



**FUNCTIONS OF BONDING
BEFORE DEGREASING
NON STRUCTURAL BONDING IN THICK JOINTS
OF BODY ELEMENTS**

NORMES VEHICULES

B14 1425

March 1994

1/12

This is a translation, the French original shall be used in all cases of litigation.

Date of translation: 95-02

CONTENTS

- | | |
|----------------------------|--|
| 1. Object | 6. Conditions of implementation |
| 2. Reference documents | 7. Characteristics of product identification |
| 3. Expression on documents | |

- | |
|--|
| 4. Choice of the function mode |
| 5. Characteristics of the function modes |

APPENDICES

- | |
|---------------------------------------|
| 1. Specific conditions |
| 2. SPA Model |
| 3. Correspondence with norme B14 1400 |

1. OBJECT

This norme defines the characteristics which apply to the various functions of bonding with non structural bonding in thick joints, carried out before degreasing, for the bonding of body elements.

This document must be accompanied by normes B14 0100 and B74 0100 which give the general requirements for consultation with suppliers.

2. REFERENCE DOCUMENTS**PSA Documents**

Normes: B14 0100, B14 1400, B20 0150, B74 0100, B74 0200, D10 1145, D15 5003, D17 1058, D41 1108, D41 1241, D42 5274, D45 1105, D45 1148, D45 1174, D45 1180, D45 1545, D47 1165, D55 1018, D55 1089, D55 1107, D55 1206, D55 1209, D59 1160, D59 1456, D59 5145, D59 5224.

3. EXPRESSION ON DOCUMENTS

The function is defined by the number of the function mode followed by the reference number of this norme.

Example: BONDING OF STIFFENER TO ENGINE BONNET PANEL

FUNCTION 133

norme B14 1425

Replaces functions 128 and 130 of norme B14 1400.

**SPECIFIC TO
THE GROUP**

2nd EDITION: Addition of new function.
3rd EDITION: Modification of paragraphs 3.3 and 3.5.

**NORME
TECHNIQUE**

4. CHOICE OF THE FUNCTION MODE

The purpose of this table is to guide the designer towards the function mode fulfilling the essential requirements for the type of bonding he has selected.

CONVENTIONAL THICKNESS OF THE JOINT	BREAKING LOAD AT 23°C ± 2°C	DIMENSIONAL VARIATION	CATAPHORESIS COMPATIBILITY	CORROSION UNDER SEALANT	EXAMPLES OF USE	FUNCTION MODE
2 mm	≥ 0,1 MPa	$\frac{\Delta V}{V} \geq 30\%$	Grading 0	None	ROOF PANEL BOWS	132
2 mm	≥ 0,3 MPa	-	Grading 0	None	BONNET INNER PANELS AND JOINTS	133
2 mm	≥ 0,4 MPa	$40 \leq \frac{\Delta V}{V} \leq 70\%$	Grading 0	None	BONNET INNER PANELS, DOOR STIFFENERS	134

شرکت ایران خودرو
معاونت فنی و مهندسی
آرشیو فنی مرکز

5. CHARACTERISTICS OF THE FUNCTION MODES

DOCU- MENTS	CHARACTERISTICS	SPECIFIC CON- DITIONS	EXPRESSION OF RESULTS	FUNCTION MODE NUMBER		
				132	133	134
D41 1108	5.1. SHEAR STRENGTH With thickness of joint 2 mm 5.1.1. At 23°C ± 2°C 5.1.1.1. Before ageing Breaking load	(1)	MPa	≥ 0,1	≥ 0,3	≥ 0,4
D47 1165	5.1.1.2. After ageing Breaking load at H14 and H21	(1)	MPa	≥ 0,1	≥ 0,3	≥ 0,4
	According to cycle H Loss of resistance between H14 and H21	(1)	%	≤ 20	≤ 20	≤ 20
	5.1.2. At 80°C ± 2°C	(1), (2)	MPa	≥ 0,1	≥ 0,3	≥ 0,1
	5.1.3. Permitted types of failure 5.1.3.1. Before ageing	-	Note	(3)	(3)	(3)
	5.1.3.2. After ageing	-	Note	(3)	(3)	(3)
D42 5274	5.2. BEHAVIOUR TO IMPACT 5.2.1. Impact at -40°C ± 2°C	(1)	Note	-	*	-
D45 1174	5.2.2. Bending over mandrel at 23°C ± 2°C after impact at -40°C and after stabilisation 24 h at 23°C ± 2°C	-	Note	-	**	-
D59 5224	5.3. COMPATIBILITY WITH PRIMER PAINTS 5.3.1. Before ageing	(1)	Grading	0	0	0
D17 1058	5.3.2. After ageing (500 h BS)	(1)	Grading	0	0	0
D45 1174	5.4. FLEXIBILITY (Bending over mandrel) - (Bead of 10 mm) At 23°C ± 2°C	(1)	Grading	≤ B	≤ B	≤ B
D45 1180	5.5. DIMENSIONAL STABILITY TO HEAT Operating mode C	(1)	%	$\frac{\Delta V}{V} \geq 30$	$0 < \frac{\Delta V}{V} \leq 20$	$40 < \frac{\Delta V}{V} \leq 70$
D45 1148	5.6. RATE OF ABSORPTION OF WATER AND RISKS OF CORROSION Rate of absorption of water	(4) (1)	%	-	≤ 30	≤ 20
	Blister and corrosion underneath product	(1)	Note	none	none	none

* Slight cracks.

** No propagation of cracks or detachment of the product.

Note 1: A dash means that there is no requirement.

Note 2: Numerical references are grouped in appendix 1.

شرکت ایران خودرو
معاونت فنی و مهندسی
آرشیو فنی مرکز

6. CONDITIONS OF IMPLEMENTATION

DOCU- MENTS	CHARACTERISTICS	SPECIFIC CON- DITIONS	EXPRESSION OF RESULTS	INDEXES			
				Extruded bead	Extruded in blobs	Preformed bead	Hot extruded bead
				A	B	C	D
D15 5003	6.1. IN MANUFACTURE						
	6.1.1. Substrates receiver and carrier						
	Type	(5)	Type	-	-	-	-
	Temperature	-	°C	10 to 35	10 to 35	10 to 30	10 to 35
	6.1.2. Application						
	Method of application	-	Method	Non brushed	Non brushed	Preformed bead	Non brushed
	Extrusion pressure	-	bar	100 to 150	100 to 300	-	100 to 250
	Temperature of application	-	°C	10 to 30	10 to 30	10 to 30	45 to 50
	6.1.3. Storage temperature	-	°C	10 to 30	10 to 30	10 to 30	10 to 30
	6.2. IN LABORATORY						
D15 5003	6.2.1. Preparation of substrates						
	- Type of substrate	(6)	Type	-	-	-	-
	- Temperature of substrate	-	°C	23 ± 2	23 ± 2	23 ± 2	23 ± 2
	- Method of application	-	Method	Specific method	Specific method	Specific method	Specific method
	- Temperature of application	-	°C	10 to 30	10 to 30	10 to 30	45 to 50
	6.2.2. Rheological characteristics						
	- method 1 (measuring system C4B)						
	6.2.2.1. Viscosity (η)						
	- At 23°C ± 2°C						
	. η_0 (at t = 0)	-	Pa.s	*	*	-	*
	. η_{15} (at t + 15 days)	-	Pa.s	*	*	-	*
	. ratio $\frac{\eta_{15} - \eta_0}{\eta_0}$	-	%	*	*	-	*
	- At 10°C ± 2°C	-	Pa.s	*	*	-	*
	- At 30°C ± 2°C	-	Pa.s	*	*	-	*
	6.2.2.2. Flow limit (f)						
	- At 23°C ± 2°C						
	. f_0 (at t = 0)	-	N/m ²	*	*	-	*
	. f_{15} (at t + 15 days)	-	N/m ²	*	*	-	*
	. ratio $\frac{f_{15} - f_0}{f_0}$	-	%	*	*	-	*
	- At 10°C ± 2°C	-	N/m ²	*	*	-	*
	- At 30°C ± 2°C	-	N/m ²	*	*	-	*

* شرکت ایران خودرو

* معاونت فنی و مهندسی

* آزمایشگاه سازه ها

* There is no requirement but the value must remain in conformity with that of the approved sample. This value may be shown on a "Specification for Product Approval" (see cahier des charges B20 0150 and SPA model on appendix 2).

Note: Numerical references are grouped in appendix 1.

6. CONDITIONS OF IMPLEMENTATION (continued)

DOCU- MENTS	CHARACTERISTICS	SPECIFIC CON- DITIONS	EXPRESSION OF RESULTS	INDEXES			
				Non brushed	brushed	Preformed bead	Hot extruded bead
				A	B	C	D
D55 1089	6.2.3. Consistency with nozzle No. 2 ø3 mm and pressure 5 bars						
	Output (d) - At 23°C ± 2°C . d_0 (at $t = 0$)	-	g/min	*	*	-	-
	. d_{15} (at $t + 15$ days)	-	g/min	*	*	-	-
	ratio $\frac{d_{15} - d_0}{d_0}$	-	%	*	*	-	-
	- At 10°C ± 2°C	-	g/min	.	.	-	-
	- At 30°C ± 2°C	-	g/min	*	*	-	-
D55 1089	6.2.4. Consistency of hot extruded products with nozzle No. 3, Ø 5 mm and pressure 3 bars	(10)					
	- Instantaneous output (d_1) at the reference temperature		g/min	-	-	-	*
	- Instantaneous output (d_0) at the operating temperature		g/min	-	-	-	*
	- Stability with time (output d_1 after the operating temperature has been maintained for 72 h)						
	Loss between d_0 and d_1 $\frac{d_0 - d_1}{d_0} \cdot 100$		%	-	-	-	≤ 20
	- Stability at high temperature output (d_2) after the overheat temperature has been maintained for 24 hours $\frac{d_0 - d_2}{d_0} \cdot 100$		%	-	-	-	≤ 50
D55 1107	6.2.5. Static flow (Block 12 mm)						
	- Sliding	L	mm	0	0	0	0
			L + L'	0	0	0	0
	- Flow	L	mm	≤ 5	≤ 5	-	≤ 5
			L + L'	≤ 10	≤ 10	-	-

* There is no requirement but the value must remain in conformity with that of the approved sample.
This value may be shown on a "Specification for Product Approval" (see cahier des charges B20 0150
and SPA model in appendix 2).

** Good behaviour.

*** No anomalies to report.

Note: Numerical references are grouped in appendix 1.

شرکت ایران خودرو
معاونت فنی و مهندسی
آرشیو فنی مرکز

۱۵۱

6. CONDITIONS OF IMPLEMENTATION (continued)

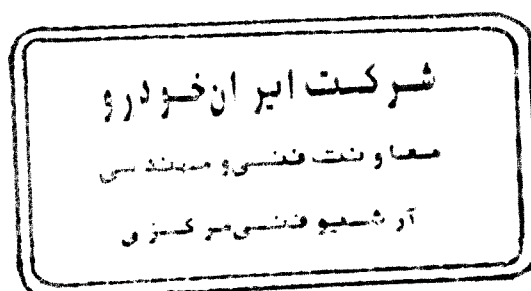
DOCU- MENTS	CHARACTERISTICS	SPECIFIC CON- DITIONS	EXPRESSION OF RESULTS	INDEXES			
				Non brushed	Brushed	Preformed bead	Hot extruded bead
				A	B	C	D
D55 1206	6.2.6. Dynamic flow (S Cam) - Sliding L	-	mm	0	0	0	0
	- flow L	-	mm	≤ 10	≤ 10	0	≤ 10
D45 1105	6.2.7. Stability at high temperature At 220°C	(7)	min.	≥ 50	≥ 50	≥ 50	≥ 50
	At 240°C	(7)	min.	≥ 20	≥ 20	≥ 20	≥ 20
D59 1456	6.2.8. Pollution of the dip bath - Pollutant at 1% (v/v)	-	Note	None	None	None	None
1241	6.2.9. Influence of dip baths	-	Note	None	None	None	None
D59 5145	6.2.10. Behaviour to surface treatments	-	Note	**	**	**	**
	In { immersion	-	%	≤ 5	-	≤ 5	≤ 5
	Spray (test specimen B)	-	Note	***	-	***	***

* There is no requirement but the value must remain in conformity with that of the approved sample. This value may be shown on a "Specification for Product Approval."
(See cahier des charges B20 0150 and SPA model in Appendix 2).

** Good behaviour.

*** No anomalies to report.

Note: Numerical references are grouped in appendix 1.



7. CHARACTERISTICS OF PRODUCT IDENTIFICATION

DOCUMENTS	CHARACTERISTICS	SPECIFIC CONDITIONS	EXPRESSION OF RESULTS	REQUIREMENTS
-	7.1. TYPE OF PRODUCT			*
-	7.2. COLOUR			*
D55 1018	7.3. DENSITY		g/ml	*
D55 1209	7.4. DRY EXTRACT a a - b	With b = 60 min at 200°C	% %	* *
D10 1145	7.5. CONVENTIONAL AMOUNT OF ASH		%	*
D45 1148	7.6. RATE OF ABSORPTION OF WATER	(1)	%	*
D45 1545	7.7. EXTENSIBILITY	(1)		
	- Modulus	at 23°C ± 2°C at 80°C ± 2°C at -40°C ± 2°C	MPa MPa MPa	* * *
	- Elongation	at 23°C ± 2°C at 80°C ± 2°C at -40°C ± 2°C	% % %	* * *
	- Secant modulus	at 23°C ± 2°C at 80°C ± 2°C at -40°C ± 2°C	MPa MPa MPa	* * *
D41 1108	7.8. RESISTANCE TO OVER STOVING AND UNDER STOVING			
	- LOSS OF Δ SUC (overstoving)	(9)	%	*
	- LOSS OF Δ SOC (understoving)	(9)	%	*
	- accepted types of failure	(3)	Note	-

* There is no requirement but the value must remain in conformity with that of the approved sample. This value may be shown on a "Specification for Product Approval" (see cahier des charges B20 0150 and SPA model in appendix 2).

Note: Numerical references are grouped in appendix 1.

شرکت ایران خودرو
معاونت فنی و مهندسی
آرشیو فنی مرکز

۱۰۲

APPENDIX 1 (1/2)

SPECIFIC CONDITIONS

- (1) The stoving cycles are defined in norme B74 0200 PPR stovings.
The compulsory cycles to be used are cycles 1 and 2, if required cycles 3 and 4 according to the conditions of implementation in manufacture.
- (2) In the absence of a thermal enclosure suitable to the tensile test machine, use the following operating mode:
- regulate the thermal enclosure to 83°C,
 - after stabilisation of the temperature, introduce in the enclosure the test specimen as well as a thermal insulator (such as wadding, approximately 20 mm thick),
 - wait for 30 minutes, then remove the test specimen, inserting it into the thermal insulator,
 - fix the test specimen equipped with its insulator to the tensile test machine,
 - apply the tensile 1 minute after removing the test specimen from the enclosure.
- (3) The types of failure accepted before and after ageing are:
- cohesive failure (RC) and cohesive failure on surface (RCS).
- When more than one type of failure occurs, the cohesive failure must be greater than or equal to 50%.
- (4) These tests only apply to preformed beads.
- (5) Production oiled sheet metal
- Steel,
 - Galvanised steel on one or two faces. For the sheet metal galvanised on one face (MONOGAL type), the bonding is carried out on the zinc treated face.
 - Electro zinc plated steel on one or two faces.
- Note:** This specification may also apply to types of substrate other than those defined above provided that they are in conformity with the requirements. Otherwise, it is advisable to consult the appropriate Chemistry Laboratory.
- (6) All the substrates defined in (5) must be degreased and regreased according to méthode d'essai D59 1160 with the operating modes DA and RA.
- (7) These tests are to be carried out only on products containing chlorinated compounds of the type polyvinyl chloride (PVC).
- (8) Apply by gravity, on a substrate of dimensions 120 x 200 mm defined in (5), a preformed bead 150 mm long. After 30 seconds, place the whole on a vertical plane and record the possible run and slip of the bead after 30 minutes.
- (9) Subject the three test specimens which have undergone the stoving cycles 1, 2, 3 and 4 [see (1)], to a tensile-shear strength tests (RTC) according to méthode d'essai D41 1108.

Determine the variation Δ RTC (tensile shear strength) in % according to the following relationships:

$$\Delta \text{ SUC} = \frac{\text{RTC}_2 - \text{RTC}_4}{\text{RTC}_2} \cdot 100$$

$$\Delta \text{ SOC} = \frac{\text{RTC}_1 - \text{RTC}_3}{\text{RTC}_1} \cdot 100$$

where the numerical values of the indexes represent the appropriate numbers of the stoving cycles.

شرکت ایر ان خودرو
معاونت فنی و سنجش
آزمایشگاه فنی مرکزی

۱۵۳

APPENDIX 2 (2/2)

SPA MODEL

DOCUMENTS	CARACTERISTIQUES	EXPRESSION DES RESULTATS	RESULTATS OU VALEURS	
			Min.	Max.
D55 1089	<p>2.2 CONSISTANCE (Buse Ø 3 mm, pression 5 bars)</p> <p>2.2.1. Débit (d)</p> <p>- A 23 °C ± 2 °C</p> <p>. d₀ (à t = 0)</p> <p>. d₁₅ (à t + 15 j)</p> <p>. Rapport $\frac{d_{15} - d_0}{d_0}$</p> <p>- A 10 °C ± 2 °C</p> <p>- A 30 °C ± 2 °C</p>	<p>g/min</p> <p>g/min</p> <p>%</p> <p>g/min</p> <p>g/min</p>		
D41 1108	<p>3 - CARACTERISTIQUES D'USAGE DU PRODUIT POLYMERISE</p> <p>3.1. RESISTANCE AU CISAILEMENT (1)</p> <p>(Avec épaisseur de joint : 2 mm)</p> <p>3.1.1. Contrainte de rupture avec vieillissement à 23 °C ± 2 °C (1)</p>	<p>MPa</p>		
D45 1545	<p>3.2. EXTENSIBILITE</p> <p>Module E {</p> <p>à 23 °C ± 2 °C</p> <p>à 80 °C ± 2 °C</p> <p>à - 40 °C ± 2 °C</p> <p>Allongement {</p> <p>à 23 °C ± 2 °C</p> <p>à 80 °C ± 2 °C</p> <p>à - 40 °C ± 2 °C</p> <p>à la rupture</p> <p>Module sécant {</p> <p>à 23 °C ± 2 °C</p> <p>à 80 °C ± 2 °C</p> <p>à - 40 °C ± 2 °C</p> <p>à 20 %</p> <p>d'allongement</p>	<p>MPa</p> <p>MPa</p> <p>MPa</p> <p>%</p> <p>%</p> <p>%</p> <p>MPa</p> <p>MPa</p> <p>MPa</p>		
D41 1108	<p>3.3. TENUE A LA SURCUSSION ET A LA SOUS-CUISSON</p> <p>Perte de Δ SUC</p> <p>Perte de Δ SOC</p> <p>Faciès de rupture</p>	<p>%</p> <p>%</p> <p>Notation</p>		
	<p>4 - NOTA</p> <p>Toutes les autres caractéristiques du produit doivent satisfaire : Fonction NNN/LETTRE REPERE/norme B14 1425.</p>			
B74 0200	<p>(1) Essais réalisés suivant les cycles 1 et 2 définis dans la norme B74 0200 cuissons PPR.</p>			

شرکت ایران خودرو

معاونت فنی و مهندسی

آرشیو فنی شرکت

۱۵۷

شرکت ایران خودرو
معاونت فنی و مهندسی
آرشیو فنی مرکزی

107

APPENDIX 1 (2/2)

SPECIFIC CONDITIONS (continued)

(10) Consistency of hot extruded products.

The test is carried out with nozzle No. 3, 5 mm diameter, with a pressure of 3 bars.

A - Reference temperature 50°C, instantaneous output.

The product is conditioned in cups then left to rest for 16 hours at 23°C. The cups are then placed in a water-bath at 50°C together with the nozzle and the piston used for the measurement which is carried out as soon as the product has reached the temperature of 50°C. (An extended stay of the product at this temperature results in a change in viscosity). The time elapsed between the removal of the cup from the water-bath and the start of the measurement must be as short as possible (≤ 1 minute).

The measurement is carried out over a duration of 30 seconds which is then taken to 1 minute.

The first two determinations only are to be taken into account, the next ones being in general poorer due to the cooling of the product caused by the cold air intake on the piston.

B - Working temperature 45°C, output in terms of stability with time.

Proceed as indicated in A but at 45°C instead of 50°C.

Carry out two measurements in two separate cups.

- The first measurement gives the instantaneous output: d_0 .
- The second measurement after ageing for 72 hours gives the output: d_1 .

Ageing at 45°C may be carried out by stoving, in this case, when the cup is removed from the oven, place again the cup in the water-bath for stabilisation at 45°C before measurement (the temperature must be taken at the core of the product).

C - Overheat temperature 65°C, output in terms of stability at high temperature.

Carry out a single measurement, output at 45°C after ageing for 24 hours at 65°C to obtain d_2 .

شرکت ایران خودرو
معاونت فنی و مهندسی
آرشیو فنی مرکزی

۱۵۵

APPENDIX 2 (1/2)

SPA MODEL

Fournisseur responsable :

Référence fournisseur :

Exemple d'utilisation :

Désignation normalisée de la matière : "Désignation" Norme B14 0100.

Référence documents normatifs : N° de fonction/Repère du type de conditions de mise en œuvre/B14 1425.

N° de codification du produit :

Référence du document "Hygiène, Sécurité, Pollution" existant :

DOCUMENTS	CARACTERISTIQUES	EXPRESSION DES RESULTATS	RESULTATS OU VALEURS	
			Min.	Max.
D55 1018 D55 1209	1 - CARACTERISTIQUES D'IDENTIFICATION			
	1.1. NATURE DU PRODUIT	-		
	1.2. COULEUR	-		
	1.3. MASSE VOLUMIQUE	g/cm ³		
D10 1145 D45 1148	1.4. EXTRAIT SEC			
	a	%		
	a - b (avec b = 60 min à 200 °C)	%		
D15 5003	1.5. TAUX DE CENDRES CONVENTIONNEL	%		
	1.6. TAUX D'ABSORPTION D'EAU	%		
D15 5003	2 - CARACTERISTIQUES RHEOLOGIQUES			
	2.1. COMPORTEMENTS RHEOLOGIQUES - MODE 1			
	(Système de mesure C4B)			
	2.1.1. Viscosité (η)			
	- A 23 °C \pm 2 °C			
	. η_0 (à t = 0)	Pa.s		
	. η_{15} (à t + 15 j)	Pa.s		
	. rapport $\frac{\eta_{15} - \eta_0}{\eta_0}$	%		
	- A 10 °C \pm 2 °C	Pa.s		
	- A 30 °C \pm 2 °C	Pa.s		
	2.1.2. Limite d'écoulement (f)			
	- A 23 °C \pm 2 °C			
	. f_0 (à t = 0)	N/m ²		
	. f_{15} (à t + 15 j)	N/m ²		
	. rapport $\frac{f_{15} - f_0}{f_0}$	%		
	- A 10 °C \pm 2 °C	N/m ²		
	- A 30 °C \pm 2 °C	N/m ²		

Ce document, ne peut être ni reproduit ni communiqué à d'autres personnes que le fournisseur responsable.

سركت اير ان خوررو
معاونت فني و مهندسي
آر شيو فني و مهندسي

APPENDIX 3

CORRESPONDENCE WITH NORME B14 1400

	Old	New
Document	B14 1400	B14 1425
Function mode	128	132
	130	133

شرکت ایران خودرو
معاونت فنی و مهندسی
آرشیو فنی مرکزی