

General flow of calculations for Declaration of Performance for Protector Guardrail D228

For permanent rooftop guardrails there is no dedicated product standard. That means: calculate under Eurocode, plus a Declaration of Performance under the Construction Products Regulation, plus per-project confirmation that the installation on this specific building falls within the calculated envelope.

The generic strength of the guardrail itself is verified in a separate document [001 Berekening Hekwerk NEN-EN13374 rev 6 T2 VD]. These follow the requirements of EN 13374, as stated below.

6.1 Temporary edge protection - EN 13374:2025 load cases

LINE	CLAUSE	LOAD CASE	DESIGNATION	POINT LOAD [N]	DISTRIBUTED LOAD Q_D [N/M ²]	γ_F	REQUIREMENT
1	6.3.2	SLS - Toeboard level	F_{T2}	200	-	1.0	max 55 mm elastic deflection
		SLS - Guardrails level	F_{T1}	300	-	1.0	
2	6.3.3	ULS - Toeboard level	F_{T2}	200	-	1.5	$E_d \leq R_d$
		ULS - All other parts	F_{T1}	300	-	1.5	
3	6.3.4	ULS - Maximum wind	Q_{nw}	-	600	1.5	$E_d \leq R_d$
4	6.3.5	ULS - Load combination toeboard	$Q_{nw} + F_{T2}$	200	200	1.5	$E_d \leq R_d$
		ULS - Load combination all other parts	$Q_{nw} + F_{T1}$	300	200	1.5	
5	6.3.6	ULS - Parallel	F_{T2}	200	-	1.5	$E_d \leq R_d$
6	6.3.7	ULS - Accidental loads	F_a	1250	-	1.0	$E_d \leq R_d$, max 300 mm deflection

Lines 2 to 5 specify fundamental loads. Line 6 specifies the accidental (fall) load case which is typically governing for stress in the guardrail itself.

Windloads

In the first 4 pages, each stanchion type is calculated.

Per stanchion configuration (3m or 4m stanchion distance) the exposed windarea is calculated according to EN 1991-1-4. Relevant safety factors and wind coefficients are taken into account.

These are then translated into a sliding force and a tipping force. These effects [E] are expressed in units per N/m² of windpressure.

Per counterweight system the resistance is calculated, using the safetyfactor of 0,9 for favourable weights. The resistance is calculated for both tipping directions and sliding.

Together with the [E] values of the 1st table, the max allowed windloads for the 3 failuremodes (2x tipping, 1x sliding) are then calculated

A safety factor of 1,5 is then applied (green columns).

Imposed loads on the roof structure

The ballasted Protector Guardrail D228 transfers its dead weight into the roof. The values are what a specific configuration imposes on the roof deck, expressed three ways: local point load per stanchion (kN), average distributed line load (kN/m), and pressure on the roof surface (N/cm²) for the tile-bearing check on the insulation. The roof structure and insulation must be verified to carry these values. These are characteristic values (unfactored). These can be found in the yellow columns

Pages 5,6,7

These tables summarize the results for quick reference.