



# Dosimetry Definitions

Dosimeters monitor external radiation exposure and provide a record of your occupational dose. Dosimeters use filters to measure dose at different depths in the human body. These are illustrated in the dose report as Deep Dose Equivalent (DDE), Lens Dose Equivalent (LDE), Shallow Dose Equivalent, and Shallow Dose Equivalent Extremity (SDEM). When users wear lead, the dosimeter is worn on the outside of the lead and the dose is calculated rather than measured. Fetal dosimeters are issued to declared pregnant workers, but the gestational dose is conservatively calculated from the collar dosimeters. The ALARA program at UW is designed to keep doses As Low as Reasonably Achievable.

## Four Types of Dose Readings

### Personnel Dosimeters

Name	Participant #	November 2020			
		DDE	LDE	SDE	SDEM

- 1) **DDE** – Deep Dose Equivalent applies to external whole-body exposure at a disuse depth of 1 cm (1,000 mg/cm<sup>2</sup>)
- 2) **LDE** – Lens Dose Equivalent applies to the external exposure of the lens of the eye at a tissue depth of 0.3 cm (300 mg/cm<sup>2</sup>)
- 3) **SDE** – Shallow Dose Equivalent applies to the external exposure of the skin at a tissue depth of 0.007 cm (7mg/cm<sup>2</sup>) averaged over an area of one square centimeter.
- 4) **SDEM** – Shallow Dose Equivalent Extremity measures the same depth as SDE (0.007 cm), but is measured using a ring dosimeter and represents extremity dose.

## EDE2 Lead Calculation

Some users wear lead while using radiation. Since the dosimeter is worn on the outside of lead, the dose to the individual is calculated instead of read directly from the dosimeter. This calculation is already performed on the dose you see in your dose report.

## Fetal Dosimeters and Fetal Dose

Fetal dosimeters are issued to declared pregnant radiation workers. They are worn in the center of the body, near the fetus. Because fetal dosimeters are issued at a later time than the date of conception, the collar dosimeter (and EDE2 calculation, if applicable) is used as a conservative estimate to measure the total gestational dose.

Period Begin	Period End	Collar (mrem)	Fetal (mrem)	
7/1/2020	7/31/2020	9		
8/1/2020	8/31/2020	9	0	
9/1/2020	9/30/2020	2	0	
10/1/2020	10/31/2020	8	Unused	N/A

Total Dose for Gestation Period: 28 mrem

Fetal Exposure Limit: 500 mrem

Percent of Exposure Limit: 6 %

## ALARA Program

ALARA stands for As Low as Reasonably Achievable. In practice, it means UW Radiation Safety monitors dosimetry results and investigates anyone that that exceeds ALARA 2 doses, and evaluates doses above ALARA 1 levels.

Dose Type	ALARA Level 1 (mrem)	ALARA Level 2 (mrem)
DDE	125	375
LDE	375	1125
SDE	1875	5625
SDEM	1250	3750