

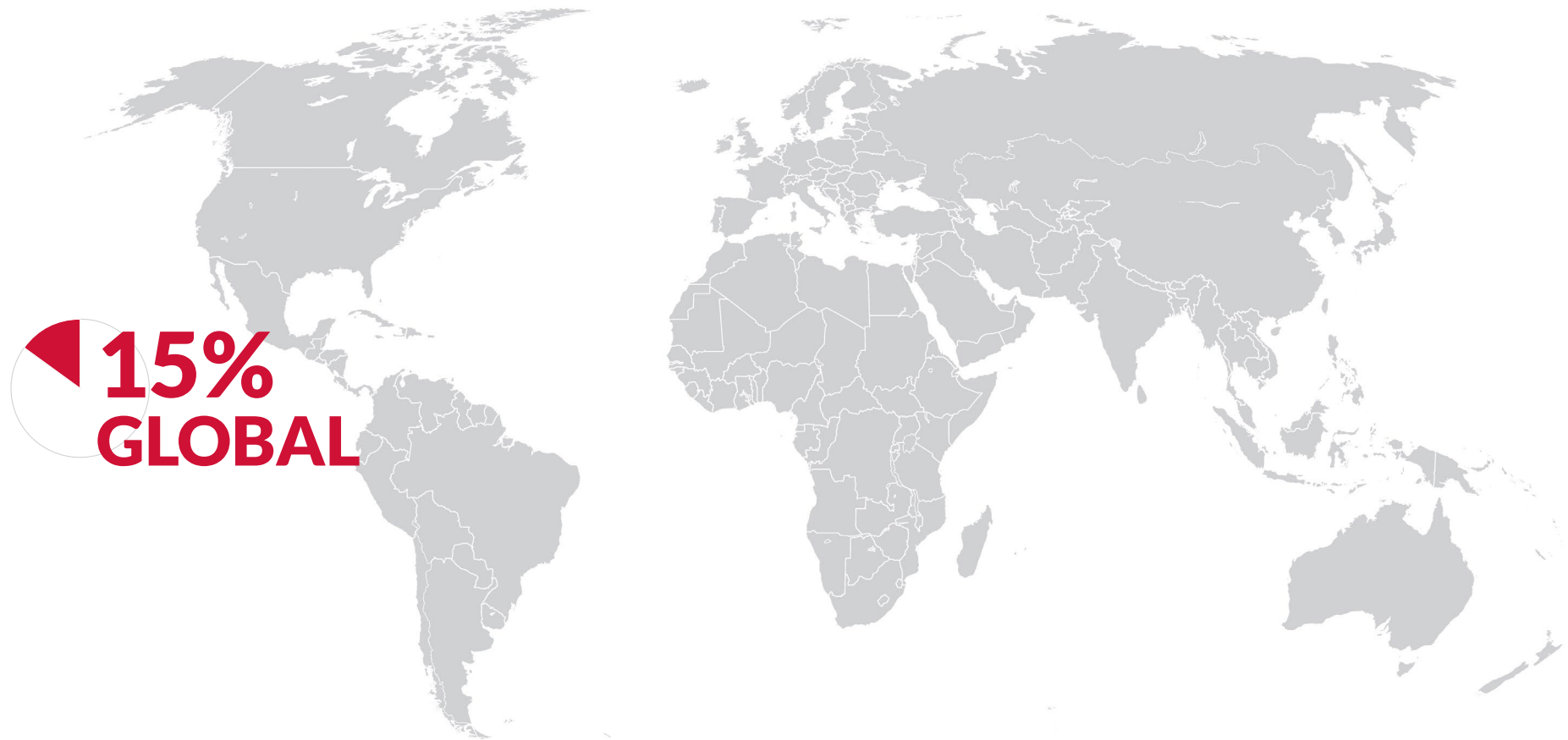
**SCREEN-PRINTABLE
SILVER MATERIAL FOR THE
AUTOMOTIVE GLASS MARKET**

CHIMET'S SALE OF SILVER PASTES

MORE THAN
50%
EUROPEAN

A pie chart with a red segment representing more than 50% of the total, and a white segment representing the remainder.

15%
GLOBAL

A pie chart with a red segment representing 15% of the total, and a white segment representing the remainder.

CONTENTS

- Overview on Chimet Silver Materials
- The 3XXX system
- Laboratory Test

OVERVIEW

OVERVIEW ON CHIMET SILVER MATERIALS FOR THE AUTOMOTIVE GLASS MARKET

3YXX			
LAMINATED GLASSES	BACKLIGHTS		
	Latest development with very low residual weakening on glass	General purpose silver material	Pigmented version for high energy absorption
320X	310X	380X (*)	390X (**)
AG PASTE 3202 85% AG PASTE 3200 80% AG PASTE 3204 70%	AG PASTE 3105 88% AG PASTE 3100 80% AG PASTE 3104 70% AG PASTE 3106 60%	AG PASTE 3805 88% AG PASTE 3802 85% AG PASTE 3800 80% AG PASTE 3804 70% AG PASTE 3801 65% AG PASTE 3806 60% AG PASTE 3803 50%	AG PASTE 3900 80% AG PASTE 3901 65%

(*) Available the very high silver content AG PASTE 3857 92% for special bus bar on laminated only

(**) Available special version with higher black organic pigment contained or higher silver

BACKLIGHTS

CHIMET SILVER MATERIALS FOR BACKLIGHTS

	Latest development with very low residual weakening on glass	General purpose silver material	Pigmented version for high energy absorption
	310X	380X (*)	390X (**)
	AG PASTE 3105 88%	AG PASTE 3805 88%	AG PASTE 3900 80%
	AG PASTE 3100 80%	AG PASTE 3802 85%	AG PASTE 3901 65%
	AG PASTE 3104 70%	AG PASTE 3800 80%	
	AG PASTE 3106 60%	AG PASTE 3804 70%	
		AG PASTE 3801 65%	
		AG PASTE 3806 60%	
		AG PASTE 3803 50%	
WET PASTE PROPERTIES	Rheology	Shear-thinning	Shear-thinning
	Minimum line width, μ	250	250
	Intermixability	YES	YES
	High power member, %	88	88
	Lower power member, %	60	50
	Silver powder	Fine, $d_{50} < 2\mu$	Fine, $d_{50} < 2\mu$
	Glass powder	$\text{Bi}_2\text{O}_3 \bullet \text{B}_2\text{O}_3 \bullet \text{ZnO}$	$\text{Bi}_2\text{O}_3 \bullet \text{B}_2\text{O}_3 \bullet \text{ZnO}$
Pigmented	NO	NO	
SINTERED FILM	Resistivity window, $\mu\Omega \bullet \text{cm}$	2,5 ÷ 3,5	2,5 ÷ 5,0
	Sulphuric acid resistance	> 2h@80°C, 0,1M	> 2h@80°C, 0,1M
	Pull strength	> 20kg	> 20kg
	Residual weakening	Very low	Low
			Acceptable

LAMINATED

CHIMET SILVER MATERIALS FOR LAMINATED

320X

AG PASTE 3202 85%

AG PASTE 3200 80%

AG PASTE 3204 70%

WET PASTE PROPERTIES	Rheology	Shear-thinning	
	Minimum line width, μ	250	
	Intermixability	YES	
	High power member, %	85	
	Lower power member, %	70	
	Silver powder	Fine, $d_{50} < 2\mu$	
	Glass powder	$\text{Bi}_2\text{O}_3 \bullet \text{B}_2\text{O}_3 \bullet \text{ZnO}$	
	Pigmented	NO	
	SINTERED FILM	Resistivity window, $\mu\Omega \bullet \text{cm}$	2,5 ÷ 3,5
		Sulphuric acid resistance	> 2h@80°C, 0,1M
Pull strength		> 20kg	
Residual weakening		Very low	

RESEARCH & DEVELOPMENT

R&D LEVEL SILVER MATERIALS FOR BACKLIGHT

388X

AG PASTE 3882 85%

AG PASTE 3880 80%

AG PASTE 3886 60%

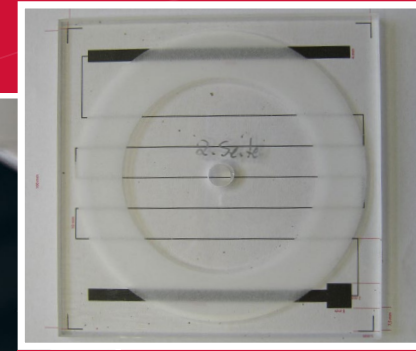
Silver material AG PASTE 388X are developed to offer a cost effective screen printable conductor for backlights - release Q3/Q4

	WET PASTE PROPERTIES	SINTERED FILM
	Rheology	Shear-thinning
	Minimum line width, μ	250
	Intermixability	YES
	High power member, %	85
	Lower power member, %	60
	Silver powder	Fine, $d_{50} < 4\mu$
	Glass powder	$\text{Bi}_2\text{O}_3 \bullet \text{B}_2\text{O}_3 \bullet \text{ZnO}$
	Pigmented	NO
	Resistivity window, $\mu\Omega \bullet \text{cm}$	2,5 ÷ 4,0
	Sulphuric acid resistance	> 2h@80°C, 0,1M
	Pull strength	> 20kg
	Residual weakening	Low

LABORATORY

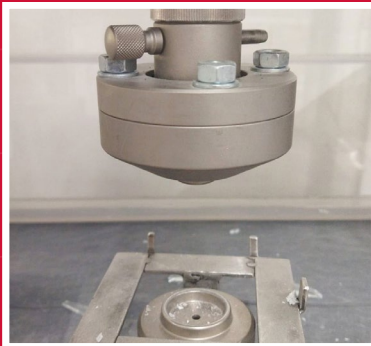


HIGH CHEMICAL RESISTANCE



HIGH ABRASION RESISTANCE

LOW RESIDUAL STRESS



HIGH SCRATCH RESISTANCE



At our site in Vicinaggio (centre of Italy near Florence) we have a comprehensive equipped R&D, printing and testing laboratories:

- Development and formulation of silver materials
- Screen printing and firing of silver material in combination with different black ceramics and T, t conditions
- Characterization of fired material, chemical and mechanical characterization including SEM investigations
- Accelerated ageing tests

www.chimet.com