FATFREE

FatFree Suite v13.0.1
FatFree GUI v13.0.1

FATIGUE ANALYSIS OF FREE SPANNING PIPELINES

DNV·GL

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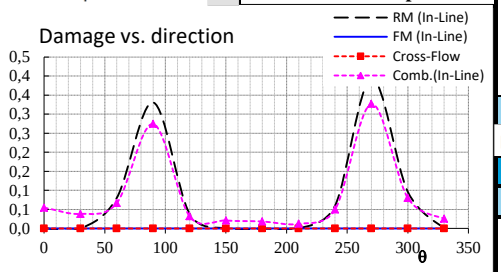
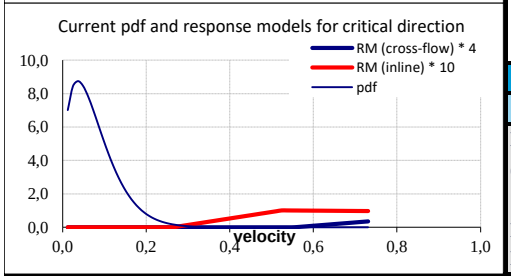
FATFREE IS READY
License status: OK. License expires in 375 days.

Project: | Date: | Calculations by
References: | | Verified by

Calculation options	Code	Free Span Scenario	Response Data	Soil Properties	SN-Curve, cap position	SN-Curve, root position	Safety Factors
Multi-mode	RP-F105	Flat sea-bed	RP-F105 Span	Clay - Very soft	F1 (seawater cp)	F1 (seawater cp)	MEDIUM

Return Period Values	Directionality	Current Modelling	Current Sheet Name
Automatic Generated	Discrete - C dir.	Uc Weibull pdf	Current Template





h [m]	110	f_1 (in-line)	0,773	ζ_{struc}	0,005	m_1	3	m_1	3	Not well defined	
L [m]	40	f_1 (cr-flow)	0,831	ζ_{soil} (in-line)	0,020	m_2	5	m_2	5	η	0,50
e [m]	0,40	A_1 (in-line)	111	ζ_{soil} (cr-flow)	0,020	$Log(C_1)$	11,299	$Log(C_1)$	11,299	γ_k	1,15
d [m]		A_1 (cr-flow)	121	$\zeta_{h,RM}$	0,0000	$Log(C_2)$	14,832	$Log(C_2)$	14,832	$\gamma_{f,IL(inline)}$	1,20
θ_{pipe}	0,0	λ_1	1,290	K_S(in-line)	0,61	$logN_{sw}$	6,00	$logN_{sw}$	6,00	$\gamma_{f,CF(cr-flow)}$	1,20
D [m]	0,400	δ/D	0,42	K_S(cr-flow)	0,61					γ_S	1,30
L/D_s	100	S_{eff}/P_E	0,08	K_V	8,980E+05	SCF	1,40	SCF	1,00	$\gamma_{on,IL}$	1,10
Wave Modelling		**Wave Sheet Name**		K_L	5,968E+05	R_{cap}	0,200	R_{root}	0,180	$\gamma_{on,CF}$	1,20
No Wave		**Wave Template**		$K_{V,S}$	7,500E+04					Ψ_R	1,00

STRUCTURAL MODELLING

Coating data		Functional Loads		Pipe Dimensions [m]		Constants		Densities [kg/m^3]		Special input	
k_c	0.25	H_{eff} [N]	9,00E+04	D_s	0,4000	ν	0,30	ρ_{steel}	7850	Normal	
f_{cn} [Mpa]	42	p [bar]	0	t_{steel}	0,0200	α [$^oC^{-1}$]	1,17E-05	$\rho_{concrete}$	1800	$R_{S,C}$	-
k [m]	3,3E-03	ΔT [^oC]	0	$t_{concrete}$	0,0000	E [N/m^2]	2,07E+11	$\rho_{coating}$	940	$R_{S,W}$	-
				$t_{coating}$	0,0000			ρ_{cont}	0	$R_{IL,strakes}$	-
										$R_{CF,strakes}$	-
										$R_{CF\text{-}ind\text{-}IL,strakes}$	-

RESULTS

FATIGUE LIFE

In-line (Response Model)	3,02E+05	yrs
Cross-Flow	1,00E+06	yrs
In-line (Force Model)	-	yrs
In-line (Combined)	3,02E+05	yrs

DYNAMIC STRESS [MPa]

Cross-flow	Peak	Von Mises	Inline	Peak	Von Mises
σ_x(1 year)	0,0	37,9	σ_x(1 year)	0,0	10,6
σ_x(10 year)	0,0	37,9	σ_x(10 year)	0,0	10,6
σ_x(100 year)	0,0	37,9	σ_x(100 year)	2,1	11,7