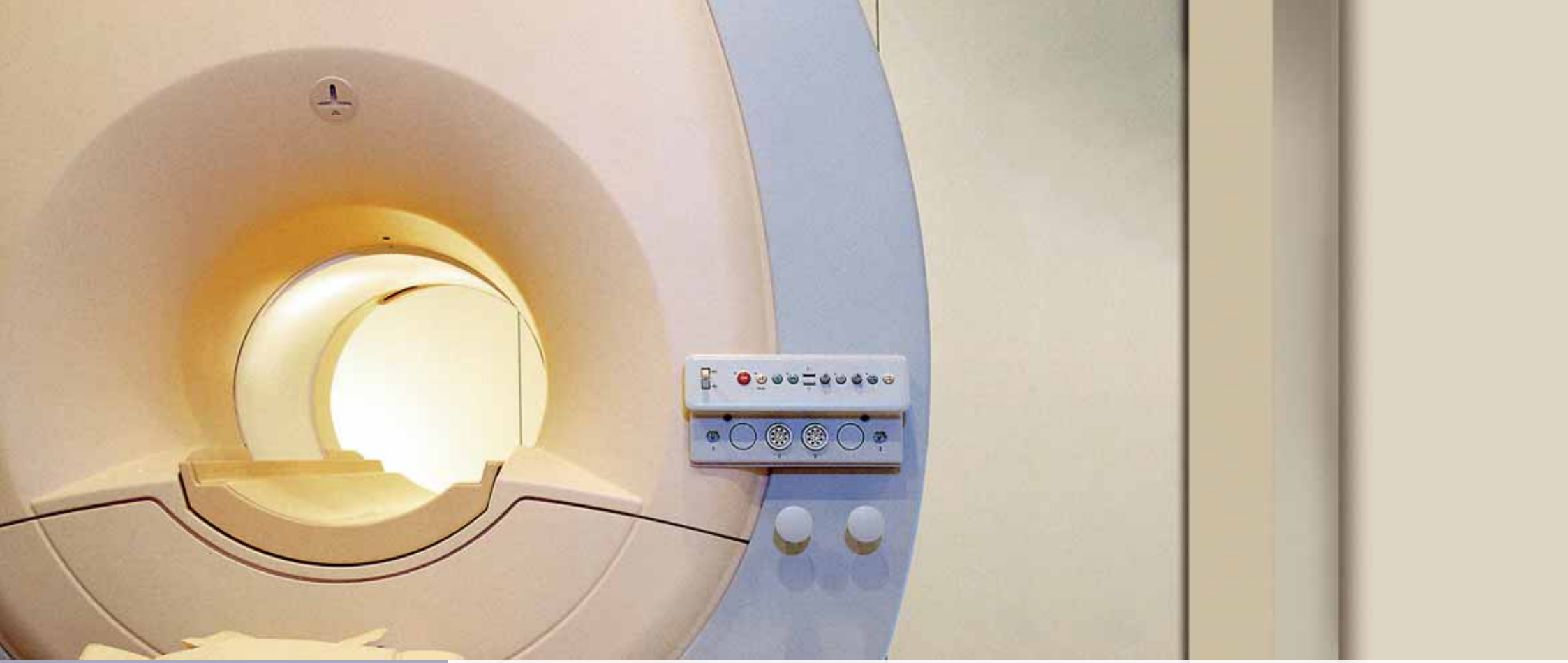


SOUND DAMPING

Norms, standards and solutions

MR SCHUTZTECHNIK

SOUND DAMPING

NORMS

Sound damping norms

Modern, high-performance magnetic resonance tomographs require effective sound damping of the surrounding components in order to prevent detractings caused by sound transmissions-spreading into the horizontally and vertically adjoining rooms. A distinction has to be made in this connection between airborne and structure-borne sound transmission because the respective countermeasures required in each case are fundamentally different.

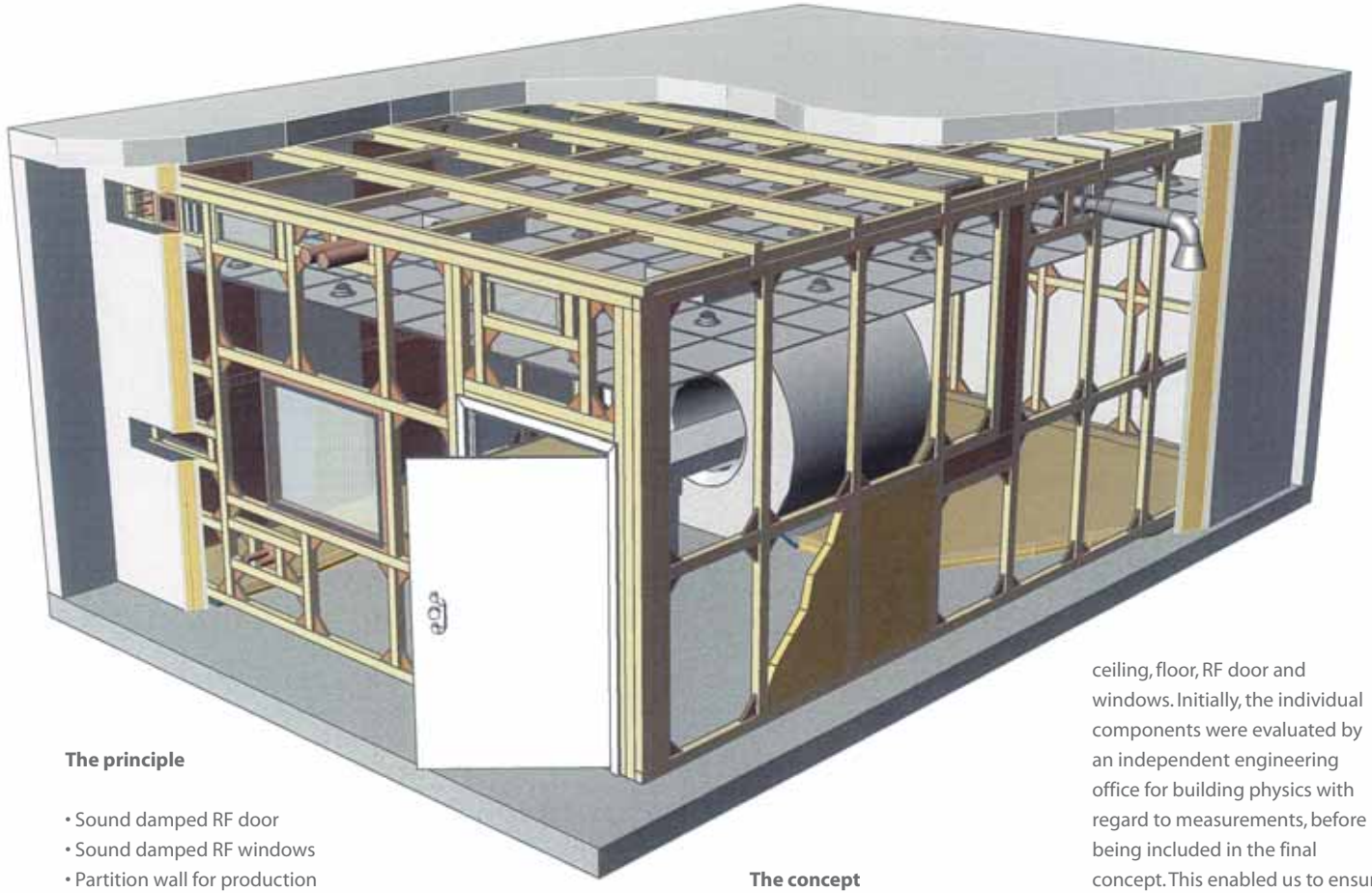
An overall total sound reduction index comprises essentially the sound damping installed by the customer and the sound damping reduction (ΔR) of the RF cabin construction.

Diverse input parameters are mandatory to determine the sound damping measures. They form the basis for optimally adjusting the sound damping measures to the given structure of the building.

Decisive criteria are:
- Use of the horizontally and vertically adjoining rooms
- Composition/structure of the building
- Type of MRT and its manufacturer

Sound damping procedures are based on the following sets of regulations:
- DIN 4109, version 11/89, Sound damping in structural engineering
- DIN EN ISO 140, version 12/98 Measurement of sound damping
- DIN EN ISO 717, version 1/97 Assessment of sound damping in buildings and components.

STANDARDS AND SOLUTIONS



The principle

- Sound damped RF door
- Sound damped RF windows
- Partition wall for production spring-mass system
- Sound damped cabin construction
- Sound damped, decoupled cabin floor
- Reducing elements for structure-borne sounds for MRT
- Sound absorbing separating ceiling
- Ceiling suspensions decoupled from structure-borne sounds

The concept

In order to avoid the transmission of structure-borne and airborne sounds, different measures, with regard to RF cage construction are necessary in addition to the input parameters. These measures include variants specially designed by us for walls, ceiling, floor, RF door and windows. Initially, the individual components were evaluated by an independent engineering office for building physics with regard to measurements, before being included in the final concept. This enabled us to ensure that the sound damping measures used on the cabin are ideally adapted to the building situation and the MRT.

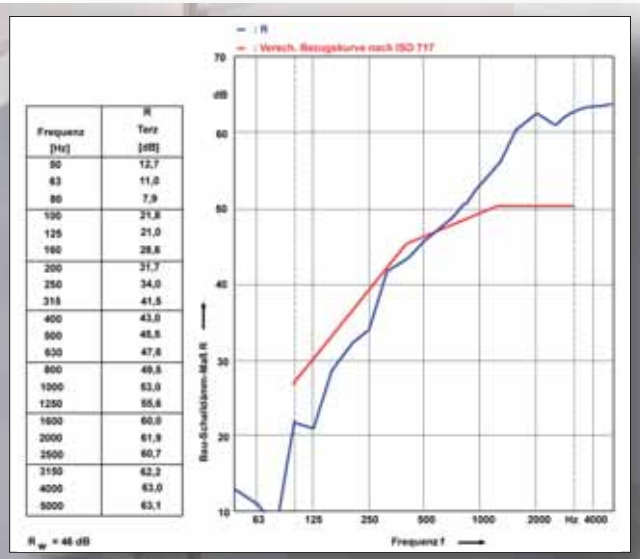
We deliberately dispensed with the assessment of individual components of the cabin based on laboratory measurement procedures. Instead, all the elements were measured and assessed after they had been installed in the RF cabin, thereby eliminating tolerance deviations.

The sound damping matrix prepared on our cabins provides an important basis for determining the individually required sound damping measures. It can be used with most MRT installations and offers you perfect sound damping at an optimised cost.

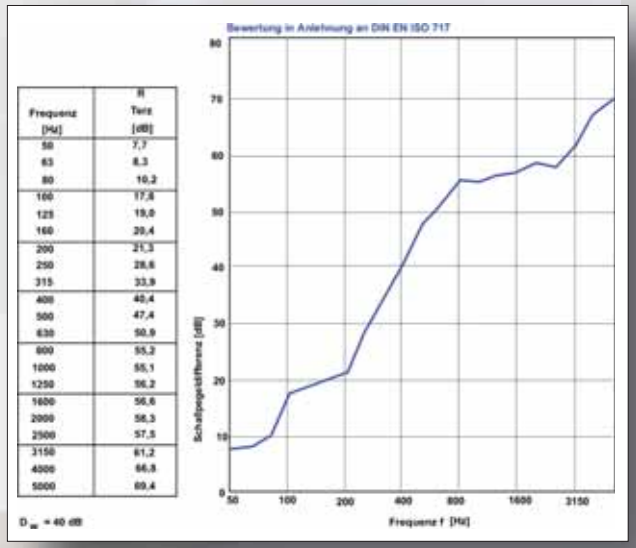
In order to reduce airborne and structure-borne sounds, different cavity sound insulation measures are selected, depending on the conditions in hand. The objective here is to create an effective spring-mass system. In addition, materials for increasing mass as well as Sylomer pads are used under the cabin floor and the MRT.

RF doors adapted to the respective situation as well as extra soundproofed RF windows also form a permanent part of the overall concept.

WINDOWS, WALLS + CEILINGS



Window



Walls and ceilings

Sound damping RF windows

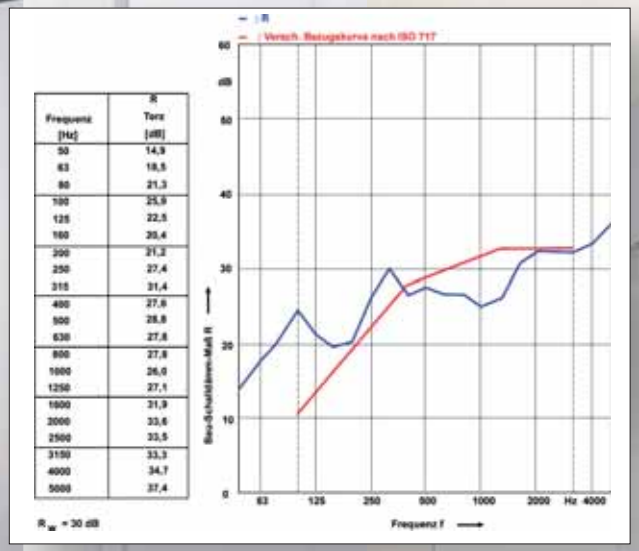
The special design of the extra soundproofed RF window has an excellent sound reduction index even before further measures have been taken.

It is only in very rare cases that additional measures for increasing the sound reduction index are necessary.

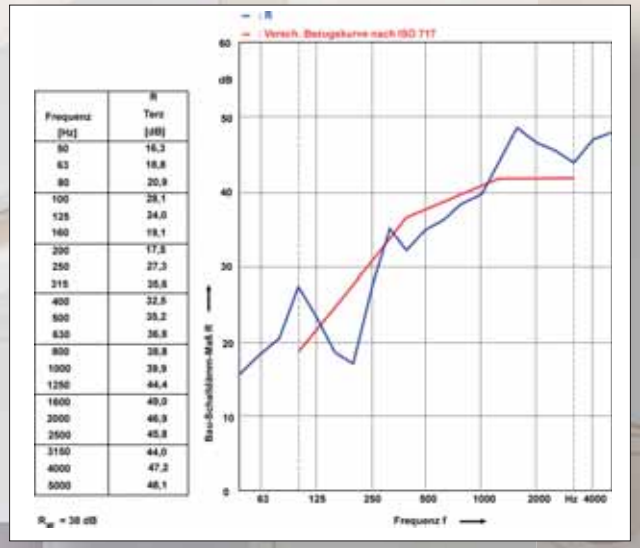
Walls and ceilings

Measurement of the sound level difference based on DIN ISO 717 produces a remarkable result even with the standard version of the wall and ceiling design of our cabins.
The value of Dw = 40 dB provides a basis for achieving an outstanding reduction in airborne sound. The designs developed by us improve the structural sound damping measurements (Rw) with $\Delta R = 6$ dB, $\Delta R = 12$ dB or even $\Delta R = 20$ dB as required.

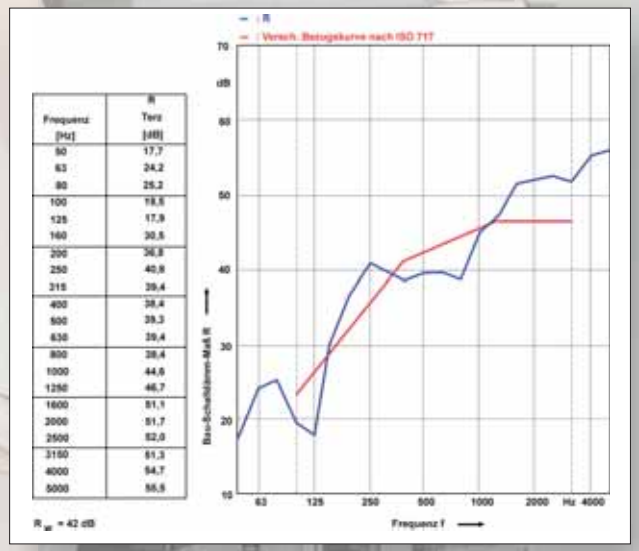
DOORS



Standard door



Sound damping door



High sound damping door

Sound damping RF doors

Different RF door concepts enable an optimum adjustment to be made to on-site conditions. The illustrations show the individual door versions with the relevant assessment under ISO 717-1.

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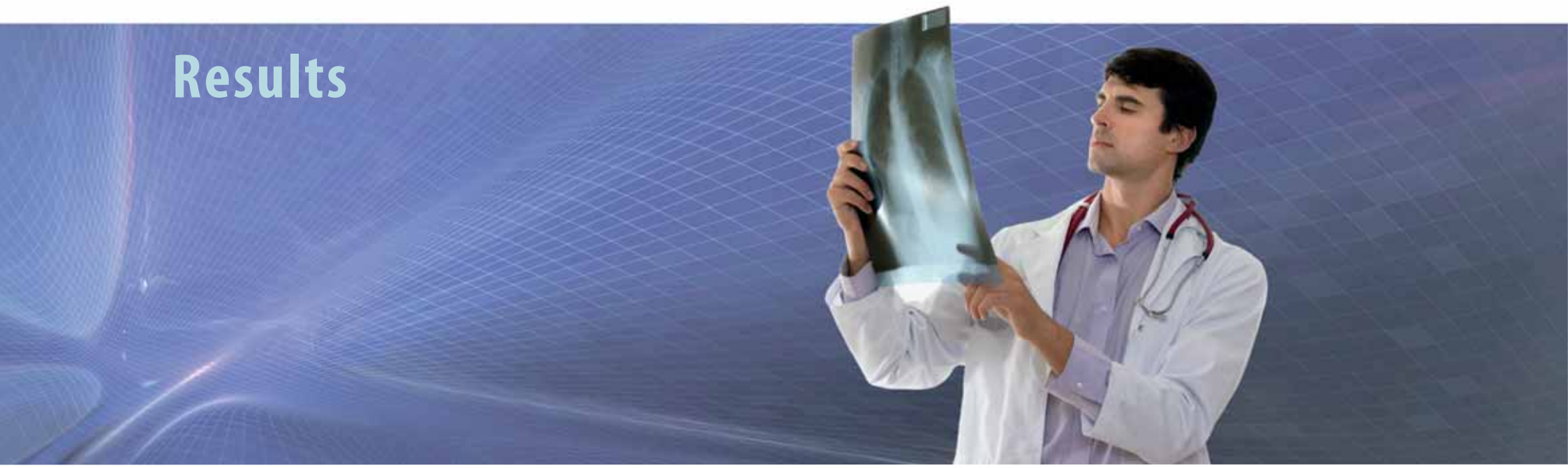
Results



With more than 1,200 cabins completed (as at 1/08), we are one of the world's leading FR specialists.

Europe
No of completed RF cabin projects: **930**

Of which in Germany:
No of completed RF cabin projects: **520**

Near East
No of completed RF cabin projects: **120**

Rest of Africa
No of completed RF cabin projects: **50**

Middle East
No of completed RF cabin projects: **50**

Rest of Asia
No of completed RF cabin projects: **20**

Latin America
No of completed RF cabin projects: **120**

SCHUTZTECHNIK

SAFETY THROUGH PRECISION

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