

**Cables de Comunicaciones Zaragoza.  
CW1601 Approval application.**

**1. GENERAL INFORMATION**

**1.1 LIST OF CONTENTS**

<b>1.</b>	<b>General Information</b> 1.1 List of Contents 1.2 Contractors Name 1.3 Test report 1.4 Product Description 1.5 Report Author And Date 1.6 Distribution 1.7 Authorisation 1.8 Contractual Information	<b>Pages 1 to 2</b>
<b>2.</b>	<b>Technical Submission</b> 2.1 Product Description 2.2 Product Code 2.3 Clause by Clause Compliance Statement 2.4 Material Declaration 2.5 Document History	<b>Pages 2 to 6</b>

**1.2 CONTRACTOR:** Cables de Comunicaciones Zaragoza.

**1.3 TEST REPORT:** See attached files: CW1601 units 1-2.pdf  
CW1601 units 3-4.pdf

**1.4 PRODUCT DESCRIPTION**

High performance cable with copper conductors, PE insulation and LSZH sheath.

**1.5 REPORT AUTHOR:** Daniel Fdez. de Velasco  
**DATE:** 04/04/2010

**1.6 DISTRIBUTION:** Openreach Specification Authority 2 Copies  
Cable Company File 1 Copy

**1.7 AUTHORISATION**

Signed Author:.....

Name Daniel Fdez de Velasco

Signed Technical Manager:.....

Name Valentín Abadia

Signed Quality Manager:.....

Name Archie Goya

## 1.8 CONTRACTUAL INFORMATION

### 1.8.1 PRIME CONTRACTOR:

Name: Cables de Comunicaciones Zaragoza, S.L.

Address Pol. Malpica. C/D, 83. 50016. Zaragoza. Spain

### 1.8.2 SUBCONTRACTOR:

Name: -

Address: -

### 1.8.3 BT CONTRACT NUMBER:

To be determined.

## 2. TECHNICAL SUBMISSION

**2.1 PRODUCT DESCRIPTION:** See Specification CW 1601 Issue 5

**2.2 PRODUCT CODE:** EA8102F51010000N (100Pr 0.5mm)

### 2.3 CLAUSE BY CLAUSE RESPONSE to CW 1601 Issue 5

Clause	Summary of Requirement	Actual Result	Conformance
1	General		Noted
2.1	Conductor-Material	Plain copper, uniform quality and free from defects .	Compliant
2.2	Dimensions	<b>See table 1</b>	Compliant
2.3	Electrical requirement.	<b>See table 1</b>	Compliant
2.4.1	Conductor- Mechanical requirements; elongation >14% at 20°	Typical value 25%	Compliant
2.4.2	Conductor-Joints. Not permitted.	No joints.	Compliant
3.1	Insulation-Material. HDPE BS EN50290-2 part 23 and CW1000	<b>See 2.4 material declaration</b>	Compliant
3.2	Insulation-colours. Incorporated in the insulating compound	Identifiable.	Compliant
3.3	Insulation-Thickness	<b>See table 1</b>	Compliant

4	Cabling elements. Twisted pairs. Laylength < 50mm.	Maximum laylength: 31mm. Uni-directional twist.	Compliant.
5.1	Stranding-Units 16Pair (U) 20 Pair (E) 25 Pair (L)	25 pair units used in <b>16581L</b> sample cable.	Compliant
5.2.1	Lappings over units or subunits	Polypropylene lappings used.	Compliant
5.2.2	Units- sub-units, are laid up into a compact and circular cable core.	Compact, circular cable core.	Compliant
5.3	Cable core protection. Polyethylene terephthalate tape. Longitudinal, 10mm or 30% overlap (the smaller)	One tape applied longitudinally. 15mm minimum overlap.	Compliant
6.1	Traceability- sheath marks CW1404	Marking according to CW1404	Compliant
7	Ripcord- Non higroscopic, colour fast dyes, 80N.	Slit test passed. No dyes used. 130N Breaking load.	Compliant
8.1	Sheath-material	<b>See 2.4 material declaration</b>	Compliant
8.2	Sheath-colour Light Grey 3P RAL 9018 (H)	RAL 9018	Compliant
8.3	Sheath-Dimensions (Acc. to table 3 for 100/0.5mm cable:) Thickness > 1.0mm OD < 23.5mm	Measured Thickness = 1.13mm OD = 22.6mm	Compliant
8.4	Sheath-Appearance Uniform, continuous, not adhered to core..	Good	Compliant
9	Sheath-Identification According to CW1404	According to CW1404	Compliant
10	Strippability IEC60189, 50mm, < 4.4N	1,5N - 4,0N	Compliant
11.1	Capacitance unbalance (pair-pair) Measured values divided by $1/2 (L/500 + (L/500)^{1/2})$ Not more than 1% of corrected values shall exceed 500pF/500m	Maximum measured value in sample cable: 37pF/500m	Compliant
11.2	Insulation resistance measured at 500V dc > 500 Mohm x km at 10°C. (table 9)	Measured values at room temperature > 10000 Mohm x km	Compliant

11.3	Attenuation. (table 8) Frequency      dB/100m @ 20°C MHz              not higher than: 1.0              2.6 4.0              5.6 8.0              8.5 10.0             9.8 16.0             13.1	Measured (worst value for each frequency) 2.4 4.6 6.4 7.2 8.8	Compliant
11.4	Near-end Crosstalk Attenuation Minimum NEXTA (dB) = 152 - 15 x log <sub>10</sub> frequency (Hz) (1-20MHz)	Measured values between 1 and 20Mhz above limit. (see electrical report files)	Compliant
11.5	Characteristic Impedance 1000ohm +/- 15%. (1-20MHz)	Measured values between 1 and 20Mhz within limits. (see electrical report files)	Compliant
11.6	Fire performance. Classification "C" as per M84. a) Single Cable Vertical Burning Test/ M84 E- 4.2.1 (IEC 60332-1-2.)  b) Acid Gas Emission/ M84 E-4.3.1 (EN 50267-2- 1) /0,5% by weight maximum. c) Corrosivity of Evolved Gases/ M84 E-4.3.2 (EN 50267-2-3)/ pH > 4,3 and Conductivity: < 10 µS/mm d) Fume emission/ M84 E-4.3.3/ The material shall not include any functional groups containing Halogen, Phosphorous, Nitrogen or Sulphur, however, trace amounts up to 0.5% w/w maybe permitted. e) Smoke emission from completed cables/ M84 4.5.2 ( BS -EN 61034)/ Minimum transmittance during test 60 %	a) Length of non affected sample: 390 mm  b) 0,06 %  c) pH=5,6 Conductivity: 2,1 µS/mm.  d) See supplier's certificate in 2.4 (material declaration)  e) 65%	Compliant  PASSED  PASSED  PASSED  PASSED
11.7	Minimum bending radius: 6x cable overall diameter. 6x22.6mm= 135.6mm	5 complete turns. No damage.	Compliant
12	Sealing of ends to prevent ingress of moisture.	Heat shrinkable caps used.	Compliant
13	TABLES:		

**TABLE 1.**

<b>Requirement</b>	<b>Specification</b>	<b>Actual Result</b>	<b>Conformance</b>
Conductor diameter	Nominal 0.5mm	<b>In range 0.496-0.506mm</b>	<b>Pass</b>
Conductor resistance	Maximum 97.8 Ohms.	<b>96.2 Ohm (worst value)</b>	<b>Pass</b>
Insulation thickness	Nominal 0.15mm	<b>0.175mm</b>	<b>Pass</b>
Insulated Conductor Overall Diameter	Nominal 0.95 mm	<b>0.85mm</b>	<b>Pass</b>

**TABLE 2: Wire identification colours.**

<b>Pair number</b>	<b>A wire</b>	<b>B wire</b>	<b>Result</b>	<b>Conformance</b>
1	White	Blue	Compliant	Pass
2	White	Orange	Compliant	Pass
3	White	Green	Compliant	Pass
4	White	Brown	Compliant	Pass
5	White	Grey	Compliant	Pass
6	Red	Blue	Compliant	Pass
7	Red	Orange	Compliant	Pass
8	Red	Green	Compliant	Pass
9	Red	Brown	Compliant	Pass
10	Red	Grey	Compliant	Pass
11	Black	Blue	Compliant	Pass
12	Black	Orange	Compliant	Pass
13	Black	Green	Compliant	Pass
14	Black	Brown	Compliant	Pass
15	Black	Grey	Compliant	Pass
16	Yellow	Blue	Compliant	Pass
17	Yellow	Orange	Compliant	Pass
18	Yellow	Green	Compliant	Pass
19	Yellow	Brown	Compliant	Pass
20	Yellow	Grey	Compliant	Pass
21	Violet	Blue	Compliant	Pass
22	Violet	Orange	Compliant	Pass
23	Violet	Green	Compliant	Pass
24	Violet	Brown	Compliant	Pass
25	Violet	Grey	Compliant	Pass

## 2.4 MATERIAL DECLARATION

### 2.4.1 MATERIAL REQUIRING MATERIALS REGISTRATION

Insulation material (solid polyethylene)

Material Manufacturer	Material Reference	Date of Registration	Comment
REPSOL	TR-210	-	HDPE material Material datasheet attached as separate file named:  <i>TR210_english.pdf</i>

Sheath material LSZH material)

Material Manufacturer	Material Reference	Date of Registration	Comment
Vicom	HF-350	-	LSZH material as per BS EN 50290-2-27. See datasheet:  <i>VICOM HF-350_Vicom_.pdf</i>  See halogen absence declaration:  <i>VICOM HF-350_halogen absence.pdf</i>  See temperature index certificate:  <i>VICOM HF-350_temp_index.pdf</i>

### 2.4.2 OTHER MATERIALS

Application	Material Description
Conductor	Plain Annealed Copper.
Unit binders	Polypropylene
Cable Core Wraps/Tapes	Polyamide

## 2.5 DOCUMENT HISTORY

Ref. Number	Issue	Date of Issue	Comments
PA/004/2011 CW1601 Issue 5	1	04/04/2011	