	TECHNICAL INFORMATION		**NTC 022** *English version*
I.U. Anchors and Pins	Issue Date : 16/03/05	Issuer : V. ROSTAIND	Sheet : 1/2

Product concerned : **SPIT TRIGA Z M6 to M20 – Behaviour to seismic action**

This technical information aims at proposing you resistance values to design the anchors SPIT TRIGA Z in the concrete for earthquake resistance.
These data are given according to the chapter 5 - **"Anchors exposed to seismic actions"** in the french professional rules: "*Recommendations for professional people in construction for design of fixings for metal anchors in concrete"*-. Amendment of December 2004 published by the CISMA.

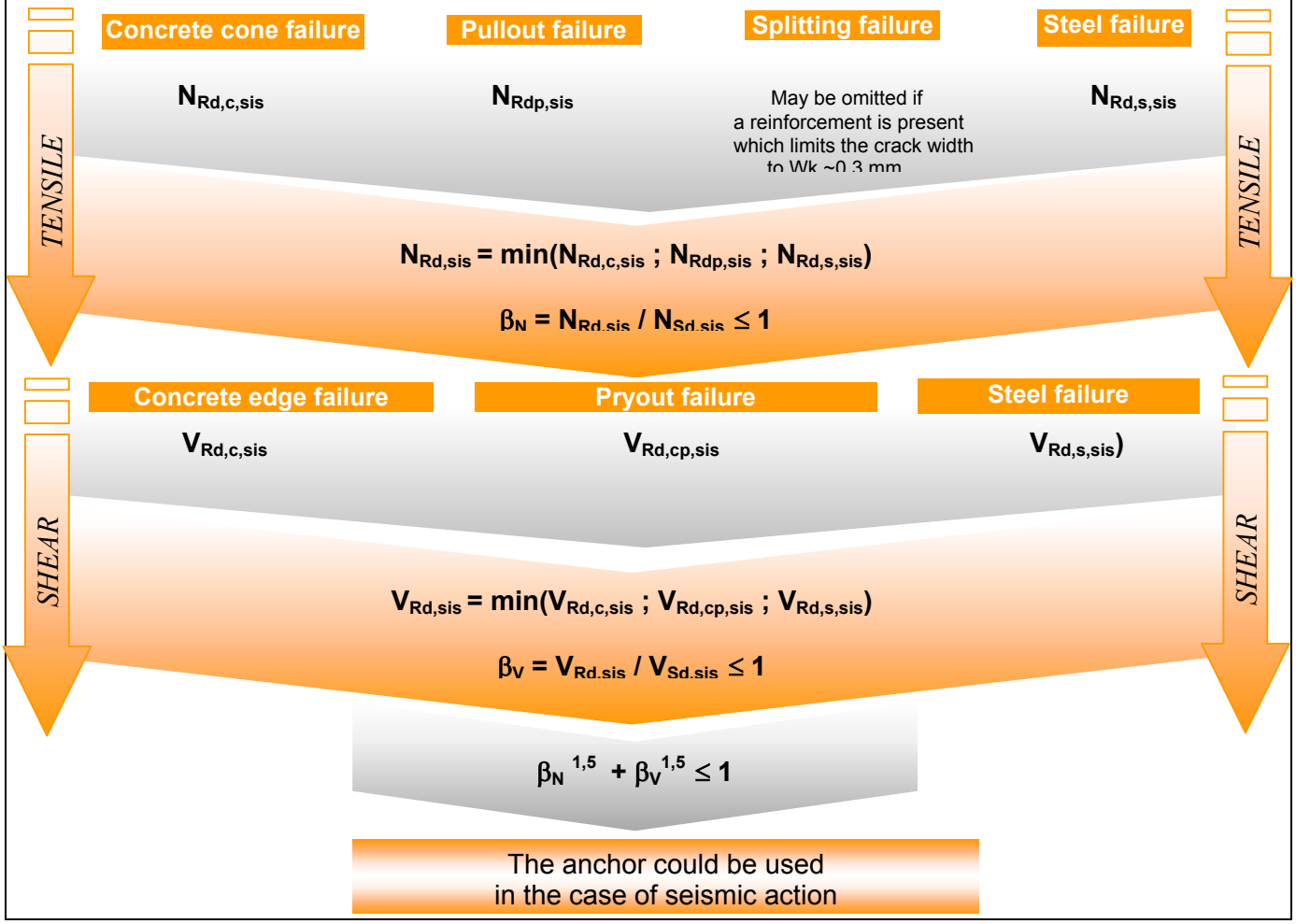
The ultimate design resistance ($N_{Rd,sis}$ $V_{Rd,sis}$) are determined from the characteristics resistances givent in the ETA nb. ETA-05/0044 :

- In tensile : $N_{Rd,sis} = \frac{N_{Rk,sis}}{\gamma_M^*} = \frac{0,75.N_{Rk(ATE)}}{\gamma_M^*}$ for each failure mode.
- In shear : $V_{Rd,sis} = \frac{V_{Rk,sis}}{\gamma_M^*} = \frac{0,3.V_{Rk(ATE)}}{\gamma_M^*}$ for each failure mode.

*The values of γ_M are given in the table in page 2 for the seismic actions.

The designer must determined the horizontal effects ($N_{Sd,sis}$) and vertical effects ($V_{sd,sis}$) of the seismic action in take into account the mass and the height of the element, the acceleration, and the fundamental vibration period of the building.

The principle to design in accordance with the ETAGuideline 001 – Annex C, Method A is :



Product concerned : **SPIT TRIGA Z M6 to M20 – Behaviour to seismic action**

Steel failure			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**
Characteristic resistance under seismic actions	$N_{Rk,s,sis}$	kN	12	21	34	50	94	147
Safety partial factor	γ_{Ms}	-	1,50					

Pullout failure			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**
Characteristic resistance under seismic actions	$N_{Rk,p,sis}$	kN	3,7	9	12	*	*	*
Safety partial factor	γ_{Mp}	-	1,50					

* Not decisive failure mode

Concrete con failure in cracked concrete			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**
Effective anchorage depth	h_{ef}	mm	50	60	70	80	100	125
Characteristic resistance in cracked concrete C20/25 under seismic actions	$N^0_{Rk,c,sis}$	kN	9,5	12,5	15,8	19,3	27	37,7
	$\psi_{ucr,N}$	-	1,0					
Safety partial factor	γ_{Mc}	-	1,38					
Increasing factor for N_{Rk} C30/37	ψ_c	-	1,22					
C40/50			1,41					
C50/60			1,55					
Spacing	$s_{cr,N}$	mm	150	180	210	240	300	375
	$s_{cr,sp}$	mm	300	300	300	300	380	480
Edge distance	$c_{cr,N}$	mm	75	90	105	120	150	185
	$c_{cr,sp}$	mm	150	150	150	150	190	240

Steel failure without lever arm			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**
SCREW version								
Characteristic resistance under seismic actions	$V_{Rk,s,sis}$	kN	7	9,8	14,7	21,8	35	52
Safety partial factor	γ_{Ms}	-	1,25					
THREADED ROD version								
Characteristic resistance under seismic actions	$V_{Rk,s,sis}$	kN	4,3	5,7	9,3	14,2	27,9	32,9
Safety partial factor	γ_{Ms}	-	1,25					
THREADED ROD only								
Characteristic resistance under seismic actions	$V_{Rk,s,sis}$	kN	2,4	4,4	7	10	18,8	29,4
Safety partial factor	γ_{Ms}	-	1,25					

. Steel failure with lever arm			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**
Factor in equation (5.6)	k	-	1	2				
Safety partial factor	γ_{Mpr}	-	1,38					
$V_{Rk,cp,sis} = 0,3.V_{Rk,cp}$ calculated according to equation 5.6 of annex C								

Rupture béton bord de dalle			**M6**	**M8**	**M10**	**M12**	**M16**	**M20**
Effective length of anchor under shear loading	l_f	mm	50	60	70	80	100	125
Outside diameter of anchor	d_{nom}	mm	9,5	11,5	14,5	17,5	23,5	27,4
Safety partial factor	γ_{Mpr}	-	1,38					
$V_{Rk,c,sis} = 0,3.V_{Rk,c}$ calculated according to equation 5.6 of annex C								