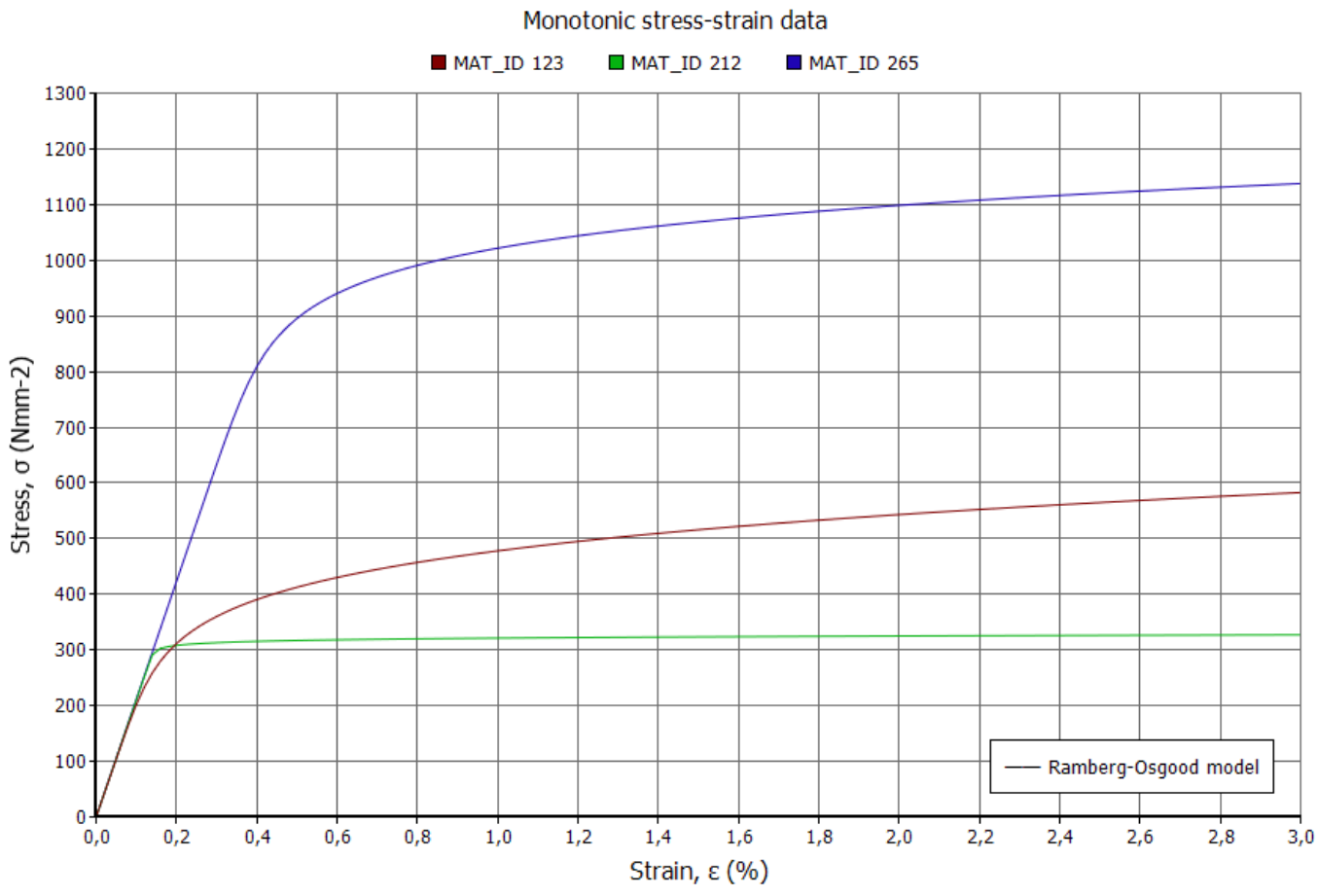
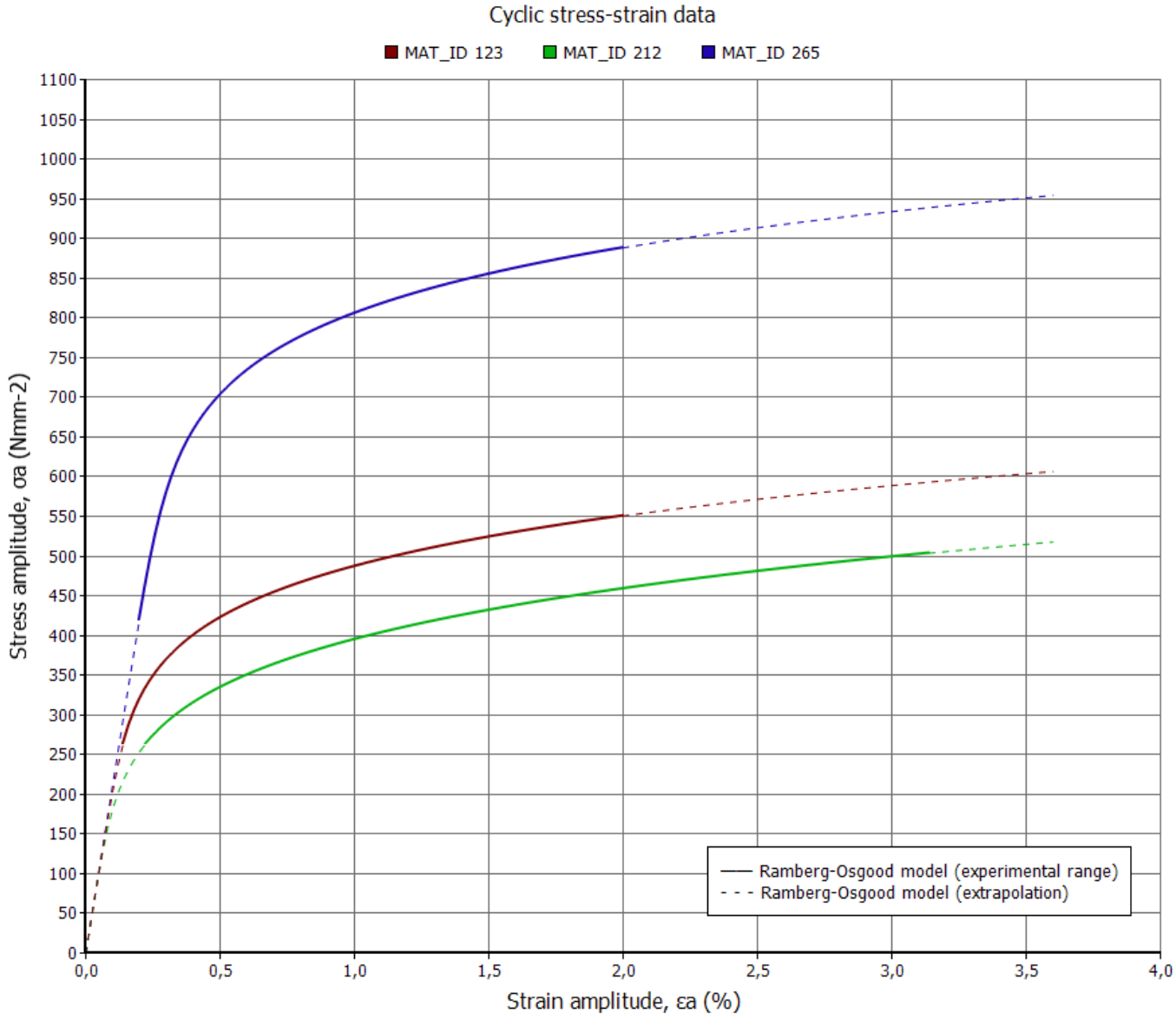
Material search results - COMPARISON REPORT

GENERAL INFORMATION	MAT_ID 123	MAT_ID 212	MAT_ID 265
MATERIAL INFORMATION			
Material designation			
AISI	*A633 ; A633GR.E ; E*	*A182-F11 ; F12*	*4140 ; 4140(H)*
AFNOR	*A590AP ; E460-I*	*15CD3-5 ; 15CD4-05*	*42CD4 ; 42 CrMo 4*
ASTM		*12 ; T2*	
BS	*55F*	*620-440 ; 620-540 ; 620B*	*708A42 ; 708M40*
DIN	**StE 460**	**13 CrMo 4 4**	**42 CrMo 4**
EN	*FeE460KG ; KW ; P460N*	*13 CrMo 4 5 ; 14 CrMo 4 5*	*42 CrMo 4*
GOST	*18G2AFPS*	*12ChM ; 15ChM*	
ISO	*E360DD ; HS460D ; P74*	*F32 ; P32 ; TS32 ; TW32*	*3 ; 42 CrNiMo 4 ; 5 ; C32*
JIS			*SCM440*
SAE			*4140 ; 4140(H)*
SS	*2143*	*2216 ; 2216-04*	*2244*
UNS	*K02900*	*K11562*	*G41400 ; G(H)41400*
W.Nr.	**1.8905**	**1.7335**	**1.7225**
Other			
Additional remarks			
Material group	Low-alloy steel	Low-alloy steel	Low-alloy steel
TESTED MATERIAL			
Chemical composition, (%)			
C	0,16000	0,14000	0,43000
Si	0,46000	0,27000	0,28000
Mn	1,63999	0,40000	0,71000
P	0,01300	0,01500	0,03300
S		0,02100	0,02800
Cr		0,95000	1,09000
Mo		0,42000	
Ni			
Cu			
Al	0,04200		0,17000
Co			
Ti			
W			
V			
Nb			
N			
Other			
Heat treatment	as received	quenched & tempered	quenched & tempered
Microstructure			
Hardness			
Brinnel			
Vickers			
Rockwell			

MONOTONIC DATA	MAT_ID 123	MAT_ID 212	MAT_ID 265
TESTING CONDITIONS			
Testing temperature, T (°C)	23	23	23
Testing medium	air	air	air
Loading type	axial	axial	axial
Loading control	displacement control		displacement control
MONOTONIC PROPERTIES			
Young's modulus, E (Nmm^{-2})	208000	210000	211400
Poisson's ratio, ν			
Yield strength, R_e or $R_{p0,2}$ (Nmm^{-2})	510,0	310,0	998,0
Ultimate tens. strength, R_m (Nmm^{-2})	682,0	475,0	1111,0
Elongation related to 5x diameter of specimen, A_5 (%)	32,0	31,0	23,0
Reduction of area at fracture, Z (RA) (%)		65,0	60,0
True fracture stress, σ_f (Nmm^{-2})	574,0		1525,0
True fracture strain, ε_f	0,6610		0,4960
MONOTONIC STRESS-STRAIN PARAMETERS AND CURVES - RAMBERG-OSGOOD MODEL			
Strength coefficient, K (Nmm^{-2})	1026,0	345,0	1469,0
Strain hardening exponent, n	0,1570	0,0150	0,0690



CYCLIC/FATIGUE DATA	MAT_ID 123	MAT_ID 212	MAT_ID 265
TESTING CONDITIONS AND SPECIMEN INFORMATION			
Testing temperature, T (°C)	23	23	23
Testing medium	air	air	air
Loading type	axial	axial	axial
Loading control	total strain control	total strain control	total strain control
Loading ratio	-1	-1	-1
CYCLIC PROPERTIES			
Cyclic yield strength, $R'_{p0,2}$ (Nmm^{-2})	396,0	302,0	716,0
CYCLIC STRESS-STRAIN PARAMETERS AND CURVES - RAMBERG-OSGOOD MODEL			
Cyclic strength coeff., K' (Nmm^{-2})	1011,0	990,0	1367,0
Cyclic strain hardening exponent, n'	0,1500	0,1910	0,1040



CYCLIC/FATIGUE DATA	MAT_ID 123	MAT_ID 212	MAT_ID 265
FATIGUE PROPERTIES			
Transition life, N_T (number of cycles at $\varepsilon_{a,e} = \varepsilon_{a,p}$)	196050	14371	13285
Number of cycles corresponding to the fatigue limit (or $2 \cdot 10^6$ cycles), N_E			
Stress amplitude at N_E (fat. limit) for 50% surviv. probab., σ_E (Nmm^{-2})			
Strain amplitude at N_E (fatigue limit) for 50% survival probability, ε_E			
10/90 scatter band of stress amplitudes, ($\sigma_{a,10\%}$ / $\sigma_{a,90\%}$), T_σ	1,052	1,085	1,199
10/90 scatter band of plastic strain amplit. ($\varepsilon_{a,p,10\%}$ / $\varepsilon_{a,p,90\%}$), $T_{\varepsilon p}$	2,194	1,250	1,952
Exponent of *S-N* curve			
FATIGUE STRAIN-LIFE PARAMETERS AND CURVES - COFFIN-MANSON-BASQUIN MODEL			
Fatigue strength coeff., σ'_f, (Nmm^{-2})	962,0	877,0	1454,0
Fatigue strength exponent, b	-0,0880	-0,1110	-0,0750
Fatigue ductility coefficient, ε'_f	0,5508	0,5390	1,5080
Fatigue ductility exponent, c	-0,5630	-0,5840	-0,7160