

It   
Doesn't  
Affect  
The  
Water

**Perolin Company**  
**of Canada**  
**Limited**

**TORONTO, CANADA**



HOME OFFICE: DORTMUND, GERMANY

FACTORIES

Vienna, Austria  
Amsterdam, Holland  
Bruxelles, Belgium  
Zurich, Switzerland  
Copenhagen, Denmark

Budapest, Hungary  
Bukarest, Roumania  
Kreuzlingen, Germany  
Milano, Italy  
Paris, France  
London, England

## Perolin German Boiler Metal Treatment

A steam boiler is a steam generator — not a kettle for chemical reactions

## D. R. Dampf-Kessel Mischung

### Perolin—the Anti-Crust

Ever since the advent of the steam boiler, the one great difficulty encountered in generating steam with an economical consumption of fuel has been the incrustation that formed on the water-covered surface. This hard coating of insoluble material on the metal is commonly known as Scale—and the deposit in the form of insoluble powder anywhere inside the water or steam space is called sediment.

#### Many Soluble Substances

Rain Water is practically pure, but coming in contact with the earth, it dissolves and gathers various scale forming substances such as Lime, Magnesium, Sulphur, Gypsum, Silica, Iron, etc.

Sub-Soil Water obtained from springs and wells is clear, usually low in mechanically suspended matter, but high in solids in solution.

Artesian or Deep Well Water is most always rich in dissolved solids.

#### Heat and Acid Corrode

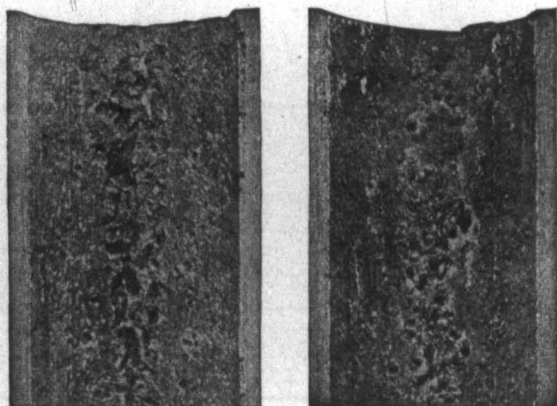
Water taken from marshes or where it comes in contact with masses of organic matter, contains acid which will corrode the boiler metal. This water may be neutral to iron at normal temperatures, but on raising the temperature the acid becomes an active corrosive and pitting agent.

#### Water Changes Constantly

No matter from what source the water is obtained, its chemical composition is continually changing, due to climatic conditions and

## Perolin German Boiler Metal Treatment

seasons. In periods of drought the soluble matter increases and water that will not ordinarily produce a heavy scale will cause endless trouble then.



*Showing Corrosion of Tubes*

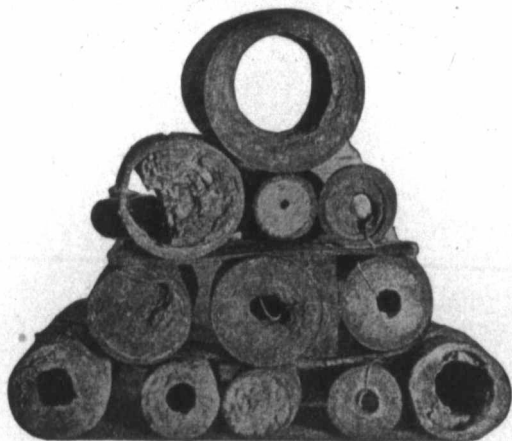
### **"Free Analysis" only a "Talking Point"**

The necessity of having your water analyzed and a preparation made-to-order is the strong argument of the chemical compound concerns. This is merely a "talking point"—for the water you use in your boiler today may have an entirely different composition next week; therefore, even if an analysis is made and a chemical compound *supposedly* prepared especially for your particular conditions, when your water changes, the compound is worthless, and in some cases will combine with the various substances thereof to form a scale of its own.

Scale contains iron—from the iron salts in the water, and any compound that is strong enough to *dissolve* the scale will attack and dissolve or injure the boiler metal.

## D. R. Dampf-Kessel Mischung

---



*Accumulation of Scale in Flue Ends*

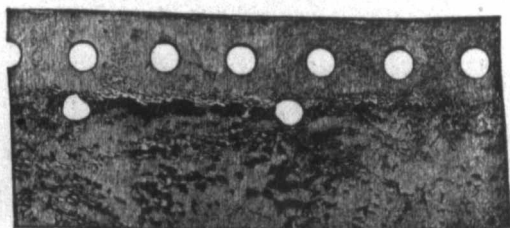
### Loss of Heat Due to Scale Formation

Water is primarily a poor conductor of heat, and since the heat imparted to boiler waters is on the bottom of the shell or tubes and the circulation is in vertical lines or planes, the hot water passes upward and its place is taken by slightly cooler water in its turn. Therefore, to secure the highest results in evaporative efficiency, the medium of heat transmission must be in the most perfect and clean condition possible and maintained so at all times. The steel shell of the boiler is this medium and is a good one when clean. The instant that its surface becomes coated there is an immediate reduction in the evaporative efficiency, the extent of which depends upon the thickness of the coating or scale; a very thin scale frequently producing easily detected loss of efficiency. The amount of solids deposited in a boiler is astonishing; over 300



## Perolin German Boiler Metal Treatment

pounds per month will be precipitated in a 100 horse power boiler using water containing only seven grains of solids to the gallon.



*A Pitted Plate—Outer Lap*

### The Money Lost from Scale

That scale is an excellent insulator and non-conductor of heat is shown by the following extract from a report of tests made in a boiler at "The Conservatory" in Berlin.

	Water Vaporized per Hour	Coal Burned per Hour	Steam per Kilo of Coal per Hour
Boiler clean . . .	2,000 liters	255 kilos	7.84
Boiler with scale 3.2 millimeters thick	1,360 liters	347 kilos	3.91

This data converted into equivalent U. S. Standards is

	Water Vaporized per Hour	Coal Burned per Hour	Steam per Lb. of Coal per Hour
Boiler clean . . .	528.35 gals.	566 pounds	.9334
Boiler with scale $\frac{1}{8}$ of an inch thick . . .	359.27 gals.	770.5 pounds	.4636

A careful study of this table shows that with only one-eighth of an inch of scale the increased amount of fuel consumed is 36% ; a

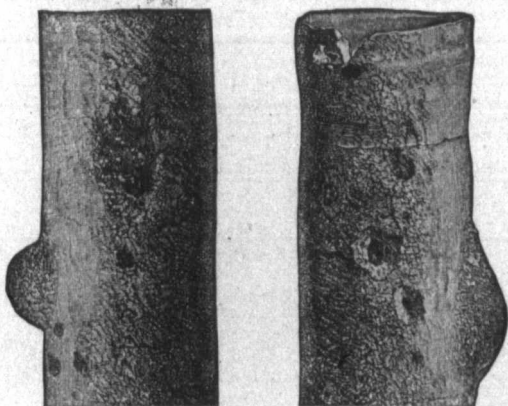
## **D. R. Dampf-Kessel Mischung**

---

decrease of 32% in the amount of water vaporized per hour, and a loss of 50% of steam generated per pound of coal per hour.

### **Stop and Figure Your Loss**

If you will adapt these figures to your own plant you can readily see the amount of money that you are wasting every month. It, therefore, behooves the Owner, Manager and Engineer of any steam plant to interest himself in an economical and efficient means of removing this scale and keeping this formation off of the boiler metal. To remove the scale by mechanical appliances, besides being expensive, affords only temporary relief, and does not prevent scale formation.



*Pitted Tubes*

### **The German Method of Cleaning Boilers**

It was clearly demonstrated by a chemical engineer of Friedenshutte, Germany, before the Society of Continental Steam Users, that



## Perolin German Boiler Metal Treatment

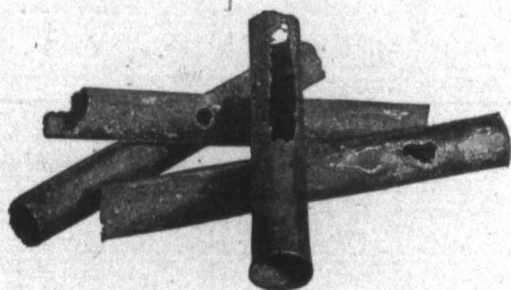
---

a given feed water in any locality will not analyze the same at different temperatures or at different periods of the year, and therefore it was impossible to produce satisfactory and lasting results with any chemical treatment of the water.

A radical solution was proposed, and after several years of experimenting along the theory that the only constant and unvarying element in generating steam is the metal itself, a successful preparation was compounded which would absolutely remove the scale and further prepare and maintain a surface on the water-covered boiler plates, which would positively solve the scale problem.

### A Product with Peculiar Properties

This material was originally put out in Germany under the trade name of "D. R. Dampf-Kessel-Mischung" and its peculiar properties were that it did not dissolve the scale or scale forming sediment but had an intense affinity for the heated metal,



*Effect of Galvanic Action upon Tubes*

A boiler under fire expands and contracts due to the changing temperature of the fire. The scale adhering to the metal is a non-conductor

## D. R. Dampf-Kessel Mischung

of heat and being of a stony formation and non-elastic, will neither expand nor contract, and therefore when the metal expands this coat of scale becomes filled with cracks extending through to the metal.

### The Problem Solved

When an amount of Perolin proportionate to the heating area is injected into the boiler water, its affinity for the heated metal



*Bagged Plate, Caused by Scale.*

causes it to be drawn through the cracks in the scale into contact with the metal, where it works its way along the steel, breaking the bond of adhesion between the scale and the metal, so that the scale falls off and can be easily washed out. It further leaves a surface on this metal which prevents the precipitated scale forming sediments of the water from adhering thereto, keeping them in suspension until removed through the blow-off pipe when blowing off the boiler. On account of Perolin having a higher conductivity of heat than water, this surface does not in any way hinder the transmission of heat.

### Universally Successful

The successful results obtained from the use of this treatment were so universal, that it is now found in continual use in almost

## Perolin German Boiler Metal Treatment

every plant on the Continent. We manufacture this same treatment in this country, under the same German formula, and we are meeting with the same satisfactory results in all sections of the United States. Boiler metal is always the same, and therefore the results from the use of PEROLIN are assured and unvarying in all localities. The element of guess-work and the effect due to the changing of the water-formation are entirely eliminated.

### Economy

As soon as all of the scale is removed and a surface is obtained, it is only necessary to feed enough Perolin to maintain this surface on the metal which will prevent the further formation of scale. This amount varies in different plants and depends upon the draft and circulation of the boiler. The average amount required to maintain a clean boiler with PEROLIN (taken from a great number of plants using PEROLIN) is less than one-half pound per 100 horse power per day. The metal of a boiler is not continually being evaporated like the water, and for this one reason alone, PEROLIN is the cheapest means of keeping your boilers clean and free from scale, regardless of the cost per pound of any other preparation or mechanical means on the market.

PEROLIN—The German Boiler Metal Treatment is put up in

550 pound barrels

350 pound barrels

150 pound barrels

Net weight.

## D. R. Dampf-Kessel Mischung



*A Few of the Scale Formations  
Removed by Perolin*

We guarantee PEROLIN—The German Boiler Metal Treatment:—

- (1) To remove scale already formed in your boilers.
- (2) To prevent new scale forming.
- (3) To stop pitting and any galvanic action.
- (4) Not to corrode or injure the boiler metal.
- (5) Not to impart any off-odor to the steam generated from the water.
- (6) Not to affect the products of breweries, ice plants, creameries or any plant where live steam is used in the manufacture of their product.

### **Our Proposition**

PEROLIN GERMAN BOILER METAL TREATMENT is one that can be depended upon to produce uniform and unvarying results in your boiler. We make strong claims for PEROLIN in our Warranty—and back them to the last letter. In order

## Perolin German Boiler Metal Treatment

to convince you that PEROLIN will produce these results in your plant, we offer to ship you—freight prepaid—a sufficient quantity to test for 60 days. If it does not accomplish what we claim it will—return what you have left, and the amount used will cost you nothing.

All we ask is that you use it as we outline—and advise us at each washout as to the improvements in the condition of your boiler during this test period. We prepay the freight, so that if PEROLIN should fail to accomplish in your plant what we claim it will—the test has cost you nothing.

### **Confidence and Co-Operation Bring Success**

We have a treatment in which we have the utmost confidence and know what it will accomplish if it is used correctly—and therefore, the essence of our proposition is Co-Operation. We employ a corps of competent engineers, whose personal attention will be given the test in your plant, and upon receipt of each of your reports, will give you assistance, and further instructions to overcome any obstacles you may encounter in removing the scale in your boilers.

**PEROLIN—The German Boiler Metal  
Treatment, makes good its Guarantee**

Perolin