

## **Rheology Seminar**

May, 22-23, 2019, Politecnico di Milano Dipartimento CMIC "Giulio Natta" Piazza Leonardo da Vinci 32 Milano - Edificio 6-Sala conferenze Giulio Natta

## Program Day 1

Rheology theory: viscosity and flow behaviorIntroduction: rheology, viscoelastic behavior9:300Simple viscosity test methods: finger test etc., flow cups, capilary and failing ball viscometers, notational tests using relative and absolute measuring systems, concentric cylinders, coneplate, parallel plates08:30Definition of terms: shear stress, shear rate, (shear) viscosity, Newtor's viscosity law Rotational tests: controlled shear rate (CSR), controlled shear stress (CSS), application diagrams with examples of industrial users10:30COFFEE BREAK10:45Group 1 Hands-on session - Group 2 Continued: rheology theory - Group 1 Continued: rheology theory - Group 2 LuNCH12:30LUNCH13:30Group 1 Continued: rheology theory - Shear thickening (dilatant) flow behavior - Shear thickening (dilatant) flow behavior - Shear thickening (dilatant) flow behavior - Shear thickening (dilatant) flow behavior; - Shear thickening (dilatant) flow behavior; heating, cooling, hardening15:00Time-dependent flow behavior; heating, cooling, hardening16:15Application discussion17:00End	09:00	REGISTRATION AND INTRODUCTION	English language, by Thomas Mezger. Price includes: Rheo Book "Applied Rheology" by Thomas Mezger, coffee, lunches, dinner 2 days course:	
10:30COFFEE BREAK10:45for 2 groups - Group 2 Continued: rheology theory10:45- Group 2 Continued: rheology theory12:30LUNCH13:30- Group 1 Continued: rheology theory - Group 2 Hands-on session14:45COFFEE BREAK14:45COFFEE BREAK15:00- Time-dependent flow behavior - Shear thickening (dilatant) flow behavior: - Yield point, different test conditions and analysis Methods - Time-dependent flow behavior: heating, cooling, hardeningTo register, please send an email to16:15Application discussion- Contact Name & Surname - Company - Email address	09:30	<ul> <li>Introduction: rheology, viscoelastic behavior</li> <li>Simple viscosity test methods: finger test etc., flow cups, capillary and falling ball viscometers, rotational tests using relative and absolute measuring systems, concentric cylinders, coneplate, parallel plates</li> <li>Definition of terms: shear stress, shear rate, (shear) viscosity, Newton's viscosity law</li> <li>Rotational tests: controlled shear rate (CSR), controlled shear stress (CSS), application diagrams with examples of industrial users</li> <li>Ideally viscous (Newtonian) flow behavior</li> <li>Shear-thinning (pseudoplastic) flow behavior, zeroshear</li> </ul>		
10:45- Group 1 Hands-on session - Group 2 Continued: rheology theory1 day course: (excluding dinner)12:30LUNCHEuro 600.0013:30- Group 1 Continued: rheology theory - Group 2 Hands-on sessionEuro 600.0014:45COFFEE BREAK14:45COFFEE BREAK15:00- Time-dependent flow behavior: - Shear thickening (dilatant) flow behavior: structure break and recovery, thixotropic behavior, curing - Temperature-dependent flow behavior: heating, cooling, hardeningTo register, please send an email to16:15Application discussion- Contact Name & Surname - Company - Email address	10:30	COFFEE BREAK		
12:00       Editorit         13:30       for 2 groups         13:30       Group 1 Continued: rheology theory         Group 2 Hands-on session       Group 2 Hands-on session         14:45       COFFEE BREAK         15:00       Shear thickening (dilatant) flow behavior         Yield point, different test conditions and analysis Methods         Time-dependent flow behavior: structure break and recovery, thixotropic behavior, curing         Temperature-dependent flow behavior: heating, cooling, hardening         16:15       Application discussion         17:00       End         00.00       Dit MEE	10:45	- Group 1 Hands-on session	-	
<ul> <li>13:30 - Group 1 Continued: rheology theory - Group 2 Hands-on session</li> <li>14:45 COFFEE BREAK</li> <li>14:45 Continued rheology theory: viscosity and flow behavior - Shear thickening (dilatant) flow behavior - Yield point, different test conditions and analysis Methods</li> <li>15:00 - Time-dependent flow behavior: structure break and recovery, thixotropic behavior, curing - Temperature-dependent flow behavior: heating, cooling, hardening</li> <li>16:15 Application discussion</li> <li>16:15 End</li> <li>20:00 End</li> <li>20:00 End</li> </ul>	12:30	LUNCH	Euro 600.00	
<ul> <li>Continued rheology theory: viscosity and flow behavior</li> <li>Shear thickening (dilatant) flow behavior</li> <li>Yield point, different test conditions and analysis Methods</li> <li>Time-dependent flow behavior: structure break and recovery, thixotropic behavior, curing</li> <li>Temperature-dependent flow behavior: heating, cooling, hardening</li> <li>Tention discussion</li> <li>Application discussion</li> <li>End</li> </ul> To register, please send an email to Info.it@anton-paar.com with the following details: <ul> <li>Contact Name &amp; Surname</li> <li>Company</li> <li>Email address</li> </ul>	13:30	- Group 1 Continued: rheology theory		
<ul> <li>Shear thickening (dilatant) flow behavior</li> <li>Yield point, different test conditions and analysis Methods</li> <li>Time-dependent flow behavior: structure break and recovery, thixotropic behavior, curing</li> <li>Temperature-dependent flow behavior: heating, cooling, hardening</li> <li>Tenzerature-dependent flow behavior: heating, cooling, hardening</li> <li>Application discussion</li> <li>End</li> <li>Dentity ED</li> </ul>	14:45	COFFEE BREAK		
16:15Application discussion-Contact Name & Surname17:00End-Company-Email address	15:00	<ul> <li>Shear thickening (dilatant) flow behavior</li> <li>Yield point, different test conditions and analysis Methods</li> <li>Time-dependent flow behavior: structure break and recovery, thixotropic behavior, curing</li> <li>Temperature-dependent flow behavior: heating, cooling,</li> </ul>	email to info.it@anton-paar.com	
17:00     End     -     Company       -     Email address	16:15		-	
			- Email address	
	20:00	DINNER		



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Program I	Day	2
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	09:00	<ul> <li>Rheology theory: viscosity and flow behavior</li> <li>Introduction: viscoelastic behavior</li> <li>Definition of terms: (shear) strain or deformation, shear modulus, Hooke's elasticity law, Young's modulus, Poisson's</li> </ul>	Early bird registration, (December 20th, 2018)
		<ul> <li>ratio, strain rate (shear rate)</li> <li>Ideally elastic deformation behavior</li> <li>Oscillatory tests: introduction, definition of the terms: Storage and loss modulus, loss or damping factor, vector diagram, application diagrams with examples of industrial users</li> <li>Amplitude sweep: linear viscoelastic (LVE) range</li> </ul>	<b>Price includes:</b> Rheo Book "Applied Rheology" by Thomas Mezger, coffee, lunches, dinner
	10:30	COFFEE BREAK	2 days course:
	10:45	for 2 groups - Group 1 Hands-on session - Group 2 Continued: rheology theory	May 22-23, 2019 all inclusive: (dinner) Euro 1100.00
	12:30	LUNCH	
	13:30	for 2 groups - Group 1 Continued: rheology theory - Group 2 Hands-on session	1 day course: (excluding dinner) Euro 500.00
	14:45	COFFEE BREAK	
-		<ul> <li>Continued rheology theory: elasticity and viscoelastic behavior</li> <li>Frequency sweep: unlinked polymers and curve crossover point, complex viscosity; crosslinked polymers; dispersions</li> </ul>	
	15:00	<ul> <li>and gels: storage stability</li> <li>Time-dependent viscoelastic behavior: Structure break and recovery, thixotropic behavior, curing</li> <li>Temperature-dependent viscoelastic behavior (DMTA):</li> </ul>	To register, please send an email to
		<ul> <li>Melting, glass transition; crystallization; gel formation, sol/gel transition; hardening, curing</li> <li>Solid torsion bar tests</li> </ul>	info.it@anton-paar.com with the following details: - Contact Name & Surname
	16:00	Application discussion	- Company
	18:00	END	- Email address
			- Contact Number