



# Technical Enamel

The Truly Unique Surface Protection

email800

emailABR60

email850P

email250*light*

# Maximum Hardness with the Elements Air, Fi

This is really all it takes to implement safe production methods in sensitive industries.

This is how, in several phases and in a melting process of 1,400 °C, quartz, feldspar, borax, soda, salpetre and metallic oxides result in “**Technical Enamel – made by Düker Email Technologie**”. In the end, it is the special mixing ratio of the basic substances that determines the resistance to aggressive media.

This is why **technical enamels** are considered a more specific type of surface protection which is, among others, used by the chemical and pharmaceutical industries for their plants. **Düker Email Technologie** enamels are also suitable for food safety and have been certified accordingly.

Why is that so? The reason for this can be found in quality-oriented and economic requirements:

Components that have been coated with **technical enamel** contribute to minimizing the usual time and effort spent on maintenance and care.

Pipes, valves, bottom outlet valves and columns by **Düker Email Technologie** can all be combined into complex and extremely durable units. For the user this means that all options remain open:

- The standard range
- Special parts design
- Or custom-made design combining both



# re, Earth and Water

Technical Enamels by Düker Email Technologie are convincing products which beat out other technologies and leave other modern surface protection systems in the dust. This is confirmed not only by users but also by independent research institutions and neutral testing institutes.

New product developments and new process engineering methods have led to an increase in the areas of application as well as the requirements for surface protection in chemical plant engineering, the pharmaceutical and food industries. We have taken up these challenges and come out with particularly resistant enamel types.



# email800

## The Standard for Maximum Resistance

email800 is the basic programme for the chemical and pharmaceutical industry. The special surface protection of email800 dealing with aggressive media is highly chemical corrosion-resistant, diffusion safe, temperature and wear-resistant with long service life. Unlimited use under vacuum is possible at any time.

The standard product range includes the nominal diameters from 25 mm to 600 mm and standard length up to 3 m or 4 m, depending on the nominal diameter. The versions can be supplied according to DIN, ASME or company standard including containers, fittings and special components.



DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
R old	8	8	8	8	8	10	10	12	12	12	12	12	12	12	12	12
R new	4	4	4	4	4	5	5	5	6	6	6	7	7	8	10	10



### Responding to market requirements...

... Düker Email Technologie has reduced the radii of the glass lined flanges and stub ends. The biggest advantage is the significantly improved and cost-efficient cleanability of the glass lined components. (DIN-2873-2002-06)



Meets the requirements according to EN ISO 28721-1 or EN ISO 28721-4

**Acid resistance**

- DIN EN ISO 28706-2

**Alkali resistance**

- DIN EN ISO 28706-4

### Jacketed pipes and fittings

The design with a heating or cooling jacket offer the possibility for keeping temperatures constant with the same quality features and highest safety standard. Under this system, the flange (stub end) is heated/cooled at the same time.



The external finish is usually applied using a zinc dust primer. On customer's request a finish painting or galvanizing as well as delivery with earthing bolts is possible.



Fittings with zinc dust primer (above), with finish painting (middle) and earthing bolts (below)

# email850P – Especially for the Pharmaceutical

With email850P Düker Email Technologie meets

- The high-level requirements of sterile process engineering methods, cleanability and product safety.

email850P combines improved surface properties, optimized corrosion properties and biologically inert behaviour, which benefits operational safety and avoids product contamination in pharmaceutical processes.



## Resistance

“Multi-purpose” enamel with optimized corrosion properties during alkaline exposure, in order to also meet the cleaning requirements in pharmaceutical processes (CIP, SIP).

## Safety

### Product safety means...

- No critical heavy metal oxides in the glass structure
- No contamination of the product with heavy metals oxides
- Biologically inert behaviour of the surface upon product contact

### Process safety means...

- Special colouring (light blue) for easy spotting of contamination and product residue on the enamelled surface
- Optimized layer thickness and pore structure, even at small radii
- Good contrast between surface and medium

## Cleanability

Properties such as base material, surface roughness, topography and structure are crucial to the function of the surface with regard to cleanability

### Good cleanability means...

- Avoidance of cross-contamination
- Short cleaning duration featuring repeatable, thorough cleaning results

email850P is much easier to clean than the 1.4404 and 316L stainless steels commonly used today. Reason: optimized topographic roughness ( $R_a < 0.3 \mu\text{m}$ ), lower adhesion tendencies (surface energy). No changes to the surfaces with product contact following prolonged operation (cleaning cycles) of the production facility can be observed. No signs of corrosion, such as “rouging” occur.



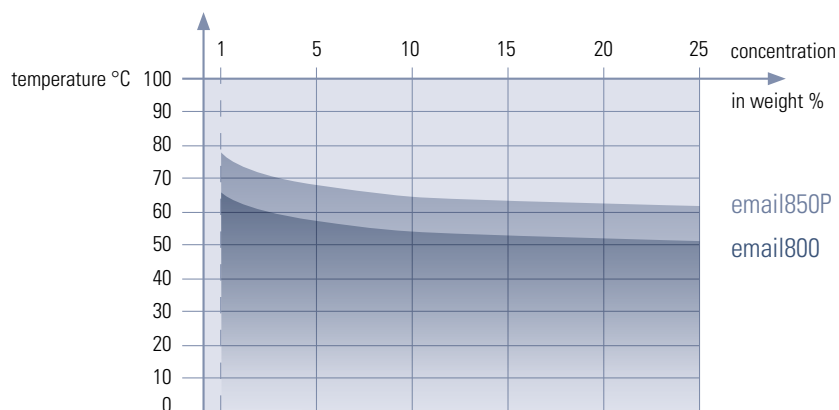
# al Industry



Pipeline components designed to customer requirements...

... are a further specialty in the **Düker Email Technologie** range of products. Customized versions or special lengths are possible. In case of distributors – also called collectors – we offer certain standard versions.

Corrosion resistance NaOH-aqueous solutions  
Improving the alkali resistance > 30 %



## Quality and safety

Certified quality ensures safety. Extensive internal tests in accordance with DIN-ISO, ASME, factory standards and specific company stipulations ensure optimal certified safety.

Please ask for our special produced pipe parts and for further information.

You can also find more details on our homepage [www.dueker-emailtechnologie.de](http://www.dueker-emailtechnologie.de)

# email250/light

The Lightweight for Aggressive Exhaust Air and Waste Water



The brand name *email250/light* features glass lined pipes and fittings made by Düker Email Technologie for especially aggressive exhaust air and waste water.

*email250/light* convinces through simple installation, stability and durability. The inner glass

lining makes this pipe system especially suitable for chemical aggressive media.

- Chemical and pharmaceutical industries
- Environmental engineering and recycling
- Dust extraction/ degreasing
- Welding fumes and oil mist
- Chemical waste water and exhaust air
- ...



Standard email250light pipes and fittings are primed with zinc powder. Finish Painting can be applied for a surcharge.

**Advantages of email250light at a glance:**

- Thermal loading from -20 °C up to +200 °C
- Long-term stability
- No material embrittlement as is typical for plastic material
- Extremely safe during fire
- Fracture-proof
- Anti-adhesive smooth surface
- Low weight
- Spark test with 5 kV

email250light is a pore-free chemical glass lining with a layer thickness between 0.4 mm and 0.6 mm.

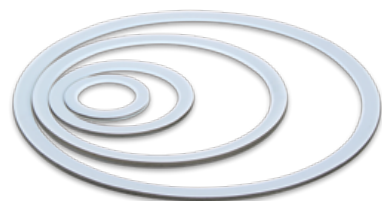
Components with nominal diameters of DN 50 to DN 300 are manufactured with a wall thickness of the steel body of 3 mm or 4 mm. The items come with a standard graphite gasket or alternatively a graphite gasket with a PTFE envelope. The connection is realized with easy-to-install loose flanges. The change to other pipe connections is done using adapter pieces with DIN loose flanges.

To avoid charging, the version is available with earthing bolts or complete external zinc plating for earthing.

enamel250light can be used under vacuum < 0.5 bar.



The connection of our email250light pipes and fittings is realized with easy-to-install loose flanges.



In addition to the graphite gasket the shown PTFE enveloped graphite gasket is favoured.

# emailABR60

## Extreme Hardness for Heavy-Duty Demands

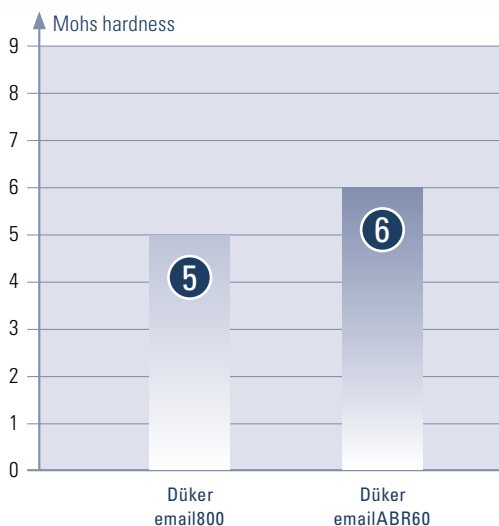
Out of the demand to corrosion during chemical process there are further applications asking to confirm extended abrasion resistance. This is why Düker Email Technologie has developed new enamel types that are characterized by extreme resistance.

The **emailABR60** is the perfect combination of chemical resistance, comparable to the **email800** quality, and a high degree of abrasion resistance.



**emailABR60** reaches 6 Mohs on the hardness scale. Comparison: Regular enamel reaches 4 Mohs, **email800** 5 Mohs and Diamonds 10 Mohs.

### Comparison of hardness of different technical enamels



#### The benefits at a glance:

- High abrasion resistance
- Extended life time of installations and components
- Reduction of system downtimes
- Can be also used under combined abrasive/corrosive stress
- Use in various sections of the conveyance of solid media
- Suitable for re-glassing

# DPI – Plant Engineering

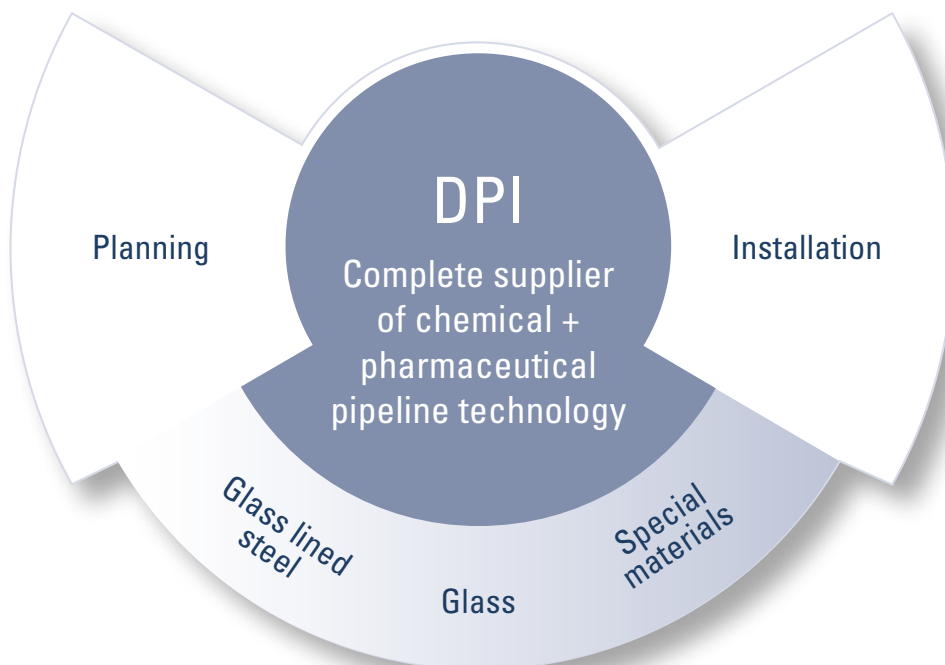
## Custom-Made Solutions from Your One-Stop-Shop

Chemical plant operators are increasingly striving to reduce interfaces. When building equipment, chemical and pharmaceutical companies prefer to deal with just a few system providers, instead of a multitude of suppliers.

With **DPI, Düker Email Technologie** focuses all services connected with pipeline and plant installations to a single source. The customer benefits from a network of experts who will contribute their knowledge and experience on the basis of individual projects, acting as a team. The operators benefit by reducing their administration costs and relieving some of the work load on their internal departments. As a full-service provider, **DPI** further assumes overall warranty.

### DPI offers:

- Engineering/planning
- Delivery of glass lined pipeline and system components
- The procurement of enamelled, process engineering modules, e.g. columns, separators and containers
- Supply of PTFE-lined pipeline components
- Installation/start-up
- Maintenance



## Düker Email Technologie offers

- Functionality, safety and customer benefits for the chemical and pharmaceutical industries
- Integrated solutions from a single source
- Highly acid-resistant enameled pipeline parts, fittings and columns
- Comprehensive services
- Qualification of your employees
- Engineering, procurement, construction, assembly and maintenance for process plants

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