

# European Technical Approval

- ▶ No (European) Standard for reinforcing bars
- ▶ EAD European assessment document = testing and quality rules
- ▶ ETA defines material properties



# Combar Reference Projects: Industry

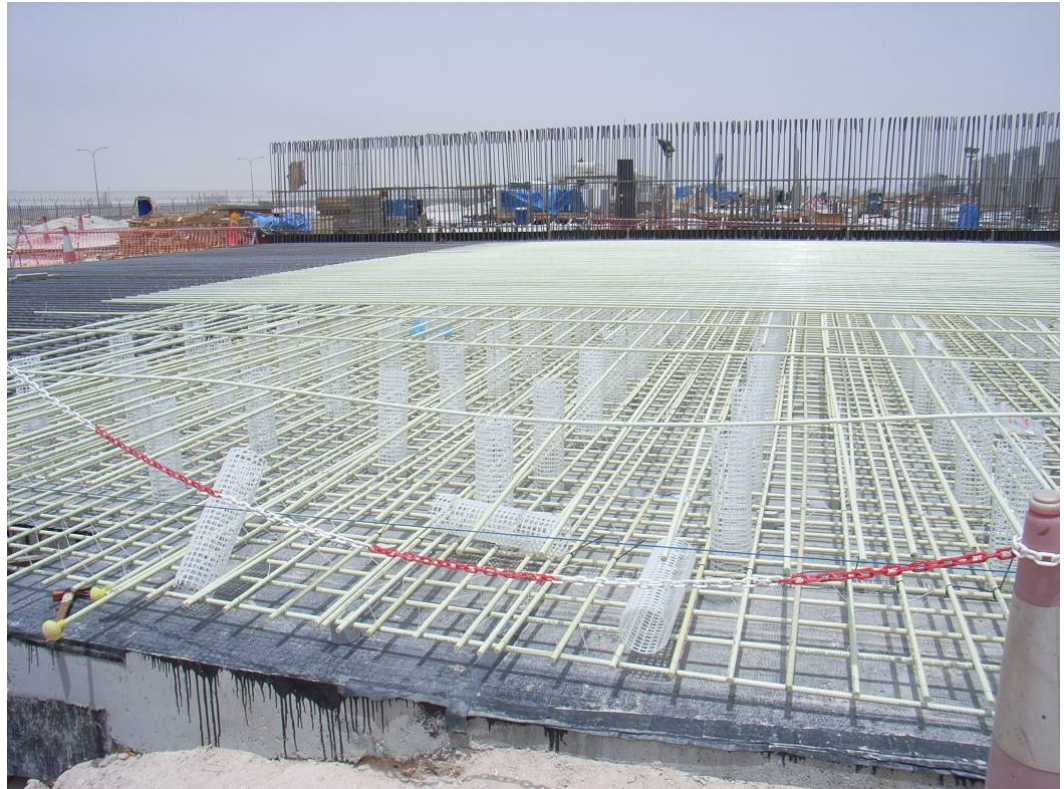
no induction currents and  
corresponding heating up of  
reinforcement near rectifiers  
structural reinforcement  
1000 m<sup>2</sup>

Qatar Aluminum Factory

Qatar, 2008

Ras az Khair Aluminum Factory

KSA, 2011

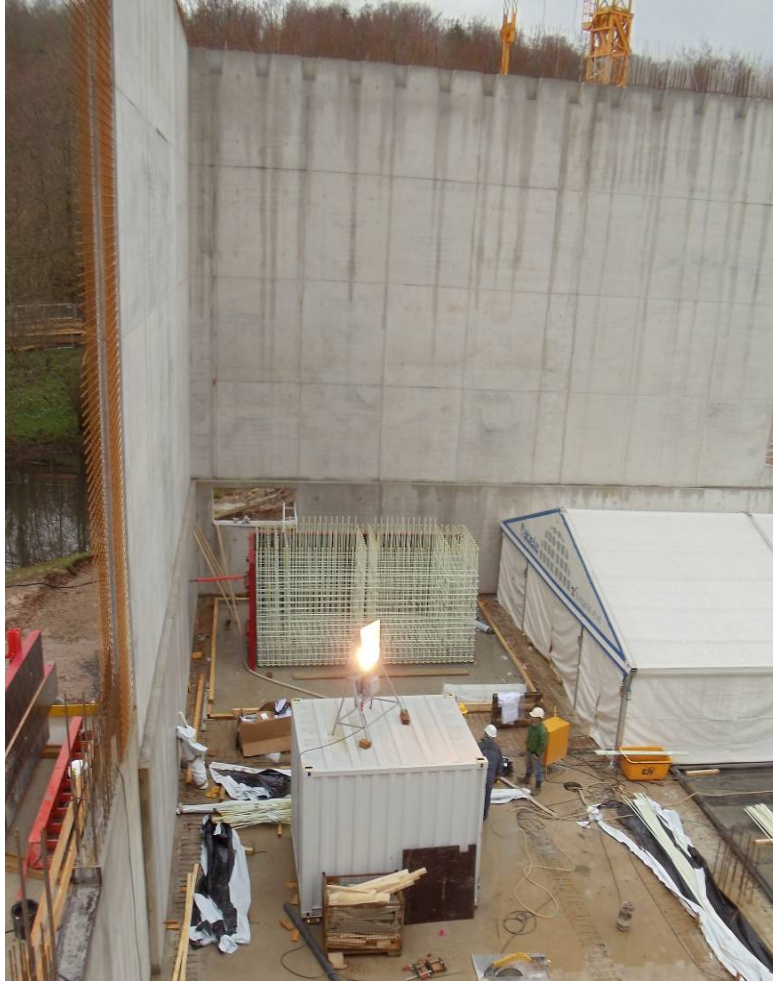


# Combar Reference Projects: Research facilities

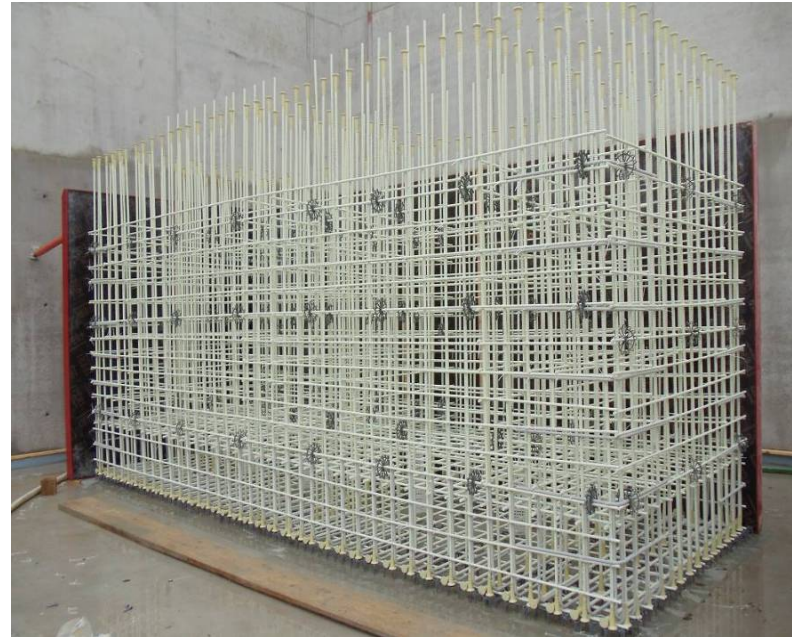


IBM  
Zurich, CH  
2010

# Combar Reference Projects: Research facilities



precision lab  
Max-Planck-Institute for Solid State  
Research, Stuttgart  
2010 - 2011



unimpaired operation of  
research equipment

# Combar Reference Projects: Structures without steel



Bahnhofcity Vienna 2009

basement walls and drilled  
piles without steel to avoid  
inductance from neighboring  
subway tunnel

Huttengasse Vienna 2012



# Combar Reference Projects: Ecological housing



Christian Schifferle, Co-Präsident der Genossenschaft «Gesund Wohnen MCS», lehnt Ende September 2012 an seiner künftigen Parterre-Wohnung im Rohbau. Er wird sie im Herbst 2013 beziehen.



slabs to avoid disturbances to the earth's magnetic field.

# Combar Reference Projects: Slender pre-cast elements



Redevelopment of former freight station in Freiburg as office building

45mm concrete steps ( $\varnothing$  8mm Combar)



# Combar Standard Application: Hoesch Additive Floor®

substitution for stainless steel mats



Parking garage Nahe River  
Bad Kreuznach 2006  
Parking garage T-Mobile Bonn, 2007  
extension parking garage P1  
Festo AG, Esslingen, 2007  
Parking garage Lidl  
Freiburg, 2008  
Parking garage VEGA  
Schiltach, 2008  
P&R parking garage Rütgersstr.  
City of Buchholz, 2010  
parking garage Edeka,  
Zuffenhausen, 2010



# Combar Reference Projects: rail beds and tracks

light rail line 26 Vienna, A  
2009



# Combar Reference Projects: rail beds and tracks



floor slab  
BVB Depot  
Basel  
2009

# Combar Reference Projects: Civil engineering

Gdansk September, 2012

4 weeks  
Design  
Detailing  
(every bar is placed)  
Production  
Delivery  
Surveillance  
Assembly  
Installation



# Combar Reference Projects: Civil engineering

## Trockau 2015: bridge caps



Bridge built 2001 no deviations from standards like concrete cover or concrete quality. Exposed to deicing salts

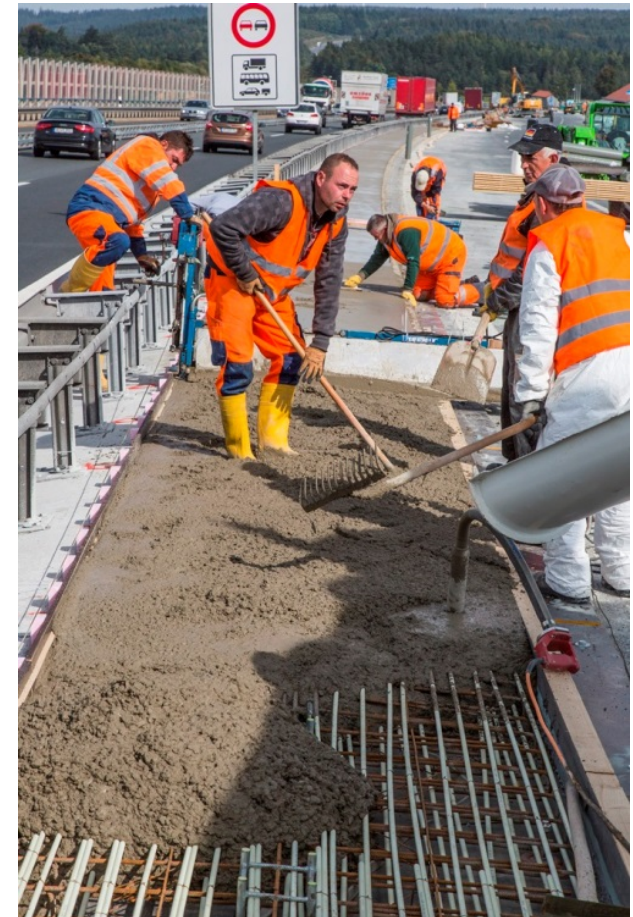
But caps with signs of severe chloride induced corrosion

# Combar Reference Projects: Civil engineering

Trockau September 2015:  
bridge caps



Longitudinal bars in FRP  
Perpendicular bars with more  
concrete cover still in steel



# Combar Reference Projects: Civil engineering



DESY Lot 3 Hamburg  
2009



# Combar Reference Projects: Civil engineering



Emscherkanal  
Bottrop  
2010



**FRP reinforcement**  
**„Where steel reaches its limits“**

