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,
2014-2020”



ΚΗ ΕΝΟΤΗΤΑ

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2014-2020»

: MIS 5002659

μ : 2016 27510047 . .

: 1.590.000,00 €

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- 01:	8
- 02 :	10
- 03 :	12
- 04 : ,	14
- 05:	15
- 06:	16
- 07:	17
- 08: (HDPE)	24
- 09:	34
- 10:	36
- 11:	41
- 12 :	43
- 13 :	46
- 14:	61
- 15:	67

[illegible]

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μ μ μ / /273 (2221/ /30-07-2012)
 (μ () μ μ
 26/04-10-2012 .
 μ , : () / /469/23-9-2013
 (:2542/ /10-10-2013), () / .628/ 7-10-2014 (: 2828/ /21-10-2014), ()
 / .667/30-10-2014 (: 3068/ /14-11-2014) μ (9)
 (9) μ 3 : () 30/2013 (/ /508/18-10-2013),
 () 22/2014 (/ /658/24-10-2014), () 26/2014 (/ /154/11-12-2014),
 (9) .
 μ μ μ . / /1211 (2524/ /16-08-2016)
 μ (59) (-) μ
 17/07-09-2016 .
 μ 22/4193/2019 (4607/ /13-12-2019) μ
 (70) (), μ μ μ
 (68) μ μ (70)
 () 1 μ / /469/23.9.2013
 (2542/ /10-10-2013), / .628/7.10.2014 (2828/ /21-10-2014),
 / .667/30.10.2014 (3068/ /14-11-2014) / .1211/01.08.2016 (2524/ /16-08-
 2016) μ /
 (2) μ μ (70)
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 μ μ μ
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 (), μ μ μ 26/04-10-2012
 μ 22/4193/2019 .

/	/	1501-" +	Τίτλος ΕΤΕΠ	
2012 (1)	2019 (2)			
01				
01-01		μ -		
1	1	01-01-01-00	μ μ	Production and transport concrete in situ

/	/	1501-'' +	Τίτλος ΕΤΕΠ	
2012 (1)	2019 (2)			
2		01-01-02-00	μ	Concrete casting
3	2	01-01-03-00	μ	Concrete curing
4	3	01-01-04-00	μ μ	Work site concrete batching plants
5		01-01-05-00	μ μ	Concrete compaction by vibration
7		01-01-07-00		Mass concrete
01-02		μ μ		
8	4	01-02-01-00	μ μ	Steel reinforcement for concrete
01-03		μ -		
10	5	01-03-00-00	μ	Scaffolding (falsework)
11		01-04-00-00	μ ()	Concrete formwork
02				
02-02				
16		02-03-00-00		General excavations for Buildings
17		02-04-00-00	μ	Excavations for foundation works
18		02-05-00-00	μ	Management of excavation materials and exploitation of dumping sites
02-07		μ /		
21		02-07-02-00	μμ μ	Refill of excavations for foundation works
02-08				
26		02-08-00-00	μ	Dealing with public networks during excavation works

/	/	1501-" +	Τίτλος ΕΤΕΠ	
2012 (1)	2019 (2)			
03				
03-06				
37		03-06-01-02	μ μ μ PVC μ	Waterproofing of roofs and terraces with PVC membranes
05				
05-03		μ		
118	31	05-03-03-00	μ	Road pavement layers with unbound aggregates
08				
08-01		μ		
174		08-01-03-01	μ	Trench excavations for utility networks
175	38	08-01-03-02	μ	Underground utilities trench backfilling
08-03				
181	41	08-03-03-00	μ	Geotextiles and related products for drains
08-05		μ		
188		08-05-01-04	μ μ μ μ	Protective coatings of hydraulic concrete structures using in-situ or ready-mixed cement mortars
190		08-05-02-02	μ μ (Waterstops)	Waterstops for concrete joints
08-06		-		
200		08-06-02-01	PVC u-	pressurized u-PVC pipe networks
201	46	08-06-02-02	u-PVC	Non pressure u-PVC pipe networks for sewage
204	47	08-06-07-02		Cast iron gate valves

/	/	1501-" +	Τίτλος ΕΤΕΠ	
2012 (1)	2019 (2)			
208	49	08-06-07-07	-	Double orifice air relief valves
211	51	08-06-08-03		Retrofitting of concrete paving slabs along constructed underground utility
213		08-06-08-06	μ μ	Prefabricated concrete manholes
08-07				
219	53	08-07-01-05	μ	Manhole steps
221		08-07-02-01		Rust protection of steel structures used in hydraulic works
08-10				
233		08-10-01-00		Work-site water pumping
234		08-10-02-00	- μ	Wastewater and sludge pumping
15		- -		
15-02				
433		15-02-01-01	μ μ μ μ	Demolition of members of concrete structures by mechanical means
15-04		- -		
440		15-04-01-00	- -	Health - Safety and Environmental Protection requirements for demolition works

A/A	ΚΩΔΙΚΟΣ	ΤΙΤΛΟΣ ΣΥΜΠΛΗΡΩΜΑΤΙΚΗΣ ΤΕΧΝΙΚΗΣ ΠΡΟΔΙΑΓΡΑΦΗΣ	ΚΩΔΙΚΟΣ ΕΤΕΠ ΠΟΥ ΣΥΜΠΛΗΡΩΝΕΤΑΙ "ΕΛΟΤ ΤΠ 1501-" +
1	ΣΤΠ ΠΜ-1	Φορτοεκφόρτωση και μεταφορά προϊόντων	---
2	ΣΤΠ ΠΜ-2	Αντιστηρίξεις ορυγμάτων υπογείων δικτύων	08-01-03-01
3	ΣΤΠ ΠΜ-3	Αποκατάσταση οδοστρωμάτων	---
4	ΣΤΠ ΠΜ-4	Αποξήλωση πλακοστρώσεων, κρασπέδων και ρείθρων	---
5	ΣΤΠ ΠΜ-5	Στεγανωτικό μάζας σκυροδέματος	---
6	ΣΤΠ ΠΜ-6	Μόνωση με επάλειψη ασφαλικού υλικού	---
7	ΣΤΠ ΠΜ-7	Αγωγοί αποχέτευσης ακαθάρτων από σωλήνες δομημένου τοιχώματος	---
8	ΣΤΠ ΠΜ-8	Δίκτυα από πολυαιθυλένιο υψηλής πυκνότητας (HDPE)	---
9	ΣΤΠ ΠΜ-9	Προστατευτική επένδυση με εποξειδική ρητίνη	---
10	ΣΤΠ ΠΜ-10	Προκατασκευασμένα φρεάτια επίσκεψης από συνθετικά υλικά	---
11	ΣΤΠ ΠΜ-11	Φρεάτια συσκευών υπογείων σωληνωτών δικτύων	---
12	ΣΤΠ ΠΜ-12	Χυτοσιδηρά τεμάχια	---
13	ΣΤΠ ΠΜ-13	Δίκτυα από χαλυβδοσωλήνες	---
14	ΣΤΠ ΠΜ-14	Μεταλλικές κατασκευές	08-07-02-01
15	ΣΤΠ ΠΜ-15	Εξυγιαντικές στρώσεις με θραυστό υλικό λατομείου	---

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(www.et.gr) μ

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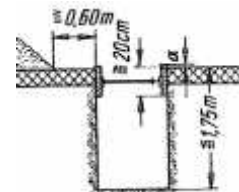
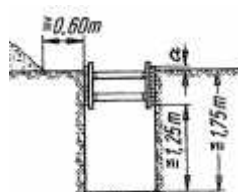
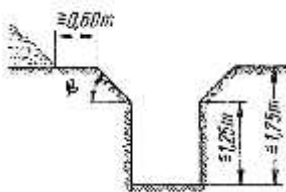
μ

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μ 1: μ μ μ μ

μ 2: μ μ μ μ

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 μ μ , μμ
 (.). μ

2.
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) -11 -201
) 265
) μ C12/15

3.
 μ μ
 μ μ .
 μ μ μ μ μ
 μ μμ μ μ , μ .
 μ μμ μ μ μ , μ μ μ
 μ .
 μ μ μ .
 , , μ μ μ ,
μ , μ μ
 μ μ . μ ,
μ .
 μ μ :
) 10 cm μ μ
 1501-05-03-03-00 (-150).
) 10 cm μ μ
 1501-05-03-03-00 (-155).
) μ μ -260 5cm.

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13

1

 μ μ μ

1. μ

μ μ μ

μ μ μ

1.

μ

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μ , . μ

μ

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The diagram illustrates a network structure with numerous nodes and edges. Many nodes are labeled with the Greek letter μ . The nodes are distributed across the frame, with some clusters and many isolated nodes. The edges are represented by thin black lines connecting the nodes. Some nodes have additional labels, such as μ or μ , which may indicate different types or states of the nodes. The overall layout is sparse, with a high degree of connectivity between the nodes.

- 07:

1. μ

μ

μ μ μ .

2.

μ

μ μ μ

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. μ

μ

μ

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. μ

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μ

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. μ μ μ .

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13476 .

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13476

μ

. . . , TÜV . . .

SN8 = μ (KN/m²)

$$XXXX = \mu$$
$$YYYY = \mu \quad \mu \quad \mu$$
$$ZZZZ = \mu \quad \mu \quad \mu$$

6.

μ μ 13476- 3.

7. μ μ μ μ μ μ

$$\begin{aligned} & \mu_{\text{H}} = 13476, \\ & \mu_{\text{H}} = \dots \\ & (\mu_{\text{H}}, \mu_{\text{H}}, \mu_{\text{H}}, \mu_{\text{H}}). \\ & \mu_{\text{H}} \\ & (\dots) \end{aligned}$$

8.

μ

) , μ μ ()
μ .

) μ , . μ
μ .

) μ (. . μ).

1,5 m, μ .

μ .

μ , μ

μ .

μ μ (. .),

μ .

μ μ μ μ μ

, μ μ μ μ μ .

9. μ

μ , :

Z μ 10 cm

μ μ , μ .

Z μ μ μ μ

μ .

Z μ μ

μ μ

μ μ μ

μ μ 30 cm .

Z μ .

μ μ , μ

μ

μ μ ,

μ . μ μ ,

μ μ μ μ

μ 90% Proctor (Optimum).

Z

μ μ μ

μ .

$$\mu_1, \mu_2, \mu_3, \mu_4$$

DN/OD 1200mm DN/ID 300 DN/ID800mm DN/OD 250mm

_____ μ : _____
 _____ , _____
 _____ μ _____
 _____ μ () μ _____ μ _____
 _____.

$$(\dots \mu \dots \mu - \dots \mu \dots \mu).$$

21

μ .

14. -

14.1.

μ , :

Z μ μ .

Z μ μ .

Z μ - μ μ ().

Z μ μ μ μ .

Z μ .

Z μ μ μ μ .

Z μ μ μ μ .

14.2. μ

μ 92/57/ «

», μ

(. . 17/96 . . 159/99 . . .) μ () .

μ

/ μ .

μ μ () .

:

Z , 388-03

Z , 397-95

Z , 345-95

Z μ , 168-95

- 08:

(HDPE)

1. μ

(HDPE) PE 80 PE 100.

2. μ μ

2.1. μ μ

μ

() :

- (HDPE) 2 3 .
- μ μ ,

μ μ 16 atm

3 (PE 100).

μ μ (PE 80, PE 100).

HDPE (High Density Polyethylene), μ
LDPE (Low Density Polyethylene) (PP)

μ , μ μ μ μ

μ μ 2000 40.000.

HDPE

		μ	μ
MFI 190/5	g/10min	ISO 1133:2000-021	0,3 - 0,7
μ 23°C 50%			
	/mm ²	ISO 527-1:1996 ²	22
μ μ	%	ISO 527-1:1996 ²	15
μ	/mm ²	μ	32
μ	%	125 mm/min	>800
μ	/mm ²	ISO 178:2003 ³	28
μ	/mm ²		800

		μ	μ
Shore D	-	D 53505:2000-08 ⁴	60
	-	ISO 8256:2004 ⁵	
μ			
	°C		130
$\mu\mu$	-1	ASTM D 696-03 ⁶	$1.7 \cdot 10^{-4}$
μ μ 20°C	W / m •	DIN 52612-1 ⁷	0.43
μ 20°C 50%.			
	• cm	ASTM D257-99 ⁸	$> 10^{16}$
		ASTM D257-99 ⁸	$> 10^{13}$

¹ Plastics - Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:1997) -- μ μ μ (MFR) μ (MVR) μ

² Plastics - Determination of tensile properties - Part 1: General principles (ISO 527-1:1993 including Corr 1:1994). -- μ 1: .

³ Plastics - Determination of flexural properties (ISO 178:2001) -- μ μ .

⁴ Testing of rubber - Shore A and Shore D hardness test -- μ Shore A .

⁵ Plastics - Determination of tensile-impact strength (ISO 8256:2004) -- μ .

⁶ Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer -- μ μ $\mu\mu$ μ μ -30°C 30°C, μ μ μ .

⁷ Testing of Thermal Insulating Materials; Determination of Thermal Conductivity by the Guarded Hot Plate Apparatus; Test Procedure and Evaluation. μ μ μ

⁸ Standard Test Methods for DC Resistance or Conductance of Insulating Materials -- μ μ μ (DIN 53482 ,)

3. μ μ

EN 12201-1:2003	Plastics piping systems for water supply - Polyethylene (PE) - Part 1: General -- μ (). 1: .
EN 12201-2:2003	Plastics piping systems for water supply - Polyethylene (PE) - Part 2: Pipes -- μ . 2: .
EN 12201-3:2003	Plastics piping systems for water supply - Polyethylene (PE) - Part 3: Fittings -- μ . 3: μ .
EN 12201-4:2001	Plastics piping systems for water supply - Polyethylene (PE) - Part 4: Valves -- μ . 4: .
EN 12201-5:2003	Plastics piping systems for water supply - Polyethylene (PE) - Part 5: Fitness for purpose of the system. -- μ . 5: μ μ
EN 13244-1:2002	Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage - Polyethylene (PE) - Part 1: General -- μ , , , (). 1:
EN 13244-2:2002	Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage - Polyethylene (PE) - Part 2: Pipes -- μ , , , (). 2: .
EN 13244-3:2002	Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage - Polyethylene (PE) - Part 3: Fittings -- μ , μ (PE)- 3: μ , μ
EN 13244-4:2002	Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage - Polyethylene (PE) - Part 4: Valves -- μ

	μ	(PE)-
	4:	
EN 13244-5:2002	Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage - Polyethylene (PE) - Part 5: Fitness for purpose of the system -- μ	μ
	(PE)- 5:	μ
EN 1680:1997	Plastics piping systems - Valves for polyethylene (PE) piping systems – Test method for leaktightness under and after bending applied to the operating mechanisms -- μ	μ
	μ () - μ	μ
	μ μ μ μ	
EN 10284:2000	Malleable cast iron fitting with compression ends for polyethylene (PE) piping systems -- μ μ μ	
	μ (PE).	
EN 12100:1997	Plastics piping systems - Polyethylene (PE) valves - Test method for resistance to bending between supports -- μ	
	- () - μ	
	μ μ μ	
EN 12099	Plastics Piping Systems - Polyethylene Piping Materials and Components - Determination of Volatile Content -- μ	μ
	μ - μ	
EN 921:1994	Plastics piping systems - Thermoplastics pipes - Determination of resistance to internal pressure at constant temperature -- μ	μ
	- μ - μ	
	μ	
EN 12119:1997	Plastics piping systems - Polyethylene (PE) valves - Test method for resistance to thermal cycling -- μ	μ
	() - μ	
	μ	

4.1.

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1400 mm: 0,5

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4.

μ o μ μ μ μ (COAL TAR EPOXY)
237 μ . μ ASTM C
541-67 ELOT 179-79.
450 μm . 150 μm .
 μ μ μ .

5. μ

[illegible]

- 10:

1. μ

(μ μ PVC-U, μ).

2. -

2.1. μ

μ :
EN 124 μμ

μ . - μ , μ ,
μ , - Gully tops and manhole tops for vehicular and
pedestrian areas - Design requirements, type testing, marking.

EN 1610 μ . - Construction
and testing of drains and sewers.

EN 752 μ . - Drain and
sewer systems outside buildings.

EN 1433 μ - μ , μ
μ , μ μμ -- Drainage
channels for vehicular and pedestrian areas - Classification, design and testing
requirements, marking and evaluation of conformity

EN 13598-2 μ
- μ () (PVC-U),
(PP) (PE) - 2:

μ
μ μ . - Plastics piping systems
for non-pressure underground drainage and sewerage - Unplasticized poly(vinyl
chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 2: Specifications
for manholes and inspection chambers in traffic areas and deep underground
installations.

13476-1 Plastics piping systems for non-pressure underground drainage and sewerage -
Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U),
polypropylene (PP) and polyethylene (PE) - Part 3: Specifications for pipes and
fittings with smooth internal and profiled external surface and the system, Type B -

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- μ μ μ μ μ μ
(PVC-U), () () -

1501-08-01-03-02

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μμ 92/57/EE, «
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μ . 305/96, μ (. . 17/96,
. . 159/99 . .).

μ /

μ μ ()

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μ	397	μ	Industrial safety helmets
	388		Protective gloves against mechanical risks
μ	ISO 20345	μ -	Personal protective equipment - Safety footwear
	ISO 20345/ 1	μ -	Personal protective equipment - Safety footwear
	ISO 20345/COR	μ -	Personal protective equipment - Safety footwear

- 11:

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 -) μ μ , μ
 - μ .
 -) μ , μ μ
 - μ .

- 12 :

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3. μ
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) μ

4.

μ

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(2) μ

$\mu \mu$ μ

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- 13 :

1. μ

2. μ μ

2.1 μ μ
 μ :

) μ ,

) μ μ μ μ μ ,

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2.2

μ μ ISO
9001:2000-12 .

μ μ μ , S235J μ
 μ 10027.

281: μ , μ , .

496: - μ .

497: - μ .

() , μ
 μ μ .

μ (μ μ
 μ) .

μ .

μ μ μ .

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10217-1:2002 Welded steel tubes for pressure purposes - Technical delivery conditions - Part 1:
Non-alloy steel tubes with specified room temperature properties --

1: μ μ
 μ μ .

47

Electrodeposited Coatings of Cadmium -- ASTM 766-86:2003 (Standard Specification for μ).

1092-1:2001 Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 1: Steel flanges --

DIN 2501-1:2003-05 Flanges - Part 1: Mating dimensions -- 1:

AWWA C208:2000 Fabricated steel water pipe fittings - Dimensions -- μ

2.4 μ

μ , μ

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3.

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3.1

10296-1:2003 (Welded circular steel tubes for mechanical and general engineering purposes - Technical delivery conditions - Part 1: Non-alloy and alloy steel tubes --

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1: μ μ μ).

3.1 μ μ

10204:2004 (Metallic products - Types of inspection documents --

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(Double Fusion Butt Weld)

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μ (μ) μ . (2,00 m).

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DIN 2605-1,-2

(DIN 2605-1:1991-02. Part 1: Steel butt-welding pipe fittings; Elbows and bends with reduced pressure factor. - Part 2: Full correlation of utilization -- 1: μ

μ . μ

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μ .),

(Butt Weld).

μ

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(SAW),

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(sizing)

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(straightening),

(ultra sonic test).

1:2002

1. _____

AWWA C203 & BS 4164:2002 (Specification for coal-tar-based hot-applied coating materials for protecting iron and steel, including a suitable primer --

(shot blasting) SA 2.5, ISO 8501-1:2001.

(sand blasting) SA 2.5, ISO 8501-1:20012.

2. _____

BS 534:1990 BS 4147:1980-10-31.

primer ().

μ : μ	
88,9 μ 168,3 mm	3 mm
168,3 μ 323,9 mm	4,5 mm
323,9 μ 2.220 mm	6 mm

52

I.I.W. (International Institute of Welding).

) (Lack of fusion):

o (Incomplete penetration): μ

(2)

4 60 mm (μ). μ μ

- (Slag inclusions - porosity): $\mu \mu \mu$

$$\circ \qquad \qquad \qquad \mu \mu \qquad \mu \qquad \mu$$

o (Undercut): μ 1,5 mm /5 (

$$\mu \quad \mu$$

μ μ 192 .

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μ μ
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3.4

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 2. μ
 3. μ
 4. μ
 5. S04 S
 6. (lle-scale), μ
 7. μ μ ,
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μ μ ,
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(cathodic protection), μ μ
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(μ , μ) μ μ

(μ, μ, μ), μ
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) μ μ μ μ μ 4,0 km μ
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) μ μ μ .
) μ μ μ μ μ , μ
 μ 10 mm,
 , μ 25
 x 25 cm .
 μ μ μ :
) 300 m μ μ .
) μ μ , μ μ .
) μ % SO₄, % Cl μ (μ h).
 μ μ 850 mV,
 μ .
 μ (. . μμ
).
 μ μ μ μ μ μ μ
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 μ), μ 1,20 m, μ μ
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μ

4.3

$$J = \mu_1 + \mu_2 + \dots + \mu_n.$$
$$J_{\mu} = \mu \int_{\mathbb{R}^N} |\nabla u|^2 dx - \frac{\mu}{2} \int_{\mathbb{R}^N} u^2 dx.$$
$$J \quad \mu \quad .$$
$$\mu \quad \mu \quad \mu \quad \mu \quad \mu$$

μμ 92/57/EE, «

» μμ μ

μ μ (. . 17/96 . . 159/99 . .).

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EN 10027-1:

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DIN 17100

DIN 17182 1691

BS 1400

AISI 304 ()

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DIN 7989 7990, DIN 6914, 6915 6916

_____:

EN ISO 1461:

μ μ μ μ μ
μ μ

-- Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods

EN ISO 8501-1:

μ μ
μ -

- 1:

μ μ μμ

μ

μ . -- Preparation of Steel substrates before application of paints and related products - Visual assessment of surface cleanliness - Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of coatings.

1501-08-07-02-01:

_____:

EN ISO 8504-1:

Preparation of steel substrates before application of paints and related products - Surface preparation methods - Part 1: General principles

EN ISO 8504-2:

μ μ
μ - μ

- 2: μ μμ --

Preparation of steel substrates before application of paints and related products - Surface preparation methods - Part 2: Abrasive blast-cleaning (EN ISO 8504-2:2000)

1501-08-07-02-01:

_____:

EN 10029 2:

μ ,

μ 3 mm - μ --
Hot-rolled steel plates 3 mm thick or above - Tolerances on dimensions and shape

_____:

EN ISO 2560:

μ

-

μ

μ

μ

μ

μ

-

μ

-- Welding consumables -

Covered electrodes for manual metal arc welding of non alloy
and fine grain steels - Classification

EN ISO 15609-1:

μ

.

-- Specification and approval of welding

procedures for metallic materials - Welding procedure
specification. rc welding

EN 1993-1:2005:

Eurocode 3: Design of steel structures - Part 1

BS EN 287-1:2011:

Qualification test of welders. Fusion welding. Steels

3.

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3.1.

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μ μ μ .

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5.

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. . 305/96) μμ μ μ
(. . 17/96 . . 159/99 . .).
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μ 38 42 , .

1. μ

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μ μ μ $\mu\mu$

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μ (.)	μ (%)
50	100
30	70 - 90
15	50 - 85
7	35 - 80
3	25 – 70

67

4.

μ

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ΘΕΩΡΗΘΗΚΕ

ΑΛΙΑΡΤΟΣ: 14-12-2020

ΣΥΝΤΑΧΘΗΚΕ

ΑΛΙΑΡΤΟΣ: 14-12-2020

ΒΑΡΟΥΞΗΣ ΧΡΗΣΤΟΣ

Πολιτικός Δομικών Έργων
Πολιτικός Μηχανικός ΕΜΠ
MSc Διαχείρισης Τεχνικών Έργων

ΤΑΡΩΝΗ ΣΤΕΛΑ

Τοπογράφος Μηχανικός ΤΕ

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