

**TUV NORD**

**CERTIFICATE**

**No. 0 9397 02**

on the approval of a static calculation

The static calculation: racks for earthquake proof battery installations  
(Geselle für erdbebensicheren Batereieinbau)  
Date 07.10.03, 28 pages + 5 annexes  
provided by: Kühne BSB GmbH  
Hirschbachstr. 70  
D-64354 Reinheim, Deutschland  
for: earthquake proof battery racks  
manufactured by: Passoni Paolo e figli S.r.l.  
Via Aristotele, 32  
I 20047 Brugherio (MI)-Italia  
alpha industrie-bedarfs gmbh  
Niedeshalmer Straße 26  
D 67550 Worms, Deutschland

was approved with respect to static design. The racks are appropriate for use as earthquake proof battery racks in USA, earthquake zone 4. The approval was done basing on DIN 18500, DIN 4140, the Uniform Building Code ed.1997 and the International Building Code ed.2000 and 2003.  
This certificate holds in connection with the RWTÜV-report of approval no. 0 9397 02, doc.no.: 4.2-397/00 may, dated Feb. 5<sup>th</sup> 2004

Essen, 2010-05-19

TÜV NORD SysTec GmbH & Co. KG

The Independent Experts

  
Dipl.-Ing. Petraschke



  
Dipl.-Ing. Meyer

09397-02 (en)-ES.doc

**EEI**

**CERTIFICATE OF APPROVAL**

**EARTHQUAKE PROOF RACKS FOR STATIC BATTERIES  
MANUFACTURED BY**

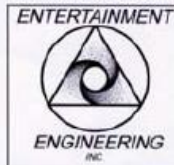
Passoni Paolo e figli S.r.l.  
Via Aristotele, 32  
20047 Brugherio (MI) - Italy  
alpha industrie-bedarfs gmbh  
Hüttenstraße, 5  
67550 Worms - Germany

The earthquake proof battery racks produced by Passoni alpha are hereby approved for compliance with the following Building Codes:

2007 California Building Code - CBC  
2006 International Building Code - IBC  
2005 IEEE Std 693 - Annex J

IEEE Recommended Practice for Seismic Design of station batteries and battery racks

These battery racks are hereby approved for structural adequacy in earthquake zone 4 as defined by the above codes. This approval is based on a thorough review of the report entitled "static calculation-racks for earthquake proof battery installation" produced by: Kühne BSB GmbH  
Hirschbachstr. 70  
D-64354 Reinheim - Deutschland  
and collateral linear static stress and critical buckling load analysis performed by our engineers. The 2 tier battery racks have been analyzed for dynamic loads according to the methods defined in the IEEE Std 693, Annex J



*Kent Bingham*

**18 May, 2008  
No. 2008-09**



**EEI**

**CERTIFICATE OF APPROVAL**

**EARTHQUAKE PROOF RACKS FOR STATIC BATTERIES  
MANUFACTURED BY**

Passoni Paolo e figli S.r.l.  
Via Aristotele, 32  
20047 Brugherio (MI) - Italy

alpha industrie-bedarfs gmbh  
Hüttenstraße, 5  
67550 Worms - Germany

The earthquake proof racks for static battery installation produced by Passoni alpha are hereby approved for use in California, in earthquake zone 4 as defined by the UBC 1997 and IBC 2003. This approval is based on a thorough review of the report entitled "static calculation-racks for earthquake proof battery installation" produced by:

Kühne BSB GmbH  
Hirschbachstr. 70  
D-64354 Reinheim, Deutschland

and collateral linear static stress and critical buckling load analysis performed by our engineers.



**21 March, 2005  
No. 2005-32**



**MRH**

**CERTIFICATE OF SEISMIC QUALIFICATION  
BY ANALYSIS**

**EARTHQUAKE PROOF RACKS FOR STATIC BATTERIES  
MANUFACTURED BY**

Passoni Paolo e figli S.r.l.  
Via Aristotele, 32  
20047 Brugherio (MI) - Italy

alpha industrie-bedarfs gmbh  
Niedeshalmer Str. 26  
DE-67550 Worms - Germany

The earthquake proof battery racks produced by Passoni alpha are hereby certified for compliance with the following Building Codes:

**2009 International Building Code - IBC 2009  
2010 California Building Code - CBC 2010**

These battery racks are hereby seismically qualified for their structural adequacy in areas with the mapped MCE spectral acceleration at short period of  $S_d \leq 2.0g$  as defined by the above codes. The modifications and limitations of this qualification are included in our seismic qualification report dated June 29, 2012. This qualification is based on a thorough review of the report entitled "static calculation-racks for earthquake proof battery installation" produced by:

Kühne BSB GmbH, Mina-Rees-Straße 5A, 64295 Darmstadt - Deutschland

and collateral linear static stress analysis performed by our engineers.

**MRH** Structural Engineers, Inc.  
1811 N. Balavia Street, Suite 121  
Orange, California 92667  
Phone: (714) 633-0360  
WWW.MRHE.COM

**29 June, 2012  
No. 12104**

