net. work. solution.

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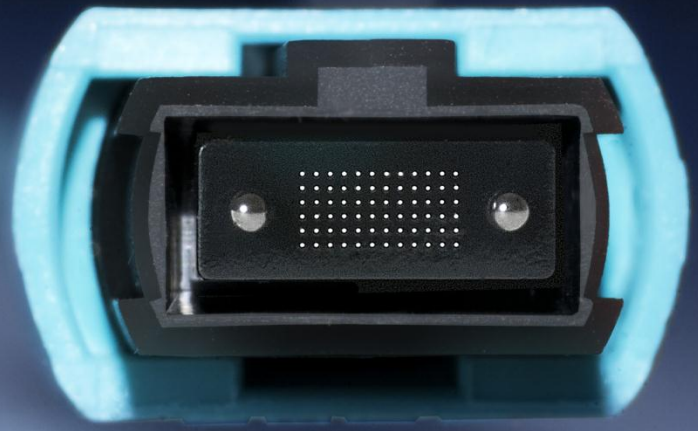

tML® - tde Modular Link system

Trust the leader in multi – fieber technology

tML® – tde Modular Link

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Components:

1) Rack Mount Enclosure
1U (8 modules), 3U (17 modules/ 5TE)

2) Modules
for every connector type
FO and CU modules can be mixed on 1U

3) Trunk Cables
MM, SM, CU

Port density: 48 ports / 1U

tML® – Trunk Cable Copper

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Significantly reduced cable volume

- less weight
- less fire load
- more space in the cable trays

tde – mini trunk cable conventional trunk cable

All cables are halogen free and high flexible. CU system cable is shielded!

tML® – Trunk Cable Copper

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1 GbE System

RJ45 module with Telco connector (1 GbE), *patented*

preterminated in lengths up to 60m

The Telco connector is no proprietary connector

10 GbE System

RJ45 module direct wired (10 GbE – CAT 6_A)

preterminated in lengths up to 50m

tML® – Trunk Cable FO

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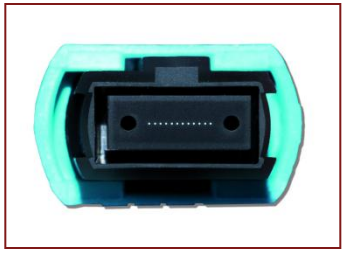
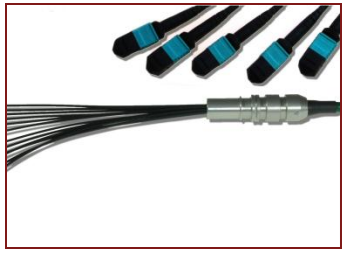
- Preterminated in all lengths
- MPO/MTP® trunk cables have a round cable design (outer diameter approx. 3mm)
- MPO/MTP® breakout cables with 48 fibers are without fan out units
- 48 x E2000 Compact ports modular on 1U
- Up to 48 x LC Duplex modular on 1U
- Optimized connector end faces through lasercleaving
- Standard loose tube cables can be used
- Preterminated trunk cables up to 144 fibers

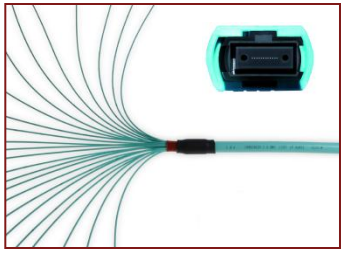
MPO/MTP®
with round cable



MPO/MTP® trunk cable with fan out unit (up to 144 fibers)



MPO/MTP® breakout cable without fan out unit (up to 96 fibers)



Attenuation Values

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fiber	connector	wavelength	typical	max	min
50/125µ OM4	**E2000**	**850 nm**	**≤ 0,10**	**0,25**	**35**
	LC	850 nm	**≤ 0,10**	0,25	35
	MPO/MTP®	850 nm	**≤ 0,17**	0,35	25
	MU	850 nm	**≤ 0,10**	0,25	35
	SC	850 nm	**≤ 0,10**	0,25	35
	Module	850 nm	**≤ 0,20**	0,35	25
09/125µ	**E2000**	**1550 nm**	**≤ 0,10**	**0,30**	**55**
	E2000 APC	1550 nm	**≤ 0,10**	0,30	72
	LC	1550 nm	**≤ 0,10**	0,30	55
	LC APC	1550 nm	**≤ 0,10**	0,30	72
	MPO/MTP® APC	1550 nm	**≤ 0,10**	0,45	65
	MU	1550 nm	**≤ 0,10**	0,30	55
	SC	1550 nm	**≤ 0,10**	0,30	55
	SC APC	1550 nm	**≤ 0,10**	0,30	72
	Module	1550 nm	**≤ 0,30**	0,50	65

Benefits at a glance

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- **High packing density**
  48 x RJ45 or 96 x fibers (standard) / 192 x fibers (Quad-LC) / 576 x fibers (MPO/MTP®)
- **Economy**
  - simple Plug & Play installation
  - low installation costs
  - Quick installation reduces downtime
  - No measurements are necessary (system components are labore tested)
  - reuse of the components after changes
  - reduced space need in cable trays and racks
- **More advantages**
  - significant reduction of space need because of the modular „mixed assembling“
  - cost reduction through demand – oriented installation
  - easy replacement of the system components
  - investment protection through reuse of components

tML creates ideal conditions for a subsequent modification of the network

Migration of Networks

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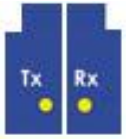
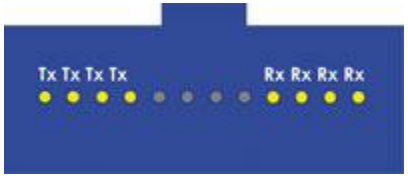
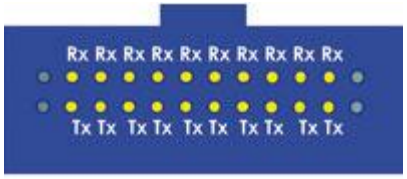
With multi fiber technology migration to 40/100 GbE



Connector for 10GbE



Connector for 40 GbE



Single port for 100 GbE

Attenuation budget for the entire link: 1,9db with OM3 100m length or 1,5db with OM4 150m lenght

Migration of Networks

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Multi fiber technology
on the way to 40/100 GbE

Investment protection:

All system components can be reused!

MPO/MTP® SM Test Values Return Loss

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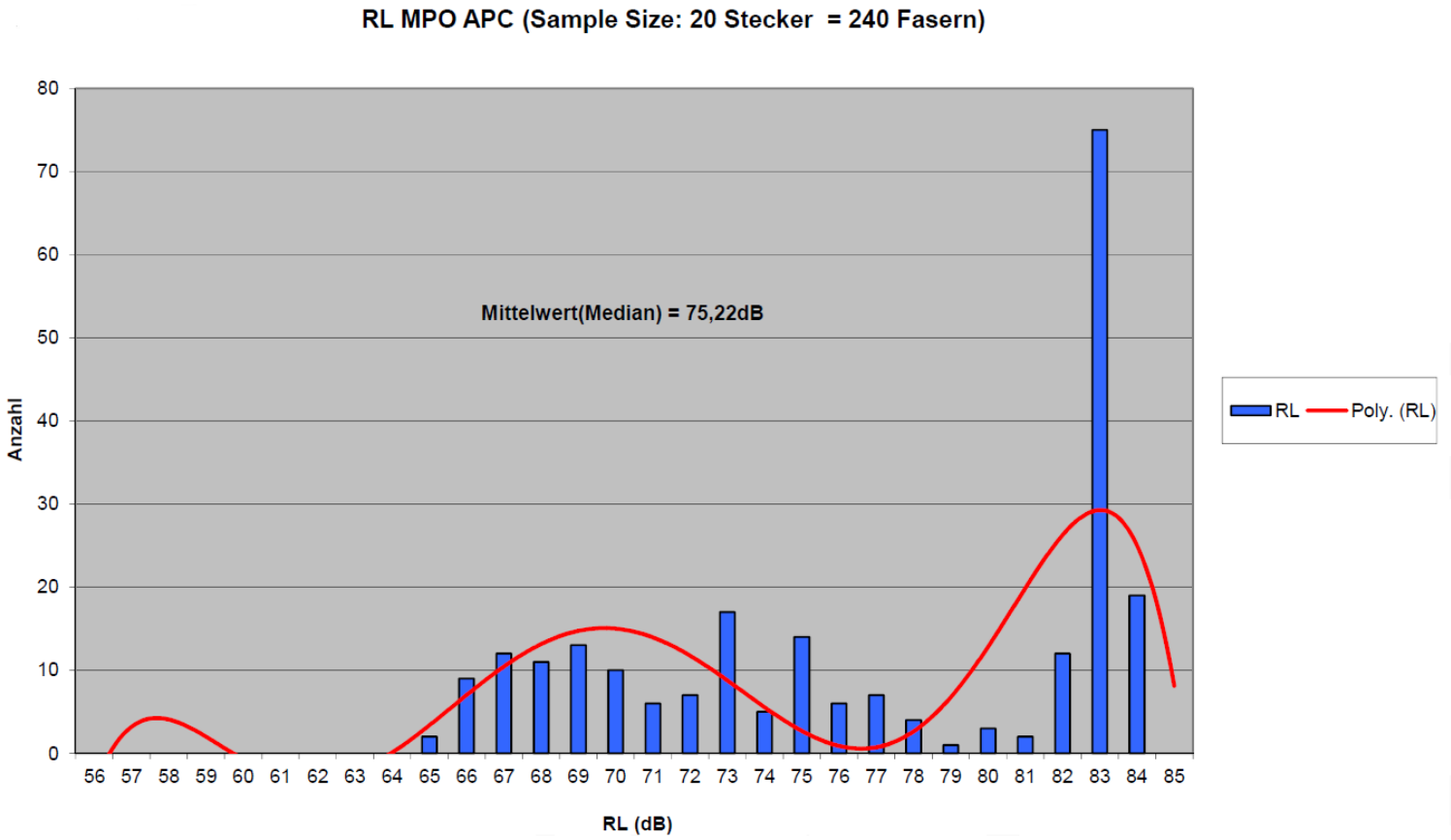

MPO/MTP® SM Test Values Insertion Loss

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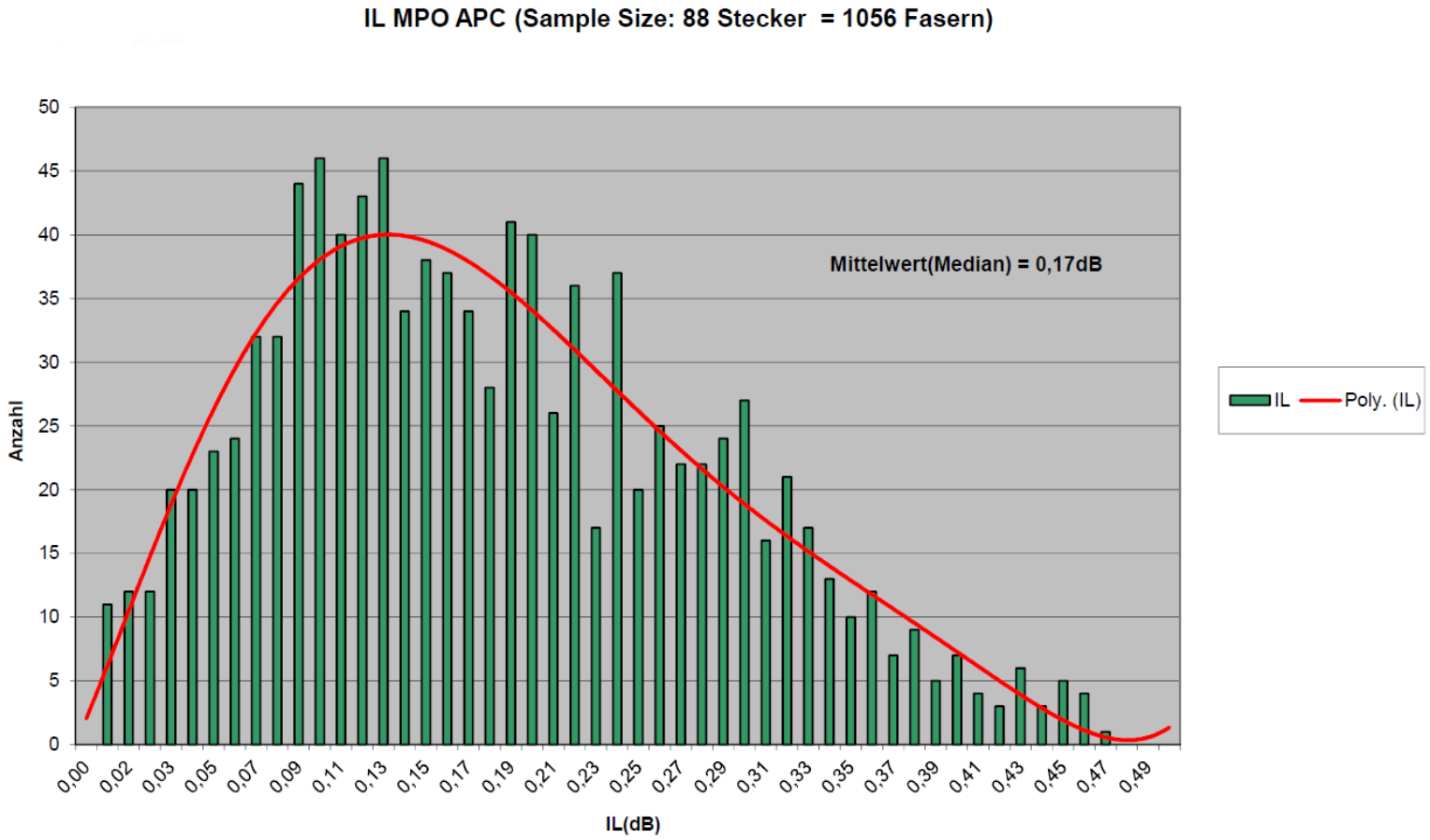
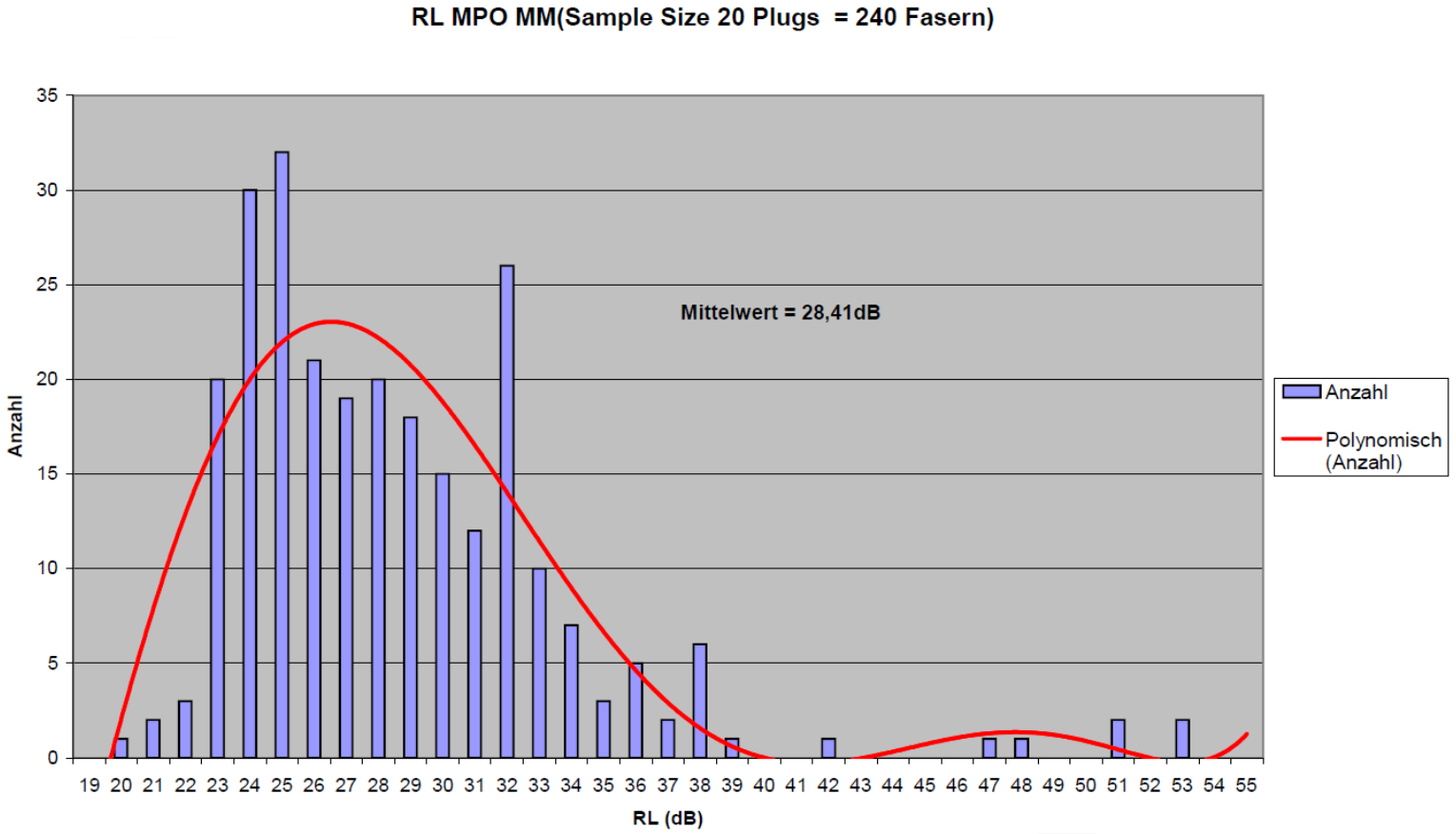


MPO/MTP® MM Test Values Return Loss



MPO/MTP® MM Test Values Insertion Loss

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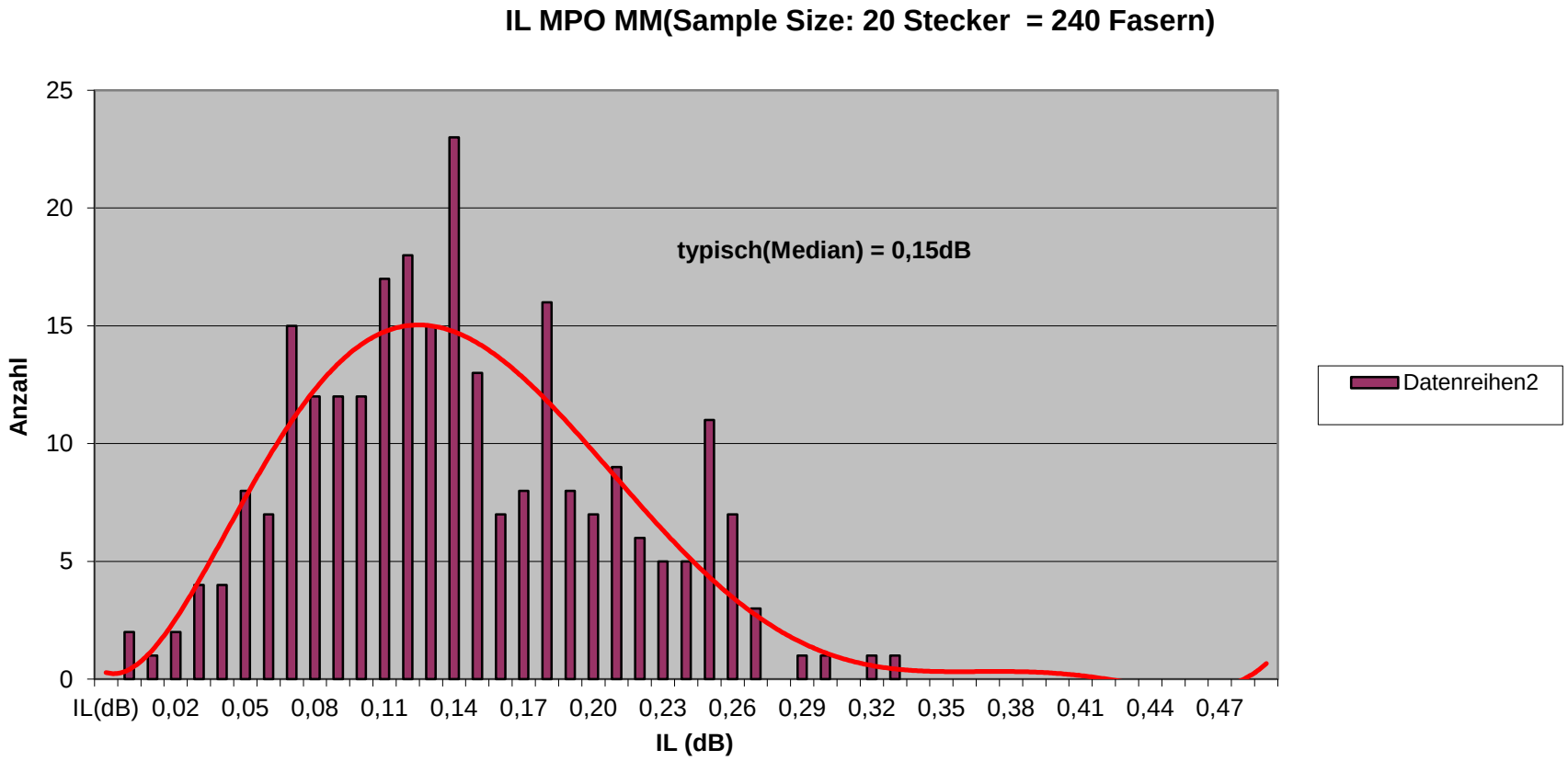

Cost Comparison

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Purchase costs

+

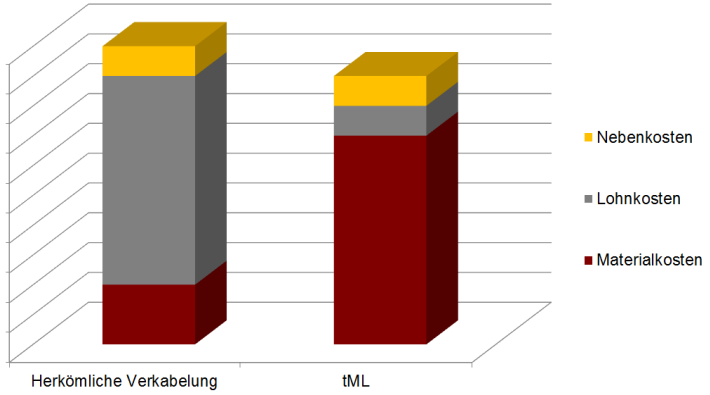
Minimal installation costs

+

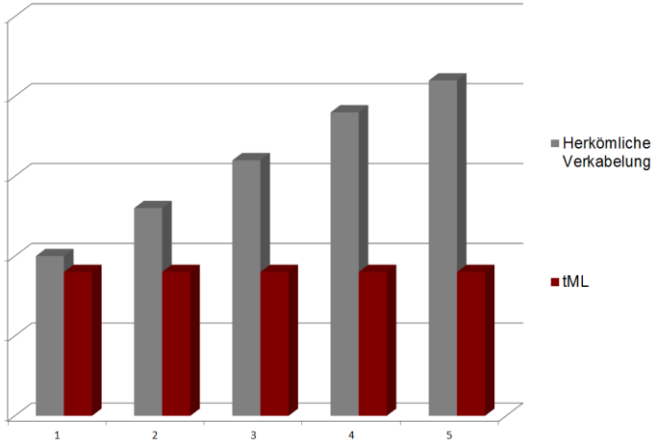
Low extra expenses

=

Savings from the beginning



„Although hugely advantageous, cost are competitive low. Further cost advantages will show up after system changes.“



tML® Applications

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Datacenter	Datacom	Telecom	Industry	Defence

References

KDRS/RZRS

ZDV-Saar

ABB

Telekommunikation mittleres Ruhrgebiet GmbH (TMR)

IT.NRW

CERN

ARZ Emmendingen

s.Oliver

tde – Energy Efficiency

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The Code of Conduct for Data Center – Wat is that?

This is an initiative of the Joint Research Centre and the Institute for Energy of the European Commission. The Code of Conduct was created in response to the increasing energy consumption in data centres.

tde's commitment to the Code of Conduct

Through targeted consulting and public relations tde stands up for the principles of the Code of Conduct and promotes the establishment of "green" data centres. The Code of Conduct only includes data centre operators and vendors that provide for an economical and efficient energy use through their activities.

Certificates

- Certificate ISO - 9001:2008
- Certificate ISO – 14001:2004
- Certificate TL – 9000-H:R5.0/R4.5

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t d e – your reliable partner

Thank you for your attention!

Any questions?