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Learning to Accept Marginal Test Results


March Seminar - CAS 2007

FIA 2007

FIA 2007
Commercial Awareness Seminars

**Learning
to
Accept
Marginal Test Results**

IEC 61935-1

	IEC 61935-1	Testing of balanced communication cabling in accordance with ISO/IEC 11801 - Part 1: Installed cabling
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IEC 61935-1: Ed.2 (2005)	
Foreword	
SCOPE	
Normative References	
Definitions	
REFERENCE MEASUREMENT PROCEDURES FOR ELECTRICAL PROPERTIES	Level II E (100 MHz) Level III (250 MHz) Level IV (600 MHz)
FIELD TEST MEASUREMENT PROCEDURES FOR ELECTRICAL PROPERTIES	
Data reporting and accuracy	
FIELD TESTER MEASUREMENT ACCURACY REQUIREMENTS	
ANNEX (informative)	
Uncertainty and variability of field test results (informative)	
IEC 61935-1: Ed.3 (2008)	
ANNEX (normative)	Level III E (500 MHz) Aliens
Reference laboratory test configuration for alien crosstalk testing	

IEC 61935-1: Data Reporting and Accuracy



IEC 61935-1

Testing of balanced communication cabling in accordance with
ISO/IEC 11801 - Part 1: Installed cabling

IEC 61935-1: Ed.2 (2005)

Foreword

SCOPE

Normative References

Definitions

REFERENCE MEASUREMENT PROCEDURES FOR ELECTRICAL PROPERTIES

FIELD TEST MEASUREMENT PROCEDURES FOR ELECTRICAL PROPERTIES
Data reporting and accuracy

FIELD TESTER MEASUREMENT ACCURACY REQUIREMENTS

ANNEX (informative)

Uncertainty and variability of field test results (informative)

PASS or FAIL result for each parameter shall be determined by the allowable limits for that parameter

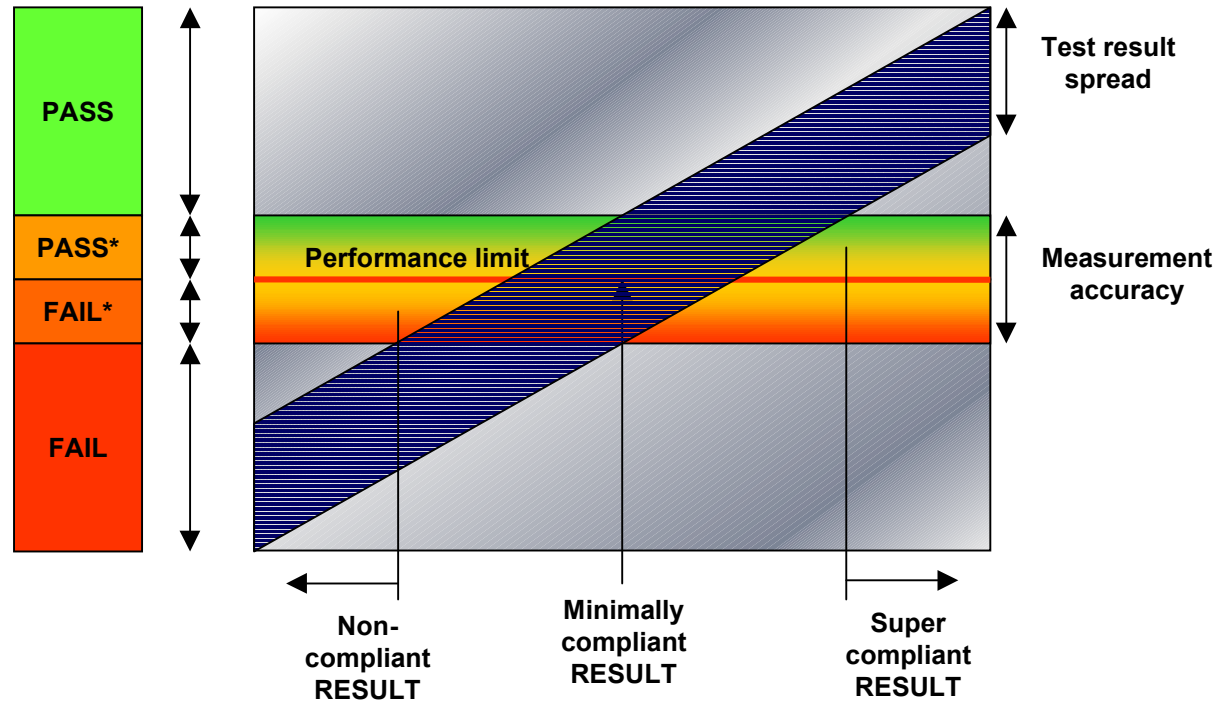
The test result of a parameter shall be marked with an asterisk (*) when the result is closer to the test limit than the measurement accuracy

An overall PASS or FAIL condition shall be determined by the results of the required individual tests

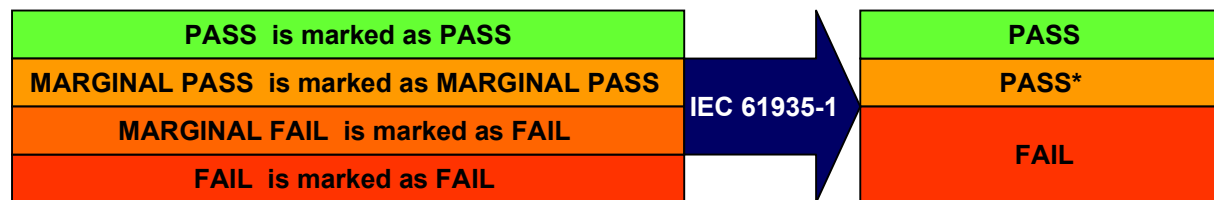
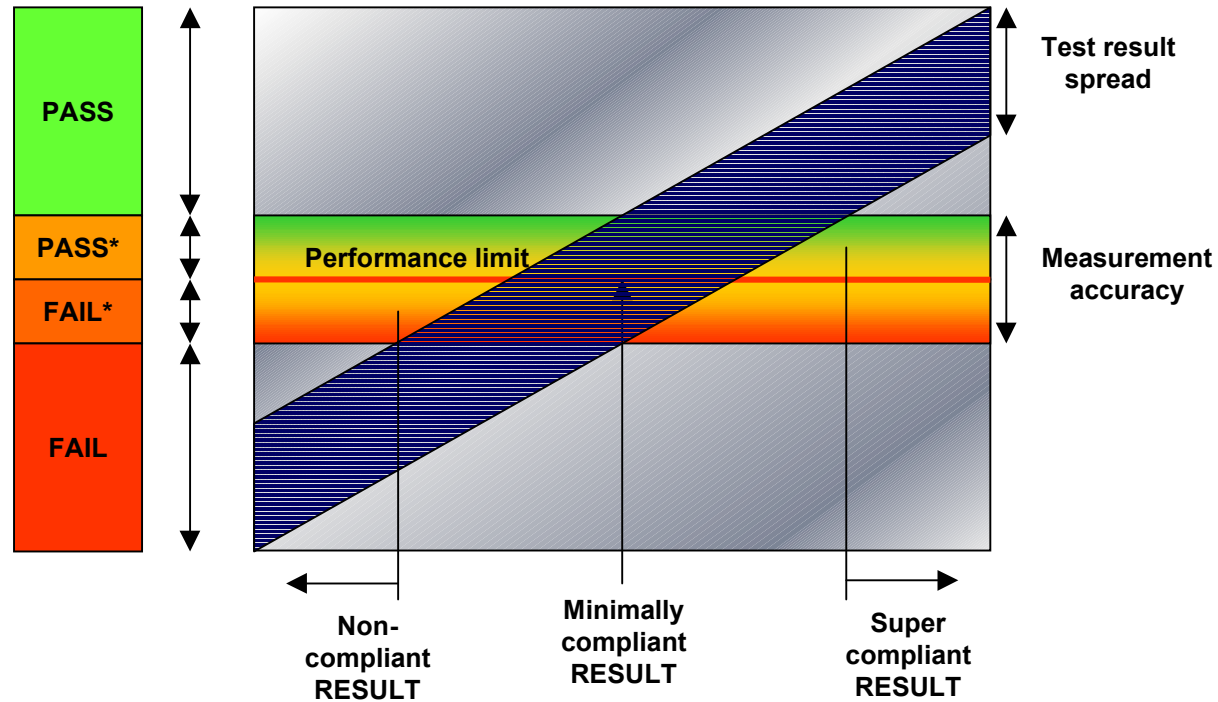
Any FAIL or FAIL* shall result in an overall FAIL

In order to achieve an overall PASS condition, all individual results shall be PASS or PASS*

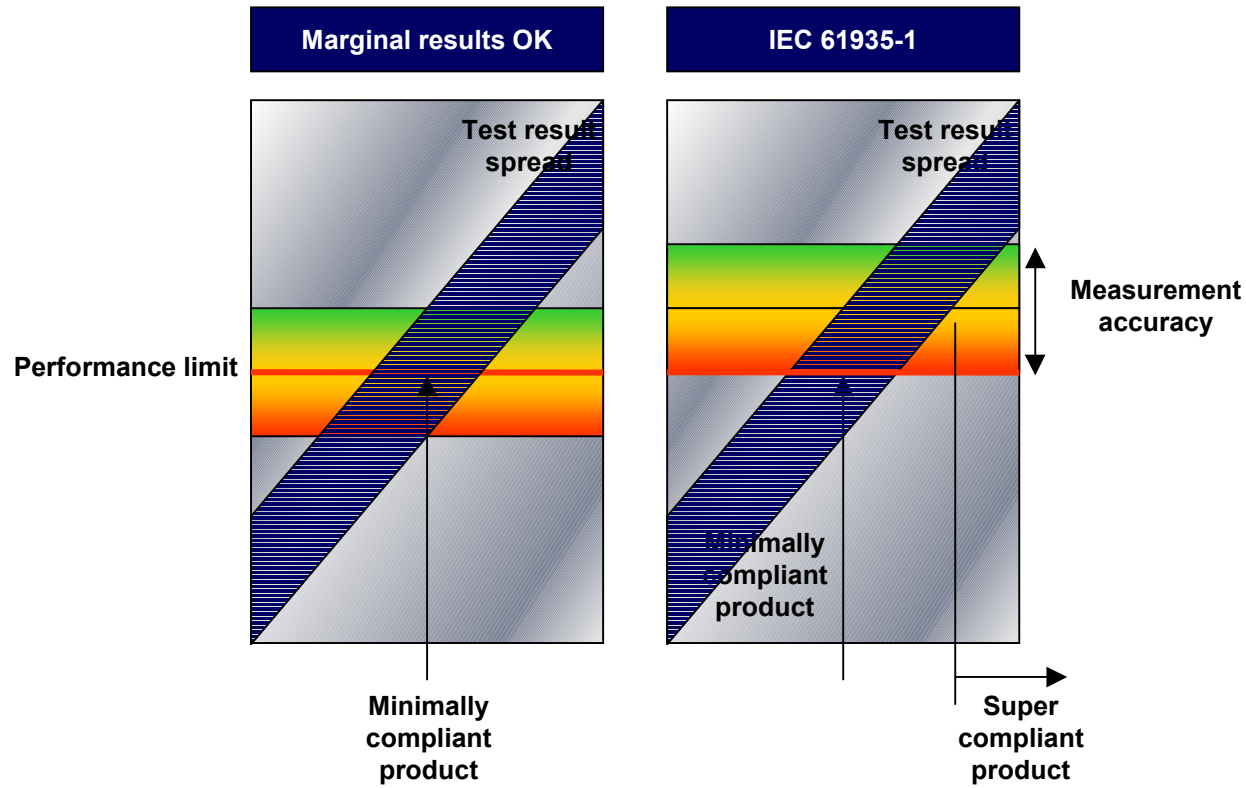
Individual Parameter Assessment



Overall Test Result Assessment

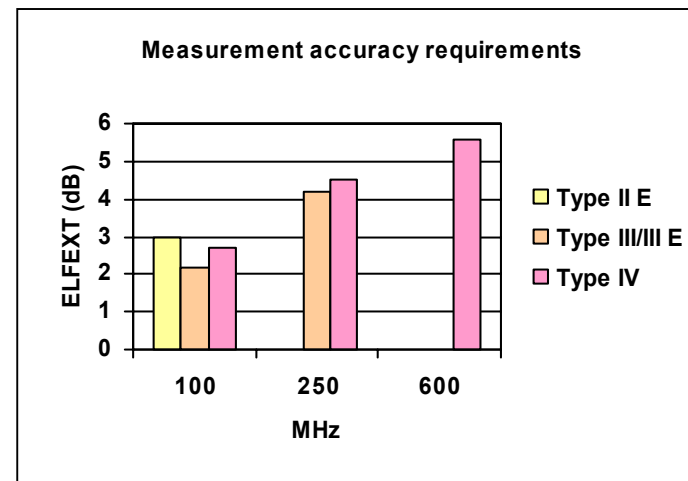
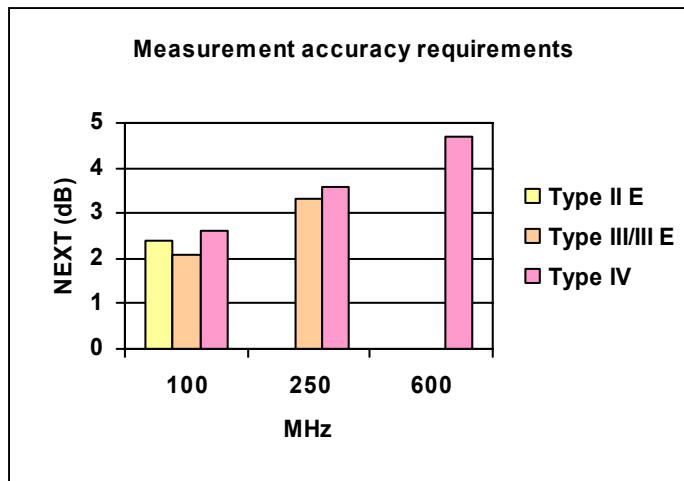
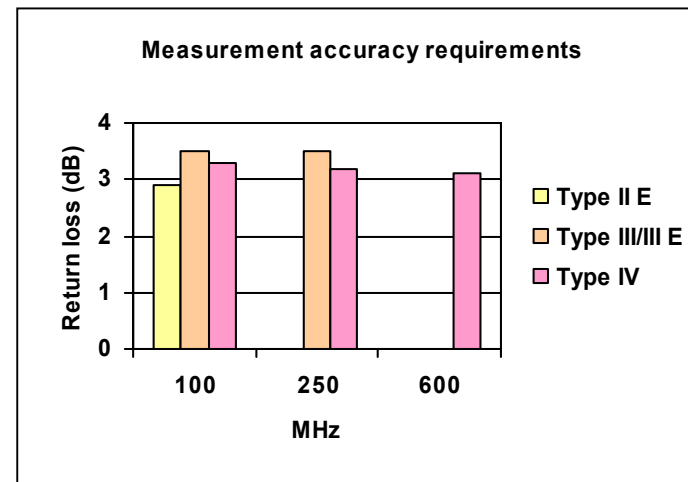
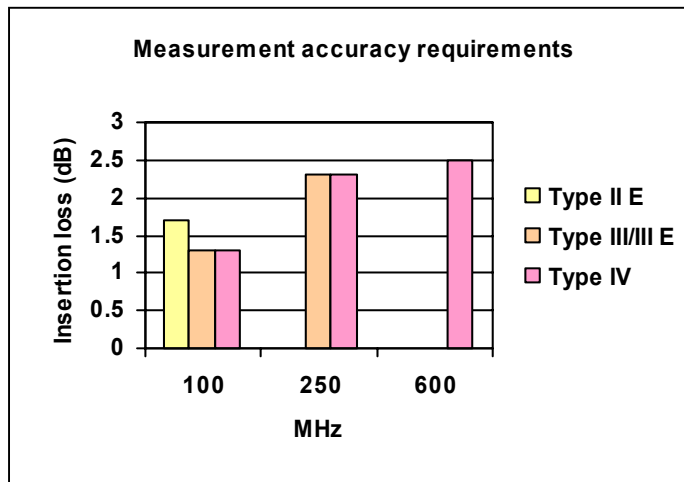


Potential Impact on Product Selection



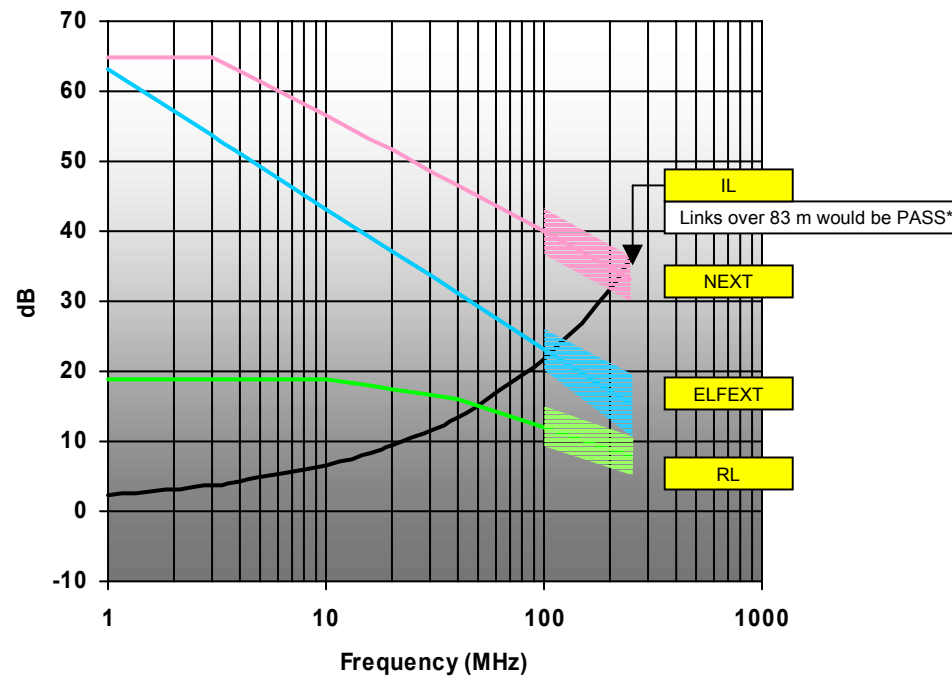
IEC 61935-1 Normative Requirements

PERMANENT LINK MEASUREMENT ACCURACY AT PERMANENT LINK LIMITS



IEC 61935-1 Normative Requirements

ISO/IEC 11801 (2002) and EN 50173-1 CLASS E LIMITS



IEC 61935-1: Ed.3 (2008)

(similar text exists in IEC 61935-1: Ed.2 (2005))

ANNEX (informative)

Uncertainty and variability of field test results (informative)

Since the reporting of marginal pass/fail conditions by showing asterisks is generally considered undesirable, field tester manufacturers generally use the tighter nominal accuracy to establish conditions for marginal pass/fail.

IEC 61935-1 Informative (Recommendations)

IEC 61935-1: Ed.3 (2008)

(similar text exists in IEC 61935-1: Ed.2 (2005))

ANNEX (informative)**Uncertainty and variability of field test results (informative)**

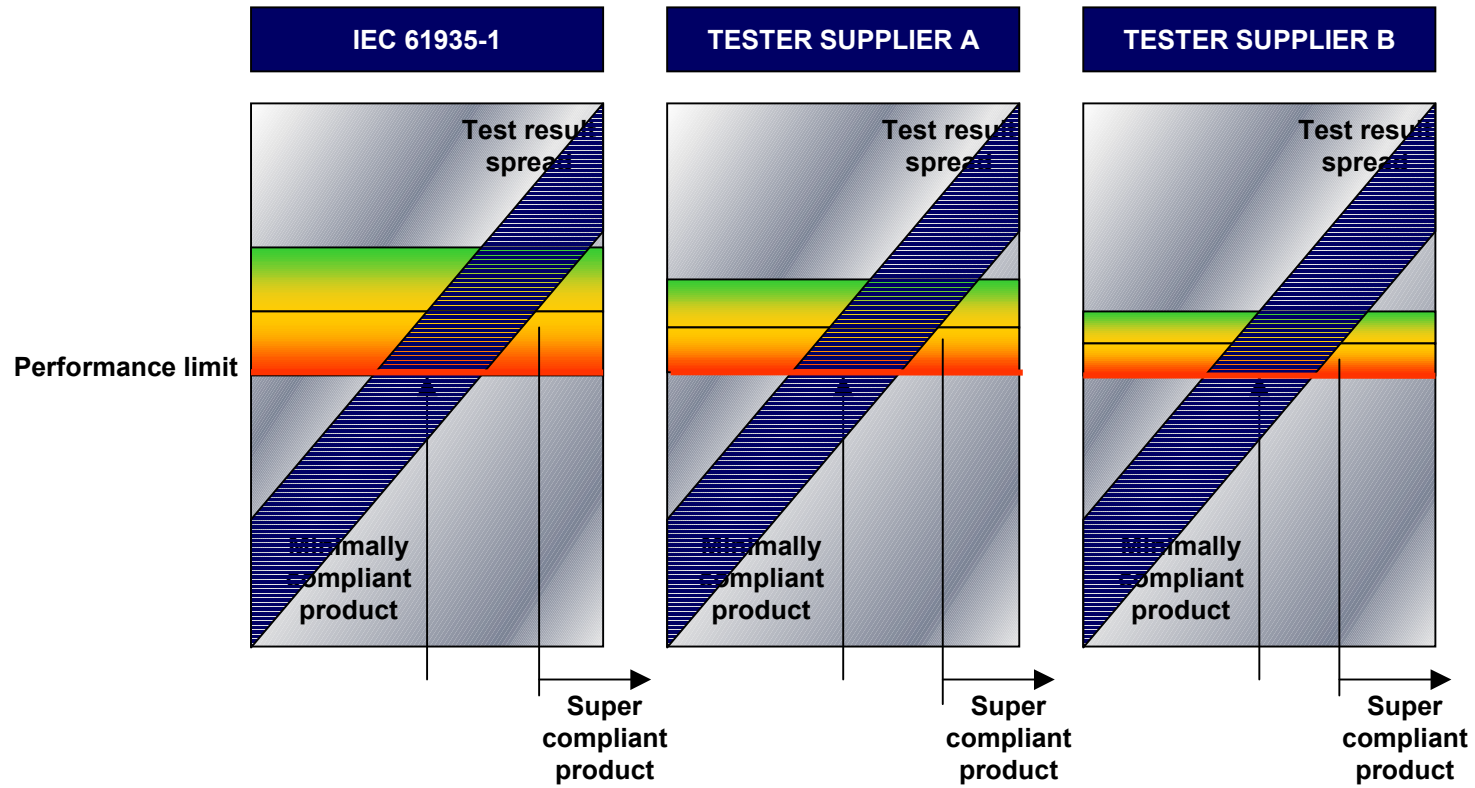
..... “nominal” accuracy performance specifications are often used to determine results that are closer to the PASS/FAIL limit than this worst case accuracy

.... expect nominal accuracy to be at least 2× better than the worst case accuracy

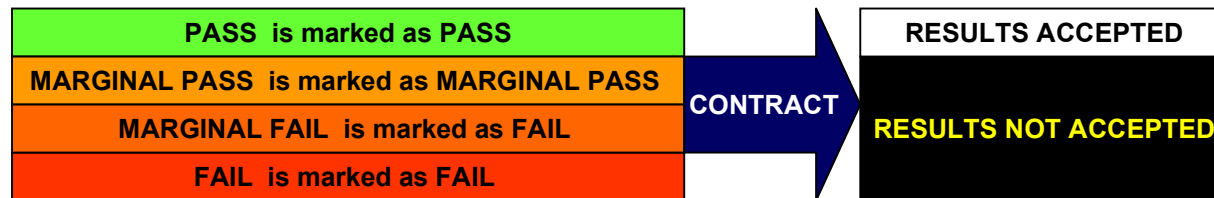
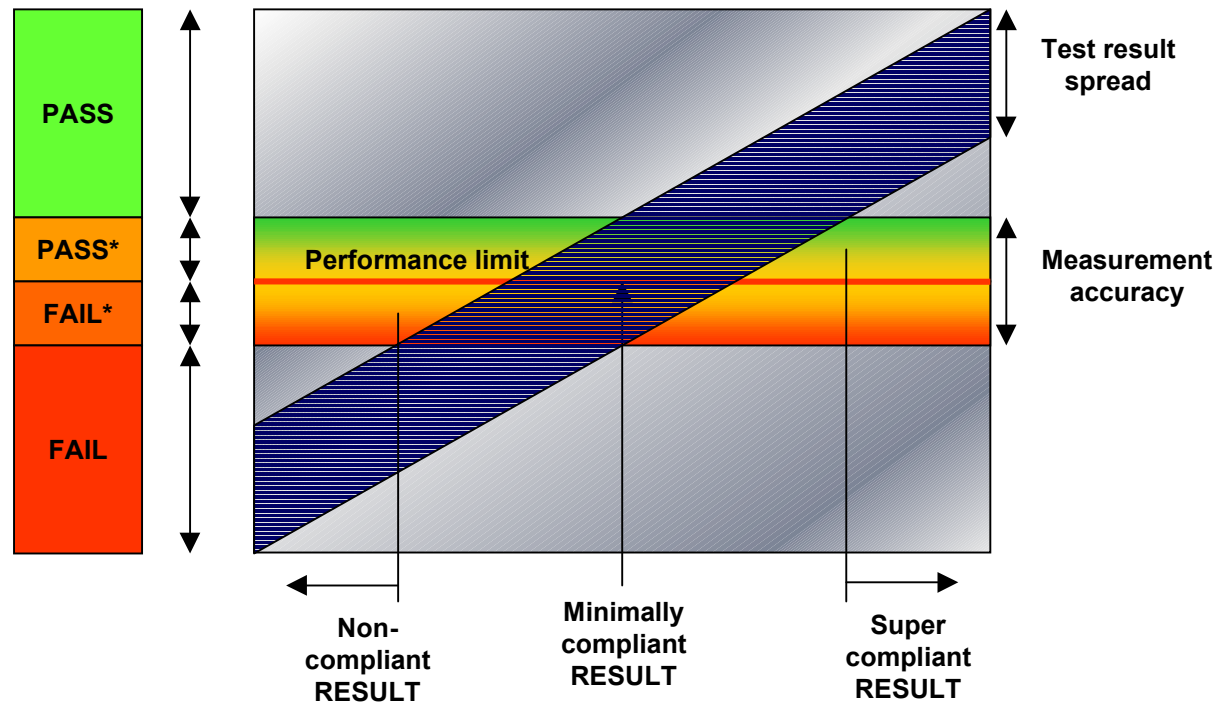
.... In many cases, field tester manufacturers may specify even tighter nominal accuracy performance than 2× better than the worst case accuracy

Field tester manufacturers should specify in detail what the “nominal accuracies” are for every measurement parameter and test configuration that are used for the purpose of establishing pass/fail conditions in results reported by the field tester. The user should obtain this information and include this information in the quality requirements.

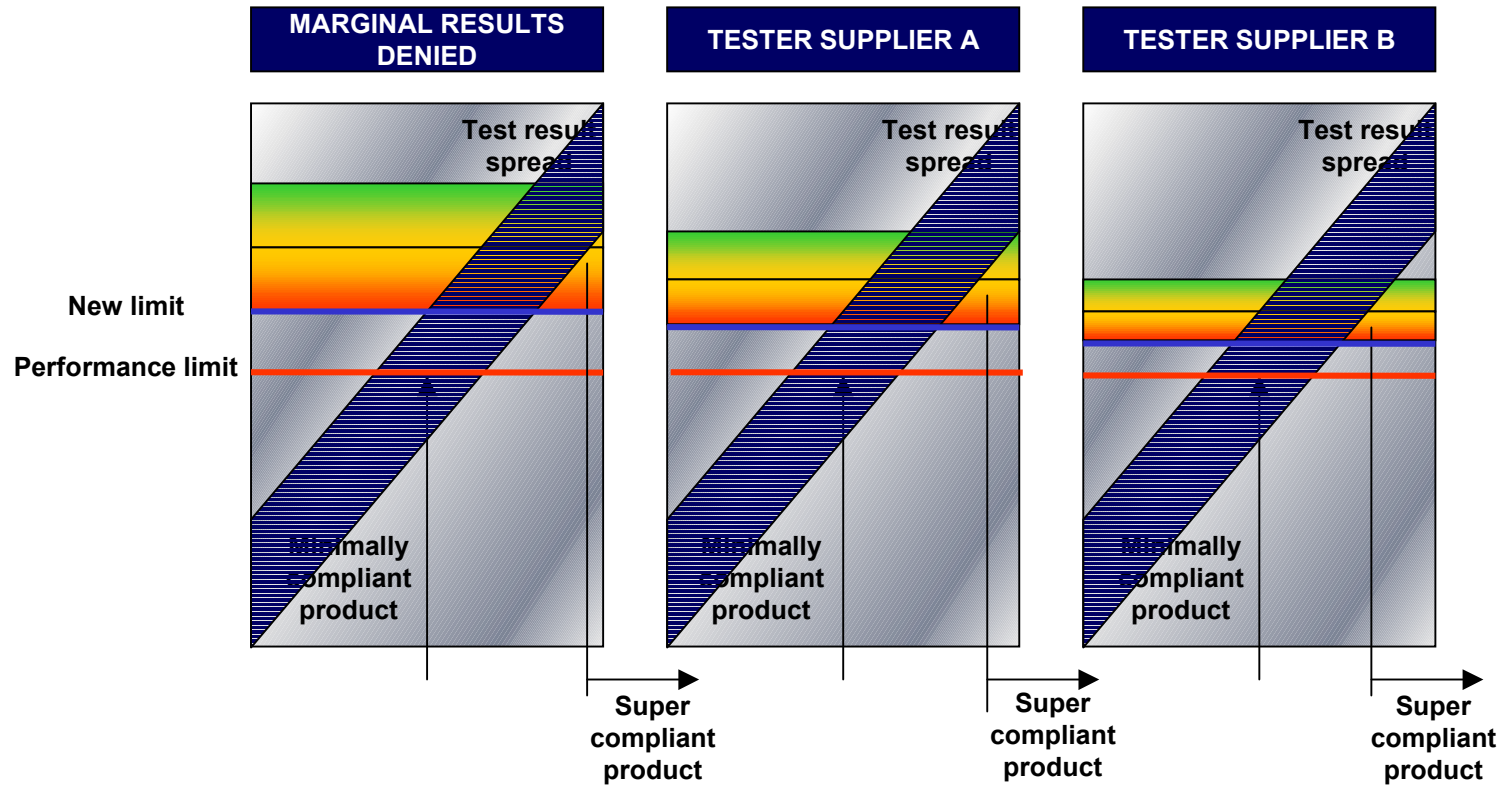
Equipment-specific Assessment



Contractual Issues - Margin Denial



Potential Impact on Product Selection



Balanced Cabling - Conclusions



IEC 61935-1

Testing of balanced communication cabling in accordance with
ISO/IEC 11801 - Part 1: Installed cabling

PASS or FAIL result for each parameter shall be determined by the allowable limits for that parameter

The test result of a parameter shall be marked with an asterisk (*) when the result is closer to the test limit than the measurement accuracy

Not applied in any similar standard

An overall PASS or FAIL condition shall be determined by the results of the required individual tests

Completely illogical

Any FAIL or FAIL* shall result in an overall FAIL

The use of nominal (self determined) accuracies in determining marginality

Limits are unknown unless the tester is defined

SUMMARY

THESE REQUIREMENTS AND RECOMMENDATIONS
ARE NOT IN LINE WITH THE CONFORMANCE CLAUSE
OF ISO/IEC 11801 (AND EN 50173-1)

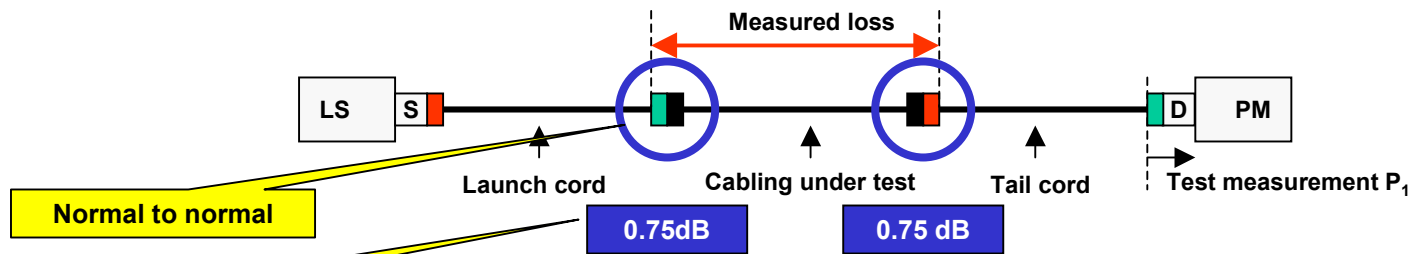
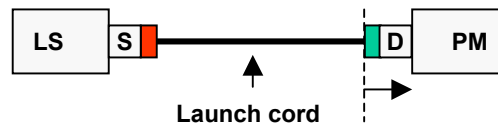
THE STANDARDS FOR WHICH THEY WERE SUPPOSEDLY WRITTEN

MARGIN DENIAL

- has limited validity if the intention is to remove disputes
- favours system suppliers that provide significant margin
- provides least technical advantage when used with most accurate test equipment

Optical Fibre Cabling - LSPM - The Old Way

 IEC 61280-4-X
EN 50346:2002



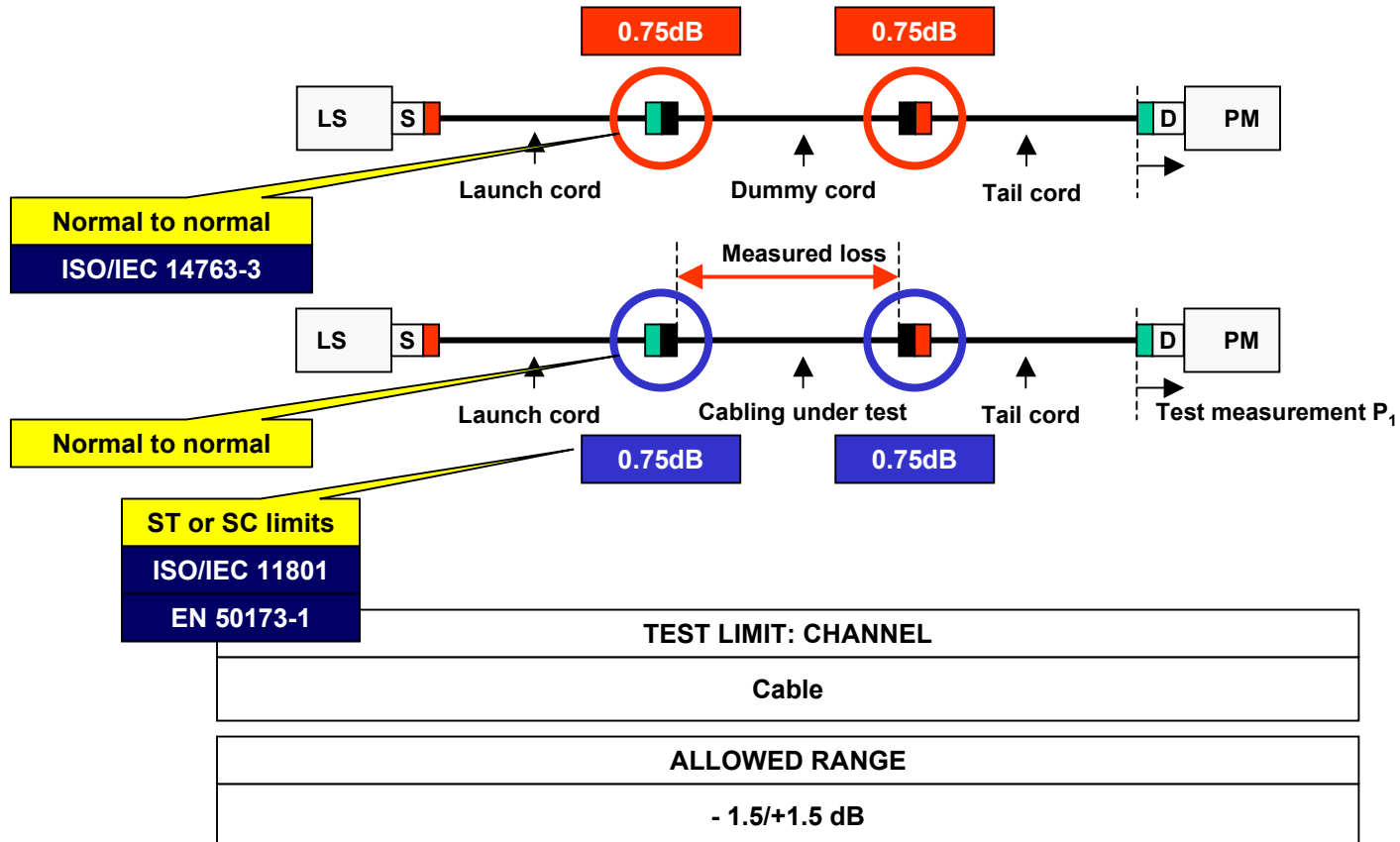
Normal to normal

ST or SC limits
ISO/IEC 11801
EN 50173-1

TEST LIMIT: LINK
Cable + 1.5dB
ALLOWED RANGE
- 1.5/+0 dB

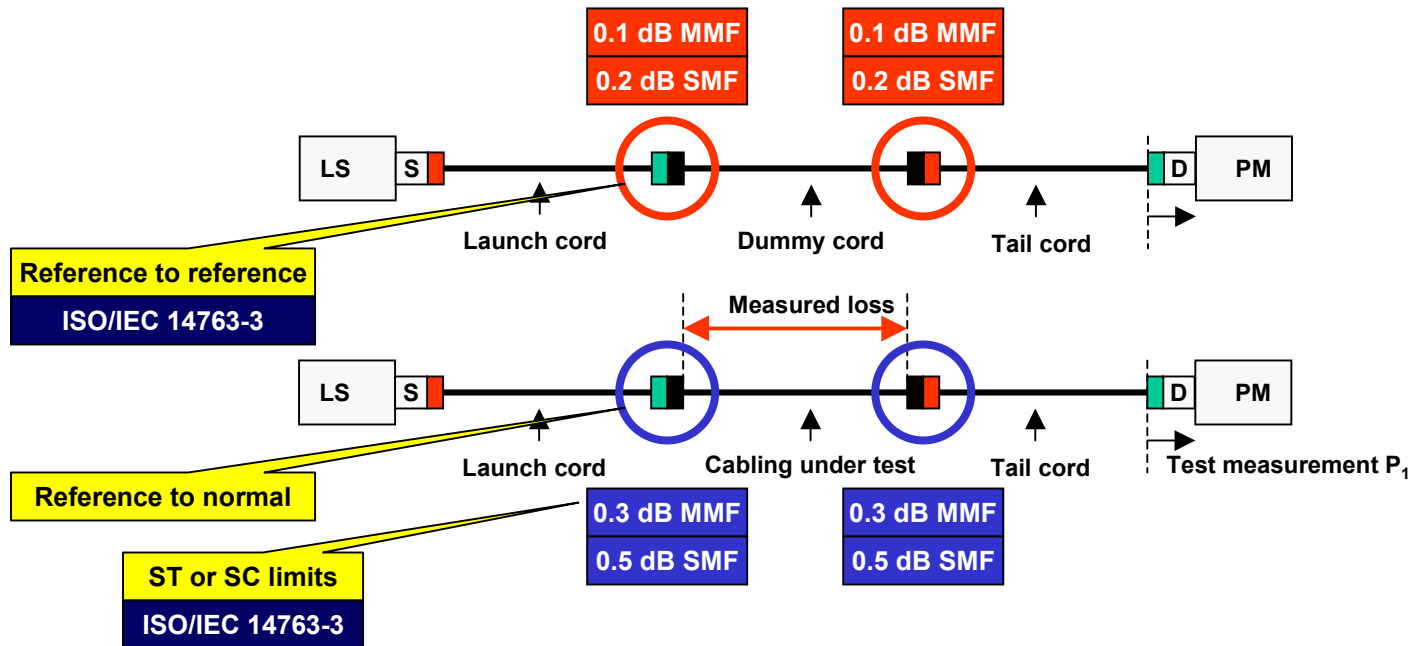
Optical Fibre Cabling - LSPM - The Old Way

 IEC 61280-4-X
EN 50346:2002



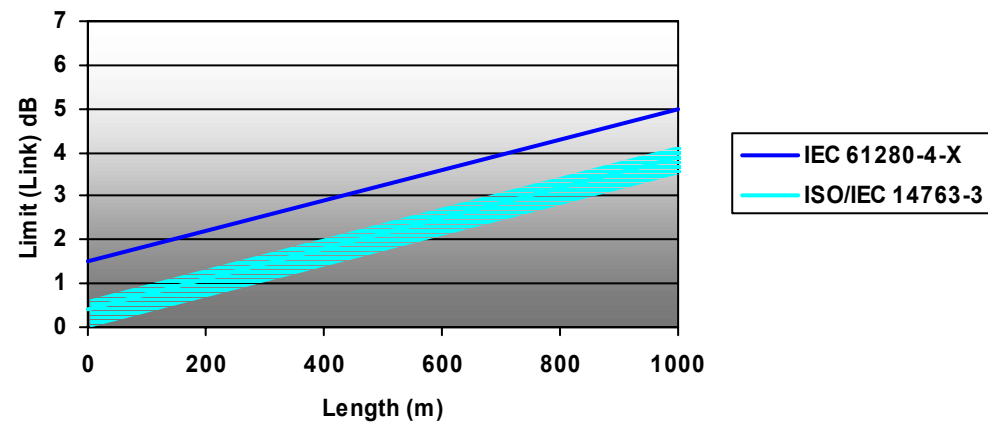
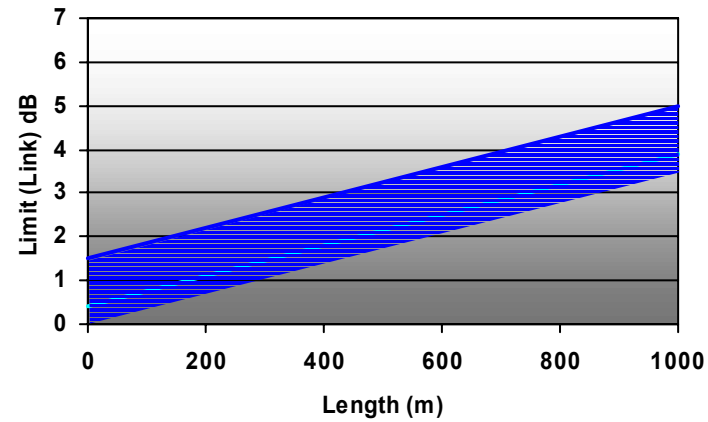
Optical Fibre Cabling - LSPM - ISO/IEC 14763-3

ISO/IEC 14763-3: 2006 Information technology - Implementation and operation of customer premises cabling - Part 3: Testing of optical fibre cabling



TEST LIMIT: LINK OR CHANNEL	
Cable + 0.4dB (MMF)	
Cable + 0.6 dB (SMF)	
ALLOWED RANGE	
+ 0.2/-0.4 dB (MMF)	
+0.4/-0.6 dB (SMF)	


Optical Fibre Cabling - MMF Link Margins



Quality Planning

	ISO/IEC 11801	ISO/IEC 24702
Conformance		

The treatment of measured results that fail to meet the requirements of this clause, or lie within the relevant measurement accuracy, shall be clearly documented within a quality plan as described in ISO/IEC TR 14763-2

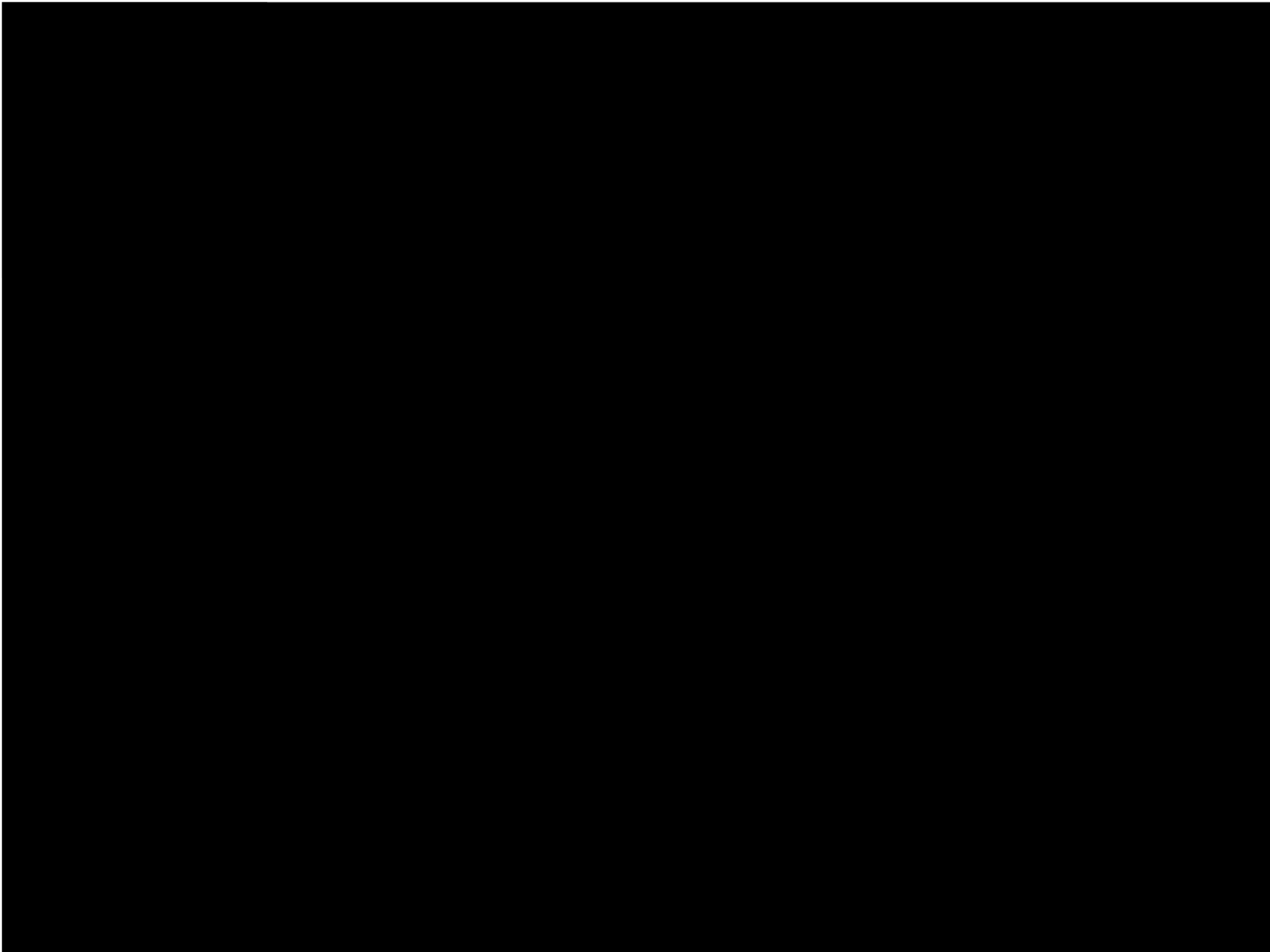
	EN 50173-1:2002				
	EN 50173-2:2007	EN 50173-3:2007	EN 50173-4:2007	EN 50173-5:2007	
Conformance					

The treatment of measured results that fail to meet the requirements of this clause, or lie within the relevant measurement accuracy, shall be clearly documented within a quality plan as described in EN 50174-1

ACTIONS

Both EN 50174-1 and ISO/IEC 14763-2 are in revision at this time

Treatment of marginal results needs to be taken out of the hands of the test equipment manufacturers and into the hands of the user



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100GBASE-F and 100GBASE-T - Fact or Fiction

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-
Fact or Fiction**