf	**External insulation facades(subphase)**	
Lv	Responsible for assembling winded facade coatings	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Fixed metal scaffolding	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Fall from above	E4 - P3 - 12
RS property	Fall of material from above or level	E3 - P2 plus 6
But	Developable platform	
RS property	Fall from above	E3 - P1 plus 3
RS property	Fall of material from above or level	E3 - P1 plus 3
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Electrocution	E3 - P1 plus 3

Acronym	Activities	Damage Entity Chance
RS property	Fires, explosions	E3 - P1 plus 3
Lf	**Installing window substructures(sub-steps)**	
Lv	Steel and glass continuous facade assembly worker	
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
AT	Fixed metal scaffolding	
RS property	Fall from above	E1 - P1 plus 1

RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Fall from above	E4 - P3 - 12
RS property	Fall of material from above or level	E3 - P2 plus 6
AT	Mobile scaffolding or trabating	
RS property	Fall from above	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E1 - P1 plus 1
But	Truck	
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
But	Cranes	
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Electrocution	E3 - P1 plus 3
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Autogù Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Autogù Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
But	Tower cranes	
RS property	Fall of material from above or level	E3 - P1 plus 3
RS property	Electrocution	E3 - P1 plus 3
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Gruista (Tower Crane)" [The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Lf	**REMOVAL AND DEMOBILIZE OF THE SITE**	
Lf	**Site unmobilly (phase)**	
Lv	Site unmobilbilise	
AT	Flag argano	
RS property	Fall of material from above or level	E3 - P2 plus 6
RS property	Electrocution	E3 - P1 plus 3
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Mobile scaffolding or trabating	
RS property	Fall from above	E3 - P3 - 9
RS property	Fall of material from above or level	E3 - P2 plus 6

RS property	Manual load handling	E2 - P3 plus 6
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Double scale	
RS property	Fall from above	E3 - P3 - 9
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Manual load handling	E2 - P3 plus 6
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Simple scale	
RS property	Fall from above	E3 - P3 - 9
RS property	Manual load handling	E2 - P3 plus 6
RS property	Shocks, hits, impacts, compressions	E2 - P2 plus 4
AT	Electric drill	
RS property	Electrocution	E3 - P1 plus 3
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Burns	E1 - P1 plus 1
RS property	Fall of material from above or level	E1 - P2 plus 2
Rm	Noise for "Multipurpose Worker" [The level of exposure is "Included between the lower and lower values higher shares: 80/85 dB(A) and 135/137 dB(C)"."	E2 - P2 plus 4
But	Truck	
RS property	Fall of material from above or level	E3 - P1 plus 3

Acronym	Activities	Damage Entity Chance
RS property	Caesareans,squeezing	E2 - P1 plus 2
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Fires, explosions	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3
RS property	Skin irritations, allergic reactions	E1 - P1 plus 1
RS property	Manual load handling	E1 - P3 plus 3
RS property	Slips, drops in level	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2
AT	Manual tools	
RS property	Punctures, cuts, abrasions	E1 - P1 plus 1
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
But	Truck with crane	
RS property	Caesareans,squeezing	E2 - P1 plus 2

RS property	Electrocution	E1 - P1 plus 1
RS property	Jets, sketches	E1 - P1 plus 1
RS property	Inhaling powders, fibers	E1 - P1 plus 1
RS property	Fires, explosions	E3 - P1 plus 3
RS property	Investment, tipping	E3 - P1 plus 3
RS property	Shocks, hits, impacts, compressions	E2 - P1 plus 2
Rm	Noise for "Truck Operator" [The exposure level is "Less than the lowest action values: 80 dB(A) and 135 dB(C)".]	E1 - P1 plus 1
Vb	Vibrations for "Truck Operator" [HAV "Not Present", WBV "Less than 0.5 m/s2"]	E2 - P1 plus 2

Legend:
[CA] - Site area features; [FE] - External factors that pose risks to the Shipyard; [RT] - Risks that site processes pose to the surrounding area; [OR] - Site organization; [LF] - Processing; [MA] - Machine; [LV] - Worker; [AT] - Tool; [RS] - Risk; [RM] - Noise risk; [VB] - Vibration risk; [CH] - Chemical risk; [CHS] - Chemical risk (safety); [MC1] - M.M.C. risk(lifting and transport); [MC2] - M.M.C. risk(push and tow); [MC3] - M.M.C. risk(high frequency); [ROA] - R.O.A. risk(welding operations); [CM] - Carcinogenic and mutagenic risk; [BIO] - Biological risk; [RL] - R.O.A. risk (laser); [RNC] - R.O.A. risk (inconsistent); [CEM] - Risk electromagnetic fields; [AM] - Asbestos risk; [RON] - Natural optical radiation risk; [MCS] - Microclimate risk (severe heat); [MFS] - Microclimate risk (severe cold); [SA] - Risk of atmospheric discharges; [IN] - Fire risk; [PR] - Prevention; [IC] - Coordination; [SG] - Signage;
[CG] - Coordination of Processes and Phases; [OU] - Further observations;
[E1] - Minor Damage Entity; [E2] - Serious Damage Entity; [E3] - Severe Damage Entity; [E4] - Serious Damage Entity;
[P1] - Very low probability; [P2] - Low probability; [P3] - Average probability; [P4] - High Probability.

3. NOISE RISK ANALYSIS AND ASSESSMENT

The specific risk assessment was carried out under the above legislation and in accordance with the operational guidelines of the Interregional Technical Coordination of Prevention in workplaces:

- **CTIPLL Operational Indications (Rev. 2 of 11 March 2010),** *"Legislative Decree 81/2008, Title VIII, Chief I, II, III, IV and V on prevention and protection from risks due to exposure to physical agents in the workplace - operational guidance."*

In particular, for the calculation of the level of daily or weekly exposure and for the calculation of the attenuation offered by individual hearing protection devices, the specific technical reference legislation was taken into account:

- **UNI EN ISO 9612:2011,** "*Acoustics - Determining*'Noise Exposure*in Workplaces - Technical Design Method*".
- **UNI 9432:2011,** "*Acoustics - Determining the level of personal exposure to noise in the work environment*".
- **UNI EN 458:2005,** "*Hearing Protectors - Recommendations for Selection, Use, Care, and Maintenance - Guide Document*".

Premise

The assessment of workers' exposure to noise during work was carried out taking into account in particular:

- the level, type and duration of exposure, including any exposure to impulsive noise;
- exposure limit values and action values in art. 189 of the D.Lgs. of 9 April 2008, No.81;
- all effects on the health and safety of workers who are particularly sensitive to noise, with particular reference to pregnant women and minors;
- As far as possible at the technical level, all the effects on the health and safety of workers resulting from interactions between noise and ototoxic substances associated with the activity carried out and between noise and vibration;
- all indirect effects on the health and safety of workers resulting from interactions between noise and warning signs or other sounds that need to be observed in order to reduce the risk of injury;
- Information on noise emission provided by the manufacturers of the work equipment in accordance with the current relevant provisions;
- the existence of alternative work equipment designed to reduce noise emission;
- prolongation of the period of noise exposure beyond normal working hours;
- information collected by health surveillance, including, as far as possible, information found in the scientific literature;
- the availability of hearing protection devices with appropriate attenuation characteristics.

If the data on the evaluation sheets, reported in the report, originate from Database [B], the assessment for that card is a preventive one, as provided by art. 9, D.Lgs. 2008, 81.

Calculating Exposure Levels

The calculation models used to estimate each worker's daily or weekly exposure levels, the attenuation and adequacy of the devices are the models reported in the technical legislation. In particular, the following expression was used to calculate personal exposure to noise, which takes the percentages of time spent on tasks, rather than the time in hours/minutes:

$$L_{EX} = 10 \log \sum_{i=1}^{n} \frac{p_i}{100} 10^{0,1 L_{Aeq,i}}$$

Where:

L_{EX} is the level of personal exposure in dB(A);

$L_{Aeq,\ i}$ is the average level of exposure equivalent Leq in dB(A) produced by the i-th activity including uncertainties; p_i is the percentage of time spent on the i-th activity

For the purposes of verifying compliance with the limit value 87 dB(A) for the calculation of actual personal exposure to noise, the expression used is analogous to the previous expression where, however, the actual equivalent average exposure level was used in place of the equivalent average exposure level, which takes into account the attenuation of the chosen IPR.

The methods used to calculate the actual $L_{Aeq,\ the}$ actual p_{peak} at the ear level when wearing the ear protector, depending on the available data are those provided by UNI EN 458:

- Eighth Band Method
- HML Method
- HML control method
- SNR Method
- Method for impulsive noises

The test of the effectiveness of the individual hearing protection devices, always applying the indications provided by UNI EN 458, was made by comparing $L_{Aeq,\ the}$ actual and the actual p_{peak} with those inferred from the following table.

Non-impulsive noises

Actual level to the ear L_{Aeq}	**Protection estimation**
Greater than Lact	Insufficient
Between Lact and Lact - 5	Acceptable
Between Lact - 5 and Lact - 10	Good
Between Lact - 10 and Lact - 15	Acceptable
Lact Minor - 15	Too high(overprotection))

Non-impulsive noises "HML Control" (*)

Actual level to the ear L_{Aeq}	**Protection estimation**
Greater than Lact	Insufficient
Between Lact and Lact - 15	Acceptable/Good
Lact Minor - 15	Too high(overprotection))

Impulsive noises

Actual level to the ear L_{Aeq} and p_{peak}	**Protection estimation**
LAeq or ppeak greater than Lact	DPI-u not adequate
LAeq and ppeak minor lact Lact	Appropriate DPI-u

The Level of Action Lact,according to the UNI EN 458, corresponds to the action value beyond which there is an obligation to use hearing IPR.

(*) In the case of the DPI attenuation value used for verification is that of high-frequency noise (H value) the protection estimate wants to check whether the DPI is "insufficient"(L_{Aeq} greater than Lact) or if the protection"may be acceptable" (L_{Aeq} less than Lact) provided more information about the noise being evaluated.

CPT RUMORE database in Turin

Database created by C.P.T.-Torino and co-financed by INAIL-Region Piedmont, under paragraph 5-bis, art.190 of D.Lgs. 81/2008 in order to ensure availability of acoustic emission values for those cases where it is impossible to have measured values in the field. Database approved by the Permanent Advisory Commission on 20 April 2011. The database is based on the following methodology:

- Notable procedures of sound power, according to the UNI EN LSO 3746 – 2009 standard. - Significant sound pressure procedures, according to UNI 9432 - 2008.

Machine/equipment cards complete with:
- data for precise identification (type, brand, model);
- processing characteristics (phase, materials);
- frequency analysis;

- Analyst: Real-Time 1/1 and 1/3 Octave, FFT, RT6O. - Measurement range: 22 dBA to 140 dBA.
- Dynamic range: 100 dB, A/D converter 4 x 20 bits.
- Frequency range: 10 Hz to 20 kHz.
- Digital RMS rectifier with Peak detector, resolution 0.1 dB.
- Microphone: SV 22 (type 1), 50 mV/Pa,1/2" polarized capacitor with IEPE preamp model SV 12L. - Scorer: B&K (type 4230), 94 dB, 1000 Hz.

Note. The where it was not possible to find the sound emission values of some equipment as it was not present in the new database of the C.P.T.-Torino referred to the values reported in the previous database also approved by the Permanent Advisory Commission.

4. OUTCOME OF THE RUMORE RISK ASSESSMENT

Below are the workers employed in processing and activities involving noise exposure. For each job, the noise risk bracket is indicated.

Workers and Machines

Job	OUTCOME OF THE EVALUATION
1) Demolition officer for partitions	"Greater than values: 85 dB(A) and 137 dB(C)"
2) Responsible for the construction of the fence and access to the construction site	"Included: 80/85 dB(A) and 135/137 dB(C)"
3) Worker for the construction of an electrical site	"Greater than values: 85 dB(A) and 137 dB(C)"
4) Responsible for removing ceilings, plasters and interior coverings	"Greater than values: 85 dB(A) and 137 dB(C)"
5) Plant removal officer	"Greater than values: 85 dB(A) and 137 dB(C)"
6) Plant removal officer	"Greater than values: 85 dB(A) and 137 dB(C)"
7) Screed removal officer	"Greater than values: 85 dB(A) and 137 dB(C)"
8) Person removing ceramic coatings	"Greater than values: 85 dB(A) and 137 dB(C)"
9) Site unmobiliing officer	"Included: 80/85 dB(A) and 135/137 dB(C)"
10) Truck	"Less than values: 80 dB(A) and 135 dB(C)"
11) Truck with crane	"Less than values: 80 dB(A) and 135 dB(C)"
12) Mini excavator	"Less than values: 80 dB(A) and 135 dB(C)"
13) Mini excavator with demolition hammer	"Greater than values: 85 dB(A) and 137 dB(C)"
14) Mechanical pala(minipala)	"Less than values: 80 dB(A) and 135 dB(C)"
15) Autogrù	"Less than values: 80 dB(A) and 135 dB(C)"
16) Tower cranes	"Less than values: 80 dB(A) and 135 dB(C)"
17) Drilling probe	"Included: 80/85 dB(A) and 135/137 dB(C)"
18) Scaffolding assembly and dismantling fixed metal	"Less than values: 80 dB(A) and 135 dB(C)"
19) Tanker	"Less than values: 80 dB(A) and 135 dB(C)"

5. NOISE RISK ASSESSMENT CARDS

The following risk cards show the outcome of the assessment for each job and, as required by the technical legislation, the following data:

- Exposure times for each activity (equipment) carried out by each worker, as provided by the employer after consultation with workers or their safety representatives;
- A-weighted continuous sound levels for each asset (equipment) including uncertainties; - C weighted peak sound levels for each activity (equipment);
- impulsive noises;
- the source of the data (if measured [A] or database[B]; - the type of DPI-u to use.
- continuous sound levels weighted to A actual for each activity (equipment) carried out by each worker; - Actual C weighted peak sound levels for each activity (equipment) carried out by each worker; - effectiveness of headset protection devices;
- level of daily or weekly exposure or level of exposure to activities with very variable noise exposure (art. 191);

Any provisions relating to health surveillance, information and training, the use of personal protective equipment and technical and organisational measures are included in the security document of which this is an annex.

Correlation Table Job - Scoreboard

Job	Evaluation board
Demolition officer for partitions	SCHEDA N.1 - Noise for "Common Multipurpose Worker (Demolitions)"
Responsible for the construction of the fence and access to the construction site	SCHEDA No.2 - Noise for "Multipurpose Worker"
Worker for the construction of an electrical site	SCHEDA No.3 - Noise for "Electrician (full cycle)"
Responsible for removing ceilings, plasters and interior coverings	SCHEDA N.4 - Noise for "Common Multipurpose Worker (Demolitions)"
Plant removal officer	SCHEDA No.5 - Noise for "Common Multipurpose Worker (Demolitions)"
Plant removal officer	SCHEDA No.6 - Noise for "Common Multipurpose Worker"
Screed removal officer	SCHEDA No.7 - Noise for "Common Multipurpose Worker (Demolitions)"
Person removing ceramic coatings	SCHEDA N.4 - Noise for "Common Multipurpose Worker (Demolitions)"
Site unmobilbilise	SCHEDA No.2 - Noise for "Multipurpose Worker"
Truck with crane	SCHEDA No.6 - Noise for "Truck Operator"
Truck	SCHEDA No.7 - Noise for "Truck Operator"
Mini excavator with demolition hammer	SCHEDA No.8 - Noise for "Excavator Operator with Demolition Hammer"
Mini excavator	SCHEDA No.9 - Noise for "Excavator Operator"
Mechanical pala (minipala)	SCHEDA No.10 - Noise for "Mechanical Shovel Operator"
Fixed metal scaffolding assembly and dismantling	SCHEDA No.11 - Noise for "Bridger"
Cranes	SCHEDA No.12 - Noise for "Autogù Operator"
Tower cranes	SCHEDA No.13 - Noise for "Gruista (Tower Crane)"
Drilling probe	SCHEDA No.14 - Noise for "Drill operator"
Tanker	SCHEDA No.15 - Noise for "Truck Operator"

SCHEDA N.1 - Noise for "Common Multipurpose Worker (Demolitions)"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 279 (Demolitions - Manual Demolitions).

Exposure Type: Weekly

Noise																
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device											
					Eighth APV band							L	M	H	Snr
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k				
1) Demolitions with demolition hammer and compressor (B385)																

30.0	101.0	№	74.8	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]													
	100.0	[B]	100.0		-	-	-	-	-	-	-	35.0	-	-	-			
2) Demolitions with hand tools (A201)																		
30.0	88.0	№	69.3	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]													
	100.0	[B]	100.0		-	-	-	-	-	-	-	25.0	-	-	-			
3) Material movement and rubble drain (A203)																		
30.0	83.0	№	71.8	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]													
	100.0	[B]	100.0		-	-	-	-	-	-	-	15.0	-	-	-			
4) Physiological and technical breaks (A315)																		
10.0	64.0	№	64.0	-	-													
	100.0	[A]	100.0		-	-	-	-	-	-	-	-	-	-	-			
L_{EX}			**97.0**															
$L_{EX(actual)}$			**73.0**															

Membership band:

Exposure Type: Weekly

Noise																
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device											
					Eighth APV band							L	M	H	Snr	
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k					
The exposure level is "Greater than the higher action values: 85 dB(A) and 137 dB(C)".																

Tasks:
Responsible for the demolition of partitions; Person removing screed.

SCHEDA No.2 - Noise for "Multipurpose Worker"

Analysis of noise exposure levels with reference to C.P.T.1's Homogeneous Group Card 49.1 (Constructions in General - New Buildings).

Exposure Type: Weekly

Noise																
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device											
					Eighth APV band							L	M	H	Snr	
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k					
1) Laying artefacts (frames, railings, sanitary, radiant bodies) (A33)																
95.0	84.0	№	75.0	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]											
	100.0	[B]	100.0		-	-	-	-	-	-	-	12.0	-	-	-			
2) Physiological and technical breaks (A315)																
5.0	64.0	№	64.0	-	-											
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-			

L_{EX}	**84.0**
$L_{EX(actual)}$	**75.0**

Membership band:
The exposure level is "Included between lower and upper action values: 80/85 dB(A) and 135/137 dB(C)".

Tasks:
Responsible for the construction of the fence and access to the construction site; Construction worker.

SCHEDA No.3 - Noise for "Electrician (full cycle)"

Analysis of noise exposure levels with reference to the Homogeneous Group Card 94 of C.P.T. Torino (Constructions in general - Renovations).

Exposure Type: Weekly

Noise																
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device											
					Eighth APV band							L	M	H	Snr
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k				
1) Electric groove use (B581)															
15.0	97.0	№	88.0	Insufficient	Generic (headphones or inserts). [Beta: 0.75]										
	100.0	[B]	100.0		-	-	-	-	-	-	-	12.0	-	-	-
2) Scanning with hand tools (A60)															
15.0	87.0	№	78.0	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]										
	100.0	[B]	100.0		-	-	-	-	-	-	-	12.0	-	-	-
3) Movement and laying pipes (A61)															
25.0	80.0	№	80.0	-	-										
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-

Exposure Type: Weekly

Noise																
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device											
					Eighth APV band							L	M	H	Snr	
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k					
4) Laying cables, switches and sockets (A315)																
40.0	64.0	№	64.0	-	-											
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-	
5) Physiological and technical breaks (A315)																
5.0	64.0	№	64.0	-	-											
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-	

L_{EX}	**90.0**
$L_{EX(actual)}$	**82.0**

Membership band:
The exposure level is "Greater than the higher action values: 85 dB(A) and 137 dB(C)".

Tasks:
Worker for the construction of an electrical construction site.

SCHEDA N.4 - Noise for "Common Multipurpose Worker (Demolitions)"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 279 (Demolitions - Manual Demolitions).

Exposure Type: Weekly

Noise																		
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device													
					Eighth APV band							L	M	H	Snr			
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k							
1) MARTELLO - SCLAVERANO - SGD 90 [Tab: 918-TO-1253-1-RPR-11]																		
30.0	104.6	№	78.4	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]													
	125.8	[B]	125.8		-	-	-	-	-	-	-	35.0	-	-	-			
L_{EX}			**100.0**															
$L_{EX(actual)}$			**74.0**															

Membership band:
The exposure level is "Greater than the higher action values: 85 dB(A) and 137 dB(C)".

Tasks:
Responsible for removing ceilings, plasters and interior coverings; Plant removal officer; Responsible for removing ceramic coatings.

SCHEDA No.5 - Noise for "Common Multipurpose Worker"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 49 (Constructions in general - New constructions).

Exposure Type: Weekly

Noise																		
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device													
					Eighth APV band							L	M	H	Snr			
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k							
1) Mortar pack (B143)																		

Exposure Type: Weekly

Noise																		
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device													
					Eighth APV band							L	M	H	Snr			
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k							
10.0	80.0	№	80.0	-	-													

	100.0	[A]	100.0		-	-	-	-	-	-	-	-	-	-	-
2) Plant assistance (scaner use) (B580)															
15.0	97.0	№	78.3	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]										
	100.0	[B]	100.0		-	-	-	-	-	-	-	25.0	-	-	-
3) Masonry assistance (A21)															
30.0	79.0	№	79.0	-	-										
	100.0	[A]	100.0		-	-	-	-	-	-	-	-	-	-	-
4) Traditional plaster support (A26)															
30.0	75.0	№	75.0	-	-										
	100.0	[A]	100.0		-	-	-	-	-	-	-	-	-	-	-
5) Site Cleanup (A315)															
10.0	64.0	№	64.0	-	-										
	100.0	[A]	100.0		-	-	-	-	-	-	-	-	-	-	-
6) Physiological and technical breaks (A315)															
5.0	64.0	№	64.0	-	-										
	100.0	[A]	100.0		-	-	-	-	-	-	-	-	-	-	-
L_{EX}			**90.0**												
$L_{EX(actual)}$			**78.0**												

Membership band:
The exposure level is "Greater than the higher action values: 85 dB(A) and 137 dB(C)".

Tasks:
Plant removal officer.

SCHEDA No.6 - Noise for "Truck Operator"

Analysis of noise exposure levels with reference to the Homogeneous Group Card 24 of C.P.T. Turin (Constructions in general - New constructions).

Exposure Type: Weekly

Noise																
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device											
					Eighth APV band							L	M	H	Snr
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k				
1) Truck use (B36)															
85.0	78.0	№	78.0	-	-										
	0.0	[B]	0.0		-	-	-	-	-	-	-	-	-	-	-
2) Maintenance and technical breaks (A315)															
10.0	64.0	№	64.0	-	-										
	0.0	[B]	0.0		-	-	-	-	-	-	-	-	-	-	-

3) Physiological (A315)																
5.0	64.0	№	64.0	-	-											
	0.0	[B]	0.0		-	-	-	-	-	-	-	-	-	-	-	
L_{EX}			78.0													
$L_{EX(actual)}$			78.0													

Membership band:
The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".

Exposure Type: Weekly

Noise																
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device											
					Eighth APV band							L	M	H	Snr	
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k					

Tasks:
Truck with crane.

SCHEDA No.7 - Noise for "Truck Operator"

Analysis of noise exposure levels with reference to the Homogeneous Group Card 24 of C.P.T. Turin (Constructions in general - New constructions).

Exposure Type: Weekly

Noise																
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device											
					Eighth APV band							L	M	H	Snr	
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k					
1) Truck use (B36)																
85.0	78.0	№	78.0	-	-											
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-	
2) Maintenance and technical breaks (A315)																
10.0	64.0	№	64.0	-	-											
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-	
3) Physiological (A315)																
5.0	64.0	№	64.0	-	-											
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-	
L_{EX}			78.0													
$L_{EX(actual)}$			78.0													

Membership band:
The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".

Tasks:
Truck.

SCHEDA No.8 - Noise for "Excavator Operator with Demolition Hammer"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 276 (Demolitions - Mechanized Demolitions).

Exposure Type: Weekly

Noise																		
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device													
					Eighth APV band							L	M	H	Snr			
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k							
1) EXCAVATOR WITH DEMOLITION HAMMER (B250)																		
80.0	90.0	№	75.0	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]													
	100.0	[B]	100.0		-	-	-	-	-	-	-	20.0	-	-	-			
L_{EX}			**90.0**															
$L_{EX(actual)}$			**75.0**															

Membership band:
The exposure level is "Greater than the higher action values: 85 dB(A) and 137 dB(C)".

Exposure Type: Weekly

Noise																		
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device													
					Eighth APV band							L	M	H	Snr			
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k							

Tasks:
Mini excavator with demolition hammer.

SCHEDA No.9 - Noise for "Excavator Operator"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 23 (Constructions in general - New constructions).

Exposure Type: Weekly

Noise																		
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device													
					Eighth APV band							L	M	H	Snr			
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k							
1) ESCAVATORE - FIAT-HITACHI - EX355 [Tab: 941-TO-781-1-Rpr-11]																		

85.0	76.7	№	76.7	-	-												
	113.0	[B]	113.0		-	-	-	-	-	-	-	-	-	-	-		
L_{EX}			76.0														
$L_{EX(actual)}$			76.0														

Membership band:
The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".

Tasks:
Mini excavator.

SCHEDA No.10 - Noise for "Mechanical Shovel Operator"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 72 (Constructions in general - Renovations).

Exposure Type: Weekly

Noise																	
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device												
					Eighth APV band							L	M	H	Snr		
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k						
1) MESTITY PALA - CATERPILLAR - 950H [Tab: 936-TO-1580-1-RPR-11]																	
85.0	68.1	№	68.1	-	-												
	119.9	[B]	119.9		-	-	-	-	-	-	-	-	-	-	-		
L_{EX}			68.0														
$L_{EX(actual)}$			68.0														

Membership band:
The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".

Tasks:
Mechanical pala (minipala).

SCHEDA No.11 - Noise for "Bridger"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 31 (Constructions in general - New constructions).

Exposure Type: Weekly

Noise																	
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device												
					Eighth APV band							L	M	H	Snr		
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k						
1) CRANE (B289)																	

25.0	77.0	№	77.0	-	-																
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-						
L_{EX}			**71.0**																		
$L_{EX(actual)}$			**71.0**																		

Membership band:
The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".

Tasks:
Responsible for the assembly and dismantling of the fixed metal scaffolding.

SCHEDA No.12 - Noise for "Autogù Operator"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 26 (Constructions in general - New constructions).

Exposure Type: Weekly

Noise																			
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device														
					Eighth APV band							L	M	H	Snr				
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k								
1) AUTOGRU' (B90)																			
75.0	81.0	№	81.0	-	-														
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-				
L_{EX}			**80.0**																
$L_{EX(actual)}$			**80.0**																

Membership band:
The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".

Tasks:
Cranes.

SCHEDA No.13 - Noise for "Gruista (Tower Crane)"

Analysis of noise exposure levels with reference to the Homogeneous Group Card 74 of C.P.T. Torino (Constructions in general - Renovations).

Exposure Type: Weekly

Noise																			
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device														
					Eighth APV band							L	M	H	Snr				
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k								

Exposure Type: Weekly

Noise																		
	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)		Protection device													
					Eighth APV band													
T[%]	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)	DPI-u Effectiveness	125	250	500	1k	2k	4k	8k	L	M	H	Snr			
1) CRANE (B298)																		
85.0	79.0	№	79.0	-	-													
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-			
L_{EX}			**79.0**															
$L_{EX(actual)}$			**79.0**															

Membership band:
The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".

Jobs: Tower
cranes.

SCHEDA No.14 - Noise for "Drill operator"

Analysis of noise exposure levels with reference to C.P.T. Torino's Homogeneous Group Card 265 (Special Foundations - Drilled Pali).

Exposure Type: Weekly

Noise																		
	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)		Protection device													
					Eighth APV band													
T[%]	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)	DPI-u Effectiveness	125	250	500	1k	2k	4k	8k	L	M	H	Snr			
1) DRILLER (B664)																		
75.0	86.0	№	71.0	Acceptable/Good	Generic (headphones or inserts). [Beta: 0.75]													
	100.0	[B]	100.0		-	-	-	-	-	-	-	20.0	-	-	-			
L_{EX}			**85.0**															
$L_{EX(effve)_{ivo)}}$			**70.0**															

Membership band:
The exposure level is "Included between lower and upper action values: 80/85 dB(A) and 135/137 dB(C)".

Tasks:
Drilling probe.

SCHEDA No.15 - Noise for "Truck Operator"

Analysis of noise exposure levels with reference to the Homogeneous Group Card 24 of C.P.T. Turin (Constructions in general - New constructions).

Exposure Type: Weekly

Noise																		
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device													
					Eighth APV band							L	M	H	Snr			
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k							
1) Truck use (B36)																		
85.0	78.0	№	78.0	-	-													
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-			
2) Maintenance and technical breaks (A315)																		
10.0	64.0	№	64.0	-	-													

Exposure Type: Weekly

Noise																		
T[%]	$L_{A,eq}$ dB(A)	Imp.	$L_{A,eq}$ eq eff.dB(A)	DPI-u Effectiveness	Protection device													
					Eighth APV band							L	M	H	Snr			
	P_{peak} dB(C)	Orig.	P_{peak} eff.dB(C)		125	250	500	1k	2k	4k	8k							
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-			
3) Physiological (A315)																		
5.0	64.0	№	64.0	-	-													
	100.0	[B]	100.0		-	-	-	-	-	-	-	-	-	-	-			
L_{EX}			**78.0**															
$L_{EX(actual)}$			**78.0**															

Membership band:
The exposure level is "Less than the lower action values: 80 dB(A) and 135 dB(C)".

Tasks:
Truck.

6. VIBRATION RISK ANALYSIS AND ASSESSMENT

The specific risk assessment was carried out under the above legislation and in accordance with the operational guidelines of the Interregional Technical Coordination of Prevention in workplaces:

- **CTIPLL Operational Indications (Rev. 2 of 11 March 2010),** *"Legislative Decree 81/2008, Title VIII, Chief I, II, III, IV and V on prevention and protection from risks due to exposure to physical agents in the workplace - operational guidance."*

Premise

The evaluation and, when necessary, the measurement of vibration levels was carried out according to the provisions of Annex XXXV, Part A, of D.Lgs. 81/2008, for vibrations transmitted to the hand-arm system (HAV), and according to the provisions of Annex XXXV, Part B, of D.Lgs. 81/2008, for the vibrations transmitted to the whole body (WBV).
The evaluation was carried out taking into account in particular:

- the level, type and duration of exposure, including any exposure to intermittent vibrations or repeated shocks;
- exposure limit values and action values;
- possible effects on the health and safety of workers who are particularly sensitive to risk with particular reference to pregnant women and children;
- any indirect effects on the safety and health of workers resulting from interactions between mechanical vibrations, noise and the working environment or other equipment;
- information provided by the manufacturer of the work equipment;
- the existence of alternative equipment designed to reduce levels of exposure to mechanical vibrations;
- prolongation of the period of exposure to vibrations transmitted to the whole body beyond the working hours in premises for which the employer is responsible;
- special working conditions, such as low temperatures, wet, high humidity or biomechanical overload of the upper limbs and spine;
- information collected by health surveillance, including, as far as possible, information found in the scientific literature.

Find the criteria you're following for evaluation

The assessment of vibration risk exposure was carried out taking into account the characteristics of the work activities carried out, consistent with the guidelines*for the assessment of vibration risk in the working environments*developed byISPESL (now INAIL - Technical-Scientific and Research Sector). The following procedure can be summarized as follows:

- identifying workers at risk;
- identification of exposure times;
- identification of individual machines or equipment used;
- identification, in relation to the machines and equipment used, of the level of exposure;
- normalized daily exposure level to the 8-hour reporting period.

Identifying workers at risk

The identification of workers exposed to vibration risk stems from the knowledge of the tasks performed by the individual worker, or rather from the identification of hand tools, hand-conducted machinery or mobile machinery used in work activities. It is known that work in which vibrating tools or vibration-subjected materials are involved can induce a combination of neurological and digital circulatory disorders and osteoarticular lesions to the upper limbs, as well as work activities carried out at the edges of means of transport or handling expose the body to vibrations or impacts, which can be harmful to the exposed subjects.

Identifying exposure times

The time of exposure to vibration risk depends, for each worker, on the actual work situations. Of course, the effective exposure time to harmful vibrations is less than that dedicated to processing, as a result of periods of vacuum or low-load operation or for other technical reasons, including the adoption of individual protective equipment. The specific reduction coefficient has been estimated in relation to the working methodologies adopted and the use of individual protective equipment.

Identification of individual machines or equipment used

The "Machine Directive" obliges manufacturers to design and build work equipment in such a way that the risks of vibrations transmitted by the machine are reduced to the minimum level, taking into account the technical progress and the availability of means to reduce vibrations, especially at the source. In addition, it prescribes that the instructions for use also contain the following indications: a) the weighted mean quadratic value, in frequency, of the acceleration to which the upper limbs

are exposed when exceeding 2.5 m/s^2; if that level is lower or equal to 2.5 m/s^2, it must be indicated; b) the weighted mean quadratic value, in frequency, of the acceleration to which the body is exposed (feet or sitting part) when exceeding 0.5 m/s^2; if that level is lower or equal to 0.5 m/s^2, it must be indicated.

Identifying the exposure level while using

In order to determine the acceleration value required for risk assessment, in accordance with the provisions of art. 202, paragraph 2, of the D.Lgs. of 9 April 2008, 81 and s.m.i., referred to the ISSSL Data Bank (now INAIL - Technical-Scientific and Research Sector) and/or the information provided by the manufacturers, using the data in the following manner.

[A] - Equipment measured value in BDV INAIL (formerly ISPESL)

For the machine or tool considered, the vibration values measured in conditions of use in relation to operating conditions are available in the ISPESL Vibration Database (now INAIL - Technical-Scientific and Research Sector).
The values reported in the ISPESL Vibration Database (now INAIL - Technical-Scientific and Research Sector) have been taken.

[B] - Properly corrected manufacturer value

The vibration values declared by the manufacturer are available for the machine or tool considered.
It saves the programming of subsequent control measures in place, has been assumed as a vibration value, that indicated by the manufacturer, increased by the correction factor defined in the ISPESL Vibration Database (now INAIL - Technical-Scientific and Research), for equipment involving hand-arm vibrations, or by a coefficient that takes into account the age of the machine, the level of maintenance and the conditions of use , for equipment that involves vibrations to the whole body.

[C] - Similar equipment value in BDV INAIL(former ISPESL)

For the machine or tool under consideration, no specific data is available but measured vibration values of similar equipment (same category, same power) are available.
It saves the programming of subsequent control measures in place, it has been assumed as the base value of vibration that measured that of a similar equipment (same category, same power) increased by a coefficient in order to take into account the age of the machine, the level of maintenance and the conditions of use.

[D] - Worst equipment value in BDV INAIL (formerly ISPESL)

For the machine or tool considered, no specific data or data are available for similar equipment (same category, same power), but measured vibration values are available for equipment of the same type. It saves the programming of subsequent control measures in place, it has been assumed as the base value of vibration the worst (measured) of an equipment of the same genus increased by a coefficient in order to take into account the age of the machine, the level of maintenance and the conditions of use.

[E] - Typical equipment value

In the drafting of the Safety and Coordination Plan (PSC), there is an obligation to assess the specific risks of the work, even if the machines and tools used by the executor company and, therefore, the related vibration values are not yet known.
In this case, the most common type of equipment used at run time is assumed as the base vibration value.

In order to determine the acceleration value required for risk assessment, in the absence of certain benchmarks, the following was done:

Determining the normalized daily exposure level to the eight-hour reporting period

Vibrations transmitted to the hand-arm system

The assessment of the level of exposure to vibrations transmitted to the hand-arm system is mainly based on determining the normalised daily exposure value at 8 hours of work, A(8) (m/s^2), calculated on the basis of the square root of the sum of squares (A(w)sum) of the average quadratic values of frequency weighted accelerations, determined on the three orthogonal axes x, y, z, in accordance with ISO standard 5349-1: 2001. The mathematical expression for the calculation of A(8) is shown below.

$$A(8) = A(w)_{sum}(T\%)^{1/2}$$

Where:

$$A(w)_{sum} = (a_{wx}^2 + a_{wy}^2 + a_{wz}^2)^{1/2}$$

where T% the daily percentage duration of exposure to vibrations expressed in percentage and awx, awy and awz the r.m.s. values of frequency weighted acceleration (in m/s2) along the x, y, and z axes (ISO 5349-1: 2001).
If the worker is exposed to different vibration values, such as the use of multiple vibrating tools during the working day, or in the case of the use of the same machine under different operating conditions, daily exposure to vibrationsA(8), in m/s2, will be obtained by expression: A(

$$A(8) = \left[\sum_{i=1}^{n} A(8)_i^2\right]^{1/2}$$

Where:

A(8)i is the partial for operation i-th, i.e.:

$$A(8)_i = A(w)_{sum,i}(T\%_i)^{1/2}$$

where the values of T%i and A(w)sum, i are the percentage exposure time and A(w)sum value for operation ith, respectively.

Vibrations transmitted to the whole body

The assessment of the level of exposure to vibrations transmitted to the whole body is mainly based on the determination of the normalized daily exposure value at 8 hours of work, A(8) (m/s2), calculated on the basis of the greater numerical values of the average quadratic values of the frequency-weighted accelerations, determined on the three orthogonal axes:

$$A(w)_{max} = \max(1{,}40 \cdot a_{wx}; 1{,}40 \cdot a_{wy}; a_{wz})$$

formula below:

$$A(8) = A(w)_{max}(T\%)^{1/2}$$

where T% the daily percentage duration of vibration exposure expressed as a percentage and A(w)max the maximum value between 1.40awx, 1.40awy, and awz the r.m.s. values offrequency weighted acceleration (in m/s2) along the x, y, and z axes (ISO 2631-1: 1997).
If the worker is exposed to different vibration values, such as using multiple machines during the working day, or in the case of the use of the same machine under different operating conditions, daily exposure to vibrationsA(8), in m/s2, will be obtained by expression: A(

$$A(8) = \left[\sum_{i=1}^{n} A(8)_i^2\right]^{1/2}$$

Where:

A(8)i is the partial for operation i-th, i.e.:

$$A(8)_i = A(w)_{max,i}(T\%_i)^{1/2}$$

where the values of T%i to A(w)max, i are the percentage exposure time and themax A(w) value for the ith operation, respectively.

6.1. OUTCOME OF VIBRATION RISK ASSESSMENT

Below is the list of work tasks that expose to vibration and the outcome of the risk assessment divided into full body (WBV) and arm hand system (HAV).

Workers and Machines

Job	OUTCOME OF THE EVALUATION	
	Hand-arm (HAV)	Whole Body (WBV)
1) Demolition officer for partitions	"Including between 2.5 and 5.0 m/s2"	"Not present"
2) Worker for the construction of an electrical site	"Including between 2.5 and 5.0 m/s2"	"Not present"
3) Responsible for removing ceilings, plasters and interior coverings	"Including between 2.5 and 5.0 m/s2"	"Not present"
4) Plant removal officer	"Including between 2.5 and 5.0 m/s2"	"Not present"
5) Screed removal officer	"Including between 2.5 and 5.0 m/s2"	"Not present"
6) Person removing ceramic coatings		
7) Truck	"Including between 2.5 and 5.0 m/s2"	"Not present"
8) Truck with crane		
9) Mini excavator	"Not present"	"Less than 0.5 m/s2"
10) Mini excavator with demolition hammer	"Not present"	"Less than 0.5 m/s2"
	"Not present"	"Including between 0.5 and 1 m/s2"
	"Not present"	"Including between 0.5 and 1 m/s2"
11) Mechanical pala (minipala)	"Not present"	"Including between 0.5 and 1 m/s2"
12) Drilling probe	"Not present"	"Including between 0.5 and 1 m/s2"
13) Tanker	"Not present"	"Less than 0.5 m/s2"

6.2. EVALUATION BOARDS

The following risk cards, each representing a homogeneous group, report the outcome of the assessment for each job. Any provisions relating to health surveillance, information and training, the use of personal protective equipment and technical and organisational measures are included in the security document of which this is an annex.

Correlation Table Job - Scoreboard

Job	Evaluation board
Demolition officer for partitions	SCHEDA N.1 - Vibrations for "Common Multipurpose Worker (Demolitions)"
Worker for the construction of an electrical site	SCHEDA No.2 - Vibrations for "Electrician (full cycle)"
Responsible for removing ceilings, plasters and interior coverings	SCHEDA N.1 - Vibrations for "Common Multipurpose Worker (Demolitions)"
Plant removal officer	SCHEDA N.1 - Vibrations for "Common Multipurpose Worker (Demolitions)"
Screed removal officer	SCHEDA N.1 - Vibrations for "Common Multipurpose Worker (Demolitions)"
Person removing ceramic coatings	SCHEDA N.1 - Vibrations for "Common Multipurpose Worker (Demolitions)"
Truck with crane	SCHEDA No.3 - Vibrations for "Truck Operator"
Truck	SCHEDA No.3 - Vibrations for "Truck Operator"

Mini excavator with demolition hammer	SCHEDA N.4 - Vibrations for "Excavator Operator with Demolition Hammer"
Mini excavator	SCHEDA No.5 - Vibrations for "Excavator Operator"
Mechanical pala (minipala)	SCHEDA No.6 - Vibrations for "Mechanical Shovel Operator"
Drilling probe	SCHEDA No.7 - Vibrations for "Drill Operator"
Tanker	SCHEDA No.3 - Vibrations for "Truck Operator"

SCHEDA N.1 - Vibrations for "Common Multipurpose Worker (Demolitions)"

Analysis of activities and exposure times with reference to the Homogeneous Group Card 279 of C.P.T. Torino (Demolitions - Manual Demolitions): a) demolitions with tire hammer for 10%.

Machine or Tool used					
Time Processing	Correction coefficient	Exposure time	Exposure level	Data source	Type
[%]		[%]	[m/s^2]		
1) Tire wrecking hammer (generic)					
10.0	0.8	8.0		17.7 [E] - Valorandtypical HAV	equipment
HAV - Exposure A(8)		**8.00**	**4,998**		

Membership band:
Hand-Arm (HAV) - "Included between 2.5 and 5.0 m/s2"
Whole Body (WBV) - "Not Present"

Tasks:
Responsible for the demolition of partitions; Responsible for removing ceilings, plasters and interior coverings; Plant removal officer; Person removing screed; Responsible for removing ceramic coatings.

SCHEDA No.2 - Vibrations for "Electrician (full cycle)"

Analysis of activities and exposure times with reference to the Homogeneous Group Card 94 of C.P.T. Torino (Constructions in general - Renovations): a) scaner use for 15%.

Machine or Tool used					
Time Processing	Correction coefficient	Exposure time	Exposure level	Data source	Type
[%]		[%]	[m/s^2]		
1) Scanalatrice (generic)					
15.0	0.8	12.0		7.2 [E] - Typical equipment value (PSC only)	Hav
HAV - Exposure A(8)		**12.00**	**2,501**		

Membership band:
Hand-Arm (HAV) - "Included between 2.5 and 5.0 m/s2"
Whole Body (WBV) - "Not Present"

Tasks:
Worker for the construction of an electrical construction site.

SCHEDA No.3 - Vibrations for "Truck Operator"

Analysis of activities and exposure times with reference to the Homogeneous Group Card 24 of C.P.T. Turin (Constructions in general - New constructions): a) truck use for 60%.

Machine or Tool used					
Time Processing	Correction coefficient	Exposure time	Exposure level	Data source	Type
[%]		[%]	[m/s^2]		
1) Truck (generic)					
60.0	0.8	48.0	0.5 [E] - Typical equipment value (PSC only)		WBV, New1001
WBV - Exposure A(8)		**48.00**	**0.374**		

Membership band:
Hand-Arm (HAV) - "Not Present"
Whole Body (WBV) - "Less than 0.5 m/s2"

Tasks:
Truck; Truck with crane.

SCHEDA N.4 - Vibrations for "Excavator Operator with Demolition Hammer"

Analysis of activities and exposure times with reference to the Homogeneous Group Card No. 276 of C.P.T. Torino (Demolitions - Mechanized Demolitions): a) use excavator with demolition hammer for 65%.

Machine or Tool used					
Time Processing	Correction coefficient	Exposure time	Exposure level	Data source	Type
[%]		[%]	[m/s^2]		
1) Excavator with demolition hammer (generic)					
65.0	0.8	52.0	0.7 [E] - Typical equipment value (PSC only)		WBV, New1001
WBV - Exposure A(8)		**52.00**	**0.505**		

Membership band:
Hand-Arm (HAV) - "Not Present"
Whole Body (WBV) - "Includes between 0.5 and 1 m/s2"

Tasks:
Mini excavator with demolition hammer.

SCHEDA No.5 - Vibrations for "Excavator Operator"

Analysis of activities and exposure times with reference to the Homogeneous Group Card 23 of C.P.T. Torino (Constructions in general - New constructions): a) excavator use (tracked, rubberized) for 60%.

Machine or Tool used					
Time Processing	Correction coefficient	Exposure time	Exposure level	Data source	Type
[%]		[%]	[m/s^2]		
1) Excavator (generic)					
60.0	0.8	48.0	0.7 [E] - Typical equipment value (PSC only)		WBV, New1001

WBV - Exposure A(8)	**48.00**	**0.506**	

Membership band:
Hand-Arm (HAV) - "Not Present"
Whole Body (WBV) - "Includes between 0.5 and 1 m/s2"

Tasks:
Mini excavator.

SCHEDA No.6 - Vibrations for "Mechanical Shovel Operator"

Analysis of activities and exposure times with reference to the Homogeneous Group Card 22 of C.P.T. Torino (Constructions in general - New constructions): a) use mechanical shovel (tracked, rubberized) for 60%.

Machine or Tool used					
Time Processing	Correction coefficient	Exposure time	Exposure level	Data source	Type
[%]		[%]	[m/s^2]		
1) Mechanical Pala (generic)					
60.0	0.8	48.0	0.7 [E] - Typical equipment value (PSC only)		WBV, New1001
WBV - Exposure A(8)		**48.00**	**0.506**		

Membership band:
Hand-Arm (HAV) - "Not Present"
Whole Body (WBV) - "Includes between 0.5 and 1 m/s2"

Machine or Tool used					
Time Processing	Correction coefficient	Exposure time	Exposure level	Data source	Type
[%]		[%]	[m/s^2]		

Tasks:
Mechanical pala (minipala).

SCHEDA No.7 - Vibrations for "Drill Operator"

Analysis of activities and exposure times with reference to the Homogeneous Group Card 265 of C.P.T. Torino (Special Foundations - Drilled Stakes): a) drilling use for 65%.

Machine or Tool used					
Time Processing	Correction coefficient	Exposure time	Exposure level	Data source	Type
[%]		[%]	[m/s^2]		
1) Drilling (generic)					
65.0	0.8	52.0	0.7 [E] - Typical equipment value (PSC only)		WBV, New1001
WBV - Exposure A(8)		**52.00**	**0.505**		

Membership band:
Hand-Arm (HAV) - "Not Present"
Whole Body (WBV) - "Includes between 0.5 and 1 m/s2"

Tasks:
Drilling probe.

7. ARTIFICIAL OPTICAL RADIATION ANALYSIS AND EVALUATION WELDING OPERATIONS

The specific risk assessment was carried out under the aforementioned Italian legislation and in accordance with the operational guidelines of the Interregional Technical Coordination of Prevention in workplaces:

- **CTIPLL Operational Indications (Rev. 2 of 11 March 2010),**"*Legislative Decree 81/2008, Title VIII, Chief I, II, III, IV and V on prevention and protection from risks due to exposure to physical agents in the workplace - operational guidance".*".

Premise

According to art. 216 of D.Lgs. 9 April 2008, 81, as part of the risk assessment, the*"employer evaluates and, when necessary, measures and/or calculates the levels of optical radiation to which workers may be exposed*".
As instrumental measures are generally costly both economically and in time, risk assessment that does not require measurement is preferable when possible.
In the case of welding operations, it is known that, for any type of welding (electric arc, gas, oxytocin, etc.)and for any type of support, the times for which overexposure is reached for the employee is found to be of the order of seconds.
Although the risk is extremely high, the implementation of the measures and the exact determination of exposure times is completely unnecessary for workers. Therefore, in order to protect workers from the risks that can cause damage to the eyes and face, it is not possible in any way to eliminate or reduce the optical radiation emitted during welding operations, the most effective eye and face protection devices have been adopted to counteract the types of risks present.

Welding techniques

Welding is a process used to join two locally heated metal parts, which make up the base metal, with or without the addition of other metal representing the input metal, melted between the flaps to be joined.
Welding is said to be heterogeneous when the only input material is melted, which must necessarily have a lower melting point and therefore a composition different from that of the pieces to be soldered; is the case of braising in all its variants.
The autogenic welding involves the fusion of both the base and the input metal, which must therefore have similar composition, or the fusion of the only flaps to be welded by pressure; these are well-known gas or electric arc welds.

Balancebrasatura

In balance-brasing, the pieces of metal to be solder do not actively participate by merging into the welding process; the union of the metal pieces is made only by the fusion of the input metal that is poured between the flaps to be soldered. For this reason, the input metal has a lower melting point and therefore different composition than the base metal. It is evidently necessary to have a fairly large overlap zone as the mechanical strength of the input material is very low. The alloy generally used is a brass (copper-zinc alloy), added with silicon or nickel, with melting point around 900 degrees Celsius.
The executive modes are similar to those of autogenic welding (iecetylenic flame); they are typical of braising the difference between base metal and input metal as well as their union that takes place by wetting that consists of spreading a liquid (metal of molten input) on a solid surface (base metal).

Brazing

The braising is done by arranging the base metal so that between the parts to be joined there remains a space that allows the filling of the joint and obtain a union for wetting and capillarity.
Depending on the minor or greater melting point of the input metal, the braising is distinguished in sweet and strong. Sweet braising uses input materials with melting temperature < 450 degrees C; Typical supply materials are tin/lead alloys. The accession that occurs is rather weak and the joint is not particularly resistant. Typical uses include electronics, box, etc. Strong braising uses input materials with melting temperature > 450 degrees Celsius; Typical supply materials are copper/zinc, silver/copper alloys. The adhesion that occurs is greater and the joint is more resistant than the sweet braising.

Gas welding

Some welding techniques use the combustion of a gas to melt a metal. The gases used can be oxygen mixtures with hydrogen or methane, propane or acetylene.

Oxycetilenic flame welding

The most widespread of gas welds uses a mixture of oxygen and acetylene, contained in separate cylinders, which simultaneously feed a torch, and come out of the terminal nozzle where that mixture is lit. This mixture is the one that develops the most heat in fact the maximum achievable temperature is in the order of 3000 degrees Celsius and can therefore also be used for welding steels.

Oxidative welding

It is generated by a flame obtained from the combustion of oxygen with hydrogen. The temperature of the flame (2500 degrees Celsius) is substantially lower than that of an oxycetilenic flame and as a result is used for welding low melting metals, such as aluminium, lead and magnesium.

Electric welding

The heat required for the metal to melt is produced by an electric arc that is established between the electrode and the pieces of the metal to be welded, reaching temperatures ranging from 4000-6000 degrees Celsius.

Arc welding with fuse electrode (MMA)

The electric arc is between the electrode, which consists of a rigid metal wand between 30 and 40 cm in length, and the joint to be welded. The electrode fuses the input material; The coating material of the electrode, on the other hand, by fusing creates a protective area surrounding the welding bath (welding with coated electrode).
The operation then involves only one limb allowing the other to wield the individual protection device (facial screen) or other tool.

Arc welding with fuse electrode gas protection (MIG/MAG)

In this case the fuse electrode is a continuous uncoated wire, delivered by a gun by a special drag system to which a regular speed is set to compensate for the fusion of the wire itself and thus keep the length of the arc constant; At the same time, a protective gas is supplied that comes out of the gun along with the metal wire (electrode). The gases used, usually inert, are argon or helium (MIG: Metal Inert Gas), which can be mixed with CO_2 giving rise to an active compound that has the ability, for example in the welding of some steels, to increase penetration and welding speed, as well as being cheaper (MAG: Metal Active Gas).

Arc welding with non-fuse electrode (TIG) gas protection

The electric arc is between a tungsten electrode, which is not consumed during welding, and the piece to be soldered (TIG: Tungsten Inert Gas). The welding area is protected by a stream of inert gases (argon and helium) in order to avoid contact between the molten metal and the air. Welding can be done simply by melting the base metal, without input metal, which if necessary is added separately in the form of a wand. In this case the operation commits both limbs to wield electrode and wand.

Plasma welding

It is similar to the TIG with the difference that the full tungsten electrode is inserted into a torch, thus creating a compartment that encloses the electric arc and where the inert gas is injected. Triggering the electric arc on this column of gas causes its partial ionization and, forcing the arc inside the orifice, you have a sharp increase in the ionized part turning the gas into plasma. The end result is a higher arc temperature (up to 10000 degrees Celsius) against a smaller heat source.
It is a predominantly automatic technique, also used for small thicknesses.

DPI selection criteria

For the risks to the eyes and face from radiation found in the working environment, the technical reference standards are as follows:

- UNI EN 166:2004 "Personal Eye Protection - Specifications"
- UNI EN 167:2003 "Personal Eye Protection - Optical Testing Methods"
- UNI EN 168:2003 "Personal Eye Protection - Non-Optical Testing Methods"
- UNI EN 169:2003 "Personal Eye Protection - Welding Filters and Related Techniques - Transmission Requirements and Recommended Uses"
- UNI EN 170:2003 "Personal Eye Protection - Ultraviolet Filters - Transmission Requirements and Recommended Uses"
- UNI EN 171:2003 "Personal Eye Protection - Infrared Filters - Transmission Requirements and Recommended Uses"
- UNI EN 172:2003 "Personal Eye Protection - Sunscreens for Industrial Use"
- UNI EN 175:1999 "Personal eye protection – Eye and face protection equipment during welding and related procedures"
- UNI EN 207:2004 "Personal eye protection - Filters and eye protectors against laser radiation (laser eye protectors)"
- UNI EN 208:2004 "Personal eye protection - Eye protectors for laser and laser control work (eye protectors for laser regulation)"
- UNI EN 379:2004 "Personal Eye Protection – Automatic Welding Filters"
- UNI 10912:2000 "Individual Protection Devices - Guide for The Selection, Use and Maintenance of Eye and Face Protection Devices for Work Activities."

In particular, the protective devices used in **welding operations** are screens (facial repairs) and masks (both that meet specific requirements for adaptability, safety and ergonomics),with single-grade filters, double-scale or switchable (the latter for liquid crystals, e.g.).
Welding system filters must provide protection from both ultraviolet and infrared rays as well as visible radiation. The scale number of filters intended to protect workers from radiation exposure during welding operations and similar techniques is only the number of graduations corresponding to the filter (the code number is missing, which is present in the other filters for artificial optical radiation). Depending on the transmission factor of the filters, the UNI EN 169 standard provides for 19 graduation numbers.
In order to identify the correct scale number of filters, it is necessary to consider first: - for gas welding, balance-brasing and oxidation: the range of gas to the cannelli;

- for arc welding, arc and jet plasma cutting: the intensity of the current. Other factors to consider include:
- the distance of the operator to the arc or flame; if the operator is very close may require a higher tick;
- local lighting of the work environment; Individual characteristics.

There are also different levels of exposure to heat between gas welding and arc welding: the first reaches flame temperatures ranging from 2500 degrees Celsius to about 3,000 degrees Celsius, while the second ranges from 3000 degrees Celsius to 6000 degrees Celsius to 10,000 degrees Celsius typical of welding.
To help you choose the protective layer, the technical standard provides some indications of the number of scales to be used and below.
They are based on average working conditions where the distance of the welder's eye from the molten metal is about 50 cm and the average lighting of the working environment is about 100 lux.
The higher the scale, the higher the level of radiation protection that is formed during welding operations and related techniques.

Gas welding

Gas welding and balance-brasaturating

Scale numbers for gas welding and balance-brasing

Work	Acetylene range in litres per hour[q] all'ora [			
	q <	70 < q <	200 < q <	q > 800
Gas welding and balance-brasatura	4	5	6	7

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Oxytocin

Scale numbers for oxytocin

Work	)xygen range in litres per hour [q]

	900 < q < 2000	2000 < q <	4000 < q <
Oxytocin	5	6	7

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Arc welding

Arc Welding - "Coated Electrodes" Process

Scale numbers for arc welding - process: "Coated electrodes"

Current [A]																				
1,5	6	10	15	30	40	60	70	100	125	150	175	200	225	250	300	350	400	450	500	600
8							9		10		11		12		13			14		

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Arc Welding - "MAG" Process

Scale numbers for arc welding - process: "MAG"

Current [A]																				
1,5	6	10	15	30	40	60	70	100	125	150	175	200	225	250	300	350	400	450	500	600
8							9		10		11		12		13			14		

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Arc Welding - "TIG" Process

Scale numbers for arc welding - process: "TIG"

Current [A]																				
1,5	6	10	15	30	40	60	70	100	125	150	175	200	225	250	300	350	400	450	500	600
---		8		9			10			11			12		13			---		

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Arc welding - "MIG with heavy metals" process

Scale numbers for arc welding - process: "MIG with heavy metals"

Current [A]																				
1,5	6	10	15	30	40	60	70	100	125	150	175	200	225	250	300	350	400	450	500	600
---								9		10		11			12		13		14	---

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Arc welding - "MIG with light alloys" process

Scale numbers for arc welding - process: "MIG with light alloys"

Current [A]																				
1,5	6	10	15	30	40	60	70	100	125	150	175	200	225	250	300	350	400	450	500	600
---										10		11		12		13		14		---

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Arc Cut

Arc Welding - "Air-to-Arc Cutting" Process

Scale numbers for arc welding - process: "Air-to-arc cut"

Current [A]																				
1,5	6	10	15	30	40	60	70	100	125	150	175	200	225	250	300	350	400	450	500	600

10	11	12	13	14	15

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Arc Welding - Plasma-Jet Cutting Process

Scale numbers for arc welding - process: "Plasma-jet cut"

Current [A]																				
1,5	**6**	**10**	**15**	**30**	**40**	**60**	**70**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**300**	**350**	**400**	**450**	**500**	**600**
---								9	10	11	12			13				---		

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

Arc Welding - "Arc Cut to Microplasm"" Process

Scale numbers for arc welding - process: "Arc welding to microplasm""

Current [A]																				
1,5	**6**	**10**	**15**	**30**	**40**	**60**	**70**	**100**	**125**	**150**	**175**	**200**	**225**	**250**	**300**	**350**	**400**	**450**	**500**	**600**
-	4	5		6		7	8		9	10		11		12		---				

Source: CTIPLL Operational Indications (Rev. 2 of March 11, 2010)

7.1. OUTCOME OF THE EVALUATION ARTIFICIAL OPTICAL RADIATION WELDING OPERATIONS

Below is the list of work tasks that expose artificial optical radiation for welding operations.
It should be noted that in the case of welding operations, for any type of welding (electric arc, gas, oxytocin, etc.)and for any type of support, the times for which overexposure is achieved for the worker is of the order of seconds for which the risk is extremely high.

Workers and Machines

Job	OUTCOME OF THE EVALUATION
1) Operator for the construction of water system of sanitation and sanitation of the site	High health risk.
2) Operator for the construction of the site's water system	High health risk.

8.CHEMICAL RISK ANALYSIS AND ASSESSMENT

The specific risk assessment was carried out under the Italian legislation mentioned above and in particular referred to:

- **It is also important to note that there is a need for a more comprehensive picture of the** problem.
- **The European Parliament and the Council on the** classification, labelling and packaging of substances and mixtures are to be adapted to technical and scientific progress.
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- **The** European Parliament's Regulation 1272/2008 and the Council on the classification, labelling and packaging of substances and mixtures are amended for the purpose of adapting to technical and scientific progress.

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Premise

As an alternative to measuring the chemical agent, it is possible, and widely practiced, to use risk assessment systems based on mathematical reports called "simplified" assessment algorithms.
In particular,the risk assessment model adopted is an analysis procedure that allows risk assessment to be carried out through a score (weight) to the various factors involved in risk determination (dangerousness, quantity, duration of exposure to preventive measures) determine its absolute or reciprocal importance on the final evaluative result.
Risk R, identified according to the model, is therefore in accordance with art. 223, paragraph 1 of D.Lgs. 81/2008, which provides for risk assessment taking into account in particular the following elements of chemical agents:

- their dangerous properties;
- The health and safety information provided by the person who entered the market through the relevant safety card prepared under the legislative decrees 3 February 1997, 52, and 14 March 2003, No 65, and subsequent amendments;
- the level, type and duration of the exposure;
- the circumstances in which the work is carried out in the presence of such agents, including the amount of them;
- occupational exposure limit values or biological limit values;
- the effects of preventive and protective measures taken or to be taken;
- if available, the conclusions drawn from any health surveillance actions already taken.

It should be noted that simplified evaluation models, such as the algorithm proposed below, are to be considered tools of particular use in risk assessment - as it makes the evaluation path to employers questionable - for the classification of their companies above or below the threshold of: "*Risk irrelevant to health*". If, however, the threshold is exceeded as a result of the assessment, it is necessary to adopt the measures of Articles. 225, 226, 229 and 230 of D.Lgs. 81/2008 including the measurement of chemical agents.

Risk Assessment (R_{chim})

Risk (R_{chim}) for risk factor assessments from exposure to hazardous chemicals is determined by the product of Hazard (PP_{chim}) and Exposure (E), as shown in the following formula:

$$R_{chim} = P_{chim} \cdot E \qquad (1)$$

The value of the Danger Index (P_{chim}) is mainly determined by the analysis of health and safety information provided by the manufacturer of the substance or chemical preparation, and specifically by the analysis of the H Phrases and/or EUH Phrases contained in them. Exposure (E) which represents the level of exposure of subjects in the specific work activity is calculated separately for inhalation exposures (E_{in}) or byskin (E_{cu}) and depends mainly on the quantity in use and the effects of the prevention and protection measuresalready taken.
In addition, the proposed evaluation model specializes in the source of the risk of exposure to hazardous chemicals, i.e. depending on whether exposure is due to the processing or presence of hazardous substances or preparations, i.e., exposure to chemical agents that develop from a work activity (e.g. welding, molding of plastics, etc.).
In the model, the Risk (R_{chim}) is calculated separately for inhaled exposures and skin exposures:

$$R_{chim,in} = P_{chim} \cdot E_{in} \qquad (1st)$$

$$R_{chim,cu} = P_{chim} \cdot E_{cu} \qquad (1b)$$

And in the case of contemporary presence, the Risk (R_{chim}) is determined by the following formula:

$$R_{chim} = \left[(R_{chim,in})^2 \cdot (R_{chim,cu})^2 \right]^{1/2} \qquad (2)$$

The ranges of variation of R_{chim} for inhaled and skin exposures are as follows:

$$0{,}1 \leq R_{chim,in} \leq 100 \quad (3)$$

$$1 \leq R_{chim,cu} \leq 100 \quad (4)$$

As a result, the chemical risk value R_{chim} may be as follows:

$$1 \leq R_{chim} \leq 141 \quad (5)$$

The following range of exposures follows:

Exposure range

Risk	Outcome of the evaluation
$0{,}1 \leq R_{chim} < 15$	Definitely "Health Inconsequential" Risk
$15 \leq R_{chim} < 21$	"Health Inconsequential" Risk
$21 \leq R_{chim} \leq 40$	Risk above "Health Inconsequential"
$40 < R_{chim}$	Health-relevant risk
$R_{chim} > 80$	High health risk

Dangerous (P_{chim})

Regardless of the source of risk, whether it is a chemical or chemical preparation used or a work activity, the Danger Index of a chemical agent(P_{chim}) is attributed according to the classification of hazardous substances and preparations established by the current Italian legislation.
The risk factors of a chemical agent, or more generally a chemical or preparation, are reported in typical phrases, called H phrases and/or EUH phrases reported in the hazard labelling and safety fact sheet provided by the manufacturer.
The hazard index (P_{chim}) is of course only awarded for H phrases and/or EUH phrases that pose a risk to workers' health when exposed to dangerous chemicals.
The methodology is NOT applicable to dangerous chemicals classified or classified as dangerous for safety, dangerous to the environment or to chemical substances or preparations that can be classified or classified as carcinogenic or mutagenic.
Therefore, in the case of the joint presence of H phrases and/or EUH phrases that pose a health risk and H phrases and/or EUH phrases that pose safety or environmental risks or in the presence of carcinogens or mutagens, this "health-specific" assessment is supplemented with one or more specific assessments for the relevant hazards.
In addition, a score is also awarded for substances and preparations that are not classified as dangerous, but which in the processing process are transformed or decompose by typically emitting dangerous chemical agents (e.g. in welding operations, etc.).
The maximum score attributable to a chemical agent is 10 (substance or prepared certainly dangerous) and the minimum is 1 (substance or preparation unclassified or not classified as dangerous).

Exposure by inhalation ($E_{in,sost}$) from substance or prepared

The inhalation exposure index of a chemical or chemical preparation ($E_{in,sost}$) is determined as produced between the potential exposure index (E_p), to the chemicals contained in the chemical substances orpreparations used, and the distance factor (f_d), indicative of the distance of workers from the source of risk.

$$E_{in,sost} = E_p \cdot F_d \quad (6)$$

Potential Exposure (E_p) isa five-variable function, resolved by a progressive array system. The resulting index can be values between 1 and 10, depending on the level of exposure determined by the predicted matrix.

Exposure level		Potential exposure (E_p)
A.	Low	1
B.	Moderate	3
C.	Relevant	7
D.	High	10

Distance Factor (F_d) isa reducer coefficient of the potential exposure index (E_p) that takes into accountthe worker's distance from the risk source. The values that it can take are between f_d plus 1.00 (distance less than one meter) to f_d f-0.10 (distance greater than or equal to 10 meters).

Distance from chemical risk source		Distance factor (F_d)
A.	Less than 1 m	1,00
B.	1m to less than 3m	0,75
C.	3m to less than 5m	0,50
D.	5m to less than 10m	0,25
And.	Greater than or equal to 10 m	0,10

Determining the Potential Exposure Index (E_p)

The Potential Exposure Index (E_p) is determined by solving a system of fourprogressive arrays that use the following five variables as input data:

- Physical chemical properties
- Quantity present
- Type of use
- Type of control
- Exposure time

The first two variables,*"Physical Chemical Properties"*of the substances and chemical preparations used (solid state, fog, fine dust, liquid at different volatility or gas state) and "quantities*present"*in the workplace, are indicators of "propensity" of the products used to release airbornechemicals.
The last three variables,*"Type of Use*" (closed system, matrix inclusion, controlled use or dispersive use), "Control*type*" (full containment, localized suction, segregation, separation, general ventilation, direct manipulation) and "Exposure*time",*are instead "compensation" indicators, that is, limiting the presence of airborneagents.

Potential presence matrix

The first matrix is a function of the "*Chemical-Physical*Properties " and "Quantity*Present*" variables of the chemicals used and returns a(increasing) indicator of the potential presence of airborne chemicals on four levels.

1. Low
2. Moderate
3. Relevant
4. High

The values of the variable "*Physical Chemical Properties*" aresorted in ascending order regarding the possibility of the substance becoming available in the air, depending on the volatility of the liquid and the conceivable or known grainy of dust. The variable "*Quantity Present*" is an estimate of the amount of chemical present andintended, in any mode, for use in the work environment.

Potential presence matrix

Quantity present		A.	B.	C.	D.	And.
Physical chemical properties		Less than 0.1 kg	From 0.1 kg to less than 1 kg	1 kg to less than 10 kg	From 10 kg to less than 100 kg	Greater than or equal to 100 kg
A.	Solid state	1. Low	1. Low	1. Low	2. Moderate	2. Moderate
B.	Fog	1. Low	1. Low	1. Low	2. Moderate	2. Moderate
C.	Low Volatility Liquid	1. Low	2. Moderate	3. Relevant	3. Relevant	4. High
D.	Fine powder	1. Low	3. Relevant	3. Relevant	4. High	4. High
And.	Medium Volatility Liquid	1. Low	3. Relevant	3. Relevant	4. High	4. High
F.	High volatility liquid	1. Low	3. Relevant	3. Relevant	4. High	4. High
G.	Gas state	2.Moderate	3. Relevant	4. High	4. High	4. High

Actual presence matrix

The second matrix is a function of the previously determined indicator, "*Potential Presence*", and thevariable "Type of Use " of*the*chemicals used and returnsan (increasing) indicator of the actual presence of airborne chemicals on three levels.

1. Low
2. Average
3. High

The values of the variable "*Type of Use*" aresorted in a decreasing order regarding the possibility of dispersal of chemical agents in the air during processing.

Actual presence matrix

Type of use		A.	B.	C.	D.
Level of Potential presence		Closed system	Matrix inclusion	Controlled use	Dispersive use
1.	Low	1. Low	1. Low	1. Low	2. Average
2.	Moderate	1. Low	2. Average	2. Average	3. High
3.	Relevant	1. Low	2. Average	3. High	3. High
4.	High	2. Average	3. High	3. High	3. High

Controlled presence matrix

The third matrix is a function of the previously determined indicator, "*Actual Presence*", and thevariable "Control*type*" of the chemicals used and returns anindicator (ascending) on three levels of controlled presence, that is, the presence of airborne chemicals downstream of the processing control process.

1. Low
2. Average
3. High

The values of the variable "*Control Type*"are sorted in a decreasing manner regarding the possibility of dispersal of chemical agents in the air during processing.

Controlled presence matrix

Type of control		A.	B.	C.	D.	And.
Level of Actual presence		Full containment	Localized suction	Segregation Separation	General ventilation	Direct manipulation
1.	Low	1. Low	1. Low	1. Low	2. Average	2. Average
2.	Average	1. Low	2. Average	2. Average	3. High	3. High
3.	High	1. Low	2. Average	3. High	3. High	3. High

Potential exposure matrix

The fourth is last matrix is a function of the previously determined indicator, "Controlled*Presence*", and thevariable "Exposure*Time*" to the chemicals used and returns anindicator (ascending) on four levels of workers' potential exposure, that is, exposure intensity independent of distance from the source of chemical risk.

1. Low
2. Moderate
3. Relevant
4. High

The "*Exposure Time*" variable is an estimate of theworker's maximum time exposure to the risk source on a daily basis, regardless of the frequency of use of the product on a larger time base.

Potential exposure matrix

Exposure time		A.	B.	C.	D.	And.
Level of Controlled presence		Less than 15 min	15 min to less than 2 hours	2 hours to less than 4 hours	4 hours to less than 6 hours	Greater than or equal to 6 hours
1.	Low	1. Low	1. Low	2. Moderate	2. Moderate	3. Relevant
2.	Average	1. Low	2. Moderate	3. Relevant	3. Relevant	4. High
3.	High	2. Moderate	3. Relevant	4. High	4. High	4. High

Exposure by inhalation($E_{in,lav}$) fromwork

The inhalation exposure index of a chemical agent resulting from work activity ($E_{in,lav}$) is a function of three variables, solved by a progressive array system. The resulting index can be values between 1 and 10, depending on the level of exposure determined by the predicted matrix.

Exposure level		Exposure ($E_{in,lav}$)
A.	Low	1
B.	Moderate	3
C.	Relevant	7
D.	High	10

The matrix system adopted is a modified version of the system previously analyzed to take into account the peculiarity of exposure to chemical agents during processing and the input data are the following three variables: - Quantities present
- Type of control
- Exposure time

Controlled presence matrix

The controlled presence matrix takes into account the variable "*Quantity Present*" of the chemicals and employees and thevariable "Control*type*" of the chemicals and returns anindicator (increasing) of the actual presence of airborne chemicals on three levels.
1. Low
2. Average
3. High

Controlled presence matrix

Type of control		A.	B.	C.	D.
Quantity present		Full containment	Controlled suction	Segregation Separation	General ventilation
1.	Less than 10 kg	1. Low	1. Low	1. Low	2. Average
2.	From 10 kg to less than 100 kg	1. Low	2. Average	2. Average	3. High
3.	Greater than or equal to 100 kg	1. Low	2. Average	3. High	3. High

Inhalation exposure matrix

The exposure matrix is a function of the previously determined indicator, "*Controlled Presence*", and thevariable "Exposure*Time*" tothe fumes produced by processing and returns an indicator (ascending) on four levels of exposure by inhalation.
1. Low
2. Moderate
3. Relevant
4. High

The "*Exposure Time*" variable is an estimate of theworker's maximum time exposure to the risk source on a daily basis.

Inhalation exposure matrix

Exposure time		A.	B.	C.	D.	And.
Level of Controlled presence		Less than 15 min	15 min to less than 2 hours	2 hours to less than 4 hours	4 hours to less than 6 hours	Greater than or equal to 6 hours
1.	Low	1. Low	1. Low	2. Moderate	2. Moderate	3. Relevant
2.	Average	1. Low	2. Moderate	3. Relevant	3. Relevant	4. High
3.	High	2. Moderate	3. Relevant	4. High	4. High	4. High

Skin exposure (E_{cu})

The skin exposure index of a chemical agent (E_{cu}) is a function oftwo variables, "Type of*Use*"and "Contact*Level*", and is determined by the followingexposure matrix.

Skin exposure matrix

Contact level		A.	B.	C.	D.
Type of use		No contact	Accidental contact	Discontinued contact	Extended contact
1.	Closed system	1. Low	1. Low	2. Moderate	3. Relevant
2.	Matrix inclusion	1. Low	2. Moderate	2. Moderate	3. Relevant
3.	Controlled use	1. Low	2. Moderate	3. Relevant	4. High
3.	Dispersive use	1. Low	3. Relevant	3. Relevant	4. High

The resulting index can be values between 1 and 10, depending on the level of exposure determined by the predicted matrix.

Exposure level		Skin exposure (E_{cu})
A.	Low	1

B.	Moderate	3
C.	Relevant	7
D.	High	10

8.1. RESULTS OF THE CHEMICAL RISK ASSESSMENT

Below is the list of work tasks that expose to chemical agents and the relative outcome of the risk assessment.

Workers and Machines

Job	OUTCOME OF THE EVALUATION
1) Tank remediation officer	Risk definitely: "Inconsequential to health".

8.2. CHEMICAL RISK ASSESSMENT CARDS

The following chemical risk assessment sheets show the outcome of the assessment carried out for a single work activity with the identification of the tasks, the sources of risk and the relevant exposure range.
Any provisions relating to health surveillance, information and training, the use of personal protective equipment and technical and organisational measures are included in the security document of which this is an annex.

Correlation Table Job - Scoreboard

Job	Evaluation board
Tank remediation officer	CARD NO.1

CARD NO.1

Risks to the health of workers for the use of chemical agents in all types of proceedings, including production, handling, storage, transport or removal and treatment of waste, or resulting from such work activity.

Source of risk					
Source Danger	Inhalation exhibition	Inhalation risk	Skin exposure	Skin risk	Chemical risk
[Pchim]	[Echim,in]	[Rchim,in]	[Echim,cu]	[Rchim,cu]	[Rchim]
1) Substance used					
1.00	3.00	3.00	3.00	3.00	4.24

".

Membership band:
Definitely risk: "Inconsequential to health

Tasks:
Tank remediation officer.

Detail of risk sources:

1) Substance used

Dangerous(P_{chim}):
---. Substances and preparations that are not classified as dangerous and do not contain any dangerous substances.

Inhalationexposure (**$E_{chim,in}$):**
- Physical chemical properties: Fine powder;
- Quantity present: From 1 kg to less than 10 kg;
- Type of use: Controlled use;
- Type of control: General ventilation; - Exposure time: Lower than 15 min;- Distance from source: Less than 1 m.

Skin exposure ($E_{chim,cu}$): - Contact level: Accidental contact; - Type of use: Controlled use.