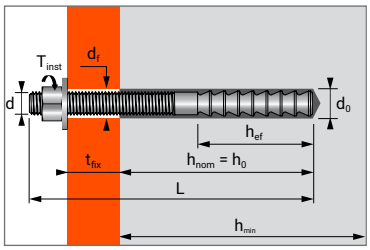
VIPER XTREM

ETA - 17/0514
*ETA - 17/0513

Vinylester resin with XTREM rod, for use in cracked and non-cracked concrete and seismic performance categories C1 & C2



CHARACTERISTICS

ZINC COATED STEEL · TROPICAL VERSION · XTREM · WRAS APPROVED PRODUCT · BREEAM tested · LEED tested · GEV-EMICODE EC2 low emission

APPLICATION

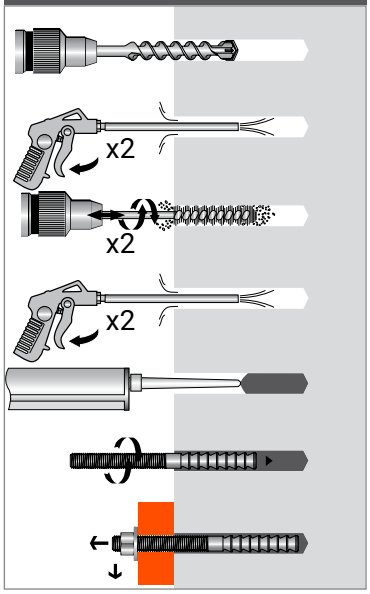
- Steel profiles
- Fixing machinery (resistant to vibration)
- Storage tanks, pipes
- Signs
- Guard rails
- Electrical insulated fixings

FIELD OF USE

Shelf life : 18 months
Installation temperature: -10°C / +40°C
In-Service temperature range:
- Range 1: -40°C / +40°C
- Range 2: -40°C /+80°C

Installation conditions:
- Category 1: Dry or wet concrete
- Category 2: Flooded holes

INSTALLATION



TECHNICAL DATA

RANGE	Minimum embedment depth		Maximum thickness of part to be fixed		Min. thick of base material	Thread diameter	Drilling diameter	Clearance diameter	Total anchor length	Tighten torque	Code SPIT XTREM studs
	(mm) h_{om} min.	(mm) h_{nom} max.	(mm) t_{fix} min.	(mm) t_{fix} max.	(mm) h_{min}	(mm) d	(mm) d_0	(mm) d_f	(mm) L	(Nm) T_{inst}	
M12X150	60	108	77	29	h_{nom}	12	14	14	150	30	060191
M12X205	60	144	132	48	+ 30 mm	12	14	14	205	30	060192
M16X200	95	144	89	40		16	18	18	200	50	060193
M16X250	95	192	139	42	h_{nom}	16	18	18	248	50	060194
M20X270	100	180	151	71	+ $2d_0$	20	22	22	270	150	060195
M20X330	100	240	211	71		20	22	22	330	150	060196
VIPER XTREM cartridge 280 ml										060187	
VIPER XTREM cartridge 410 ml										060189/060188	
VIPER XTREM TR cartridge (Tropical version) 410 ml										060201	
VIPER XTREM cartridge 825 ml										060190	

ANCHOR MECHANICAL PROPERTIES

SIZE			M12	M16	M20
f_{uk}	[N/mm²]	Min. tensile strength	800	800	800
f_{yk}	[N/mm²]	Yield strength	640	640	640
$M^0_{Rk,s}$	[Nm]	Characteristic bending moment	105	266	519
M	[Nm]	Recommended bending moment	42	106	207

SETTING TIME

TEMPERATURE	MAX. TIME FOR INSTALLATION		CURING TIME	
	Standard version	Tropical version	Standard version	Tropical version
-10°C ▸ -5°C	90 min.	-	24 h	-
-4°C ▸ 0°C	50 min.	-	240 min.	-
1°C ▸ 5°C	25 min.	60 min.	120 min.	240 min.
6°C ▸ 10°C	15 min.	40 min.	90 min.	180 min.
11°C ▸ 20°C	7 min.	15 min.	60 min.	120 min.
21°C ▸ 30°C	4 min.	8 min.	45 min.	60 min.
31°C ▸ 40°C	2 min.	4 min.	30 min.	60 min.

CHEMICAL RESISTANCE OF THE SPIT VIPER RESIN

CHEMICAL SUBSTANCES	CONCENTRATION %	RESISTANCE	CHEMICAL SUBSTANCES	CONCENTRATION %	RESISTANCE
Acetic acid	50-75	(o)	Heptane	100	(+)
Acetic acid	0-50	(+)	Hexane	100	(o)
Acetone	10	(+)	Hydrochloric acid	25	(o)
Ammonium hydroxide or Ammoniac	20	(o)	Hydrochloric acid	15	(+)
Ammonium hydroxide or Ammoniac	5	(+)	Lactic acid	0-100	(+)
Bromine water	5	(+)	Nitric acid	5-15	(o)
Chlorine water	0-100	(+)	Phosphoric acid	80	(+)
Citric acid	0-100	(+)	Phosphoric acid, vapor and condensed		(+)
Concentrated phosphoric acid	100	(+)	Sea water	0-100	(+)
Deionized water	0-100	(+)	Sodium carbonate	10	(+)
Demineralized water		(+)	Sodium chloride	0-100	(+)
Diesel fuel	0-100	(+)	Sodium hydroxide (or Caustic soda)	25	(o)
Ethyl alcohol (Ethanol)	10	(o)	Sulphuric acid	71-75	(o)
Ethylene glycol	0-100	(+)	Sulphuric acid	0-70	(+)
Formic acid	10	(+)	Sulphuric acid	Fumes	(+)
Fuel	100	(+)	Sulphuric acid / Phosphoric acid	10:20	(+)
Heavy motor oil	100	(+)	Turpentine (oil)		(o)

Resistant (+): the samples in contact with the substances did not show any Screwible damage such as cracks, attacked surfaces, burst corners nor large swelling. Sensitive (o): use with care regarding exposure of the field of usage, precautions to be taken. The samples in contact with the substance slightly attacked the material.

VIPER XTREM

MINIMUM THICKNESS OF CONCRETE, CHARATERISTIC & MINIMUM DISTANCES FOR SPACING, EDGE

SIZE			M12	M16	M20
Embedment depth	$h_{nom\ std}$	[mm]	110	125	170
Anchorage depth	h_{ef}	[mm]	60	96	100
Minimum thickness of base material	h_{min}	[mm]	140	160	215
Characteristic edge and spacing distance for full anchor capacity	$C_{cr} \geq$	[mm]	90	144	150
	$S_{cr} \geq$	[mm]	180	288	300
Minimum distances for cracked and non-cracked concrete	C_{min}	[mm]	55	60	120
	$S \geq$	[mm]	55	60	120

CHARACTERISTIC RESISTANCES [kN]

Characteristic resistances are shown as informative, and have to be used by application of safety factors .

In tensile loads, the table below shows bond strength in N/mm². All dimensions can be installed with embedment length between 7d to 20d.

The characteristic tensile load is determined with the formular: $N^{0}_{Rk,p} = \Pi.d\ h_{ef}\ .\ \tau_{Rk}$

TENSILE

NON-CRACKED CONCRETE – C20/25

SIZE		M12	M16	M20
$h_{nom\ min}$	[mm]	60	96	100
$h_{nom\ max}$	[mm]	144	192	240
$\tau_{Rk,uncr}$	[N/mm²]	17	17	17

CRACKED CONCRETE – C20/25

SIZE		M12	M16	M20
$h_{nom\ min}$	[mm]	60	96	100
$h_{nom\ max}$	[mm]	144	192	240
$\tau_{Rk,cr}$	[N/mm²]	17	16	14

SHEAR

CRACKED AND NON-CRACKED CONCRETE – C20/25 to C50/60

SIZE		M12	M16	M20
$h_{nom\ min}$	[mm]	60	96	100
$h_{nom\ max}$	[mm]	144	192	240
V_{Rks}	[kN]	*34,0*	*63,0*	*98,0*

RECOMMENDED LOADS OF ONE ANCHOR WITHOUT INFLUENCE OF SPACING & CONCRETE EDGE [kN]

Recommended values are determined from performances given in the ETA, and are guaranteed for spacing ≥ S_{cr} and edge distance ≥ C_{cr}.

TENSILE

NON-CRACKED CONCRETE – C20/25

SIZE		M12	M16	M20
$h_{nom\ std}$	[mm]	110	125	170
N_{Rec}	[kN]	18,3	32,7	50,9

CRACKED CONCRETE – C20/25

SIZE		M12	M16	M20
$h_{nom\ std}$	[mm]	110	125	170
N_{Rec}	[kN]	18,3	22,9	36,3

$N_{Rec} = \min [N_{Rd,p}\ ;\ N_{Rd,c};\ N_{Rd,s}] / \gamma_F\ ;\ \gamma_F = 1,4$

SHEAR

CRACKED AND NON-CRACKED CONCRETE – C20/25 to C50/60

SIZE		M12	M16	M20
$h_{nom\ std}$	[mm]	110	125	170
V_{Rec}	[kN]	*19,4*	*36,0*	*56,0*

$V_{Rec} = V_{Rd,s} / \gamma_F\ ;\ \gamma_F = 1,4$

Nota: The values indicated *in italics and underlined* correspond to steel failure

VIPER XTREM

i-Expert Software

Design resistances for static and seismic loads are determined from performances given in the ETA, and are guaranteed for spacing ≥ S_{cr} and edge distance ≥ C_{cr}. For project with reduced spacing and edge distance, we recommend to use SPIT i-Expert software to design your project according to EN 1992-4.

DESIGN RESISTANCE FOR STATIC LOADS IN NON CRACKED CONCRETE [kN]

TENSILE

SIZE			M12	M16	M20
$h_{nom\ std}$	[mm]		110	125	170
$N_{Rd,uncr}$	[kN]	C20/25	25,6	45,8	71,2
		C40/50	29,5	59,3	93,3

Distances S_{cr} and C_{cr} must be fulfilled

$N_{Rd,uncr} = \min[N_{Rk,p,uncr} / \gamma_{Mc} ; N_{Rk,s} / \gamma_{Ms,N}]$

$\gamma_{Mc} = 1,5 ; \gamma_{Ms,N} = 1,5$

SHEAR

SIZE			M12	M16	M20
$h_{nom\ std}$	[mm]		110	125	170
$V_{Rd,s}$	[kN]	≥C20/25	*27,2*	*50,4*	*78,4*

$V_{Rd,s} = V_{Rk,s} / \gamma_{Ms,V}$

$\gamma_{Ms,V} = 1,25$

DESIGN RESISTANCE FOR STATIC LOADS IN CRACKED CONCRETE [kN]

TENSILE

SIZE			M12	M16	M20
$h_{nom\ std}$	[mm]		110	125	170
$N_{Rd,cr}$	[kN]	C20/25	25,6	32,1	50,9
		C40/50	29,5	45,4	72,0

Distances S_{cr} and C_{cr} must be fulfilled

$N_{Rd,cr} = \min[N_{Rk,p,cr} / \gamma_{Mc} ; N_{Rk,s} / \gamma_{Ms,N}]$

$\gamma_{Mc} = 1,5 ; \gamma_{Ms,N} = 1,5$

SHEAR

SIZE			M12	M16	M20
$h_{nom\ std}$	[mm]		110	125	170
$V_{Rd,s}$	[kN]	≥C20/25	*27,2*	*50,4*	*78,4*

$V_{Rd,s} = V_{Rk,s} / \gamma_{Ms,V}$

$\gamma_{Ms,V} = 1,25$

DESIGN RESISTANCE FOR SEISMIC LOADS CATEGORY C1 [kN]

TENSILE

SIZE			M12	M16	M20
$h_{nom\ std}$	[mm]		110	125	170
$N_{Rd,C1}$	[kN]	C20/25	22,5	27,3	43,3
		C40/50	25,6	38,6	50,3

Distances S_{cr} and C_{cr} must be fulfilled

$N_{Rd,C1} = \min[N_{Rk,p,eq,C1} / \gamma_{Mc} ; N_{Rk,s,eq,C1} / \gamma_{Ms,N}]$

$\gamma_{Mc} = 1,5 ; \gamma_{Ms,N} = 1,5$

SHEAR

SIZE			M12	M16	M20
$h_{nom\ std}$	[mm]		110	125	170
$V_{Rd,s,C1}$	[kN]	≥C20/25	*18,9*	*35,2*	*54,9*

$V_{Rd,s,C1} = V_{Rk,s,eq,C1} / \gamma_{Ms,V}$

$\gamma_{Ms,V} = 1,25$

DESIGN RESISTANCE FOR SEISMIC LOADS CATEGORY C2 [kN]

TENSILE

SIZE			M12	M16	M20
$h_{nom\ std}$	[mm]		110	125	170
$N_{Rd,C2}$	[kN]	C20/25	10,7	27,3	28,5
		C40/50	10,7	30,9	28,5

Distances S_{cr} and C_{cr} must be fulfilled

$N_{Rd,C2} = \min[N_{Rk,p,eq,C2} / \gamma_{Mc} ; N_{Rk,s,eq,C2} / \gamma_{Ms,N}]$

$\gamma_{Mc} = 1,5 ; \gamma_{Ms,N} = 1,5$

SHEAR

SIZE			M12	M16	M20
$h_{nom\ std}$	[mm]		110	125	170
$V_{Rd,s,C2}$	[kN]	≥C20/25	*18,9*	*35,2*	*54,9*

$V_{Rd,s,C2} = V_{Rk,s,eq,C2} / \gamma_{Ms,V}$

$\gamma_{Ms,V} = 1,25$

Nota: The values indicated *in italics and underlined* correspond to steel failure