Hemostasis Innovation is Here.

HEMOSIL®
D-DIMER

Simple, proven, and efficient

For the exclusion of deep venous thrombosis and pulmonary embolism



werfen

D-dimer
in clinical practice

In the diagnosis of DVT and PE

Diagnosis of venous thromboembolism (VTE), which includes deep venous thrombosis (DVT) and pulmonary embolism (PE), often begins with a clinical evaluation, followed by D-dimer testing. Confirmatory tests generally involve imaging techniques. For DVT, these are proximal lower extremity or whole-leg ultrasound. For PE, imaging tests are computed tomography pulmonary angiography (CTPA) or ventilation-perfusion (VQ) scan.

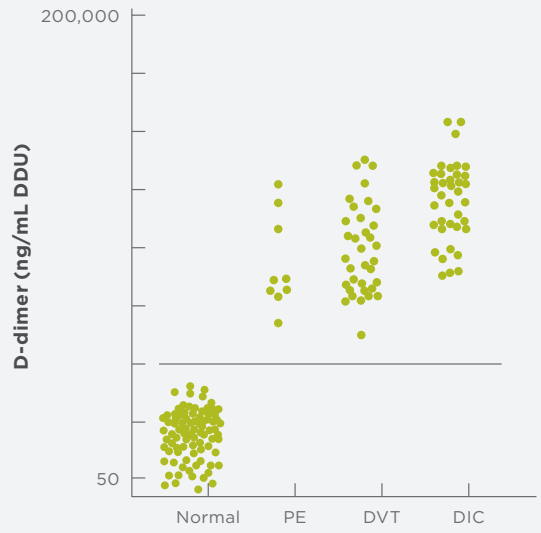
A substantial number of publications report the use of D-dimer, together with a pre-test probability (PTP) assessment model or score, as a safe, cost-effective management strategy for the evaluation of patients presenting with clinically-suspected VTE. This approach allows DVT and/or PE to be excluded in outpatients with suspected VTE who have a low or moderate PTP and a negative D-dimer, reducing the number of imaging tests required.[1-3]

Other clinical applications

D-dimer testing has been evaluated in a number of clinical applications, such as predictive factors, for recurrences of VTE after discontinuation of oral anticoagulant therapy and as an indicator of pregnancy complications.[4,5] D-dimer testing is also included in definitions of clinical laboratory criteria for the diagnosis and staging of disseminated intravascular coagulation (DIC).[6,7] Other studies suggest that elevated D-dimer levels in the normal population may indicate the risk for thrombosis.[8]

Further, D-dimer levels rise with age[2] and age-adjusted cut-off values for VTE exclusion have been shown to increase specificity and reduce the number of unnecessary imaging studies in patient populations greater than 50 years.[9-12]

D-dimer levels in VTE and DIC patient groups vs. normal subjects*



In patients with PE, DVT, and DIC, D-dimer levels are greater than the establish cut-off value or reference range.

*Data on file, Werfen.

HemosIL D-Dimer

HemosIL D-Dimer is a fully automated, latex-enhanced immunoassay for the exclusion of VTE in outpatients suspected of DVT and PE, in conjunction with a clinical PTP assessment model. It quantitatively determines the amount of D-dimer in human citrated plasma across Werfen Hemostasis systems.

The latex reagent is a suspension of polystyrene latex particles of uniform size, coated with a monoclonal antibody highly specific for the D-dimer domain included in fibrin degradation products or derivatives.

Saves time and resources

Optimizes laboratory workload

- Fully automated
- Same cut-off for the exclusion of DVT and PE across Werfen Hemostasis systems

Provides rapid patient response

- Results in <7 minutes

Enhances patient care

Cleared by regulatory authorities for the exclusion of VTE with superior accuracy and precision

- Excellent negative predictive value (NPV)
  - 100% for DVT and PE on ACL TOP® Family/ACL TOP Family 50 Series systems
  - 100% for DVT and 99.1% for PE on ACL Elite® systems
- Lower 95% CI limit <95% for NPV of low and moderate PTP group
- In conjunction with a PTP score, excludes DVT and PE using a cut-off value of 230 ng/mL DDU

HemosIL D-Dimer, with a PTP score, safely excludes DVT and PE

Using a cut-off of 230 ng/mL DDU, HemosIL D-Dimer successfully excluded DVT and PE in more than 900 patients (two clinical studies) with an NPV of 100% and sensitivity of 100%.

Single-center management study

		ACL TOP*	ACL Elite/ Elite Pro
VTE	Samples (n)	294	297
	NPV (%)	100	100
	Specificity (%)	36	38

Multicenter management study

		ACL TOP	ACL Elite
DVT	Samples (n)	302	298
	NPV (%)	100	100
	Specificity (%)	41.6	33.8

		ACL TOP	ACL Elite
PE	Samples (n)	330	331
	NPV (%)	100	99.1
	Specificity (%)	29.3	41.3

*ACL TOP = ACL TOP Family and ACL TOP Family 50 Series.

For more detail, see management studies section on next page.

VTE management studies with HemosIL D-Dimer

Single-center outcome study

Enhancing diagnosis of DVT and PE

An outcome study was performed on approximately 300 samples from patients suspected of PE or DVT (26% frequency of VTE).

Positive results were confirmed through standard imaging techniques. Results, shown below, are based on a cut-off value of 230 ng/mL DDU.

VTE Performance	HemosIL D-Dimer on ACL TOP*	HemosIL D-Dimer on ACL Elite/ Elite Pro
Samples (n)	294	297
Sensitivity (%) (95% CI)	**100** (95.1–100)	**100** (95.2–100)
Specificity (%) (95% CI)	**36** (29.6–42.6)	**38** (31.4–44.6)
NPV (%) (95% CI)	**100** (95.4–100)	**100** (95.7–100)

Multicenter management study

Excluding DVT and PE

A multicenter management study was performed at four hospitals with samples from patients suspected of PE and DVT. Patient management was based on a study-specific diagnostic algorithm involving PTP scoring. Patients with DVT and/or PE were confirmed through standard imaging techniques.

Patients with negative results completed a three-month follow-up. Results, shown below, are based on a cut-off value of 230 ng/mL DDU.

	DVT Performance			PE Performance		
ACL TOP	**All samples**	**High PTP**	**Low + moderate PTP**	**All samples**	**High PTP**	**Low + moderate PTP**
Samples (n)	302	53	249	330	24	306
Sensitivity (%) (95% CI)	**100** (59/59) (93.9–100)	**100** (27/27) (87.2–100)	**100** (32/32) (89.1–100)	**100** (50/50) (92.9–100)	**100** (7/7) (59.0–100)	**100** (43/43) (91.8–100)
Specificity (%) (95% CI)	**41.6** (101/243) (35.3–48.0)	**34.6** (9/26) (17.2–55.7)	**42.4** (92/217) (35.7–49.3)	**29.3** (82/280) (24.0–35.0)	**17.6** (3/17) (3.8–43.4)	**30.0** (79/263) (24.6–36.0)
NPV (%) (95% CI)	**100** (101/101) (96.4–100)	**100** (9/9) (66.4–100)	**100** (92/92) (96.1–100)	**100** (82/82) (95.6–100)	**100** (3/3) (29.2–100)	**100** (79/79) (95.4–100)

	DVT Performance			PE Performance		
ACL Elite	**All samples**	**High PTP**	**Low + moderate PTP**	**All samples**	**High PTP**	**Low + moderate PTP**
Samples (n)	289	54	244	331	25	306
Sensitivity (%) (95% CI)	**100** (61/61) (94.1–100)	**100** (29/29) (88.1–100)	**100** (32/32) (89.1–100)	**98.0** (49/50) (89.4–99.9)	**100** (8/8) (63.1–100)	**97.6** (41/42) (87.4–99.9)
Specificity (%) (95% CI)	**33.8** (80/237) (27.8–40.2)	**24.0** (6/25) (9.4–45.1)	**34.9** (74/212) (28.5–41.7)	**41.3** (116/281) (35.5–47.3)	**41.2** (7/17) (18.4–67.1)	**41.3** (109/264) (35.3–47.5)
NPV (%) (95% CI)	**100** (80/80) (95.5–100)	**100** (6/6) (54.1–100)	**100** (74/74) (95.1–100)	**99.1** (116/117) (95.3–100)	**100** (7/7) (59.0–100)	**99.1** (109/110) (95.0–100)

*ACL TOP = ACL TOP Family Series and ACL TOP Family 50 Series.

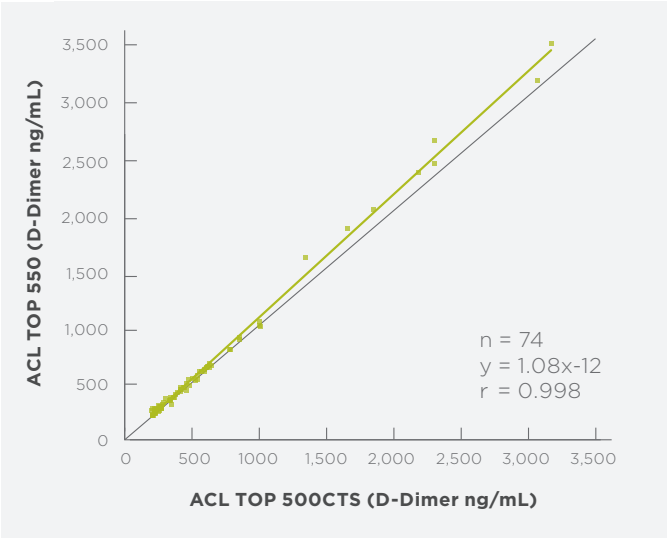
Analytical performance on Werfen Hemostasis Systems

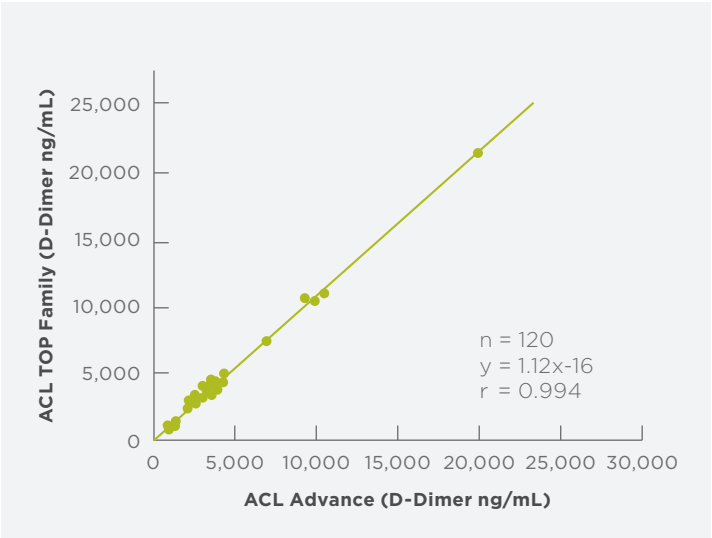
Linearity	Up to 1,050 ng/mL DDU without rerun Up to 5,250 ng/mL DDU with automated rerun		
Precision	**ACL Elite/Elite Pro**	**Mean (ng/mL DDU)**	**CV% (Total)**
	D-Dimer Plasma Pool	246	11.7
	Low D-Dimer Control	252	10.9
	High D-Dimer Control	668	3.8
	ACL TOP Family		
	D-Dimer Plasma Pool	282	9.0
	Low D-Dimer Control	340	7.7
	High D-Dimer Control	729	4.5
	ACL TOP Family 50 Series		
	D-Dimer Plasma Pool	149	10.5
	Low D-Dimer Control	328	5.6
	High D-Dimer Control	659	3.2
Detection Limit	**ACL Elite/Elite Pro**	140 ng/mL DDU	
	ACL TOP Family/ACL TOP Family 50 Series	69 ng/mL DDU	
Interferences	**ACL Elite/Elite Pro** *None up to*:	**ACL TOP Family/ACL TOP Family 50 Series** *None up to*:	
Hemoglobin	50 mg/dL	100 mg/dL	
Bilirubin	5 mg/dL	10 mg/dL	
Triglycerides	1,000 mg/dL	1,500 mg/dL	
Stability of Reconstituted Reagent	1 month at 2–8˚C 3 days at 15–25˚C, 1 month at 2–8˚C, 2 months at -20˚C		
Onboard Stability	**ACL Elite/Elite Pro**	**ACL TOP Family/ACL TOP Family 50 Series**	
Latex Reagent	1 day at 15˚C	2 days at 15˚C	
Reaction Buffer	1 day at 15–25˚C	2 days at 15˚C	

Method comparison

Excellent correlation

A comparison study of HemosIL D-Dimer on ACL TOP Family vs. ACL Advance, and on ACL TOP Family vs. ACL TOP Family 50 Series, using samples from outpatients suspected of VTE, demonstrated excellent correlation and slope.





HemosIL D-Dimer Kit Composition

Product	Part Number	Kit Configuration
D-Dimer	0020008500	4 x 3 mL Latex Reagent (lyo) 4 x 9 mL Reaction Buffer (liq) 2 x 1 mL Calibrator (lyo)
D-Dimer Controls*	0020013000	5 x 1 mL Level 1 D-Dimer Control (liq) 5 x 1 mL Level 2 D-Dimer Control (liq)
D-Dimer Controls*	0022660030	5 x 1 mL Level 1 D-Dimer Control (liq) 5 x 1 mL Level 2 D-Dimer Control (liq)

*Not available in all countries.

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