

Technical information  
and  
application instructions  
for

# B r a n t h o - K o r r u x

## " 3 in 1 "

### Rust Prevention - Metal Protection- Maintenance Paint

**Brief description:**

Brantho-Korrux "3 in 1" is a 1-component, semi-gloss coating showing very good adhesion properties and elasticity. Low solvent content, active rust-inhibitive pigments, excellent hiding power, both suitable as a primer or as a finish. Good resistance properties, can be applied on practically all types of substrates, very good filling properties, excellent edge covering and fast drying. Meets the requirements of DIN EN ISO 12944 and DIN 55928. Modern "High-Solid"-coating.

**Recommended areas of application:**

Protection against corrosion of constructions, machines and transport vehicles made of iron, steel, stainless steel, aluminium, and other non-ferric metals, hard plastics etc. in rural, urban, industrial and maritime areas. As a protective coating for new construction or maintenance, both primer and topcoat, as a primer for 1-component finishes and most 2-component finishes. Ideal for constructions built from several types of materials.

As a substitute for toxic red-lead (tested by the German Railway authorities), as a substitute for environmental unfriendly PVC / Chl. Rubber coatings (IKS tested), partly as a substitute for epoxy coatings or complicated acrylics and as a high performance alternative for alkyd coatings.

**Practical examples:**

For example winter road clearance equipment, sea containers, high-tension towers, lorry chassis's, building equipment, bridges, cranes, vessels, boats, cladding (both coated or bare), railway stations, platform structures, fences, gates, production halls, pipelines, storage tanks, gutters, cooling equipment, and many other objects. Is approved as primer coat, intermediate coat and top coat for steel-constructions and -equipments.

**Manufactured by:**

Branth-Chemie A.V. Branth  
Postfach 11 07 \* 21503 Glinde/Hamburg/Germany  
Biedenkamp 23 \* 21509 Glinde/Hamburg/Germany  
Tel.: +49 40-36 97 400 \* FAX: +49 40-36 71 48

**TABLE OF CONTENTS**

Brief description, Recommended areas of application, Practical examples	pg. 1
Technical Data /	
Application instructions (brief)	pg. 2
Various substrates /	
Temperature / Drying	pg.3
Various application methods	pg.4
Over-coating/	
Information to Decopaint-directives /	
ChemVOC-FarbV / EU 2004/2	pg.5
Colours / Information for different surfaces	pg.6
Test reports / Resistance / Standards	pg.7
DIN 55928, ISO 12944, "Ü"-Approval	pg.8

Pg. 2 Technical Data / Application instructions (brief) / Various substrates

**Technical Data**

**Product description:**

Combination of various Polyester resins combined with environmental friendly, active, multiple-phase rust-inhibitive pigments, lead-, chromate- and zinc-free. Solvent combination is free of aromatic hydrocarbons like xylene or toluene.

**Viscosity:** ± 150 sec. / DIN 4 mm

**Thinning:**

Branth's **Kombi-Thinner** (short drying time)

Branth's **Spezial-Thinner** (retards initial drying)

\* *also suitable:* Nitro-Thinner, 2-C-Thinners

\* *less suitable:* alkyd thinner, white spirit

\* **not** suitable: water

**Density:** 1,2-1,5 depends on colour

**Solids content:** 70 % (by wt.), 53 % (by vol.)

**VOC-value:** < 400 g/l.

**Coverage:** 8,8 m<sup>2</sup>/ltr. at 60 µm (theoretical)

**Gloss:** 25-55 % according NCS (depends on colour)

**Colours:** See colour card. Colours can be mutually mixed unlimitedly

**Resistance:** See page 7

**Storage stability:** 24 months (original cans, unopened cans, in a well ventilated dry environment)

**Packaging size:**

5 l. cans with "material-saver" lids

750 ml cans (8 or 16 per carton)

On special order: 10 l., 19 l., or 200l. container

**Application instructions (brief)**

**Suitable substrates:**

Iron- and steel constructions properly degreased and free from rust crusts and mill scale. Manually prepared derusted surfaces (St 2), wet blasted substrates and flash-rust are acceptable. Equipment build from various types of metal like iron, steel, galvanized steel, aluminium, and other non-ferrous metals, G.R.P., hard-PVC, wood etc. Steel, stainless steel, zinc, well adhering coatings, concrete, cement floors, castings in aluminum and steel and many other substrates.

**Material consumption:**

Theoretical consumption: 17,7 m<sup>2</sup> per litre at 30µm d.f.t.

A far higher dry film thickness can be achieved in one application. Practical consumption therefore is ±0,15 l/m<sup>2</sup> for each layer. Depending on the substrate conditions and actual exposure we recommend to apply one to three coats.

**Application:**

\* Brush and roller application without dilution;

\* Air atomised spray: 30-60 sec. (add ca. to 10%

Kombi-Thinner) tip size 1,5 - 2,0 mm; a larger opening requires less dilution;

\* Airless spray: viscosity 90 sec. at minimal 180 bar,

orifice size 0,3-0,6mm; spray-angle 40-80°

(corresponds to ±3% Kombi-Thinner)

**Drying: at 20° C / 65 % relative humidity**

\* touch dry: after 20-30 minutes

\* dry to handle: ± 100 minutes

\* fully dried: after 8-10 hours

\* fully cured: after 3 days

\* baking or forced curing (heat) is not possible

\* The actual drying times depend on film thickness, ventilation, temperature, relative humidity etc.

**Temperatures:**

ideal application temperature: 15° - 25°C

possible application temperature: -10°C to +30°C

**Health & Safety:**

Extensive information is available from the health and safety data sheets. Practical application information is labeled on each can.

**Special features:**

\* 50 different colours are available from stock (see price list)

\* other colours are available from 25l. orders (e.g. 5 x 5 l.)

\* other special-effect colours (e.g. "3 in 1" m.i.o.'s) are available from 30l. orders (e.g. 6 x 5l.)

\* different degrees of gloss can be achieved by mixing with **Brantho-Korrux "nitrofest"** (lower gloss) or **Brantho-Korrux Robust Lack** (higher gloss)

\* a "Sticker-off-effect"-surface is available in "3 in 1" from 30l. orders. This special effect reduces the adhesive strength of self adhesive stickers extremely; these are easier to remove.

\* without colour is a special production (from 25 l.); it has all the functional pigments - but does not possess the colour pigments. This can be applied as a clear-milk metal protection or can be coloured with suitable colorant pastes.

**Detailed application instructions**

**General**

\* Apply to general health and safety instructions, e.g. keep away from heat, sparks and open fire; do not eat, drink or smoke during application, use only in well ventilated areas (see MSDS).

\* Always: **Stir well before use! Check colour!**

\* Do not mix with other substances than indicated by manufacturer. Usually do not dilute for brush and roller application.

**Film**

Fresh air can be responsible for a thin film on the surface.

**Never stir this film**, but cut and remove it (then dry and dispose it). Cans, if possible, should always be kept closed.

Try to avoid air penetration while stirring. If you intend not to use the paint for a longer time, pour some thinner on the surface.

**Iron and steel**

\* Remove rust and rust scale, loose millscale, oil, grease and all other impurities by appropriate means. Apply coating on a clean and dry substrate.

\* Depending on exposure apply one or more coats by brush or roller (do not dilute). For spray application dilute according the list on page 4.

\* The service life increases at thicker total dry film thickness. In practice one up to 3 coats are recommended, depending on exposure.

\* On vertical objects a dry film thickness between 40 to 150µm without sagging can be easily applied (depending on application method per layer).

**Rusted steel**

\* Remove loose rust (rust scale), a sound substrate is required for optimum and lasting result (minimum degree of surface preparation up to St 2). Contamination (oil, grease, salts and detergents) must be removed by washing properly.

\* Brantho-Korrux "3 in 1" penetrates into the remaining rust. To prevent further corrosion of such a rough substrate, apply sufficient material.

**Aluminium (light metals)**

\* Slightly abrade, adhesion promoter or primer is not required, but always degrease and clean the substrate properly.

\* **Never** abrade with steel fibre, preferably use a plastic fibre embedded abrasive (e.g. Scotch Brite® or similar).

\* Apply normal thickness (not too thin!). Adhesion test: please note that optimal adhesion is achieved after 3 days or more.

Pg. 3 Application instructions: various substrates / Temperatures / Drying

**Plastics**

Properly clean and degrease. Check compatibility by applying "3 in 1". Most plastics like PVC window frames, GRP (glass-fibre-reinforced polyester), previous coatings, etc. Brantho-Korrux "3 in 1" is excellently suitable. Not suitable substrates are "soft" plastics like Polyethylene (=Poly-olefins); Plexiglas® (acrylics) and Polystyrene may dissolve, but can be coated.

**Weathered galvanized steel**

- \* Properly clean and degrease total substrate (e.g. use multiclean), carefully remove all loose matter and zinc salts (white rust). Remove loose matter, especially white zinc-salts. Rinse with plenty of fresh water.
- \* Apply sufficient film thickness on already rusting and consequently rough substrates.

**New galvanized steel**

- \* Slightly abrade, adhesion promoter or primer is not required, degrease and clean the substrate using a water-based cleaner/degreaser (e.g. multiclean). Rinse with plenty of fresh water.
- \* Carefully remove zinc salts (white rust). **Never** abrade with steel fibre, preferably use a plastic fibre embedded abrasive (e.g. Scotch Brite® or similar).
- \* Only apply on a well-prepared, clean and dry substrate, free of grease, oil and all other contaminants. Apply sufficient film thickness (min. 60µm dry) in order to obtain proper adhesion and long-term protection.
- \* For advanced exposures use Brantho-Korrux "2-Kompo" (or Branth's "Haftgrund-Spezial") as primer.

**Other substrates**

There are many more possibilities. Due to its elasticity "3 in 1" can be used on wood, if a permeable coating is not required. Even on glass "3 in 1" shows proper adhesion. On concrete floors a 1:1 mixture with Brantho-Korrux "nitrofest" is recommended.

Properly applied powder-coatings can be painted with Brantho-Korrux "3 in 1" without any problem. As there are various qualities powder-coatings a confirmed recommendation is not possible, in some cases Brantho-Korrux "2-Kompo" may be the better choice. Brantho-Korrux "3 in 1" adheres very well on anodised aluminium, in order to obtain a proper film thickness we recommend priming with Branth's "Haftgrund Spezial"; when a harder surface is required we advise to apply Brantho-Korrux "2-Kompo".

**Further information**

- \* Brantho-Korrux "3 in 1" may be used without producing chemical waste
- \* Adding "3 in 1-Glanz-Additiv" (750ml to a 5 litre can) will result in an approx. 20% higher gloss level.
- \* To improve the gloss more effectively Brantho-Korrux "3 in 1" can be mixed 1:1 with Branth's Robust-Lack
- \* To lower the gloss of Brantho-Korrux "3 in 1" a 1:1 mixture with Brantho-Korrux "nitrofest" is recommended. (this also reduces drying times considerably).

**Temperatures**

- \* During application a temperature of object- and surroundings around 20°C is optimal. Temperature should be between +2°C and +30°C.
- \* At higher temperatures the drying speed increases, not the curing (dry hard) time. Drying speed can be retarded (in sun and wind) by using Branth's Spezial-Thinner.
- \* At very low temperatures apply "warm" material or add some thinner.
- \* "3 in 1" can also be applied at very low temperatures, even down to -10°C, the drying time increases and also the flow properties will suffer; do not apply on ice or frost.
- \* The cured coating shows excellent heat resistance. Practical experience learned that exposure to dry heat up to max. 300°C has no influence on the quality of the product. Colour discolouration should be expected from ca. 120°C and up. For temperatures over 200°C the colour oxide-red RAL 3009 is recommended, up to 250°C also silver-aluminium RAL 9006 or black RAL 9005.
- \* Temperature-shocks (e.g. a sudden temperature change from +250°C down to +5°C (cold water), from +70°C down to -20°C) and extremely low temperatures (down to -50°C) showed no negative influence on the coating.

**Drying times**

- \* "3 in 1" is an air-drying coating which is normally applied without activator.
- \* The precise drying times depend on the film thickness, ventilation, relative humidity and air-temperature.
- \* Thicker coats can easily be applied in one coat, however, this will cause a considerable increase of the drying time. "3 in 1" reacts thermoplastic during a few days after application and cannot be abraded.
- \* Thicker coats or several coats applied in a short period of time will cause a general increase of the total drying time. It is recommended to apply a thin coat first, followed by a thicker coat.
- \* The drying mechanism of "3 in 1" causes the adhesion to increase even after approx. 3 days (completely dry). During this drying period, objects cannot be stacked or packed, as blocking will occur. If applied as a primer "3 in 1" may be mixed with "nitrofest"; this reduces the effect.
- \* Long-term exposure to liquids (e.g. rain on horizontal surfaces) may cause "moisture stains" during the curing (up to 5 days after application).
- \* Ventilation with fresh air accelerates the drying/curing speed; forced drying with warm air over 30°C slows down the curing speed significantly.
- \* **"3 in 1-Härter-Konzentrat"** shortens the drying times (dry to touch) and increases the mar resistance of the surface considerably (especially for dark colours). The addition should be between 5-10% for topcoats only (not recommended for primers), the mixture must be used within one working day. Please do **not** use **"3 in 1-Härter-Konzentrat"** in combination with metallic or m.i.o. coatings (RAL 9007, DB601, DB703, RAL 9006). Instead you can use **Branth's Quick-Härter-Konzentrat** (by no means use an overdose).

Pg. 4 Application instructions: various application methodes

**Brush application**

Apply material with standard round, oval or flat brushes (industrial quality), d.f.t. 40-80µm can be achieved. After 1-2 hours the next layer can be applied. Colours containing micaceous iron oxide (m.i.o.) achieve a d.f.t. of 60-120µm (e.g. grey aluminum 9007, mica green DB 601, dark grey DB 703)

**Spray**

The table below contains guidelines for spray application; please follow directions of equipment manufacturers. The use of Branth's Kombi-Thinner is strictly recommended. When spraying a dry film thickness from 50 µm (small objects) up to 150µm (large objects, airless) can easily be achieved.

**Roller application**

A short nap synthetic roller is recommended ( up to 12mm nap), nylon, suitable for 2-component coatings; a.d.f. of 40-60µm can be achieved. Do **not** use foam rollers.

**Special effects (e.g. orange-peel effect)**

Brantho-Korrux "3 in 1" can be used for special effects. Apply undiluted material shortly after drying of previous coat, the effect depends on opening, pressure and distance. Special effects are excellent for difficult surfaces and have a very good hiding power. "3 in 1" does not have the same "hardness" as Branth's 2-Kompo.

Guideline for spray application at 20°C	"3 in 1" colours		"3 in 1" m.i.o.'s
	small objects	large objects	large objects
<b>Air pressure 4-5 bar</b>	Viscosity in seconds DIN cup 4mm and dilution percentage		
- opening 1,4 - 1,7mm	ca. 10 + 15 % Kombi-Th.	---	---
- opening 2,0 - 2,5mm	30-60 + ca. 10 % Kombi-Th.	30-60 + ca.10 % Kombi-Th.	60-80 + 8-10 % Kombi-Th.
- opening 2,5 - 3,5mm	---	80-120 + 3-5 % KombiTh..	ca.120 + ca.3 % Kombi-Th.
<b>Airless min. 150 bar</b>			
- opening 17/40, 19/40 ( 0,4-0,6 mm)	---	80-100 + 3-5 % Kombi-Th.	ca.120 + ca.3 % Kombi-Th.
- opening 21/40, 23/40 (0,5-0,7 mm)	---	add ca. 3 % Kombi-Th.	add ca. 3 % Kombi-Th.
- opening 25/40, 27/40 (0,6-0,8 mm)	---	no dilution	no dilution
<b>Airmix 90/3 bar</b>			
- opening 0,2 - 0,5 ca. 40°	60-90 + 5-8 % Kombi-Th.	60-90 + 5-8 % Kombi-Th.	ca. 90 + ca. 5 % Kombi-Th.
<b>HVLP 5/1 bar</b>			
- opening 1,6 - 3,5	ca. 30 + ca. 15 % Kombi-Th.	ca. 30 + ca. 15 % Kombi-Th.	30-60 + ca.10 % Kombi-Th.

**Electrostatic spray**

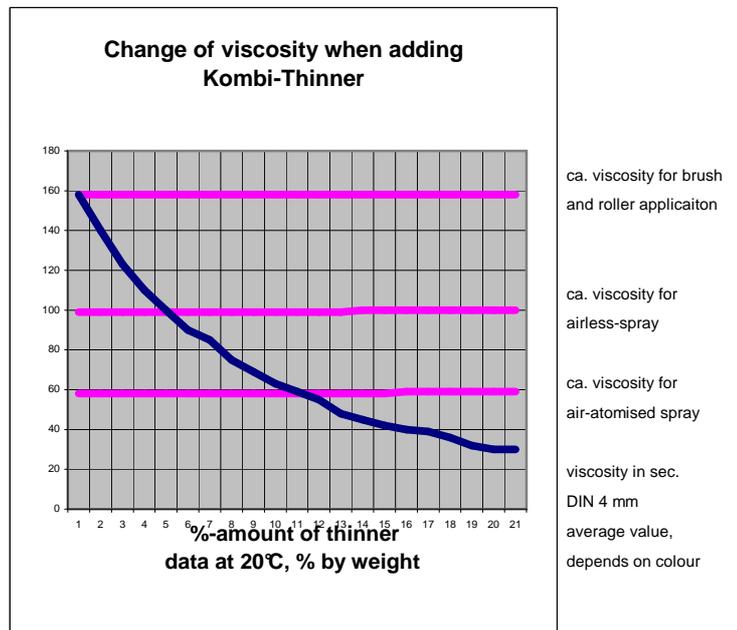
- \* Brantho-Korrux can be applied with electrostatic spray equipment (both airless and air atomised), the material shows an electrical conductivity of > 100 kΩ. Dilute according equipment manufacturer's specifications.
- \* The electrical resistance at delivery of "3 in 1" is 1500-2500 k-Ω. When diluting to airless viscosity (ca. 80-90 sec./ DIN 4 mm) this value decreases to 1000-1800 kΩ, for air atomised spray (ca. 30-35 sec./ DIN 4 mm) this value decreases to 1000-1500kΩ.
- \* On request, at special price, the material can be delivered at customer specification (min. 25 l.). Please give us the viscosity (... sec./ DIN 4 mm) and electrical conductivity (... kΩ) you wish.
- \* Aluminium and micaceous iron oxide cannot be applied with standard electrostatic equipment values: 9007 ca 3000kΩ, ca 3000kΩ airless 2000kΩ, air.atomised ca. 1500 kΩ; 9006 ca. 20.000 kΩ, airless ca. 18.000 kΩ, air atomised ca. 10.000 kΩ; adjustment by manufacturer not possible).

**Dipping**

- \* Due to its basic properties, drying time, recoatability, environmental acceptability, Brantho-Korrux "3 in 1" is suitable for dipping. Very little deposit formation in the dipping vessel.
- \* The required viscosity depends on object and passing method, normally at 20-35 sec./DIN 4mm. Adjust viscosity with Branth's special "dipping" thinner.
- \* We recommend to stir the contents of the dipping vessel continously at very low speed, complete circulation of the vessel one or twice a day is considered sufficient (practical experience).
- \* The yearly consumption should be minimal twice the content of the vessel.

**Support: selection of the appropriate airless filters:**

- red** for very low viscosity lacquers  
180 mesh/cm² - 0,084 mm size - opening 0,15-0,35 mm
  - yellow** for normal to high-build coatings  
100 mesh/cm² - 0,14 mm size - opening 0,3-0,5 mm
  - white** for zinc-rich and mio coatings  
50 mesh/cm² - 0,32 mm size - opening 0,4-0,65 mm
  - green** for heavy materials alike bitumen  
30 mesh/cm² - 0,5 mm size - opening ab 0,7 mm
- For Brantho-Korrux **yellow** and **white** are right.



**Recoat intervals at 20°C / 65% relative humidity**

primer	topcoat	minimum	ideal
"3 in 1"	"3 in 1"	15 min.	> 1 day
"3 in 1"	Robust-Lack	15 min.	> 1 day
"3 in 1"	S-Glasur	30 min.	> 8 hours
"3 in 1"	Alkyd paint	30 min.	> 6 hours
"3 in 1"	Water-based	2 hours	> 12 Std.
"3 in 1"	nitro-cellulose	5 hours	> 3 days
"3 in 1"	2-c-acrylic	12 hours	> 3 days
"3 in 1"	2-c-epoxy	24 hours	> 3 days
"3 in 1"	2-c-polyurethane	16 hours	> 3 days
"3 in 1"	PVC(vinyl)	15 min.	> 1 day

**Recoating**

- \* "3 in 1" dries to a dirt repellent, eggshell finish (semi-gloss), normally a two-coat system is sufficient, an extra topcoat is not necessary.
- \* "3 in 1" can be recoated unlimitedly with itself (abrading / sanding not necessary). Adding too much thinner, low temperatures and too many too thick layers can cause after 2-3 days partially reversible wrinkles.
- \* If required, "3 in 1" can be recoated with all sorts of one-component coatings and with several (tested) two-component coatings. However, some type of coatings may require a longer drying time for "3 in 1" (fast drying two-component high-build epoxy coatings and adhesion primers with a solids of < 10% are not suitable as topcoat for "3 in 1"). The table above contains guidelines (minimum interval and recommended interval time), recoating is possible without abrading/sanding at any later moment.

**According TL of German Railways**

When recoating "3 in 1" with coatings according page 75 and 77 of TL 918 300 T2 (two-component epoxy and polyurethane coatings) a 24 hours interval is recommended due to the aggressive nature of the solvents, in order to prevent resolving or bleeding. Under normal circumstances an interval of two hours is sufficient, at varying weather conditions or at low temperatures recoat when the material is dry to handle; in any case the material can be recoated the next day without any problem.

**Sealing compound**

- \* There are materials which cannot be painted (silicon). Special sealing compounds of car-bodies cannot be coated with 1-Comp.-coatings (read their remarks), you should use 2-Comp.-coatings instead (e.g. Brantho-Korrux "2-Kompo", 2K-Flexi-Lack).

**Fillers**

- \* "3 in 1" can be applied on all available 1-Comp. and 2-Comp. fillers, if these are properly cured. No incompatibility is reported to us, Brantho-Korrux "3 in 1" showed excellent adhesion on all tested commercial fillers.
- \* Applying fillers on top of "3 in 1" is not recommended (too flexible for 1-Comp. fillers and too strong attack by styrene containing 2-Comp. "Polyester"-fillers). Better suitable are Brantho-Korrux "nitrofest", "2-Kompo", "ecobase" or "Haftgrund" (adhesion primer).

**Storage temperature:**

The ideal temperature for paint cans is between 10°C and 20°C. Frost will normally not harm the product. Temperatures over 25°C will shorten the storage stability.

**Minimum tenability**

The tenability indication on the cans implies the warranted tenability in unopened, original cans, in a cool, well-ventilated dry storage area. The indicated tenability is **no expiry date**, under normal conditions the coating may be used up to 5 years without loss of quality. The indicated minimum tenability should especially help to use the older cans first. As long as the coating material can be stirred homogeneously, it can be applied without problems.

**Information according Decopaint-directives / Limitation of emissions of volatile organic compounds/ EU Directive 2004/2**

The major areas of application of Brantho-Korrux "3 in 1" are not subject to above mentioned regulations. Within the regulations the major areas of application are IIAi = One-Component-special-coating, Metal-high-build coating (building) and IIBe = One-component-coating, underbody protection coating (vehicle repair). Further areas of application are: one-component-special coating, primer for iron, steel, aluminium, one-or multi-coat coating, corrosion resistant coating, chassis and under body protection, two-component special coating, adhesion primer, intermediate coating, protective coating, base-coat, top-coat, interior coating, primer-and intermediate coating, full-hiding coating for interior and exterior limits are valid from 2010: IIB(d) 420 g/l; IIA(d) 300 g/l; IIB(c) 540 g/l; IIA(j) 500 g/l; IIA(g) 350 g/l.

**Professional indication: 2004/42/IIA(i) 500 (2010) 500 and: 2004/42/IIB(e) 840 (2010) 840**

VOC-content for further calculations:

- **VOC as delivered, for brush and roller application, ready-to-use at 20° C** **ca. 390 g/l**
- possibly after addition of 5% "3 in 1" -activator, ready for brushing and rolling **ca. 405 g/l**
- possibly after addition of 10% "3 in 1"-activator, ready for airless-spray **ca. 415 g/l**
- ready for airless spray, without activator, including 3% Kombi-Thinner **ca. 420 g/l**
- ready for air-atomised spray, without activator, incl. 7% Kombi-Thinner **ca. 440 g/l**
- dilution with 15% Kombi-Thinner, e.g. small tip-sizes or low temperatures **ca. 490 g/l**
- to fill in special "pre-filled" spray cans to max. **ca. 840 g/l**

Information regarding REACH-VO can be derived from our MSDS.

Pg. 6 Application instructions: Colours / Information for different surfaces

**Colours**

- \* Brantho-Korrux "3 in 1" is immediately available in many colours (see colour card). All colours are intermixable in any mixing ratio.
- \* All colours show optimal protection against corrosion and optimal hiding power, this is the reason for different pricing amongst the colours.
- \* Other colours are available from 25 l. orders according to a colour standard (RAL) or colour sample.
- \* Due to the high pigment content in some colours and effect-colours (e.g. 9006) pigments can be ground under special conditions from the paint surface.
- \* This may not be acceptable in some cases (e.g. public areas), in this case we recommend a topcoat.

**Remark: Effect-Colours**

- \* The statements mentioned in our technical information, our application instructions and the test results, are based on normal colours. For aluminum and m.i.o. coatings not all data does apply (aluminum-effect, m.i.o. effect, e.g. RAL 9006, 9007, DB 601, DB 703 etc.). These colours should not be used for food contact applications or for toys. These coatings can be applied in a thicker film (50%) and will dry somewhat slower accordingly. They show better protection against corrosion. "3 in 1-Härter Konzentrat" (activator concentrate) is not suitable for these products; Quick-Härter could be used instead.
- \* The optical impression of the effect-colours (e.g. 9006, 9007, 601, 703) strongly depends on the application method used. If the colour is applied "soaking wet" will appear lighter, the "dryer", it will appear darker - but of course the surface, dry film thickness, temperature etc. are of importance. These colours appear more "alive", if they are not applied under exactly the same conditions (spray distance, dry film thickness, amount of paint on the roller etc.). Use some of Branth's Spezial-Thinner to keep the surface a bit longer "opened", to achieve a more or less even application result. The effect pigments have to be able to float regularly on the colour film.

**Colour resistance**

Nowadays we use colour-pigments with extreme high light-fastness and weather resistance for every colour. Besides that, the percentage of pigments in Brantho-Korrux products is very high, which will result in excellent hiding power and long-term resistance. Nevertheless there will be differences regarding light-fastness and weather resistance. Detailed below you will find a resistance range from very high to high resistance:

- 9010/9006/9002/7035/9007/9001/703
- 3009/0610/601/6011/7023/7011/9005/9011/444/7350/7032/7001
- 5007/1015/5012/5015/5010/8016/6005/105/35755002/6018/1006/1007/1021
- 2000/2011/2004/3020/3000/3002

Although we use extreme resistant pigments for red, orange, yellow, blue etc., colours like white and silver-aluminum show a better UV-resistance. All critical colours are manufactured with high-quality UV-absorbers. The colour stability can be improved by over-coating with a clear coat (e.g. Branth's Kristallglasur, Branth's 2K-Anti-Graffiti Topcoat), critical colours show considerably lower (white-) fading after several years.

**Surface**

For a good metal protection a thick layer and a good edge protection is important (next to the following characteristics as underbody protection, electro chemical corrosion resistance, adhesion, barrier effect). To achieve the last attribute, "3 in 1" has a very good position on vertical surfaces, a fast drying time, a high dry volume and other features. Therefore it is difficult that the surface is completely even. According to the application-methods and -conditions one may achieve a more or less structured surface. (Adding a small amount of Branth's Spezial-Thinner improves the run, but reduces other characteristics.)

**Gloss**

Degree of gloss of "3 in 1" is "semi-gloss / dirt repellent" and differs per colour in order to obtain an optimal pigmentation (hiding power). Degree of gloss according to NCS 25 - 55 % (depends on colour). By mixing "3 in 1" with Branth's **Robust-Lack** (high gloss) a higher gloss can be obtained, by mixing with Brantho-Korrux "**nitrofest**" (flat) a lower gloss can be obtained.

Pg. 7 Test results, resistance and durability, standards (Part 1)

**TÜV-tested:** Brantho-Korrux "3 in 1" successfully passed all corrosion resistance tests for lead- and chromate free coatings by TÜV, our quality control system is assured by TÜV.

**DB-tested:** (Deutsche Bahn = German Railways)  
Brantho-Korrux "3 in 1" is extensively tested as substitute for red-lead primers and approved for protection of steel-constructions. (Material No.: 672.05 according TL 918300 T2).

**BAST/ZTV-KOR-directives:**  
Conformation tests according to DIN-EN-ISO 12944 respect. DIN 55928 have been achieved by MPA-NRW.  
For each charge of production we carry out our own manufacturing inspection. External quality control of our QS-system assured by TÜV (regular audit inspection).  
Upon request we can give you for each charge of production (from 50 liters amount ordered) a work's test certification. All our cans with the Ü-mark are approved as construction products (corresponding resp. ÜZVO).  
Check tests (at purchaser's expense) can be requested at any time; taking averages for an inspection certification (resp. 8.2.3.3.) can be requested by every purchaser (at his own expense).

**PVC-substitute:** Brantho-Korrux "3 in 1" complies with and even surpasses the requirements of PVC-coatings according DB-TL 918300 BL 77, extensively tested by IKS. (short- and long term).

**Epoxi-substitute:** Brantho-Korrux "3 in 1" can partly be used as a substitute for 2-component epoxy coatings. Up to a resistance against sulphuric acid 40% and potassium hydroxide 25% (spot-test), completely cured Brantho-Korrux "3 in 1" complies with all requirements according DB-TL 9183000 Page 87.

**Food contact:** Brantho-Korrux "3 in 1" can be used for application of the inside of storage tanks and processing equipment for food products, according the directions of German Ministry of Health (XL), (tested by the approved laboratory of Dr. Kittel 01/1989).

**Toys:** Brantho-Korrux "3 in 1" may be used for playground equipment of toys, on which normally is chewed or sucked, and direct contact with the skin occurs (tested according DIN 53160, the test solutions showed pH values between 2,4 und 8,8).  
(Institute for corrosion protection, Dresden 10/1993 + 10/2010)  
A new stricter test according DIN EN 71-3 (security of toys), meets the requirements again.  
(Institute for varnish and paint, Magdeburg 2013/14)

**Anti-slip properties:** For stairways, floors, etc. we recommend the application of RAL 9007, DB 703 or DB 601 (or mixtures with these colours), roughness of the dried coatings provides a non-skid effect.  
Measuring results "3 in 1" RAL 9007 according to:  
- DIN 51130/BGR181 (production rooms): R12  
- DIN 51097/GUV-I8527 (high humidity rooms barefooted): C

**Electrostatic conductivity:** The electric conductivity is sufficient to make the product suitable for petrol storage tanks exteriorly (Values: RAL 7032 = 0,04 x 10<sup>9</sup> k-Ω; RAL 9006/9007 = 0,02 x 10<sup>9</sup> k-Ω).

**Classification according DIN 4102-1:** Brantho-Korrux "3 in 1" meets the requirements of "Baustoffklasse B2".  
Metals acc. DIN4102 (reaction to fire on building materials and components) classified with and without organic coating in the building material class A1/A2, "not-flammable".

**Resistance:** Resistance against many substances was tested successfully according DIN 53168-B, e.g. against transformer-oil (up to 60°C), diesel/fuel oil, gear oil (up to 80°C), hydraulic oil (up to 80°C), lubricating grease, anti-freeze(e.g. VW-Audi glycol 100% and 50%, Glythermin NF 50%), cooling fluids (pH 8-11), salt water (5% = sea water), melasses 1,5% acetic acid, 10% ethyl alcohol, bird droppings (sea-gull and pigeon), etc.

**DIN-tests:** a brochure with test-results is available upon request, DIN 53167, 50021 SS, 53210, 53209; condensation water tests according DIN 50018 KFW 2,0 S, 50018 SFW 0,2 S, DB-TL; impact resistance according DIN 53154; abrasion resistance acc. DIN 53233; elongation acc. DIN-EN-ISO 1519; elasticity acc. DIN-EN-ISO 1520 and many other tests.

**Colour exactness:** Slight deviation with regard to colour standards (RAL) or samples may occur in individual cases, this is dictated by the choice of the raw materials. Quality control is carried out visually and with a computer system according CIE colour model. Tolerances/margins are determined at Branth Chemie internally according DIN 6175.

**Quality control:** Apart from our quality control according the Q.S. manual, the purchaser of material (from 50 l. and up) can be supplied upon request, with a quality certificate according DIN 50049-2.3.

**Eco-Audit:** Brantho-Korrux "3 in 1" is manufactured according the EMAS-directives and respect. according DIN-ISO 14001.

**Waterway signalisation (WSV-approval):** Brantho-Korrux "3 in 1" is approved for "floating" waterway markings like buoys, etc.

**Daimler-Chrysler-Release:** Brantho-Korrux "3 in 1" has been accepted by the areas of business for vehicles of the Daimler Chrysler AG for the inside layer of mineral and hydraulic tanks.

**Produktcode for coatings according GISBAU**  
Primer, pigmented, solvent based, free of aromatic hydrocarbons: M-GP02  
Coating, solvent based, aromatic free: M-LL01

**Classification according VdL-RL 01 "Coatings for the building industry":** Metal protection, corrosion resistant primer, semi-gloss top-coat, **free of aromatic solvents.**

**Brantho-Korrux "3 in 1" meets the requirements of the EU-Directives:**  
2002/95/EG-RoHS (electronical equipment); 76/769/EG (tinn organic compounds); 2003/11/EG (dangerous substances ...); 2005/69/EG (PAK); 2006/122/EG (PFOS); 2000/53/EG (End-of life vehicles); 1907/2006/EG (REACH, as far as we can see up to now, also: ILRS-List (of the car industry)).

**NORSOK-corrosion protection test**  
A 3 layer testing system of min. 3x100µm d.f.t. Brantho-Korrux "3in1" meets the requirements of the most demanding corrosion protection test (Norsok-Test M 501, Edition 6, System 1, Corrosion protection, October 2013 by COT) during 4200 hours severe exchange test with sratch (UVA, +60°C, -20°C, condensation, salt spray test etc.)

**Mining approval (§ 4 Abs. 1 Nr. 2 GesBergV)**  
Substance main group 4, substance subgroup 1, Lfd.-Nr. 42  
AZ: Hygiene Institute "A 108 395-03-To"

Pg. 8 Standards (Part 2), DIN 55928, ISO 12944, "Ü"-Approval

**VOB/DIN 18363:** **Brantho-Korrux "3 in 1"** is approved for all sorts of steel substrates and suitable for application on most metal substrates. For application acc. DIN 55938 Part 5 Tab. 5 (Duplex-Systems) excellent practical results are available. The requirements acc. DIN 55928 Part 5 Table 6 (Water engineering with steel) meet **Brantho-Korrux "2K-Durasolid"**. A freshly applied coating of **Brantho-Korrux "3in1"** can hardly be sanded or abraded due to the high flexibility. "3in1" shows excellent adhesion on previous coatings and all tested topcoats adhere excellently when applied on **Brantho-Korrux "3in1"**.

**Approvals for steel-constructions and -equipment**

For the erection, modification and maintenance of building constructions **Brantho-Korrux "3 in 1"** is approved according following Ü-mark. The approval concerns practically all Corrosion Classes and practically all Coating Systems acc. Din 55929 T5 Tab.4 (should not be used for extreme chemical exposures - acc. Remark 2 -. When using for O.E.M. or shop application please note **Brantho-Korrux "3in1"** is more elastic and flexible as e.g. 2-component systems).

**Brantho-Korrux "3 in 1" fulfills DIN-EN-ISO 12944**

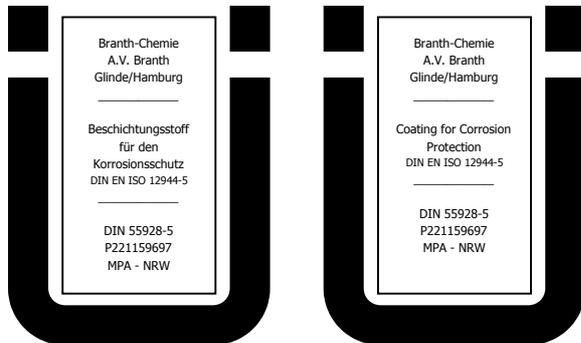
**Brantho-Korrux "3 in 1"** is qualified according DIN-EN-ISO 12944-6 for all 6 corrosion categories in atmospheric conditions on steel (Sa 2½) and hand prepared steel (St 2). According DIN 12944 the lifetime expectancy in corrosion categories C-5-J (extreme industrial) and C-5-M (extreme marine) is over 15 years for a min. 3-coat-system; in the corrosion categories C-1 (minor), C-2 (light), C-3- (medium) and C-4 (strong) the highest possible lifetime expectancy is achieved for a 1-coat or a 2-coat system. (examples see below)

According DIN 12944-5 **Brantho-Korrux "3 in 1"** is approved for initial protection of steel substrates (prepared to Sa 2½ or St 2)(Part 5.1.2.1.) and also for maintenance of previously coated substrates acc. Part 5.1.2.2..

According the requirements of DIN 12944-1 Part 5 (also 12944-5 Part 5.3) **Brantho-Korrux "3 in 1"** does not contain toxic preparations and offers a low VOC-content.

In order to achieve the expected lifetime in the corrosion categories of DIN-EN-ISO 12944-6, we recommend following d.f.t. on iron and steel. Rough, uneven substrates need if necessary a thicker layer. One coat resp. a d.f.t. of 80µm (two coats resp. 160µm etc.).

translation



**Primer**

**Brantho-Korrux "3 in 1"** can be applied on all steel substrates as a primer, prepared as follows: Sa 2, Sa 2 1/2, Sa 3, St 2, St 3 - thus on blasted or manually prepared, slightly rusty substrates. **Brantho-Korrux "3in1"** substitutes all primers acc. DIN 55928 T5 Table 4 and is an equivalent for red lead primers acc. Part 3.3.2.1. of DIN 559828 T5.

**Topcoats (intermediate and finish)**

**Brantho-Korrux "3 in 1"** ist approved as intermediate and topcoat and can be used as substitute for the following systems acc. DIN 55928 T5 Table 4: Alkyd resin, Alkydresin-combinations, Epoxy-ester, Vinyl-chlorid-copolymer (PVC), Chlorinated Rubber.

**Corrosive exposures (applicability)**

**Brantho-Korrux "3 in 1"** is suitable as a primer, intermediate and topcoat for following exposures: interior, rural, urban, industrial and marine atmospheres, as well as for the following exposures in the open air: chemical (Ch), sprinkler salt, - sand, - grit and exhaust fumes. It may be used in the open air as well as in confined areas on accessible and inaccessible surfaces. For chemical exposures in confined areas **Brantho-Korrux "3 in 1"** can be used as a primer and can be covered with special, chemical resistant, 2-component coatings, e.g. Brath's 2K-Anti-Graffic-Lack.

corrosion category	life time	K = up to 5 years	M = up to 15 years	L = over 15 years
C1 minor		min. 60 µ	min. 60 µ	min. 80 µ
C2 light		min. 60 µ	min. 80 µ	min. 160 µ
C3 medium		min. 80 µ	80-160 µ	160-240 µ
C4 strong		80-160 µ	min. 160 µ	min. 240 µ
C5J very strong		160-240 µ	160-240 µ	240-320 µ
C5M very strong		160-240 µ	160-240 µ	240-320 µ

C1-examples: Inside: heated buildings, stores, schools, hotels  
 C2-examples: Inside: unheated buildings;  
 Outside: atmosphere with low level pollution  
 C3-examples: Inside: factories, laundries;  
 Outside: city and industrial atmosphere  
 C4-examples: Inside: industrial constructions, swimming pools  
 Outside: industrial and coastal atmosphere  
 C5J-examples: Inside: buildings with constant condensation;  
 Outside: high humidity, aggressive atmosphere  
 C5M-examples: Inside: buildings with constant condensation;  
 Outside: coastal and offshore atmosphere

To achieve the curing (dry hard) time of thicker coatings faster, use Branth's HgS, **Brantho-Korrux "2-Kompo"** or Branth's RMB instead of **Brantho-Korrux "3 in 1"** as a primer and/or intermediate coat.

For galvanized steel surfaces and extreme exposures we recommend priming with **Brantho-Korrux "2 Kompo"**; because of the galvanization 80µm d.f.t. less is sufficient.

For special surface needs, other top coats can be used.

For longer-term exposures under water (fresh water, sea water, brackish water, ground soil) we recommend to use only **Brantho-Korrux "2K-Durasolid"**.

The information herein contained is based on our present knowledge. It is based on practical experience during many years and is composed carefully. The technical information is average, and values do not impose any liability. As the application of this material in any individual case is beyond our control we cannot be held liable. This information sheet is a translation of the German sheet 08/11; by Jos van Ochten for BrabCoat in Roosendaal, The Netherlands (last translation 01/08). Addendum and corrections by Branth-Chemie 08/11.