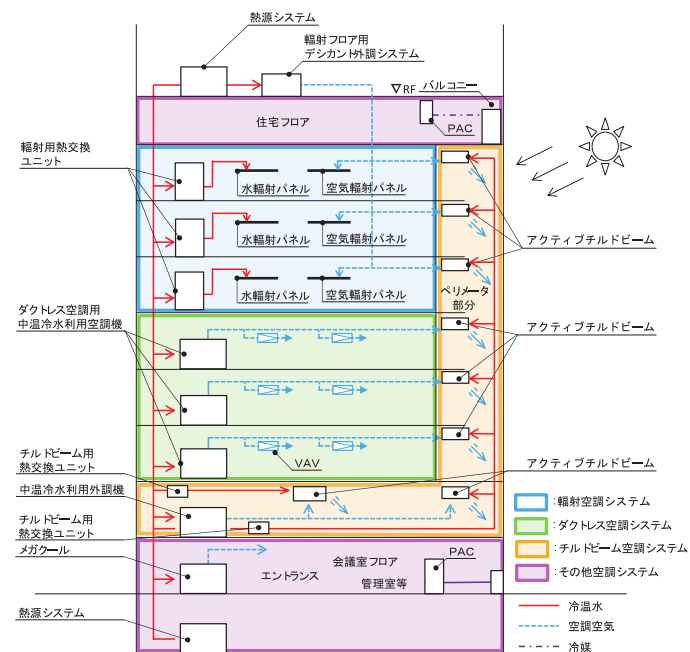


中規模事務所ビルで ZEB をめざす 環境先進プロジェクト

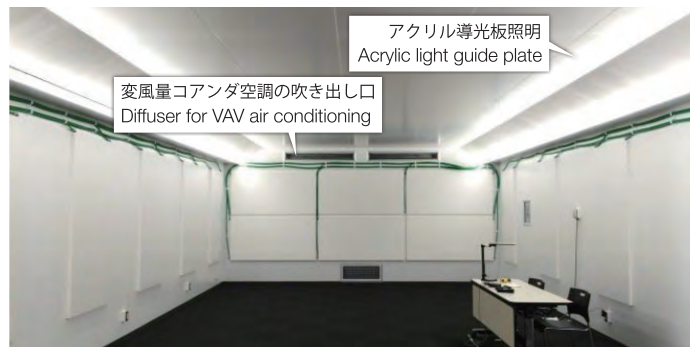
風量が変動しても風速を一定に保つ「コアンダ空調用吹き出し口」を開発。

梁型を活かして設置する「省エネ型導光板照明」を開発。

東京都千代田区で計画の中規模事務所ビルで、天井放射空調や変風量コアンダ空調、アクティブチルドビーム、導光板照明などの環境先進技術を統合し、ZEBの実現を目指しています。とくに、天井面に冷温水を流して穏やかに冷暖房する「天井放射空調」や、流体が平滑な面に付着する特性“コアンダ効果”を利用し、天井面に空調空気を這わせて搬送する「変風量コアンダ空調」などを導入することで、階高を抑制し、省エネ・省コストを実現します。また、ファサード面を全面ガラス張りの階段室とし、日射熱を利用した重力換気のボイドと兼用することで、意匠性と環境性の調和を図っています。さらに、室内に露出する梁型を活かし、アクリル導光板とLEDを組み合わせたアンビエント照明を設置。天井まわりを均一に明るくしたうえで、手元のタスク照明を併用し、省エネ化を図ります。



空調システム模式図
Figure of air conditioning system



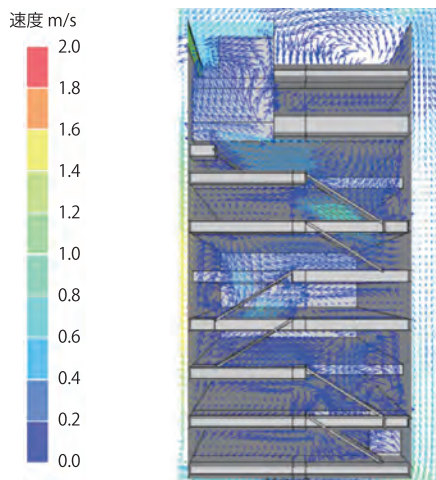
変風量コアンダ空調と導光板照明のモックアップ実験
Mockup experiment of VAV air conditioning and lighting system with light guide plate

Developed "air conditioning diffuser for systems utilizing the Coanda effect", which maintains the velocity of airflow even when the amount of airflow changes.

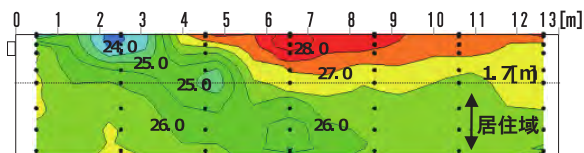
Developed "energy-saving lighting system with light guide plate" which can be installed by utilizing beam form.

A medium-scale office building in Chiyoda-ku, Tokyo, is planned, aiming for the realization of ZEB by the integration of environmentally advanced technologies including radiant air conditioning, VAV air conditioning utilizing the Coanda effect, active chilled beam, and light guide plate. Particularly, technologies including the radiant air conditioning that gently heats or cools a room via the radiant effect of water pumped through the ceiling, and the VAV air conditioning that utilizes the Coanda effect, the tendency of a fluid jet to stay attached to a smooth surface, to deliver heated or cooled air along the ceiling, are included to limit the floor height and to realize energy saving as well as cost reduction. In addition, the facade is an all glass-covered stair hall which is also used as a void for gravity ventilation that utilizes solar heat, creating a balance between the design and environmental friendliness.

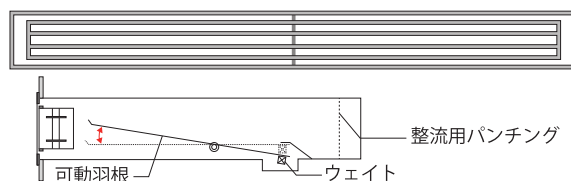
Furthermore, ambient lighting system combining with acrylic light guide plate and LED is installed as it fits the exposed beam form in order to uniformly illuminate the ceiling. It is combined with task lighting system to make it energy efficient.



気流シミュレーション
Airflow simulation



空気温度分布シミュレーション (室内断面図)
Air temperature distribution simulation (cross section of the interior)



変風量コアンダ空調用に開発した自立式風速一定吹き出し口 (特許出願済み)
Independent diffuser that keeps constant air velocity, developed for VAV air conditioning (patent pending)