SLOVENSKI STANDARD

SIST EN 10222-4:2000/A1:2002

01-september-2002

Jekleni izkovki za tlaļne posode - 4. del: Variva drobnozrnata jekla z veliko dogovorno napetostjo teļenja

Steel forgings for pressure purposes - Part 4: Weldable fine grain steels with high proof strength

Schmiedestücke aus Stahl für Druckbehälter - Teil 4: Schweißgeeignete Feinkornbaustähle mit hoher Dehngrenze

Pieces forgées en acier pour appareils a pression - Partie 4: Aciers soudables a grains fins avec limite d'élasticité élevée

Ta slovenski standard je istoveten z: **EN 10222-4:1998/A1:2001**

ICS:

77.140.30

77.140.85

SIST EN 10222-4:2000/A1:2002 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10222-4:1998/A1

July 2001

ICS 77.140.30; 77.140.85

English version

Steel forgings for pressure purposes - Part 4: Weldable fine grain steels with high proof strength

Pièces forgées en acier pour appareils à pression - Partie 4: Aciers soudables à grains fins avec limite d'élasticité élevée

Schmiedestücke aus Stahl für Druckbehälter - Teil 4: Schweißgeeignete Feinkornbaustähle mit hoher Dehngrenze

This amendment A1 modifies the European Standard EN 10222-4:1998; it was approved by CEN on 20 April 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 10222-4:1998/A1:2001 E

Foreword

This Amendment EN 10222-4:1998/A1:2001 to the EN 10222-4:1998 has been prepared by Technical Committee ECISS/TC 28 "Steel forgings", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2002, and conflicting national standards shall be withdrawn at the latest by January 2002.

This Amendment to the European Standard EN 10222-4:1998 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Table 1 - Chemical composition, mechanical properties and heat treatment

Steel designation		Chemical composition, (cast analysis) % [1]														Mechanical properties at room temperature					Heat treatment				Carbon equivalent value
Name	Number	C	Si	Mn	P	S	Al [2] total		N	Cr	Cu	Mo	Nb	Ni	V	Nb+V	Thickness of the ruling section t_R [3]	Yield strength R_{eH} [4]	Tensile strength R_m	Elongation after fracture A [5]		Symbol [6]	Austenizing or solution temperature	Cooling in [7]	Tempering	
		max			max	max	min	max	max	max	max	max	max	max	max	max	mm	N/mm² min	N/mm²	min % 1	t, tr		°C		°C	max %
P285NH/ P285QH	1.0477/ 1.0478	0,18	0,40 max	0,60 to 1,40	0,025	0,015	0,020	0,060	0,020	0,30	0,20	0,08	0,03	0,30	0,05	0,05	$t_R \leq 16$	285	390	24	23	N	880 to 960	a	-	0,41
																	$16 < t_R \leq 35$	285	to							
																	$35 < t_R \leq 70$	265	510							
																	$70 < t_R \leq 100$	245	370						600 to	
																	$100 < t_R \leq 250$	225	to	22	21	QT	860 to 940	o,w	700	
																	$250 < t_R \leq 400$	205	510							
P355NH/ P355QH1	1.0565/ 1.0571	0,20	0,10 to 0,50	0,90 to 1,65	0,025	0,015	0,020	0,060	0,020	0,30	0,20	0,08	0,05	0,30	0,10	0,12	$t_R \leq 16$	355	490	23	21	N	880 to 960	a	-	0,47
																	$16 < t_R \leq 35$	355	to							
																	$35 < t_R \leq 70$	335	630							
																	$70 < t_R \leq 100$	315	470						600 to	
																	$100 < t_R \leq 250$	295	to	21	19	QT	860 to 940	o,w	700	
																	$250 < t_R \leq 400$	275	630							
P420NH/ P420QH	1.8932/ 1.8936	0,20	0,10 to 0,60	1,00 to 1,70	0,025	0,015	0,020	0,060	0,020	0,30	0,20	0,10	0,05	1,00	0,20	0,22	$t_R \leq 16$	420	530	20	19	N	880 to 960	a	-	0,51
																	$16 < t_R \leq 35$	410	to							
																	$35 < t_R \leq 70$	385	680							
																	$70 < t_R \leq 100$	365	510						600 to	
																	$100 < t_R \leq 250$	345	to	18	17	QT	860 to 940	o,w	700	
																	$250 < t_R \leq 400$	325	670							

[1] Elements not listed in this table shall not be intentionally added to the steel without the approval of the purchaser except for finishing the cast. All appropriate measures shall be taken to prevent the addition from scrap or other materials used in steelmaking of these elements which may adversely affect the mechanical properties and usability.

[2] Minimum Al level need not apply when Nb, V and Ti is used to control N content.

[3] The thickness ranges given in this column apply for the as heat treated thickness of forgings with the ruling section. This is characterized by rectangular shape, a width to thickness ratio ≥ 2 and a length to thickness ratio of ≥ 4. For forgings with other sections the equivalent thickness shall be determined according to annex B of EN 10222-1 or be agreed at the time of enquiry and order.

[4] Until the yield point criteria are harmonized in the various National Codes, determinations of R_{eH} may be replaced by determination of $R_{p0,2}$. In this case the $R_{p0,2}$ values are 10 N/mm² lower for R_{eH} values up to 355 N/mm² and 15 N/mm² lower for R_{eH} values greater than 355 N/mm².

[5] l – longitudinal t – tangential tr - transverse

[6] N - normalized QT – quenched and tempered

[7] a - air o - oil w - water