JFE UNIVERSAL BRITE

Laminated Steel Sheet for Containers

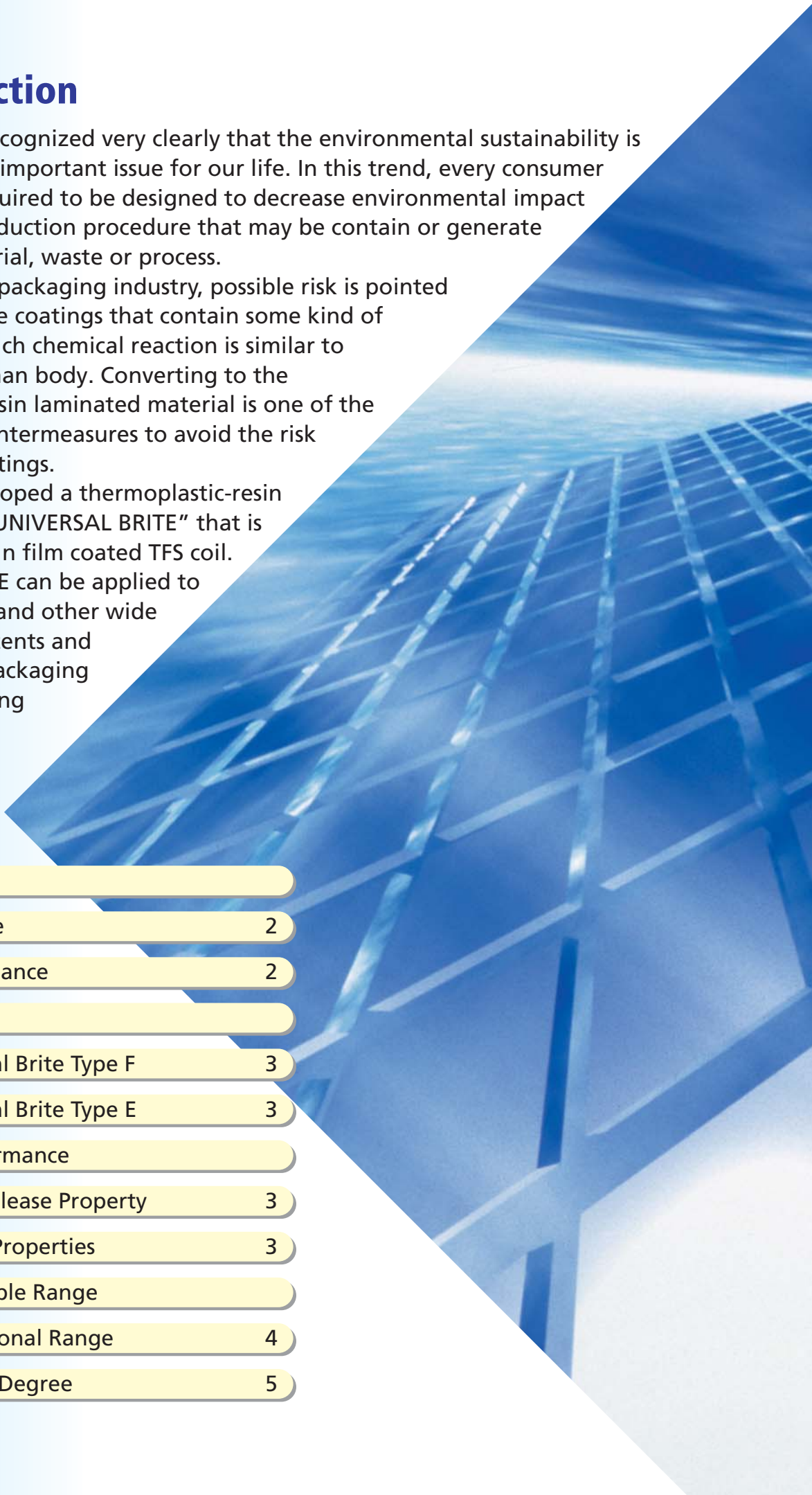
JFE Steel Corporation

1. Introduction

It has been recognized very clearly that the environmental sustainability is one of the most important issue for our life. In this trend, every consumer products are required to be designed to decrease environmental impact including its production procedure that may be contain or generate hazardous material, waste or process.

In the metal packaging industry, possible risk is pointed with solvent base coatings that contain some kind of monomer of which chemical reaction is similar to hormone in human body. Converting to the thermoplastic-resin laminated material is one of the most drastic countermeasures to avoid the risk with solvent coatings.

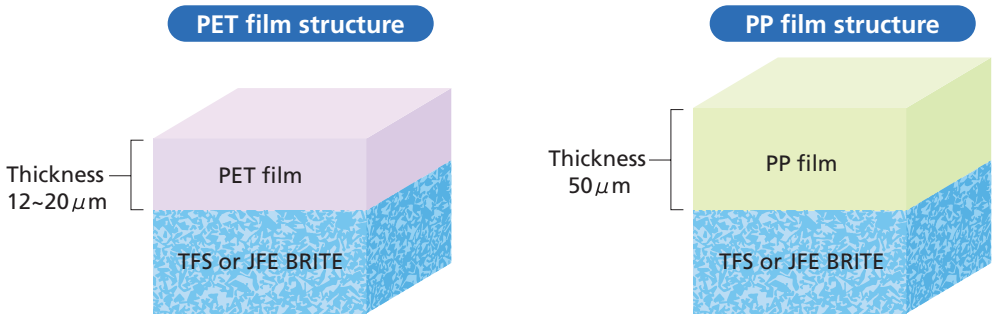
JFE has developed a thermoplastic-resin laminated TFS "UNIVERSAL BRITE" that is continuously resin film coated TFS coil. UNIVERSAL BRITE can be applied to food, chemicals and other wide variation of contents and decrease total packaging cost by eliminating coating process.



Contents

2. Film Structure

UNIVERSAL BRITE can be classified into two main types: PET and PP.
Laminating can be done either on one side or on both sides.



Note: For information on other than the film thickness, consult us.

3. Basic Performance

The basic performance of UNIVERSAL BRITE is shown below.

		UNIVERSAL BRITE		TFS (comparison)
		PET	PP	
Corrosion resistance when used bare Note 1)	Rusting resistance	◎	◎	○
	Acid resistance	◎	◎	△
	Alkali resistance	○ Note 2)	◎	◎
	Sulfidation resistance	◎	△	◎
	Stress-cracking resistance	△ Note 4)	△ Note 4)	△
Painting properties		◎ Note 4)	◎ Note 4)	◎
Corrosion resistance after painting Note 3)		◎ Note 4)	◎ Note 4)	○
Filiform corrosion resistance		◎	◎	◎
Lacquer adhesion		○ Note 4)	○ Note 4)	◎
Inner plain press workability		◎	◎	△
Solderability		×	×	×
Weldability Note 5)		○ Note 6)	○ Note 6)	△
Heat resistance Note 7)		○	△	◎

Note 1) : Corrosion resistance when used bare : Evaluated in the closed state.
The evaluation may change depending on the content actually used; contact us in advance.
Note 2) : Contact us for the desired pH in advance.
Note 3) : Evaluation by cross-cut corrosion test : The evaluation may change depending on the actual conditions of use.
Note 4) : Each performance may change depending on the actual conditions of use.
Note 5) : Evaluation when welded with the plating layer not polished.
Note 6) : The weldability is evaluated without laminate covering when JFE BRITE is used as the substrate.
Note 7) : Heat resistance: The properties may change through the process of painting or printing.

* Film cracking may occur depending on the environment if the film is flawed due to processing.
* Shelf life of the container may be affected can design, container making process and packing condition.
Packing test with same condition to commercial production is essentially required before applying this product to every particular contents.

4. Application

4.1 Universal Brite Type F

This is the first food can use laminated TFS material that is developed and commercialized in history. This product satisfies the wide variation of needs including “contents release ability” for food can use, and also enables cost saving of can manufacture.

4.2 Universal Brite Type E

This is the first eighteen litter can use laminated TFS material that is developed and commercialized in history. This product can be applied to more wide variation of contents compared to lacquered can with low can manufacturing cost.

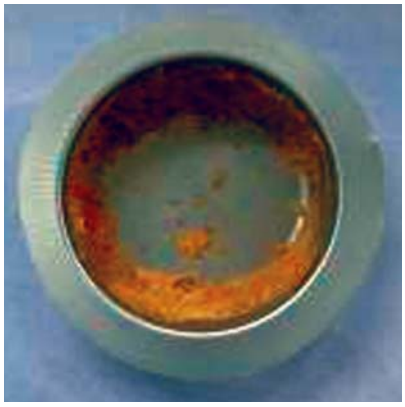
5. Special Performance

5.1 Meat Release Property

Meat release property can be provided by adding a surface modifier to the top layer of the PET film.

Content released after retort-pouch packaged
Content : Mixture of meat, egg, etc.

UNIVERSAL BRITE



Lacquered TFS

5.2 Design Properties

It is possible to manufacture laminated steel sheets of various colors by adding dye or pigment to the film. Contact us in case of special requirements for the color.

Clear

White

Gold

6. Manufacturable Range

6.1 Dimensional Range

● Sheet product

Unit : mm

	T1 ~ T5		DR8 ~ DR10	
	Manufacturable range	Normally possible range	Manufacturable range	Normally possible range
Sheet thickness	0.15 ~ 0.40	0.18 ~ 0.35	0.15 ~ 0.40	0.18 ~ 0.35
Sheet width	600 ~ 1240	600 ~ 1067	600 ~ 1240	600 ~ 1067
Shear length	406 ~ 1110	500 ~ 1050	406 ~ 1110	406 ~ 1050

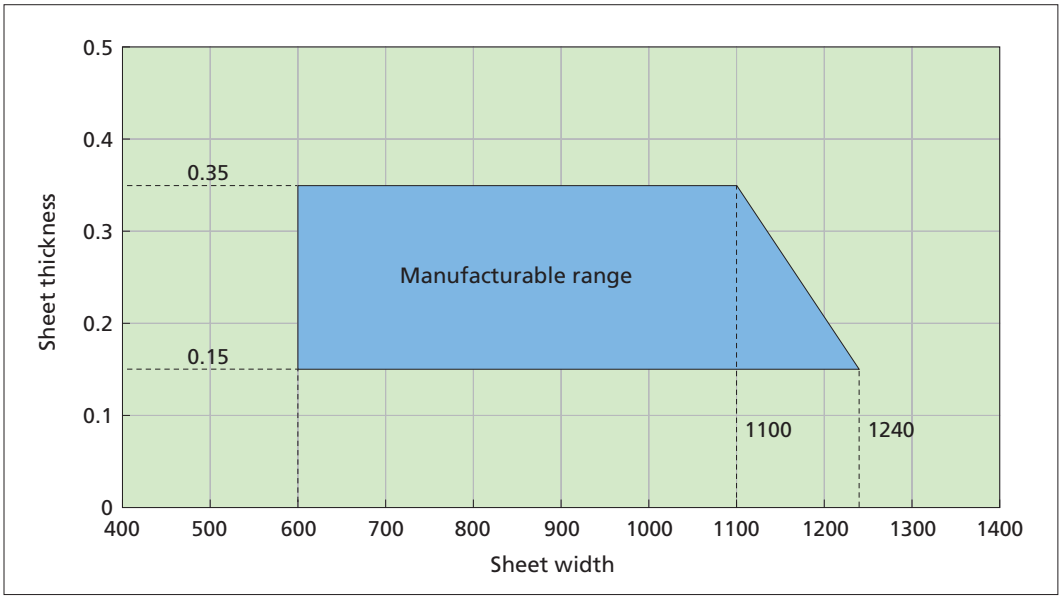
● Coil product

	T1 ~ T5		DR8 ~ DR10	
	Manufacturable range	Normally possible range	Manufacturable range	Normally possible range
Sheet thickness mm	[See Fig. 1]	0.18 ~ 0.35	[See Fig. 1]	0.18 ~ 0.35
Sheet width mm	[See Fig. 1]	600 ~ 1067	[See Fig. 1]	600 ~ 1067
Inside diameter mm	420, 508	420, 508	420, 508	420, 508
inch	16.5, 20	16.5, 20	16.5, 20	16.5, 20
Outside diameter mm	2130	2130	2130	2130
Coil unit mass t	1.0 ~ 18.0	3.0 ~ 15.0	1.0 ~ 18.0	3.0 ~ 15.0

Notes : 1. In case of the coil product, the weld zone or film joint may be included.
2. For any order in the manufacturable range outside the normally possible range, consult us.

Fig. 1 Manufacturable Range (Coil Product)

Unit : mm



6.2 Temper Degree

	Temper degree	Target HR30T	Application
One-time rolled product	T-1	49 ± 5	Deep-drawn can, cap, etc. required to be very flexible
	T-2	53 ± 5	Normally drawn products required to be moderately tough
	T-2.5	55 ± 5	For ordinary use, combining drawing properties of T-2 and toughness of T-3
	T-3	57 ± 5	For ordinary use, provided with appropriate toughness to reduce buckling
	T-S	59 ± 5	Easier processing than T-4
	T-4	61 ± 5	Relatively tough, used for can body, top/bottom ends, cap, etc.
	T-5	65 ± 5	Application requiring good resistance against buckling, such as can body, top/bottom ends
Two-time rolled product	DR-8	73 ± 5	Body material of round can requiring rigidity and strength
	DR-9	76 ± 5	Top/bottom of round can requiring rigidity and strength
	DR-9M	77 ± 5	Same as for DR-9
	DR-10	80 ± 5	Special application requiring strength

Note: Temper degree is that of stock sheet before laminating.

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